

DECEMBER 1995/\$3

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

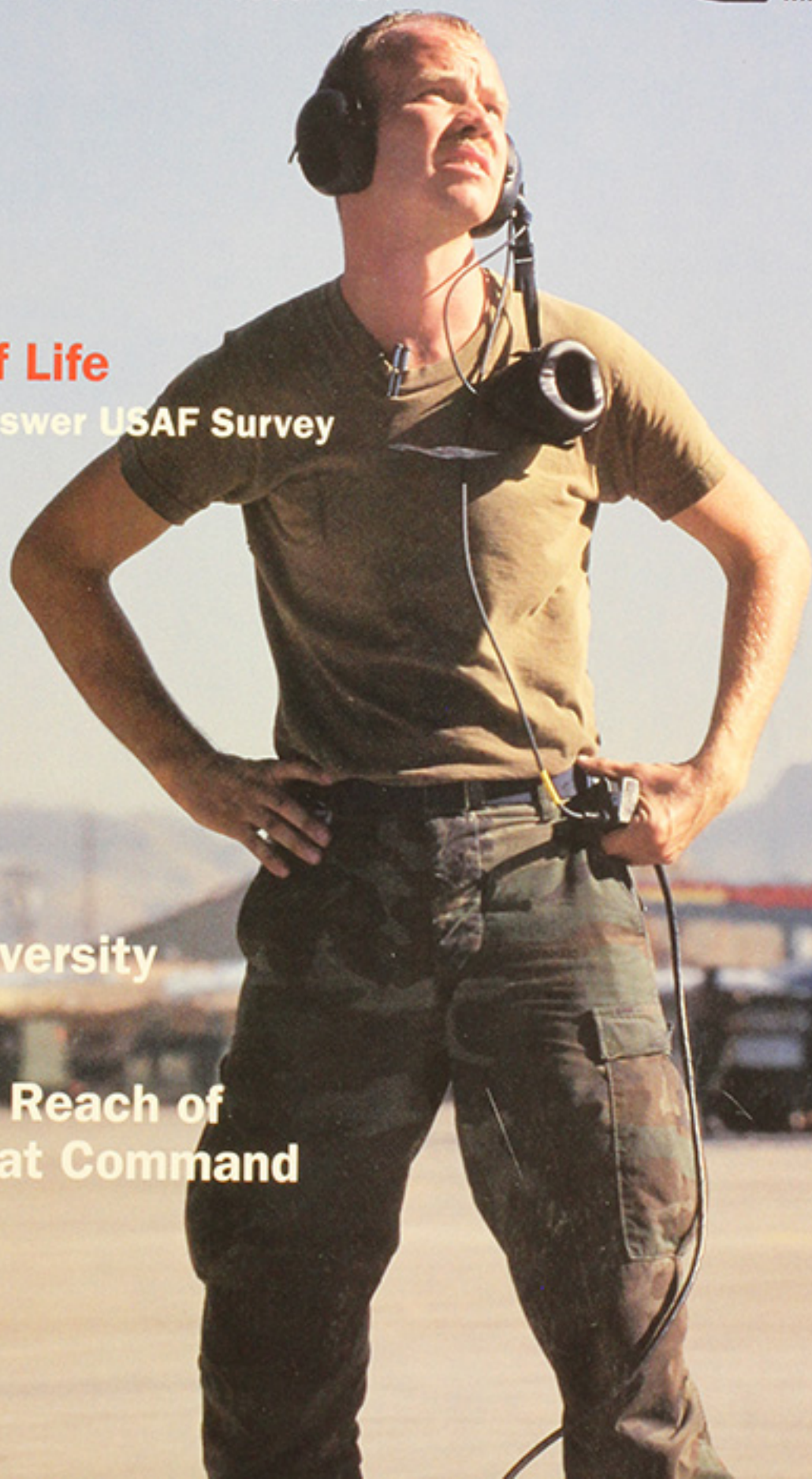
MAGAZINE

Quality of Life

356,409 Answer USAF Survey

BUFF University

The Long Reach of
Air Combat Command



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Oct. 20, 1995. Lockheed Martin Aeronautical Systems and the U.S. Air Force rolled out the C-130J Hercules, the most advanced and cost-effective tactical airlifter ever produced. The C-130J boasts state-of-the-art digital avionics. Flies higher and farther than previous versions. Requires less runway for takeoffs and landings. Employs mission computers for more accurate airdrops. And offers significant cost savings over a 30-year lifespan. The C-130J. Built by the world's leading military aircraft manufacturer. Ready to serve the Air Force well into the next century.

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MAGAZINE

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About the cover: F-111 crew chief SSgt. Michael Flanary, 27th Fighter Wing, Cannon AFB, N. M., was one of more than 350,000 respondents to USAF's Quality-of-Life survey. See "The Quality of Military Life," p. 30. Photo by Paul Kennedy.



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By John T. Correll, Editor in Chief

Percentages of Reality

THE headline in *The Bulletin of the Atomic Scientists* asks, "So Where's the Peace Dividend?" The leadoff text block declares flatly that "the Soviet Union is gone, but high defense spending continues." Mike Moore, editor of the *Bulletin*, is unimpressed with the "modest" reductions to defense and says that "military expenditures have not fallen at the pace one would expect." He warns that defense spending "may yet suck the life out of the economy."

Does Mr. Moore understand that the Pentagon budget is about forty percent below its Cold War peak? That military aircraft procurement is down by eighty-nine percent since 1980? Does he know that defense will consume just 3.8 percent of the Gross Domestic Product this year, compared with about twelve percent in the 1950s? How does he figure that military spending, projected at 2.8 percent of GDP by the turn of the century, will suck the life out of the economy?

Unfortunately, others share Mr. Moore's misconception, and his arguments reflect a theme that is growing in popularity. Writing in the *Baltimore Sun*, for example, Karen M. Paget says that "all talk of a peace dividend has evaporated" and complains that the defense budget has been given "immunity" instead of being cut. The subtitle on a *Newsday* editorial says that "Defense Over-spending Hurts Everything Else." Michael E. Ruane of the Philadelphia *Inquirer* claims the government is "lavishing" money on the Pentagon while "slashing spending almost everywhere else."

Back of this outlash, of course, is the fear that the 104th Congress will carry out its intention to cut federal expenditures ruthlessly in order to balance the budget. All sorts of spending programs are in peril, and their supporters hope to save them by having the reductions fall on defense instead. If possible, they would also like to gain a bit in the exchange.

Mr. Moore of *The Bulletin of the Atomic Scientists* talks of "diverting at least a few billion dollars each

year" from military accounts to "repairing the nation's tattered infrastructure." *Newsday's* heart lies with "worthy programs such as Medicaid or Head Start." Ms. Paget says that "welfare and homeless programs, food and nutrition programs" have suffered because the politicians have been too easy on defense.

Defense cuts are only part of what they seek. In August, the Senate rejected, 63-37, an attempt by Sen. Dale Bumpers (D-Ark.) to tear down the budget "fire wall" recently re-

There is a long tradition of blaming defense for the nation's economic problems. The old arguments are back again as pressure mounts on spending programs.

established by this year's budget resolution. The fire wall provisions say that money gained from defense cuts can be used to reduce the deficit but cannot be spent on such non-defense programs as environmental protection and food stamps.

There is a long tradition of blaming defense for the nation's economic problems. The general trend of the past fifty years, however, is that the defense budget has become less of a burden, both in relation to the overall economy and to other categories of federal spending. As events unfold, it is useful to remember how we reached this point in our fiscal affairs.

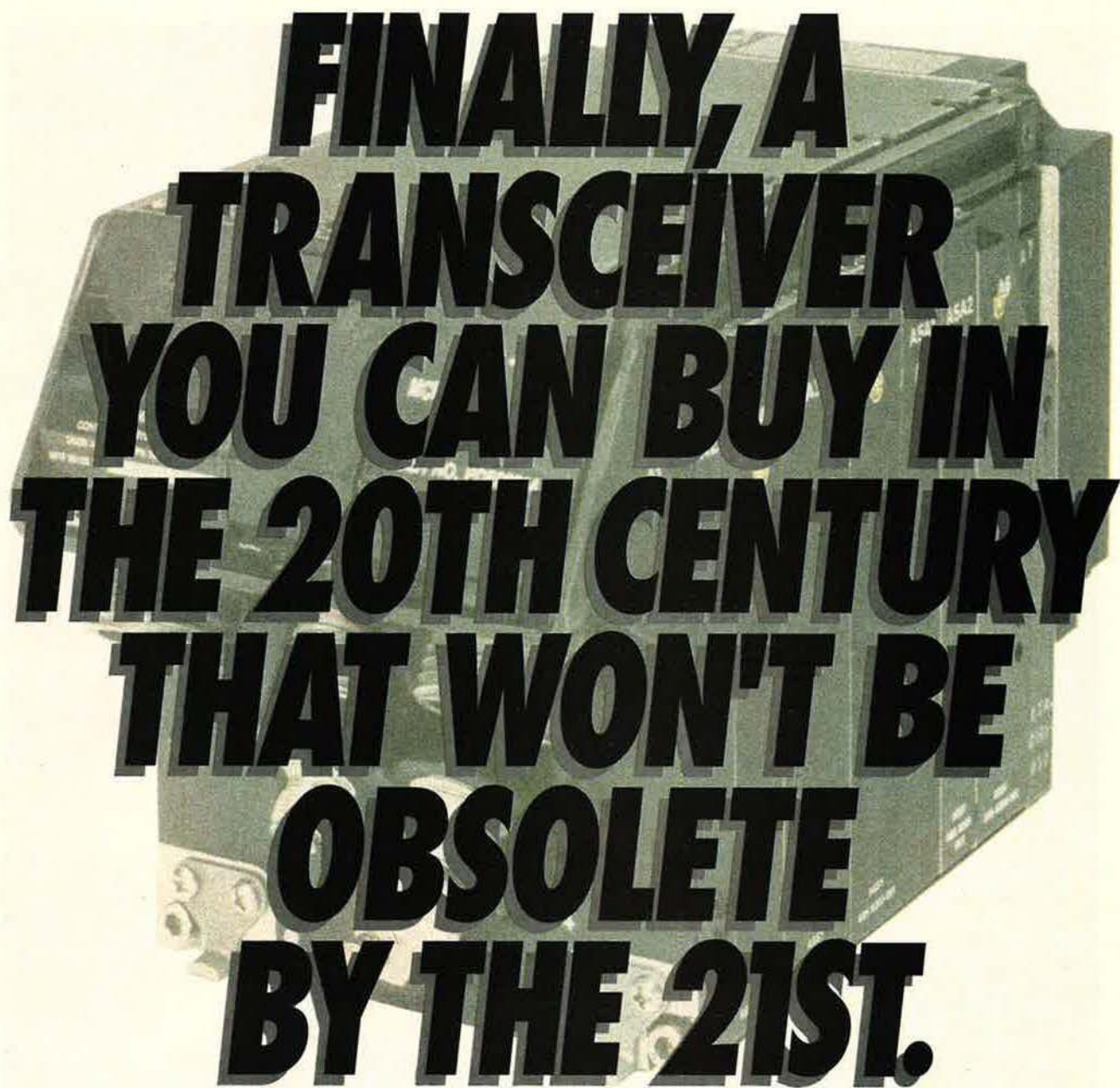
The last time the federal budget was balanced was 1969. Defense outlays that year were 8.9 percent of GDP. Never in the twenty-six straight deficit years that followed did they reach that level again, although total outlays as a percentage of GDP did rise. At the peak of

the Reagan defense recovery, defense was 6.5 percent of GDP. Contrary to myth, defense never drove the federal deficit.

Defense reductions began in 1986, but the big drop came after the Warsaw Pact and the Soviet Union collapsed. The Bush Administration moved to reduce the defense budget by another thirty percent. That, on top of the earlier savings, set up a peace dividend of some magnitude, although the effect was offset by increased spending in nondefense programs. Soon after coming to office—and before doing any appreciable analysis of the feasibility—the Clinton Administration announced massive new budget cuts. The notorious "Bottom-Up Review" of 1993 was an attempt to work it out, but the Administration never quite managed to make ends meet. As a result, the Pentagon operated with a rolling shortfall. In December 1994, President Clinton bowed to reality and requested more money for defense. The prevailing mood of the new Congress, however, was that the Administration had cut defense too much and that further adjustments are necessary.

Nobody we know believes that the defense budget is above criticism, but it contributes nothing to the debate to make wild assertions such as the claim that the economic peace dividend didn't amount to much. For those who believe otherwise, we recommend some study time with *Historical Tables, Budget of the United States Government, Fiscal Year 1996*, available from the Government Printing Office.

Among the facts they will find there are that in the 1950s, defense reached the level of 69.5 percent of federal outlays; that in the 1960s, the lowest level for defense was 42.8 percent of total outlays; and that at the peak of the Reagan defense recovery, defense accounted for 28.1 percent of federal outlays. By the current projection, the defense share of total outlays in Fiscal Year 2000 will be 14.1 percent. Those who cannot see the peace dividend are not looking very hard. ■



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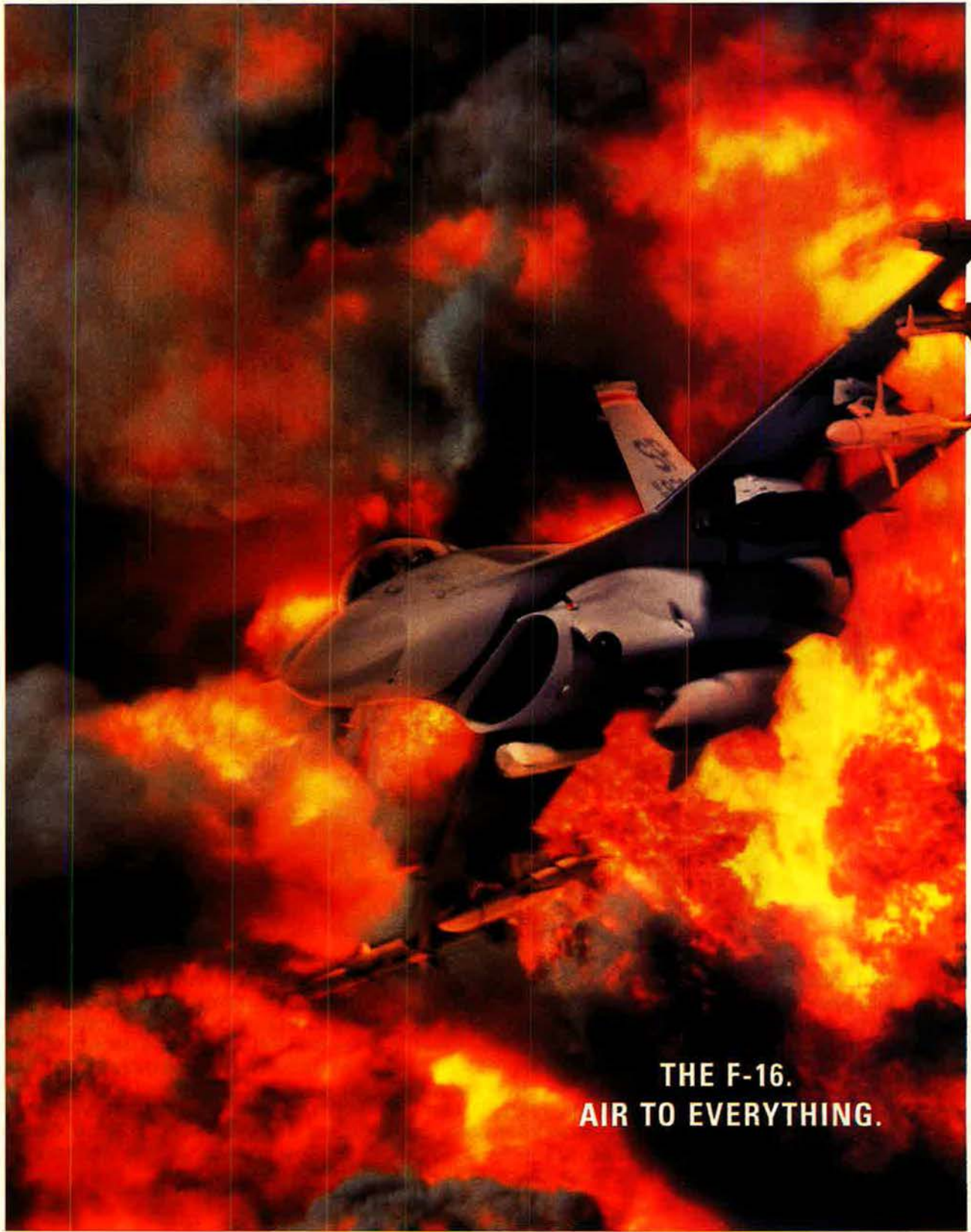
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Letters

BUFFs in the 1960s

Lt. Gen. Stephen B. Croker does a disservice in "Heavyweights for the New Strategy" [October 1995, p. 24] when he says that bomber crews are "better prepared" today than they were before the stand-down from nuclear alert. In the early 1960s, B-52 crews accomplished long overwater and polar navigation stints during Chrome Dome and similar airborne alert sorties when the political environment dictated that thermonuclear weapons could not be flown over Canadian territory. The overwater/overice navigation was precise, using less accurate equipment than is available to today's navigators, who routinely use the Global Positioning System or inertial navigation system.

We flew twenty-four-hour missions, accomplishing celestial/grid navigation using a sextant rather than a computer-assisted astrotracker. We were proficient enough to fly these tedious missions after coming off a seven-day alert tour. The only training we didn't get was low-level. But we got our share of that during "local" missions.

Landing a B-52 in Iceland is not necessarily the accomplishment that General Croker describes. Keflavik is not some remote strip with a turf runway. Post-recovery plans in the SIOF of the 1960s had BUFF strike crews landing at meaner and leaner places than a US naval air station with instrument approach procedures.

It's true that we never took the B-52 anywhere but home. But that was a "given" when each bomb wing commander had to be ready to go to war on the other side of the globe every day. All we needed was a "Cleared to land," and we could have put the beast on the ground on any runway that could hold us.

According to 2d Air Force briefings, today's B-52 mission lasts six to eight hours. In the Ds, we regularly flew twelve to fourteen hours. Check the old crew dogs' logbooks, General. We hadn't eaten the flight lunch at the six-hour mark! The General's command practices "long-endurance" missions once a quarter. We were

lucky when we flew Chrome Dome only twice a month.

I don't belittle the accomplishment of today's fine Air Combat Command crews, but General Croker should be more cognizant of the navigational accomplishments and proficiency of earlier crew members who sat in those same seats and flew "anywhere and anytime."

Roger G. Ferguson
Sleepy Hollow, Ill.

Two Teams for ABL

The Rockwell Airborne Laser contractor team was extremely distressed at its omission from "Aerospace Technology Exposition" [November 1995, p. 78]. The casual reader might conclude that the Air Force is working with one ABL team, not two.

The ABL System Program Office has awarded similar contracts to two industry teams to carry out the current competitive phase of the ABL program. At the conclusion of that phase, one team will be selected to move forward. Rockwell heads a team that includes Hughes, E-Systems, Loral, R. M. Parsons, and SVS. This team is a full competitor to the team mentioned in the article.

Barry Waldman
Rockwell International
Seal Beach, Calif.

Rewarding the Enlisted

"Officer Jobs for Enlisted Troops" [October 1995, p. 34] mentions the Air Force's rejection of a RAND Corp. study that suggests a return to a warrant officer (WO) or limited-duty

officer (LDO) system as a money-saving measure. By adding that rank layer to the force, more than money would be saved; it would put the Air Force in step with its sister services, which provide such incentives to supergrades and other NCOs whose jobs were formerly held by officers.

According to the article, in CMSAF David J. Campanale's view, enlisted personnel policies under the All-Volunteer Force have created more opportunities for enlisted members "to educate themselves, improve their horizons, and do more than just the menial tasks that had been associated with the enlisted ranks." Whereas the Army, Navy, Marine Corps, and Coast Guard offer this added incentive for advancement to deserving NCOs, the Air Force rejects the system. . . .

In terms of advancement, Air Force enlisted personnel should be afforded a level playing field comparable to that of the other services. During more than thirty years of active duty in the Air Force (as an enlisted man, aviation cadet, and commissioned officer), eighteen of which were spent in joint-service assignments, I observed enlisted personnel in the other services entering the WO/LDO program and have seen fine results.

The Air Force's idea to place an NCO in a job formerly held by an officer, without properly rewarding him or her by affording promotion opportunities, seems flawed. Much could be gained by reinstating the WO/LDO program.

Lt. Col. Thomas R. Forbes,
USAF (Ret.)
Novato, Calif.

Organizational Incongruity

"Officer Jobs for Enlisted Troops" and "Seven Careers Damaged in Black Hawk Review Action" [October 1995 "Aerospace World," p. 16] indicate an organizational incongruity.

On one hand, Gen. Ronald R. Fogleman holds Capt. Joseph M. Halcli (then a 1st Lt.) and 1st Lt. Ricky L. Wilson (then a 2d Lt.) accountable for the Black Hawk "friendly fire" incident by failing to meet Air

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

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Letters

Force standards in their jobs as AWACS weapon directors (WDs). On the other hand, the Air Force has downgraded those jobs to enlisted billets. The Air Force justifies this downgrading by concluding the degree of risk and accountability required for the AWACS WD job doesn't need an officer. In short, an AWACS WD doesn't make or break an Air Force mission.

If an AWACS WD isn't accountable for any Air Force mission success, how can anyone hold Captain Halcli and Lieutenant Wilson accountable for a mission failure? If an AWACS WD is accountable for Air Force mission success or failure, then why downgrade the billet from an officer slot to an enlisted slot?

I suspect the answers to these questions have little to do with logic or fairness. The answers have more to do with providing a pound of flesh, protecting rated career fields, and saving money, all of which I'm sure are worthy moral goals.

As an aside, I wonder if the Air Force has run into any problems getting enough of our smart and talented enlisted troops to volunteer for AWACS WD slots? I suspect it has. My guess is that the troops are dragging their feet and moaning about pay. The reason: In our society, we expect more pay as the difficulty and accountability for task performance increase.

Matt Dalrymple
Converse, Tex.

Countering Biological Warfare

While interesting and thought provoking, "Counterproliferation" [*October 1995, p. 56*] falls short of the mark concerning the delivery of weapons of mass destruction (WMDs)—particularly biological agents. The thrust of the article is that WMDs will likely be delivered by missiles, mobile or otherwise. I find this viewpoint myopic for several reasons. . . .

Given our capabilities of launch and trajectory detection, missiles can almost always be tracked to their source, positively identifying the attackers. Our capability is, of course, not a secret to our potential enemies. Despite isolated historical instances, I find it hard to believe that a lot of groups are willing to become martyrs merely for the chance to use their missiles, especially when much better alternatives exist.

Why use missiles when the best delivery vehicle may be a human being? Given the extreme lethality of some of today's toxins and other bio-

logical agents, a single person can easily conceal enough product to kill or incapacitate thousands. These products can even be tailored to have a built-in timing mechanism—much like the timer on an explosive device. Some biological agents act within minutes, while others take a month or more—plenty of time to escape detection.

My recent experience investigating the Ebola outbreak in Zaire has caused me to reflect on our defensive capabilities (or lack thereof) against an intentional disease epidemic. My conclusions are alarming and disheartening but not permanently so. We must realize that humans are a potential means of WMD delivery—especially in light of their efficiency and effectiveness. People are the ultimate "fire and forget" delivery platforms. They are also "reloadable." One person could deliver many attacks, none detectable until far too late for prevention.

We must also coordinate our national response efforts to disease outbreaks. Many federal agencies, such as DoD, the Centers for Disease Control and Prevention, the US Department of Agriculture, and the Federal Emergency Management Agency, possess and practice forms of outbreak detection and control, but these efforts are not yet coordinated. Each agency has strengths that could (and should) compensate for the weaknesses of others.

Such articles as James Kitfield's "Counterproliferation" do much to alert us to tomorrow's risks from WMDs. We must, however, take this alertness to the next level and prepare an integrated response—one geared toward prevention of horrible biological warfare scenarios.

Maj. Donald L. Noah, USAF
The Centers for Disease
Control and Prevention
Atlanta, Ga.

A Low Blow to Retirees

I just finished reading "High One Is a Low Blow" [*October 1995 "Editorial," p. 2*]. Because I retired in 1984 as a chief master sergeant with thirty-one years of service, this program does not affect my retirement pay. But it does have an impact on people I served with on active duty. This upsets me.

Many people who have never served in the military do not understand that a person who signs up loses a lot of basic freedoms. The government owns you for the period of your enlistment. The twenty- to thirty-year

retirement benefits members receive are a small return.

As more Congressmen who have not served in the military get elected, we will see more benefits taken away. It is happening today with the re-alignment and closing of bases. The retirement package will get smaller. There may come a point when retirement pay is all a person will get. No medical benefits. Commissaries, exchanges, and clubs will be phased out. I hope that never happens, but it may.

Our real hope is mostly in people who have the means to inform the members of the House and Senate that military retirement benefits should be maintained. Maybe some new laws should be put in place to prevent wholesale attacks on the military retirement system.

CMSgt. Frank M. Anderson, Jr.,
USAF (Ret.)
Austin, Tex.

From P-26 to P-80

In "The Army Air Forces at War" [*September 1995 "Editorial," p. 5*], Air Force Secretary Sheila E. Widnall is quoted as saying, "In 1941, our squadrons were still flying the P-26, an open-cockpit monoplane. Yet, by 1945, we were flying our first jet, the P-80 Shooting Star." The Secretary of the Air Force needs a new speechwriter. No US squadrons were flying the P-26A, and the Shooting Star was not the first US jet. The P-26 first flew in January 1932 and was soon superseded by the Seversky P-35 and the Curtiss P-36. Sent to the Philippines and Panama, the P-26A had a hell of a time replacing the versatile Curtiss P-6E, which did not go out of style with the Air Corps until 1939.

In 1941, Air Corps squadrons flew the P-36, the Curtiss P-40, the Bell P-39, and the Lockheed P-38 in the States and the P-35 and P-36 in Panama and in the Philippines. The P-26As in the Philippines were turned over to Field Marshal Douglas MacArthur's fledgling Philippine Commonwealth Air Force. During the Japanese invasion, one Filipino pilot downed a Japanese Zero or one of the Army's Nakajima Ki. fighters. . . .

The Bell P-59A Airacomet, developed at Muroc AAB, Calif., by Bell and General Electric (final changes in both engine and airframe) from Group Capt. Frank Whittle's spare engine, had its maiden flight in October 1942. It could not outfight the P-51 Mustang, and much difficulty arose in coordinating the engines, but in December 1944, sixty-six were delivered to the US Army Air Forces

for familiarization on the first US-produced jet.

The P-80A by Lockheed, originally using a de Havilland engine, was another story. Its first flight was in January 1944, and, although it did not take part in World War II, a small number were sent to Europe for familiarization flying in 1945. The F-80 proved itself in Korea, and 1,731 were built.

James L. Ballance
San Francisco, Calif.

Keeping CAP With the Air Force

I want to thank the Air Force Association for supporting Civil Air Patrol in the recent Congressional budget debate [*"The Civil Air Patrol Connection," October 1995 "Capitol Hill," p. 10*]. While CAP's funding is a small part of the Department of Defense budget, the actual amount we save is certainly many times that of our annual budget. Those who believe we have a low-priority mission need only talk to those people whose lives are saved each year by CAP aircrews and ground crews across the country. This is a perfect example of a government program that works.

Those of us who proudly wear the Air Force uniform in service to our communities are only asking for the resources necessary to continue this tradition.

Maj. Michael F. Sarcone, CAP
Squadron 83, Iowa Wing
Des Moines, Iowa

In reference to "The Civil Air Patrol Connection," I'm sure Sen. John McCain's concerns about the budget are honorable, but the service CAP renders is worth a great deal more than the current, or future, budget allocation. I agree completely that if CAP were transferred to the Department of Transportation, its demise could be realized.

Being associated with a military organization aids CAP immeasurably in building the character of young people. . . .

From the standpoint of cost, CAP would be very expensive to replace with a paid labor force. CAP, when activated for search and rescue, does not cost the taxpayers anything in wages. CAP members dedicate many hours to searching for people who have gone down in planes or gotten lost during outdoor excursions.

Look at the hours that CAP members chalked up during the floods of 1993 in the Midwest—the first time that the Federal Aviation Administration (FAA) turned over responsibility for monitoring a no-fly zone during a natural disaster to a voluntary orga-



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nization. CAP responded to this assignment with great pride and at minimal cost to the taxpayers. How much would it have cost if the FAA had had to bring in its own people?

Military training and disciplinary techniques enable CAP to handle this type of responsibility. This can be obtained only from modeling itself after a military sponsor, the US Air Force.

Last, but not least, is the pride that comes from being a member of the only organization that is an auxiliary of a military department. . . .

MSgt. Chris Whitehead,
USAF (Ret.)
Richmond, Va.

I'm a cadet sergeant in Civil Air Patrol, and I'm responding to "The Civil Air Patrol Connection." It would be a very bad decision for Congress to take CAP away from the Air Force. I'm proud to be in CAP and to represent my country at my age. I feel that if Civil Air Patrol were transferred to the Department of Transportation or to the individual states, it would not have the same meaning it has as an auxiliary of the Air Force. . . .

I will be writing to my senators and will try to get other members of my CAP squadron to do the same.

Cadet Sgt. Joel Ogden,
CAP
Fairborn, Ohio

Unforgettable Spicer

The article on Maj. Gen. Henry Spicer [*"A Speech Worth Dying For," October 1995, p. 72*] was sent to me by a friend because I was also a POW in Barth, Germany.

To illustrate further the greatness, strength, leadership, and sheer guts of this man, I wish to point out that when the Germans asked all Jewish officers to step forward from the ranks, he joined Col. Hubert Zemke in ordering all personnel to step forward.

He warned the Germans that if we were harmed, he would return after the war and turn Germany into farmland forever.

I will never forget his speeches and am probably alive today because of his guts and leadership.

Irwin J. Stovroff
Boca Raton, Fla.

My sincere thanks to *Air Force Magazine* and to C. V. Glines for his meaningful story about Colonel Spicer. It was my great privilege to work for Colonel Spicer, first at Howard AFB, Panama, when he was the com-

mander of the 36th Fighter Group, then at Williams AFB, Ariz., where I was one of his instructor pilots.

General Spicer was a tremendous individual with an uncanny memory for names and faces. Unless my memory has failed me, he died December 4, 1968 (not in 1967, as the article stated). I know this because I returned from Vietnam on that date. He will always be remembered by those who knew him and admired him so very much.

Col. Eugene H. Butler,
USAF (Ret.)
Provo, Utah

A Cold-Comfort Treaty

The American people have consistently voiced their support for SDI and ballistic missile defense. (Sadly, many of them think we already have it; visitors to North American Aerospace Defense Command facilities at Cheyenne Mountain AS, Colo., often express their gratitude to their military tour guides for "defending" the country.)

"Toward a Thin Missile Defense" [*July 1995, p. 54*] was excellent but disheartening. Lt. Gen. Jay M. Garner, commander of US Army Space and Strategic Defense Command, seems hung up on political correctness and legalisms. I would remind him that the 1972 Antiballistic Missile Treaty he is so solicitous of was signed with a nation that no longer exists. Even then, either party had a right to withdraw with six months' notice. Some years ago, Russian President Boris Yeltsin indicated his support for a joint spacebased system like Brilliant Pebbles.

The whole "strategy" is no more than a slow dance of appeasement around the Arms Control and Disarmament Agency. If thousands, even millions, of Americans die from an ICBM attack of whatever scale, every dotted "i" and crossed "t" of that stupid, obsolete ABM Treaty will be cold comfort to the survivors. If, God forbid, that ever happens, General Garner and the political and diplomatic "wets" had better stay in their bunkers.

John Cody
Pittsford, N. Y.

Part of a Team

"Aerospace World" [*July 1995 "News Notes," p. 30*] mentions that Electronic Systems Center, Hanscom AFB, Mass., is working on the Combat Survivor Evader Locator system to help locate downed aircrews. It should be noted that Electronic Sys-

tems Center is just one of the Combat Survivor Evader Locator Integrated Product Team (IPT) members, along with Human Systems Center, Brooks AFB, Tex.; Space and Missile Systems Center, Los Angeles AFB, Calif.; and others.

The acquisition lead for the program is currently assigned to the Directorate of Developmental Planning, Space and Missile Systems Center, Los Angeles AFB, Calif. Once the program passes Milestone I, the Global Positioning System Joint Program Office will become the Integrated Product Team lead.

Col. Christopher A. Waln,
USAF
Los Angeles, Calif.

Belgian Fighting Falcons

The letter from Harris W. Clark of Las Vegas, Nev., drew my attention [*"Reaching 3,000 Hours," August 1995 "Letters," p. 9*]. . . . The last paragraph, stating that retired Belgian Air Force Capt. Jean-Marie Toussaint was the very first Belgian pilot to fly the F-16, back in 1979, is incorrect. . . .

He was preceded by two Belgian Air Force pilots. The first, Maj. J. P. De Heyn, made his first flight in an F-16A on November 9, 1977, while the second, Maj. G. L. Devolder, got his checkout on September 9, 1978. . . .

Brig. Gen. Jozef P. De Heyn,
Belgian Air Force
Defense, Military, Naval, and Air
Attaché
Embassy of Belgium
Washington, D. C.

A Landing, Not a Takeoff

I read "The C-17 Makes Its Point" [*October 1995, p. 38*] with great enjoyment on several levels. From the taxpayers' point of view (and mine), the C-17 Globemaster III appears to be a major bargain. From the standpoint of the assault transport types, it appears to be an unmixed blessing. (In my blue-suit days, I was an assault transport type.) The performance in on-time departures and maintainability are phenomenal. However, I have a complaint. It has more to do with the photograph on p. 39 and its caption than with the article itself.

The C-17 in the picture is making an assault landing, under full-court-press conditions. It is not taking off, as the caption states. The pilot is trying for 1,200 feet or so. It is three seconds after touchdown. The flaps and other drag devices are fully de-

ployed. The engines are in full reverse thrust, and brakes are coming on. That is what generates the huge dust cloud. In three more seconds it will envelop the airplane and blind the pilots, the photographer, and anyone else standing nearby. During this kind of arrival, you are a busy boy.

William H. McKee
Anchorage, Alaska

Loberg's Flying Fortress

I would like to correct the information given in my letter in the September issue of *Air Force Magazine* ["Four-Engine Dogfights," p. 12]. Contrary to what was stated in the edited version of the letter, Ed Loberg was flying a B-17, and the date on which he and his crew shot down the Japanese flying boat was October 23, 1942.

Col. John W. Livingston,
USAF (Ret.)
Austin, Tex.

Problems in the Scrapbook

I write to correct an error in the caption for a photograph on p. 45 of the September 1995 issue ["World War II Scrapbook"].

Brig. Gen. Joseph W. Turner is seen shaking hands with me, Capt. Bill Atkinson, after my crew and I completed our tour of twenty-nine missions. This event took place at the 390th Bomb Group, Framlingham, UK, on June 2, 1944. We were promoted for one mission because of our participation in the Pathfinder program.

William L. Atkinson
Carlsbad, Calif.

In "World War II Scrapbook" and in the "Table of Contents" explaining the cover, you incorrectly identified the town at which the B-24s were stationed. Upon further research, you would have found that it is Manduria (not Mandaria), Italy. Manduria is a town of more than 50,000 located approximately thirty miles outside of Taranto, Italy.

Capt. Maurizio Mazza,
USAF
Randolph AFB, Tex.

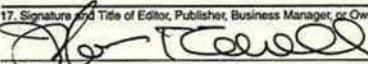
I trust that it is a typographical error that appears in the photo caption on p. 50 of the September 1995 *Air Force Magazine*. The Stearman I soloed in (February 1942) was a PT-17, not a PT-19.

"World War II Scrapbook" was outstanding. Keep up the good work!
Lt. Col. Bert McDowell, Jr.,
USAF (Ret.)
Irving, Tex.



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The Chart Page

By Tamar A. Mehuron, Associate Editor

After USAF Leaves

The Fate of Bases Targeted by BRAC in 1988 and 1991: Spot Check on Job Creation The Record So Far

A recent General Accounting Office study examined the status of property disposal at thirty-seven military installations identified for closure in the 1988 and 1991 Base Realignment and Closure (BRAC) actions. The study included the Air Force bases shown below, plus eleven Army and nine Navy installations.

The government retains about three-fifths of the property at these bases; the

land is contaminated, contains unexploded ordnance, or is needed by other US agencies. The other two-fifths of the property has become available for community reuse—civil aviation, business development, educational facilities, wildlife habitats, or other uses.

Replacement-job creation has been slow. At only three former USAF sites—England AFB, La., Pease AFB, N. H., and Chantute AFB, Ill.—have reuse

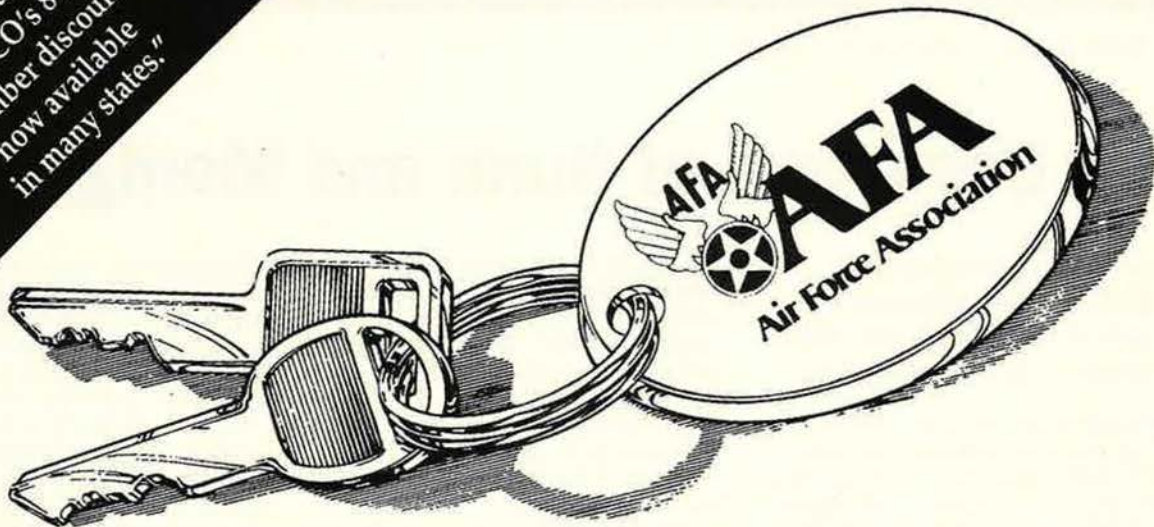
efforts created enough jobs to replace or nearly replace those lost in the closure. Overall, Air Force BRAC communities have recovered thirty percent of the lost employment, though the expectation is that recovery will take a decade or longer.

Environmental cleanup costs have ranged from \$5 million at Richards-Gebaur ARS, Mo., to \$146 million at Castle AFB, Calif.

Base	Date Closed	Jobs Lost	Jobs Created	Percent Recovered	Environmental Cleanup Cost
Castle AFB, Calif.	Sept. 1995	1,164	0	0.00	\$146,000,000
Chantute AFB, Ill.	Sept. 1993	1,035	1,002	96.81	43,500,000
Eaker AFB, Ark.	Dec. 1992	792	106	13.38	47,000,000
England AFB, La.	Dec. 1992	697	718	103.01	42,100,000
George AFB, Calif.	Dec. 1992	506	209	41.30	75,800,000
Grissom AFB, Ind.	Sept. 1994	807	28	3.47	25,600,000
Loring AFB, Maine	Sept. 1994	1,326	144	10.86	141,900,000
Lowry AFB, Colo.	Sept. 1994	2,290	104	4.54	18,800,000
Mather AFB, Calif.	Sept. 1993	1,012	241	23.81	94,000,000
Myrtle Beach AFB, S. C.	Mar. 1993	799	588	73.59	27,000,000
Norton AFB, Calif.	Mar. 1994	2,133	25	1.17	117,400,000
Pease AFB, N. H.	Mar. 1991	400	1,038	259.50	140,000,000
Richards-Gebaur ARS, Mo.	Sept. 1994	569	0	0.00	5,000,000
Rickenbacker ANGB, Ohio	Sept. 1994	1,129	8	0.71	41,700,000
Williams AFB, Ariz.	Sept. 1993	781	368	47.12	42,700,000
Wurtsmith AFB, Mich.	June 1993	705	553	78.44	70,000,000
Total		16,145	5,132	31.79	\$1,078,500,000

Source: GAO, "Military Bases: Case Studies on Selected Bases Closed in 1988 and 1991," August 1995.

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By Brian Green, Congressional Editor

The Departure of Nunn and Montgomery

These two Democratic stalwarts have decided not to stand for reelection. Their absence will be keenly felt.

Two Democratic icons of the Congressional defense establishment—Sen. Sam Nunn of Georgia and Rep. G. V. "Sonny" Montgomery of Mississippi—are retiring. They share a common background in the moderate/conservative wing of their party, and both possess a wealth of knowledge on defense and veterans issues that will now be lost to Congress.

Senator Nunn, chairman of the Senate Armed Services Committee (SASC) from 1987 to 1995 and now its senior minority member, is widely acknowledged to be the foremost defense expert in Congress today. He said he is leaving the Senate at a time when "there is no shortage of challenges," but he is convinced the US military is ready, well led, and "equipped with the world's best technology." He is widely reported to be unhappy at the prospect of serving in the minority for the foreseeable future.

Senator Nunn's expertise and leadership allowed him to wield considerable influence. His was "a voice on foreign policy and defense matters upon which we could rely," said Sen. J. Bennett Johnston (D-La.). His power and expertise also allowed him to build bipartisan support for his positions on controversial issues.

He is closely associated with a number of issues, among them support for the B-2 bomber, restrictions on homosexuals in the military, a narrow interpretation of the Antiballistic Missile Treaty, the so-called Nunn-Lugar program to dismantle nuclear warheads in the former Soviet Union, and reforms to enhance joint operations.

Both his independence and his clout were clear when he opposed President Clinton's early initiative to allow homosexuals to serve openly in the military.

On rare but notable occasions, however, he failed to persuade his

colleagues to follow his lead. Though he has been the principal proponent of the B-2 bomber, he could not convince the SASC to support continued procurement beyond the twenty aircraft now authorized. The SASC voted against additional B-2 funding last June by a 13-8 margin. Senator Nunn was the only Democrat to back the program.

Senator Nunn also opposed the resolution authorizing the use of force in the Persian Gulf following the Iraqi invasion of Kuwait. The Senate approved the use of force by a vote of 52-47.

Senator Nunn's overall record, however, demonstrates moderate, pro-military views. His retirement and that of Sen. J. James Exon (D-Neb.), another moderate SASC Democrat, leaves Sen. Carl M. Levin (D-Mich.) in line to be the new ranking minority member on the committee. Senator Levin is followed in seniority by Sen. Edward M. Kennedy (D-Mass.). Both are liberals not so inclined to support Pentagon initiatives or compromise with Senate Republicans.

Senator Levin, for example, sponsored the amendment to this year's Senate defense authorization bill to delete Republican provisions requiring deployment of a multisite national ballistic missile defense system. Nunn supported the Levin effort, but when it failed, it was Nunn who crafted the compromise that passed. Senator Levin has supported some conventional weapon systems, but his record also shows consistent opposition to nuclear programs and (since 1992) the B-2 bomber. He was one of the few committee Democrats to unequivocally support President Clinton's initiative to allow homosexuals to serve in the military.

In the Senate as a whole, Senator Nunn is the eighth of fifteen Democrats to retire rather than face the rigors of a reelection campaign. This exodus of Democrats gives Republicans a better chance to retain control of the Senate, in which they now enjoy a 53-46 margin. It also gives rise to a sharper ideological split between the two parties. In the past,

Republicans could sometimes prevail even in the minority with support from conservative Democrats. Centrist Democrats and Republicans sometimes coalesced around compromise positions. Such outcomes appear less likely in the future.

With Representative Montgomery's departure, veterans will lose one of their staunchest Congressional allies. He sponsored and pushed through significantly improved educational benefits for veterans in what is now known as the Montgomery GI Bill. He was also largely successful in protecting the Veterans Health Administration from personnel cuts proposed in the Administration's reinventing government initiative.

In recent years, his influence in veterans matters has been challenged both within the Democratic Party and by the new Republican House majority. He barely survived a 1992 challenge to his chairmanship of the House Veterans' Affairs Committee by Rep. Lane Evans (D-Ill.), who focused more on the concerns of younger veterans than Representative Montgomery had. Montgomery lost his chairmanship in 1995, when the Republicans took control of the House.

Representative Montgomery was largely responsible for the renewed Congressional emphasis on improved Guard and Reserve equipment and played a central role in funding the equipment needs of the reserve components.

The impact of Representative Montgomery's retirement will be offset in part by the bipartisan nature of the Veterans' Affairs Committee. He worked well with Republicans both as chairman and as ranking minority member. Representatives of Guard and Reserve interests express somewhat more concern over his departure. Several members of the House are thought to be interested in playing a leading role in Guard and Reserve matters, including Rep. Greg Laughlin (R-Tex.), sponsor of the still-pending Reserve Revitalization Act, and Rep. Steve Buyer (R-Ind.). None, however, will bring Montgomery's stature to the task. ■

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Aerospace World

By Suzann Chapman, Associate Editor

DoD OKs Full C-17 Fleet

The Defense Department cleared the Air Force to procure eighty additional C-17 airlifters from McDonnell Douglas, bringing the total in the fleet to 120. Long-standing USAF plans had called for buying exactly that number.

Pentagon officials estimated the value of C-17 production contracts for the eighty additional aircraft at \$18 billion.

Deputy Secretary of Defense John P. White announced the move on November 3. The decision had been reached by members of the Defense Acquisition Board after two days of intense review and discussion over various alternatives.

The Pentagon's move marks the apparent end of the two-year debate over strategic airlift, featuring competition between the McDonnell Douglas C-17 and the Boeing 747-400F Non-developmental Airlift Aircraft (NDAA). Another contender, the Lockheed C-5D, ran a distant third.

When the C-17 program experienced delivery and performance problems, along with rising costs, about three years ago, the Pentagon began considering potential alternatives to solve its future strategic airlift requirements. DoD pared down several NDAA options to the 747-400F—also known as the C-33 in its military version with widened doors and strengthened floor—and the C-5D.

Secretary White credited Air Force acquisition personnel with turning the C-17 program around, thus "creating strong airlift options for the department—options that we did not have two years ago." He added that McDonnell Douglas "got the cost down and the quality up."

Early production lots fluctuated widely in cost and ran six months late on deliveries. However, the program moved from "a situation that was not under control," said Under Secretary of Defense for Acquisition and Technology Paul G. Kaminski, to one that "lines up, not with the ceiling price, but with the target price."

He noted that over the past two

On October 28, Minuteman II silo M-06, near Holden, Mo., was the site for a significant piece of history as the US Defense Secretary and his Russian counterpart simultaneously pushed two buttons on a small detonator, setting off nearly 1,000 pounds of explosives to implode the ICBM silo. Silo M-06 was the eighteenth of 150 silos that will be imploded in Missouri under the Strategic Arms Reduction Treaty I, signed by both countries in 1991. The destruction of the US silo mirrored the dismantling of a Russian strategic bomber and Ukrainian ICBMs earlier this year by the two defense chiefs, William Perry and Gen. Pavel Grachev.



AP photo by Cliff Schlap

years, production performance has improved such that the contractor is delivering aircraft on time or about a month early. The last ten deliveries have been ahead of schedule.

MOG Establishes Bottom Line

In his explanation of the C-17 decision, Dr. Kaminski emphasized that the C-17 had exceeded the threshold—the minimum performance characteristics—in all cases and, in most cases, met the objective value, or the performance the Pentagon would like the aircraft to have.

Performance parameters included payload it could carry for 3,200 nautical miles, maximum payload it could carry with a landing length of 3,000 feet, backup and turning capabilities, the ability to carry outside cargo, and airdrop capability.

As the Pentagon worked through the analysis of all three aircraft, using performance predictions for the C-33 and C-5D and actual performance data from the C-17, Dr. Kaminski said that one parameter became key: MOG (maximum aircraft on the ground).

The MOG represents the number of aircraft that could share a confined space, such as a small or active runway, at the same time and still allow rapid on- and offload and refueling. What the MOG showed when used to help calculate the throughput (*i.e.*, the ability to deliver cargo) was a greater than two to one advantage for C-17s.

The payload multiplied by the MOG multiplied by the number of cycles per day (how many times each type of aircraft could move through a given

airfield spot each day) equals the throughput. According to Pentagon analysis, eight C-17s could operate in the same area that only three C-5s or 747s could fit in. The C-17 could handle 3,852 tons per day compared to 1,754 for the 747 or 1,443 for the C-5.

Dr. Kaminski pointed out that the force mixes that the Pentagon looked at most closely were a force of 100 C-17s and eighteen NDAA vs. a force of 120 C-17s and zero NDAA. Other potential mixes did not meet essential requirements.

Comparing those two likely force mixes, Dr. Kaminski said that while there was not much difference in cost—about one percent of life-cycle cost—there was a big difference associated with the MOG parameter. "What we found was that the force of 120/0 was a more resilient force," he said, adding, "The force of 120/0 showed far greater flexibility and tolerance to this key MOG parameter" than the 100/eighteen force did.

McChord to Receive C-17s

In a surprise move during the Pentagon press briefing November 3 to announce the purchase of another eighty McDonnell Douglas C-17s, Air Force Chief of Staff Gen. Ronald R. Fogleman confirmed that forty-eight of the new airlifters would bed down with the 62d Airlift Wing at McChord AFB, Wash.

When initially asked about basing by a reporter who said that staff members for Rep. Norman D. Dicks (D-Wash.) had been told the Air Force planned to put two C-17 squadrons at the Washington base, General Fogleman said he did not know what the Congressman's office had been told. However, at the close of the briefing, he told reporters he had just received a note that, in fact, Congressional notification had been made on basing forty-eight C-17s at McChord.

In response to the original question, he also stated that although the Air Force is still developing final plans, McChord AFB is a key base on the West Coast. "It's located next to an Army installation," he said. "I think it would make sense to put C-17s in there eventually."

Additionally, he noted that Charleston AFB, S. C., the current home for the only existing active-duty and reserve C-17 squadrons, should receive a total of forty-eight aircraft.

With the commitment to go beyond an initial forty aircraft, the Air Force also plans to open a dedicated schoolhouse at Altus AFB, Okla., according to General Fogleman.

Task Force Links Readiness, Quality of Life

Privatized housing topped the list of recommendations that Defense Secretary William J. Perry characterized as "decidedly not business as usual" when he announced the results of the Task Force on Quality of Life October 19.

The panel of nineteen members, headed by former Army Secretary John O. Marsh, Jr., spent almost one year talking with service members, reviewing the problems, and weighing potential solutions to help the armed forces maintain readiness and retain high-quality people.

Like the Defense Department, the panel found "an unbreakable link between readiness and quality of life."

The task force concentrated on three key quality-of-life issues: housing, personnel tempo, and community and family services. The perstempo panel, headed by retired Army Gen. John A. Wickham, Jr., recommended several measures, such as increased use of reserve forces and greater use of simulation technology and long-distance learning, to reduce the time personnel spend away from home. Gen. John A. Shaud, USAF (Ret.), now Executive Director of the Air Force Association, chaired the committee that looked into issues of community and family services. Their recommendations included reviewing the method to calculate child-care needs and standardizing tuition assistance rates within DoD.

Even before the task force completed its report, the Pentagon opted to act on the suggestion to look to the private sector to revitalize the military family and bachelor housing situation. Last spring, the Defense Department asked Congress to change existing legislation that precludes the use of commercial standards and practices and to provide \$1 billion in budget authority to cover pilot programs over the next five years.

DoD officials expect private-sector initiatives to alleviate substantial housing quality problems that have been growing for more than thirty years. Using current funding and procedures, DoD estimates that remedying the family housing problem would cost about \$20 billion and could take forty years. The "get well" estimate for bachelor housing is similarly bleak—about \$9 billion.

"If we could only count on appropriated funds used in conventional ways to solve the problem, it would essentially be unsolvable," Secretary Perry said at the October briefing.

Undoubtedly that was the sentiment of the task force members, including Rear Adm. Roberta L. Hazard, USN (Ret.), who headed the housing committee. The task force report stated that DoD's housing delivery system "is so intrinsically flawed" that they propose creation of an entirely new system run by a Military Housing Authority. They said the authority would use private housing industry management principles and practices. "Like any other company, the proposed authority would be empowered to raise operating and investment money from private sources," according to the report.

GI Bill Hike May Hurt Recruiting

A move to increase service members' contributions to the Montgomery GI Bill education program might make volunteering for the military even less attractive for the nation's young people than current studies indicate.

Faced with the prospect of a sustained "challenging recruiting environment," Defense Department officials believe that a Senate Veterans Affairs Committee's proposed increase in the service member's share from \$100 a month to \$133 could tip the scales the wrong way for many potential recruits. The committee said the increase would save \$80 million in 1996 and \$933 million over seven years.

Top defense officials have complained that any erosion in education benefits will impair DoD's ability to maintain accession levels and sustain force readiness.

The current education program, enacted in 1985, enrolls about ninety-

four percent of all new recruits each year. It allows first-term recruits to contribute to their college education during their first three years of service. For every \$100 a member pays, the Veterans Affairs Department contributes nearly \$400. After three years, the \$3,600 individual contributions, combined with the VA share, equal about \$18,000 for college once the service member leaves the military.

Pilot Retention Still Falling

With the projected pilot shortage expected to exceed 1,700 in Fiscal 2001, the Air Force plans to offer new Aviator Continuation Pay—pilot bonus—agreements throughout Fiscal 1996. Personnel officials estimate the new bonuses will reduce the long-term loss by more than 650 pilots.

Additionally, the steady decline in retention rates for helicopter pilots has prompted the service for the first time to offer the bonus to rotary-wing pilots as well as to fixed-wing pilots.

Eligibility requirements include:

completion of undergraduate flying training, sufficient active-duty service time remaining, rank of lieutenant colonel or below, a minimum of eight years but less than thirteen years of total active federal commissioned service, and qualification for operational flight duties.

USAF Needs More Officers to Leave

Although enlisted applications under the Air Force's Fiscal 1996 volunteer early retirement program reached the service's goal, officer applications are still short of their mark. The service announced in mid-October that it plans to expand eligibility for officers. According to personnel officials, the program, which began in May, achieved almost half of the officer and slightly more than the enlisted reductions needed, but officer applications have leveled off.

To meet its Fiscal 1996 end-strength figures of 75,928 officers and 308,272 enlisted members, the Air Force will take the following steps:

- Offer early retirements to once-deferred captains from the June 1995 majors selection board who will have fifteen years of service by June 30, 1996.
- Waive part of the active-duty service commitment for Air Force Institute of Technology and professional military education course graduates and expand waivers for people who received tuition assistance.
- Accelerate officer separation dates.
- Close the enlisted early retirement program on October 30.

Early retirement applications totaled 1,571 as of October 25, including about 1,021 enlisted members and 550 officers. With the expanded officer program, another 800 officers have become eligible for early release. The original pool consisted of about 8,000 eligible officers.

However, USAF has revised those goals to 1,100 enlisted and 1,300 officers to reflect later estimates on the number of individuals who will leave the service through normal attrition. Service officials maintain that they will not resort to nonvoluntary means, such as the reduction in force and Selective Early Retirement Boards, used earlier in the drawdown.

2025 on the Internet

Anyone with an idea or new concept for future air, space, or information power—and access to the Internet—can participate in a revolutionary study under way by Air University, Maxwell AFB, Ala.

Responding to a request from the Air Force Chief of Staff, Gen. Ronald R. Fogleman, AU officials embarked on a new study called Air Force 2025 to seek ideas on high-leverage technologies, systems, and strategies that may help shape the way the Air Force goes to war thirty years from now. To help them gather ideas, the university created a World Wide Web site (<http://www.au.af.mil/2025/2025home.html>) where a person can fill out a Concept and Technology Abstract.

AU planners will draft a selection of the abstracts into white papers for submission to General Fogleman in the summer of 1996.

Hurricane Opal Wreaks Havoc

Hurlburt Field suffered the strongest winds at gusts of up to 140 mph, but Eglin AFB was the hardest hit by Hurricane Opal on October 4, according to Air Force officials. The damage estimates for the two Florida bases were \$20 million to \$30 million for Eglin and \$10 million for Hurlburt.

Eglin, the Air Force's largest base at 463,452 acres, lay in the most dangerous spot—the path just east of Opal's eye.

Col. Douglas L. Hardin, Eglin's 96th Air Base Wing commander, said that the area just east of a hurricane's eye brings not only high winds but also the storm's surge point. Opal's surge was a wall of water fifteen to twenty feet high. Wind gusts at Eglin measured up to 115 mph. Two tornadoes also struck the base.

Perhaps the most severe damage was done to electronic equipment used for one of the base's weapon-testing ranges. Repairs could cost millions of dollars, said base officials.

Eglin's 11,000 base-housing residents evacuated the area. About 3,500 stayed in base shelters, another 1,500 went to shelters at neighboring Hurlburt, and the remainder headed north to Alabama or other safe areas.

The base also evacuated its aircraft to safe locations, including Dyess and Kelly AFBs, Tex.

Although the 347th Wing at Moody AFB, Ga., evacuated its aircraft, base personnel did not have to leave. Instead, Moody received about 440 people from other bases. Opal also damaged several buildings and knocked out power at two Air Force Reserve installations, Duke Field, Fla., and Dobbins ARB, Ga.

AFRES Stalks Storms

Rated the worst hurricane since

Andrew, which leveled Homestead AFB, Fla., in 1992, Hurricane Opal provided AFRES's 53d Weather Reconnaissance Squadron another opportunity to "hunt" its prey.

Known as the "Hurricane Hunters," the 53d WRS is the only unit in the world that routinely flies weather reconnaissance missions, according to USAF officials. A 53d crew flew its WC-130 into the wall of Opal's eye five times while it was fifty miles south of Pensacola, Fla., to gather information on its size, heading, and character. The crew then fed the information to the National Hurricane Center in Miami.

About two weeks later, Hurricane Roxanne caused a Mexican pipe-laying barge in the Gulf of Mexico to capsize, and the 53d WRS expanded its hurricane hunting to search for survivors. Although four ships rescued 222 people, they had to stop their search because of the hurricane, leaving twenty-three people unaccounted for.

The Coast Guard asked the 53d WRS to continue the search. Amid deteriorating weather, a 53d WC-130 spotted life rafts and one survivor and radioed the location to the Coast Guard. The crew did not see any other survivors, and the one they had spotted was gone when they overflew the area again. They did not know if a ship had picked up the survivor.

Drawdown Causes Modernization Woes

After three tries, DoD officials have gotten a drawdown "right," according to Defense Secretary William J. Perry. However, he also told a Saint Louis, Mo., group in October that the defense modernization account was the "bill payer" for the most recent drawdown.

The Pentagon focused on maintaining readiness during the current drawdown, which, unlike the ones following the Korean War and the Vietnam War, has left military forces with their "might."

"We resolved that at whatever size our military forces were, they would be well-equipped and well-trained—person for person and unit for unit," said Secretary Perry.

He added that the department put money behind immediate readiness in the form of training, spare parts, and maintenance. Now, he said, the focus must shift toward modernization, which is critical to maintaining readiness after the turn of the century.

DoD plans to raise the Fiscal 2000 modernization account to \$67 billion—

twice the amount in the Fiscal 1996 budget. It hopes to acquire the funds for such an increase through base-closure savings, acquisition system reforms, and budget increases.

F-111s and RF-4Cs Head to the Boneyard

The first six F-111Es slated for retirement left the 428th Fighter Squadron, Cannon AFB, N. M., October 11 for their new home at the Aerospace Maintenance and Regeneration Center at Davis-Monthan AFB, Ariz. Another four followed on October 16.

The center, popularly known as the boneyard, will be home to all the remaining F-111E and F models by October 1996.

The F-111, which first flew December 21, 1964, was one of the more controversial aircraft ever to fly. Yet, it overcame early problems to become a highly effective all-weather interdiction aircraft.

A few days before the F-111s left, the 152d Reconnaissance Group, Reno-Cannon IAP, Nev., sent the last four RF-4C Phantom II aircraft to the boneyard. The RF-4Cs first entered USAF service in September 1964.

Veteran Fighter Sets Mark

The F-4G "Wild Weasel," one of the oldest aircraft in USAF's inventory and soon destined for retirement, broke the 50,000 sortie mark in September for the Combined Task Force flying Operation Provide Comfort over northern Iraq.

The Idaho ANG's 190th Fighter Squadron chalked up the milestone—five years in the making.

When the 190th ends its deployment this month, the unit's F-4Gs will go to AMARC at Davis-Monthan AFB, Ariz. Some will enter the drone program, while others will sit idle. The F-4G that destroyed an Iraqi radar site during Operation Desert Storm will remain at the 190th on static display.

Maj. Mike Bell, the unit's detachment commander, said the 190th has worked with F-4s for twenty years and that it would be a sad day when they're gone. The unit will convert to A-10s and C-130s.

Improved Housing in the Works

According to CMSAF David J. Campanale, Keesler AFB, Miss., will be one of the test sites for DoD's new move to help improve family housing.

DoD plans to contract with a private developer to build base housing, either on or off base, then lease the houses from the developer. DoD expects to save money by using this privatization scheme as well as make suitable housing available sooner.

The Chief also said that although the other services are not ready to embrace single-occupancy rooms for single airmen, the Air Force is working to gain permission to make the change on its own. Currently, DoD standards do not include single-occupancy rooms.

JAST Takes New Focus, Name

A potential name change signals a shift in focus for the Joint Advanced Strike Technology program from technology demonstrator to an actual production aircraft—the Joint Strike Fighter.

As the new name suggests, the next-generation, stealthy, multiservice fighter is trying to shed its "scientific hobby shop" label, according to program officials, who say the Pentagon has restructured several technology initiatives, such as cutting six weapon seeker programs down to one.

The engineering and manufacturing development phase will run from Fiscal 2001 through Fiscal 2008, with first flight planned for 2004. Program officials said that the services' initial operational capability dates have been changing, but currently the Air Force and Marine Corps have asked for IOCs in 2007. The heavier, carrier-capable Navy version is due to become operational in 2008.

Making Space Joint

The new deputy under secretary of defense for Space told a National Space Club luncheon in Washington, D. C., on September 26 that a Joint Space Management Board to integrate space programs between DoD and the intelligence community is nearly off the drawing board.

Secretary Robert V. Davis said he expected the few remaining issues to be resolved within a few weeks, paving the way for the DoD and Central Intelligence Agency chiefs to approve a final charter. The board is part of the cooperative endeavor launched by former Deputy Secretary of Defense and now CIA Director John M. Deutch.

NCOs Charged in Pilot's Death

Faulty job performance by two noncommissioned officers at Spangdahlem AB, Germany, may have caused the death of an F-15C pilot whose aircraft failed to operate properly during a takeoff roll, crashing at the base May 30.

On October 10, USAF charged TSgts. William T. Campbell and Thomas P. Mueller, both of Spangdahlem's 52d Equipment Maintenance Squadron, with negligent homicide and four counts of dereliction of duty. Accord-

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ing to a USAF press release, charges allege that the two NCOs negligently installed and inspected the fighter's longitudinal and lateral flight-control rods, failed to inspect the work, and failed to complete the aircraft maintenance paperwork properly.

"Basically, the cross-connected controls caused the plane to roll to the left instead of going up when the stick was pulled back," said a base spokesman. "When the stick was pulled right, instead of rolling right, the plane increased its roll to the left and the nose pitched down."

As of October 12, USAF was planning an Article 32 investigation, similar to a civilian grand jury, to determine if the charges warrant a trial.

The pilot, Maj. Donald G. Lowry, Jr., was assigned to USAF at Ramstein AB, Germany, and flew routinely with Spangdahlem's 53d Fighter Squadron.

Soldier's Death Blamed on Human Error

A joint Army, Air Force, and Marine accident board recommended taking further, but unspecified, action against an OA-10 pilot and a forward air controller (FAC) after releasing its finding October 3 that human error and

inadequate safety standards caused a July 18 training accident that killed an Army captain at Fort Sill, Okla.

Capt. Christopher Williams died and nine other soldiers and Marines were injured when a USAF OA-10 pilot mistakenly dropped a 500-pound bomb on an observation post. According to the accident board, the OA-10's Pave Penny laser tracking device locked on to a laser designator around the observation post instead of the intended target.

The two OA-10s participating in the Fort Sill close air support training exercise on July 18 each made an orientation pass and two attack runs on other targets, accurately dropping six bombs in thirty minutes.

However, the board found that the pilot who dropped the fatal bomb failed to identify the friendly troop locations during his orientation pass, failed to maintain a high level of awareness, did not positively identify his target, and did not ask for additional target information to locate it properly. The board also found that he did not have full knowledge of Fort Sill fighter aircraft procedures and failed to comply with directives and procedures for target identification.

Additionally, the board said that the FAC directed "cleared hot," which meant he cleared the pilot to drop the bomb, while the aircraft was still in a position to jeopardize the safety of the ground troops. It concluded that the accident could have been prevented if a safety zone had been in place to help the Pave Penny avoid locking on to the laser designator, if the FAC had properly controlled the aircraft, and if the pilot had visually identified his target.

The Air Force has already removed the pilot from flying duty and reassigned the FAC to other duties. Their names have been withheld under the Privacy Act.

ANG Commanders Removed

The New York National Guard announced October 20 the removal of two senior Air National Guard commanders in the 174th Fighter Wing, Syracuse, N. Y., for discriminating against two female pilots.

A Guard investigation found that Maj. Jacquelyn S. Parker, ANG's first female fighter pilot, and another female pilot "had not been afforded the same opportunities as the men in the unit." Other findings included failure of the commanders to correct inappropriate behavior by unit members, including some who displayed "conduct unbecoming an officer" and

malicious behavior toward Major Parker.

The Guard removed Col. David Hamlin, 174th FW commander, from the brigadier general promotion list, relieved him of command, and required him to resign from the New York ANG. Additionally, the Guard reassigned the wing's air commander, Col. Thomas Webster, to a support position.

Better "Blackbirds" Cost Less

According to the Air Force program manager overseeing refurbishment of two SR-71 high-flying surveillance aircraft, the two "Blackbirds" have been restored to better than original shape at less than half the \$100 million that Congress anticipated spending. But it was not easy.

Capt. Michael Zimmerman, the SR-71 program manager at Aeronautical Systems Center's Reconnaissance Aircraft Systems Group, Wright-Patterson AFB, Ohio, said, "We had to go back to find all the spare parts, which had been scattered to the four winds—in junkyards outside the base, at Norton AFB, Calif., at the Marine station in Barstow, Calif., and to Eglin AFB, Fla., where the SR-71's defensive systems had been stored."

He added, "When Norton AFB closed and the stuff was moved to Barstow, some of it had been scrapped, and we had to go to salvage yards to find things like aircraft stands, to get perfectly good parts back."

Adding to the challenge, the threat situation in 1989, when the Blackbirds were deactivated, was different from today's, said Bill Grimes, chief of ASC's Special Projects Branch. "Our tasking was to bring the capabilities of the defensive systems back so that they could operate in a 1995 world," said Mr. Grimes, a former squadron commander for both U-2 and SR-71 programs for what was then Air Force Logistics Command.

He said that new capabilities, such as a data link, are being added, capabilities the SR-71 never had before.

Air Combat Command pilots with Det. 2, 9th Reconnaissance Wing, will fly the restored aircraft out of Edwards AFB, Calif. According to Captain Zimmerman, it was \$6 million cheaper to operate the SR-71s from Edwards, rather than move the aircraft and their logistics support to Beale AFB, Calif., where the 9th RW U-2s are based.

USAF Medics Respond to Sabotaged Train

USAF medics from Luke AFB, Ariz.,

responded within minutes and were the first health professionals on the scene when an Amtrak passenger train crashed October 9 in the Arizona desert. One person was killed and 112 injured in the accident, which appeared to be sabotage, according to civilian law enforcement authorities.

The Buckeye, Ariz., police called Luke AFB for help about 2:20 a.m., and the first Air Force medical team was on the way by 3:00 a.m., said Col. (Dr.) Reba Ray, 56th Medical Group chief of medical staff.

More than twenty medical personnel, including three orthopedic and two flight surgeons, responded. Col. (Dr.) Stanford Sadick, the 56th MG's senior surgeon, said they spent seven hours working in triage, evaluating patients, and helping transport the injured back to Luke. "Everybody did a great job out there," he said. "It went without a hitch."

Upgrades for Cold War Mainstays

Bringing 1960s-era systems into the 1990s is not easy, but, according to one missileer, the Rapid Execution and Combat Targeting (REACT) modifications under way for the Minuteman III force get a "thumbs up."

REACT replaces existing launch control center (LCC) crew consoles with a computerized workstation. Designed by Loral, it provides missile launch crews with a setup much like a home computer, using a type of Windows format instead of 1960s-style switches and buttons.

According to Lt. Col. Earl Henley, 341st Operations Group REACT project officer, Malmstrom AFB, Mont., "This is the most significant modification to launch control centers since we brought them on line." REACT will speed up missile retargeting, taking only a few minutes to perform what took the old Command Data Buffer System thirty or forty minutes to do.

F. E. Warren AFB, Wyo., received its last REACT system on October 5. Malmstrom LCCs are currently receiving the new modifications. The upgrade program will start at Minot AFB, N. D., in February 1996.

As a side note, USAF missile maintainers pulled the last Minuteman II ICBM from its silo northwest of Harlowton, Mont., in August. If the provisions of the Strategic Arms Reduction Treaties continue to hold, the Minuteman III will be the nation's only remaining ICBM.

Roswell Incident Unveiled

The Air Force now has released the full report of the alleged 1947

UFO (unidentified flying object) incident, near Roswell, N. M.

USAF declassified all documents related to the case in September 1994 when it announced completion of a study, including a records search and interviews, that found "the material recovered near Roswell was consistent with a balloon device of the type used in a then-classified project," according to a USAF news release.

The release added, "No records indicated, or even hinted at, the recovery of 'alien' bodies or extraterrestrial materials."

The full report, with attachments, is available through the Superintendent of Documents at (202) 512-1800. The item number is 008-070-00697-9, and the price is \$52.

Military Research Pays Off

The Air Force's Phillips Laboratory, with headquarters at Kirtland AFB, N. M., has found some useful civilian and commercial applications for its military space and missile technologies.

Recently the lab reached an agreement with Advanced Refractory Technologies of Buffalo, N. Y., that could help reduce the size and improve the performance of cathodes—electron-producing components found in ev-

erything from microwave ovens to X-ray machines. According to lab officials, the new thin-film cathode technology will be used initially in defense systems but also has wide commercial applications, including flat-panel computer monitors, improved medical equipment, and various industrial processes.

Civilian law enforcement agencies are eyeing two more Phillips Lab technologies. One is the Saber 203 Laser Illuminator. The Saber 203 "spotlights" an individual with a bright red, yet harmless, low-power laser from distances of up to 300 yards. US Marines, who used the illuminators in Somalia to help disperse threatening mobs, said that the targeted individuals froze, ending their aggressive action, and the crowd ran off.

The second device is called "Scorpion." It employs an invisible laser that could help police scan darkened areas for a hidden suspect without alerting the individual.

Another Phillips technology could significantly improve identifying potential terrorists at airports and public buildings. Unlike present systems, which can detect but not specifically identify metallic objects, the electronic walk-through security system can distinguish among a gun, a knife, or a

set of keys, and reveal the object's location.

The lab signed a contract with two Albuquerque, N. M., firms—Farr Research and EG&G Management Systems, Inc.—and EG&G Astrophysics of Long Beach, Calif., to develop and market this new Metal Object Identification System.

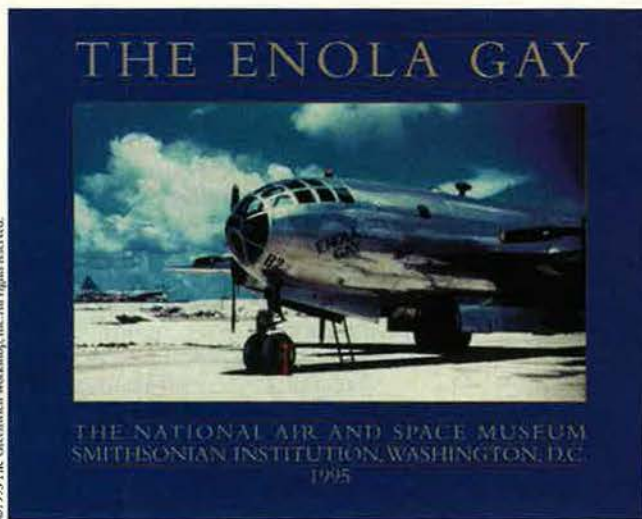
Tricare On Track

According to Assistant Secretary of Defense for Health Affairs Dr. Stephen C. Joseph, the Tricare train will not be derailed. "This system is here to stay, but let's all remember that there is no end," he added. "Tricare must remain an evolving program."

After its first six months in operation, the Tricare program in Region 11, the first to issue a Tricare contract, enrolled more than 100,000 beneficiaries. Dr. Joseph said that the Defense Department's projected enrollment for the first year was less than one-third that number. All regions within the continental US will implement the new program by Fiscal 1997.

Under DoD's final rule for Tricare, which it published October 5, Tricare Prime enrollees will have higher priority for care at a military treatment

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facility. Thus, an eligible military retiree enrolled in Tricare Prime will have a higher priority for care in MTFs than an active-duty family member who is not enrolled, contrary to earlier provisions. "Sizing Up Tricare" [August 1995, p. 64] carries a basic description of the three Tricare options.

Additionally, Dr. Joseph said that the Pentagon is exploring all means to provide health care for the entire range of beneficiaries, including Medicare-eligible retirees. In fact, he said that the department is studying the advantages and disadvantages of including the Federal Employees Health Benefits Program as a fourth option under Tricare. The FEHBP has been proposed as one possible alternative for Medicare-eligible military retirees.

DoD is also working with the Health-Care Financing Administration, which runs Medicare, to set up a demonstration project that would reimburse the department for some of the care MTFs provide Medicare-eligible retirees and their families.

New Reserve SEA

The new top Chief Master Sergeant for the Air Force Reserve is CMSgt. Carol Smits, the first woman to occupy this Senior Enlisted Advisor position.

"A Senior Enlisted Advisor should and must take care of all enlisted members' needs and concerns," said Chief Smits, a former SEA for the 302d Airlift Wing, Peterson AFB, Colo. "The only thing that changes from being an SEA at the wing level and

one at the command level is the number of people," she added.

She expects to get out to meet people, to listen to them, and to learn "how they fit into the overall picture." She said that one of her goals is to ensure that all Reservists are able to reach their potential. Although she firmly believes that individuals must share the responsibility for their careers, Chief Smits said she would like to see a strong mentoring program established.

CRAF Dollars Increase

Air Mobility Command announced that the Fiscal 1996 Civil Reserve Air Fleet contracts total more than \$290 million, an increase of \$15.3 million over last fiscal year. Airlift planners also estimated that there would be an additional \$321 million of unplanned civil air business, based on trends from previous years.

Civil carriers have committed 188 long-range cargo aircraft and 277 long-range passenger aircraft to the Fiscal 1996 CRAF program. Under CRAF, civil carriers commit personnel, services, and aircraft to support the Pentagon when needed, in return for contracts to transport military personnel and goods.

News Notes

■ Capt. Donald C. McKercher ejected safely before his F-15C crashed into the sea on October 18 about sixty-five miles south of Kadena AB, Japan. A Japan Air Self-Defense Force helicopter picked up the 44th Fighter Squadron pilot, who was on a routine training mission.

■ On October 10, Capt. Troy R. Dunn also ejected safely from his A/OA-10 Thunderbolt II, which crashed about fifty miles southeast of Eielson AFB, Alaska, on a military training range. A USAF helicopter picked up the Captain, a member of Eielson's 355th Fighter Squadron, about two hours after the crash.

■ Maryland ANG pilot Lt. Col. Ron Henry passed 4,000 hours in the A-10 Thunderbolt II September 27, marking a first for any A-10 pilot in the Air Force—active-duty, Guard, or Reserve. Now the chief of safety for the ANG's 175th Fighter Group in Baltimore, Md., Colonel Henry flew his first A-10 sortie in October 1977. He spent sixteen years on active duty and has nine years in the Guard.

■ In the wake of recent news about the so-called Unabomber, local law enforcement officers in Montgomery, Ala., arrested Maj. Lester K. Haney for allegedly depositing a bomb in the mail September 15 with the intent to kill or injure his wife. The Air Force is also investigating the incident. Major Haney, chief of intelligence at Maxwell AFB's College of Aerospace Doctrine, Research, and Education, was relieved of all duties.

■ The Air Force has made performance feedback mandatory for everyone except general officers. Based on recommendations from the panels that reviewed the officer and enlisted evaluation systems earlier this year, rating officials have to give feedback and certify when it was given.

■ Air Force ROTC has selected forty-eight active-duty airmen under its new Scholarships for Outstanding Airmen to ROTC program. After discharge from the service, the airmen enrolled in AFROTC classes at colleges and universities nationwide this fall and became full-time college students. When they graduate, they will reenter the Air Force as second lieutenants.

■ According to personnel officials, USAF will no longer tap people for involuntary overseas assignments while they are on temporary duty—including contingency or exercise operations—or performing manning assistance TDYs overseas.

■ Incirlik AB, Turkey, marked a first in US Air Forces in Europe history by moving more than 6,100 tons of excess munitions from Europe to the US in late August. It took base personnel two years, working with more than 250 Turkish diplomatic authorizations, to gain approval for the operation.

■ The 913th Airlift Wing, Willow Grove ARS, Pa., and the 439th Aero-

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medical Evacuation Squadron, Westover ARB, Mass., teamed up to maximize taxpayer dollars and improve training. The 913th now provides real flying training once every three months for the 439th's medical personnel as they fly the Reserve medics to the School of Aerospace Medicine, Brooks

AFB, Tex. The 439th had previously used mock, static aircraft for training.

■ According to Westover's 337th Airlift Squadron members, they have the most experienced C-5 aircrews in the galaxy. Six members have a total of 60,728.4 flying hours, with

18,135.6 hours in the C-5, which the unit has operated since 1987.

■ Within the next two years, the Reserve's 507th Air Refueling Wing at Tinker AFB, Okla., will gain six E-3 Airborne Warning and Control System crews for its new associate AWACS mission.

■ The 916th ARW at Seymour Johnson AFB, N. C., became the Air Force Reserve's sixth unit equipped with KC-135 Stratotankers. Flying the KC-135R, the newest version of the modified Boeing 707 refueler, the 916th now would be gained by Air Mobility Command, rather than Air Combat Command. The 916th formerly flew KC-10s.

■ USAFE selected Incirlik AB, Turkey, as best installation in the command. The base won the annual Commander in Chief's Award for Installation Excellence for its combat operations support to Operation Provide Comfort from three separate locations while the base renovated its runway. It also made \$30 million in facility improvements.

■ The Defense Commissary Agency named four Air Force commissaries among the best in 1995—Hill AFB, Utah, Grand Forks AFB, N. D., Malmstrom AFB, Mont., and Albrook AFS, Panama.

■ President Clinton appointed Lt. Col. David K. "Bob" Edmonds, former 95th Fighter Squadron commander at Tyndall AFB, Fla., to be a White House Fellow for the 1995-96 class.

■ Air Force personnel specialists who operate the Automated Records Management System earned a 1995 Federal Technology Leadership Award, one of only thirty government projects recognized. ARMS members converted more than thirteen million images from microfiche and nearly two million paper documents to optical discs in less than a year.

■ Lt. Col. (Dr.) Stephen Derdak received the Chairman's Award for Excellence in Military Medicine, with which the Joint Chiefs of Staff annually recognize one physician from each service.

■ Air Intelligence Agency named its Outstanding Airmen for 1994: SrA. Robert Andrews, MSgt. Lily Barnett, MSgt. Frederick Ferrer, SMSgt. Patrick Summers, TSgt. Sarah Daniel, and MSgt. Carol Brandt.

■ AIA's National Air Intelligence Center team of active-duty and reserve members won the first Killian Team Award, presented by the President's Foreign Intelligence Advisory Board for "outstanding contributions to foreign policy and analysis of crucial importance to the United States."

Senior Staff Changes

PROMOTION: To be Lieutenant General: Nicholas B. Kehoe III.

CHANGES: B/G James E. Andrews, from Cmdr., 319th ARW, AMC, Grand Forks AFB, N. D., to IG, Hq. AMC, Scott AFB, Ill., replacing B/G Antonio J. Ramos . . . M/G Robert S. Dickman, from Dir., Space Prgms., Ass't Sec'y of the Air Force for Acquisition, Hq. USAF, Washington, D. C., to DoD Space Architect, Under Sec'y of Defense for Acquisition and Technology, OSD, Washington, D. C. . . . B/G Robert H. Foglesong, from Cmdr., 51st FW, PACAF, Osan AB, South Korea, to Dep. Dir., Politico-Military Affairs, J-5, Jt. Staff, Washington, D. C., replacing M/G David W. McIlvoy . . . Col. (B/G selectee) Lawrence P. Graviss, from Cmdr., AEDC, AFMC, Arnold AS, Tenn., to Spec. Ass't to AFMC Cmdr. for National Facilities, Tullahoma, Tenn. . . . B/G William M. Guth, from Cmdr., 27th FW, ACC, Cannon AFB, N. M., to ACS, Ops., Hq. Allied Air Forces Northwestern Europe, NATO, and Dep. Cmdr., NATO Affairs, Hq. 3d AF, USAFE, RAF High Wycombe, UK, replacing B/G Steven R. Polk.

B/G Michael V. Hayden, from Dir., Intel., J-2, Hq. USEUCOM, Stuttgart-Vaihingen, Germany, to Spec. Ass't to the Cmdr., AIA, Kelly AFB, Tex. . . . B/G Kenneth W. Hess, from Cmdr., 374th AW, PACAF, Yokota AB, Japan, to Cmdr., 319th ARW, AMC, Grand Forks AFB, N. D., replacing B/G James E. Andrews . . . M/G (L/G selectee) Nicholas B. Kehoe III, from Cmdr., 19th AF, Hq. AETC, Randolph AFB, Tex., to Dep. Chairman, NATO Military Committee, Brussels, Belgium . . . B/G Michael C. Kostelnik, from Dir., Spec. Prgms., Under Sec'y of Defense for Acquisition and Technology, OSD, Washington, D. C., to Dir., P&P, Hq. AFMC, Wright-Patterson AFB, Ohio, replacing M/G Eugene L. Tattini . . . B/G Robert E. Larned, from Spec. Ass't to Cmdr., 20th AF, AFSPC, Malmstrom AFB, Mont., to Dir., Space Programs, Ass't Sec'y of the Air Force for Acquisition, Hq. USAF, Washington, D. C., replacing M/G Robert S. Dickman.

M/G David W. McIlvoy, from Dep. Dir., Politico-Military Affairs, J-5, Jt. Staff, Washington, D. C., to Dir., Military Personnel Policy, DCS/Personnel, Hq. USAF, Washington, D. C., replacing B/G Andrew J. Pelak, Jr. . . . B/G James E. Miller, Jr., from Dir., P&R, ACS, Intel., Hq. USAF, Washington, D. C., to Dir., Intel., J-2, Hq. USEUCOM, Stuttgart-Vaihingen, Germany, replacing B/G Michael V. Hayden . . . B/G Andrew J. Pelak, Jr., from Dir., Military Personnel Policy, DCS/Personnel, Hq. USAF, Washington, D. C., to Cmdr., 81st Training Wing, AETC, Keesler AFB, Miss., replacing B/G Karen S. Rankin . . . B/G Steven R. Polk, from ACS, Ops., Hq. Allied Air Forces Northwestern Europe, NATO, and Dep. Cmdr., NATO Affairs, Hq. 3d AF, USAFE, RAF High Wycombe, UK, to Cmdr., 51st FW, PACAF, Osan AB, South Korea, replacing B/G Robert H. Foglesong . . . B/G Roger E. Radcliff, from Cmdr., 355th Wing, ACC, Davis-Monthan AFB, Ariz., to JCS Representative, Conference on Security and Cooperation in Europe, J-5, Jt. Staff, Washington, D. C., replacing B/G Paul V. Hester.

B/G Antonio J. Ramos, from IG, Hq. AMC, Scott AFB, Ill., to Spec. Ass't to CINC, USSOUTHCOM for Int'l Negotiations, Quarry Heights, Panama . . . B/G Karen S. Rankin, from Cmdr., 81st Training Wing, AETC, Keesler AFB, Miss., to Dir., Technical Training, Hq. AETC, Randolph AFB, Tex., replacing Col. (B/G selectee) Joseph H. Wehrle, Jr. . . . B/G Arthur D. Sikes, Jr., from Dir., Production Functional Mgmt. Staff, National Military Intel. Production Ctr., DIA, Bolling AFB, D. C., to Dep. ACS, Intel., Hq. USAF, Washington, D. C., replacing B/G James E. Miller, Jr. . . . M/G W. Thomas West, from Spec. Ass't for Theater Air Defense, Hq. USAF, Washington, D. C., to Cmdr., 19th AF, Hq. AETC, Randolph AFB, Tex., replacing M/G Nicholas B. Kehoe III.

SENIOR ENLISTED ADVISOR (SEA) RETIREMENTS: CMSgt. Wayne G. Norrad, CMSgt. James A. Rossi.

SEA CHANGES: CMSgt. Mike Reynolds, to SEA, Hq. AFSOC, Hurlburt Field, Fla., replacing retired CMSgt. Wayne G. Norrad . . . CMSgt. Carol A. Smits, to SEA, Hq. AFRES, Robins AFB, Ga., replacing retired CMSgt. James A. Rossi.

SENIOR EXECUTIVE SERVICE (SES) CHANGES: Sandra G. Grese, to Dir., Civilian Personnel Policy and Personnel Plans, Hq. USAF, Washington, D. C., replacing Roger M. Blanchard . . . John M. Ledden, to Principal Dep. Dir. of Ops. for Transportation, Hq. AMC, Scott AFB, Ill. ■

There's no letup in the operational tempo, and lean resources leave a narrow margin for risk.



The Long Reach of Air Combat Command



Gen. Ronald R. Fogleman, USAF Chief of Staff, and Gen. Joseph W. Ralston, ACC commander, agree that the F-22 (seen here in YF-22 prototype form) should be the Air Force's top priority.

By John A. Tirpak, Senior Editor

SINCE its founding in 1991, Air Combat Command has been organized and reorganized. Functions have been added, taken away, then added back. ACC merged most of the forces of Strategic Air Command (SAC) and Tactical Air Command (TAC), cut troop levels, and slashed aircraft inventories by roughly forty percent.

Through it all, the Air Force's US-based fighting units deployed continuously into live-fire situations worldwide, setting a furious pace few expected to see in the post-Cold War era.

Now, the expeditionary fighter and bomber units under ACC's flag have shaken down into what appears to be a stable force structure with fairly predictable funding. However, they still are saddled with a punishing operations tempo. Margins are narrow, and the fighting forces are running hard to keep up.

Gen. Joseph W. Ralston, who last summer succeeded Gen. John Michael Loh in the top ACC job, noted that, for the sheer pace of operations, peacetime demands can seem "tougher than war."

Even as General Ralston spoke, USAF units deployed from the United States to forward locations were flying strike missions in the Balkans,

days a year deployed away from home base. Exceeding that level eventually causes experienced airmen to leave the service, and extended tours are only too common for USAF personnel operating these high-demand systems.

In response, ACC has added crews to certain aircraft to relieve some of the burden. Noted General Ralston, "We will come a lot closer to [limit-

Too Few and Too Busy

The command's fighting forces, however, are now forty percent smaller than the combined forces of SAC and TAC in 1991. Moreover, these units are struggling with a fourfold increase in contingency operations since the late 1980s.

As a result, ACC's forces sometimes are too few and too busy to be able to meet all the demands being

ACC's Shifting Force Lineup

Component	1992	1993	1994	1995
Active duty	153,148	124,519	112,166	104,330
Air National Guard	70,184	75,637	81,192	81,309
Air Force Reserve	13,816	27,687	26,329	25,579
Civilian	21,185	25,988	16,412	13,514
Total	258,333	253,831	236,099	224,732

A Smaller ACC Fleet

(Primary Aircraft Authorized)

Aircraft Type	1992	1993	1994	1995
Bombers	201	166	121	122
Fighters	698	348	324	306
Attack aircraft	373	258	231	156
EC/EW aircraft	39	45	48	48
Aerial refuelers	73	25	12	12
Other (all types)	304	381	310	254

combat air patrols over northern and southern Iraq, counterdrug missions in the Caribbean, and air support of relief missions in a variety of overseas locations. In the US, nondeployed ACC units kept up a rigorous training schedule.

General Ralston said that the pace is particularly rough for US-based personnel handling "systems that are small in number but in high demand by the CINCs," or regional commanders in chief. Such systems, he said, include the service's E-3 Airborne Warning and Control System (AWACS) and RC-135 Rivet Joint aircraft.

The Air Force tries to keep personnel from spending more than 120

ing TDYs to 120 days] this year than last year."

Still, ACC's leaders agree that the problem persists and will continue to generate major difficulties for the near future, at least. "I cannot see, right now, any significant change in optempo," reported General Ralston. "As in anything, there is a limit to what [the fighting units] can do."

Air Combat Command is not a joint-service organization and would not go into action on its own. Rather, it provides trained, combat-ready forces to the US regional commanders in Europe, the Middle East, the Far East, or other military theaters. These commanders always want as much airpower as they can get.

placed on them by the regional commanders.

General Ralston acknowledged this problem and explained that ACC is attacking it in a number of ways. First, he pointed out, the squadrons receive "outstanding" help from the Air National Guard and Air Force Reserve, which supplement the active forces when requests for airpower outstrip the available units.

"The Guard and Reserve have been absolutely crucial . . . in helping us meet our requirements," he said.

Second, planners have begun to conduct "worldwide tasking"—borrowing aircraft and crews from one theater or command and deploying them to contingency operations in another theater, in order to relieve forward-deployed units that must return to US bases for needed training or rest.

Last, General Ralston said, he and other ACC leaders in some cases have gone directly to CINCs and told them bluntly, "We just cannot provide what you've asked for. Please reevaluate your requirements." He added that, in some cases, "a reallocation was made."

There are no other ways to squeeze more work out of the available forces, General Ralston claimed, adding, "I don't know of any other variables."

In the name of economy, the Air Force in the past few years has cut back on its power-projection forces, most of which reside in ACC wings and squadrons. The next systems to go will be USAF's EF-111 escort jammers and F-4G "Wild Weasel" defense suppression systems, also ACC assets.

The bomber fleet, while far busier than in the past [see "Heavyweights for the New Strategy," October 1995, p. 24], does not get called on to deploy to contingency operations as ACC's tactical airlift and strike and fighter assets do and is not considered as "overtasked" as other force components are.

Bomber wings are occupied with integrating new aircraft and weapons, focusing on readiness for the conventional mission, and consolidating their aircraft at fewer bases. The units routinely practice globe-girdling "power-projection" missions lasting thirty or more hours, but they don't bump into the 120-day TDY limit nearly as often as their fighter or surveillance counterparts do.

Lt. Gen. George K. Muellner, principal deputy assistant secretary of the Air Force for Acquisition, said the Raven and Weasel aircraft can be phased out because "we have, in the future, more capability in stealth, . . . which reduces the amount of capability you need" in defense suppression or jamming.

Each time such cuts are made, Air



EF-111s (above) and F-4G "Wild Weasels" are slated to be the next targets of ACC's downsizing. The Navy will take over part of the mission with its EA-6s, and USAF's increased use of stealth aircraft reduces the need for jamming.

Force leaders say the resulting force is one they can live with and that the cut causes only a "reasonable risk." General Ralston acknowledged that the definition of reasonable risk lies "in the eyes of the beholder."

He asserted that each reduction has been made on the basis of what senior Air Force leaders deem the "most likely scenario" that the forces will face. They do not base such judgments solely on their perception of a "worst-case scenario," said General Ralston. The goal, he added,

is to maintain a "balance of capabilities."

In the Air Force, he said, "we are risk-averse people. We want to make sure that when we tell the political leadership we can accomplish a mission, we have a high probability of accomplishment."

He noted, however, that USAF has a steadily decreasing margin of error. "Is there a lot of margin there?" the General asked rhetorically. "I'm afraid not. I think if we've found that we had excess capacity, we've already taken that out."

With each "downsizing," more and more extensive war-gaming, modeling, and simulation is done to "play" the resulting force against a variety of contingencies. Decisions are based on this data, as well as real-world experience, he said.

"Is it a prudent risk?" he asked. "Can we manage it? . . . Can we handle what the national command authorities want us to do? . . . I feel pretty confident that the answer is yes."

Establishing Priorities

General Muellner revealed that ACC has "no more attrition assets" in its F-15E fleet. From now on, he explained, each loss of an F-15E "will directly cut into" the Air Force's deep-strike capability. General Ralston confirmed that fact. He added, "If we don't buy any more combat aircraft, . . . [then] based on projected attrition we will start eating



ACC leaders believe that the major command has enough bombers to perform its mission, provided the investment is made in the standoff and precision weapons that will make the current fleet more formidable.



The F-15Es—star performers in the Persian Gulf War—are even better today, now that they all are equipped with a complete set of LANTIRN pods. General Ralston voiced concern that, without another F-15E buy, “we will start eating into our combat force structure” in 2000 or 2001.

into our combat force structure” in 2000 or 2001.

He added that ACC estimates it needs eighteen more F-15Es to maintain the force at its prescribed levels through 2010, when a new strike aircraft—a stealthy successor to the F-16—will become available.

On the question of additional fighter buys, General Ralston defers to the Chief of Staff, Gen. Ronald R. Fogleman, who has stated his priorities. General Fogleman, asked by Congress where he would spend additional funds if they were to become available, named the F-22 fighter, C-17 transport, F-15E fighter, and F-16 fighter—in that order.

“By and large, Congress has [followed] that list” in its FY 1997 deliberations, General Ralston said.

Options for dealing with the attrition problem boil down to the following: “Buy more airplanes, . . . SLEP [Service Life Extension Program] some of the airplanes you have, maybe take some airplanes out of the boneyard.”

When it comes to bombers, General Ralston’s priority is not more B-2 Stealth bombers, but the munitions that will make the existing—and paid-for—bomber fleet more formidable.

“We’ve got to have . . . the stand-off and precision munitions for the bombers,” he said, referring to such weapons as the Joint Direct Attack

Munition and Joint Standoff Weapon, both under development.

He added, “That’s the number one ACC priority with regard to bombers—those conventional modifications.”

The ACC commander agreed with the Pentagon’s recent bomber study that said putting funds into precision munitions will pay off more quickly and more decisively than investing in new bombers. General Ralston also doesn’t want to introduce budget elements that would upset the “carefully laid out” funding sequence for other systems, which are higher on the list of priorities.

General Ralston bristles at any suggestion that the Air Force has “rolled over” and accepted budget and force-structure cuts without putting up much of a fight.

“The Air Force, on numerous occasions, has stood up and fought very, very strenuously to maintain what we felt we had to have,” he said. “We, as an Air Force, have been united. . . . There have been times when . . . we have stood up and said, ‘Absolutely not. . . . We cannot take a cut on this point.’ ”

This was particularly true in the case of the F-22 fighter and precision munitions, said General Ralston.

He added, “Every year, when it comes down to the final throw, someone always wants to say, ‘Well, let’s slip the F-22’ ” a few years. The F-22, he asserted, is “absolutely cru-

cial to the future of air superiority, which every CINC out there has to depend upon.”

Though ACC’s power-projection forces have shrunk, they have gained capabilities that make them, pound-for-pound, more potent than before.

“We have a more capable force than we did in the [Persian] Gulf War,” General Ralston said. During that conflict, the Air Force fielded just eighteen F-15Es with the Low-Altitude Navigation and Targeting Infrared for Night (LANTIRN) system, which gives a precision, laser-guided bomb capability.

“Today, we’ve got over 200 F-15Es . . . and 250 F-16s” that are equipped with LANTIRN, General Ralston reported. “This is an enormous increase in terms of combat capability and precision attack capability.”

He further noted that the AIM-120A Advanced Medium-Range Air-to-Air Missile had been deployed to the fighting forces only in the last weeks of the Gulf War and only in small numbers. Now, “every F-15C squadron is AMRAAM-equipped,” he said.

General Ralston, like other senior USAF officers, believes that the Defense Department may conduct another review of force structure with an eye toward shrinking the military yet again. However, he said he did not expect that such a review would lead to another significant cut in ACC force structure, so long as the current Pentagon spending plans hold up.

“I believe, based on the modernization plan we’ve just forwarded [to the Defense Department] and the assumptions that we made about the budget level, . . . that we do have an affordable . . . modernization plan.”

The modernization plan, in which ACC units have a huge stake, calls for a careful phasing of spending that moves the F-22 into production in the early 2000s, at about the same time that the F-16 replacement—dubbed the Next-Generation Fighter—is in the development phase. As F-22 production winds down, NGF production will ramp up.

The Air Force has been “phasing” modernization since the 1970s, when fighters were recapitalized. In the 1980s, it was the turn of the strategic forces—bombers and ICBMs. In the 1990s, it’s airlift—the C-17 and C-130J.

In the next decade, said General

Ralston, "it will be time for fighters again," and the need is urgent. When the first F-22 reaches the flight line, the F-15 will have been the premier US fighter for thirty-three years, he noted.

"We have never flown a fighter that long without replacing it," he said. "Does that mean we can't do it? No, I think we will do it, . . . but one could argue that the thirty-three-year-old F-15 is too old to be the free world's front-line fighter."

New Aircraft

New major systems take a long time to develop, and the Air Force's technology does not change as quickly as is commonly thought, General Ralston observed. One case in point for ACC is unmanned aerial vehicles.

"We're getting into UAVs in a big way," he said. "We understand they have enormous potential. We also understand they have enormous challenges. . . . We're going to have to take it one step at a time."

He anticipates that UAVs offer promise first in the field of reconnaissance, and "later, as the technology develops, certainly there are other applications as well," but "I think it's some time off before we're going to have a credible UAV reconnaissance capability, in significant numbers, that will allow us to . . . provide a meaningful capability to the CINCs."

Though funding for UAVs appears



With the Navy and Marines, USAF hopes that the JAST program will generate a new family of fighters early in the next century. Seen here in artist's concept, the aircraft must be both affordable and capable enough to replace the F-16.

in the next budget, "by the time you execute that, . . . get it delivered, . . . get personnel trained, and get it . . . up and running," a decade can easily pass, he said.

Though ACC will continue to "have an open mind" to take advantage of technological opportunities as they arise, it is wise to "throw in a bit of pragmatism" and not depend on new systems to pay off quickly, he said.

General Ralston said he is comfortable with the Air Force's spending levels on research and develop-

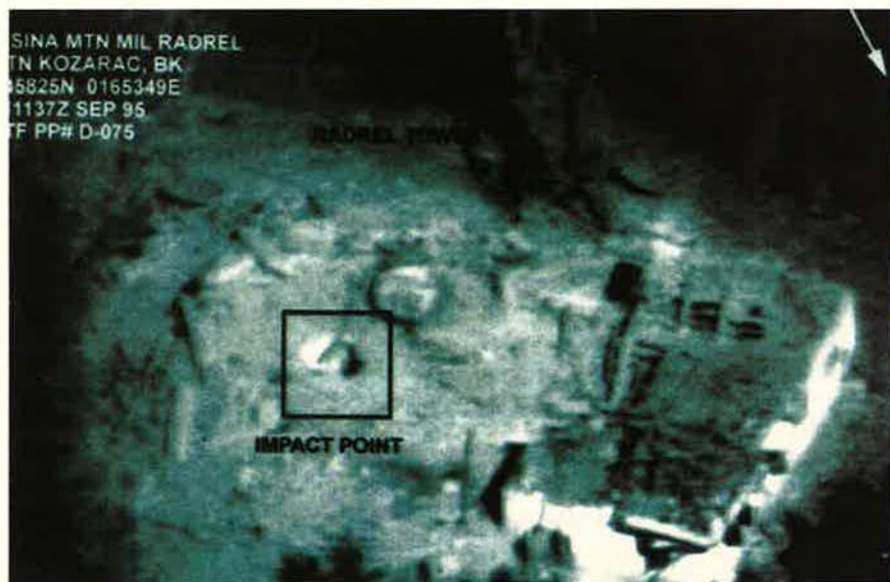
ment because they seem to be staying constant relative to the overall budget. It will, however, be "ten to fifteen years" before it can be known if the money was spent on the right technologies.

He is also satisfied with the direction that the Joint Advanced Strike Technology (JAST) program is taking, though "it's too early to tell" if the Air Force will get from it the F-16 replacement it must have in fifteen years. The JAST program is slated to generate a new family of fighters for the Navy, Marine Corps, and Air Force.

The JAST Program Office has been attentive to the Air Force's stated need for an affordable, capable airplane, he said. But "we have also been responsible on the other end" in not demanding performance that would be expensive to acquire but not absolutely necessary.

The Air Force is aggressively pursuing the use of "off-board" sensors—such as Joint STARS, AWACS, and satellites—and piping the information down to "shooter" aircraft. [See "Electronic Warfare, Economy Style," November 1995, p. 24.]

"It makes sense . . . to exploit all that information that is already out there in the ether," General Ralston said. If the big sensor systems are lost, ACC combat planes "still have a fairly autonomous capability; . . . we're no worse off than we would have been."



Unmanned aerial vehicles were used during the Gulf War and in Bosnia to provide post-strike reconnaissance photos, such as this one. General Ralston sees "enormous potential" for UAVs but also sees "enormous challenges."



General Ralston says the Lockheed Martin F-22 is "absolutely crucial to the future of air superiority" and that getting the stealthy fighter to the flight line on time "will be a magnificent accomplishment."

But he is concerned that in the zeal to cut costs on JAST aircraft, "we are going to be forced into more and more trade-offs." Off-board systems may completely substitute for expensive on-board avionics.

If that happens, "we are going to have to give up autonomous capability on airplanes," General Ralston said. "And then, if something happens to the information net, you're not going to be able to fall back" on the on-board systems because they won't be there.

The General said that he will not promote the creation of F-22 derivatives as enthusiastically as ACC has to date.

"We need to keep our focus and our energy on getting the F-22 as we know it" because it is such a crucial capability, he said. "I have no doubt" that the F-22 will spawn variants, he continued, but such talk creates an opening for opponents of the plane to demand delays while derivatives are designed. Such stretch-outs could threaten the program.

Just getting the F-22 "A model" to the flight line—on time—"will be a magnificent accomplishment," he said.

Maintaining Airspace

Another issue he will be putting heavy attention on will be the availability of training airspace.

"I've created a division here and told them that this issue is more im-

portant than the F-22 or B-2 . . . because if we lose our airspace, . . . then we're going to be out of business as an Air Force."

The service must make its case for training airspace more effectively, he said, because the advent of the supercruising F-22 (it will be able to fly at supersonic speeds without resorting to fuel-gulping afterburners) will make such ranges ever more critical. Though there may be ranges where the Air Force can "turn back airspace, . . . there are other areas where we ought to be working on getting more."

Air Combat Command has a very broad plan covering the next twenty-five years, started in 1991 under former USAF Chief of Staff Gen. Merrill A. McPeak. The "Mission Area Plans" replace what used to be called "roadmaps," as in "fighter roadmaps" and "bomber roadmaps." The MAPs sketch out generalized missions that must be accomplished, then describe, in increasing detail, the tools and enabling technologies required to meet the mission.

"You could take it all the way down to the F-16 avionics roadmap if you wanted to," General Ralston said.

Development of the MAPs is "a strategy-to-task process," he explained. "Then we apply fiscal restraints, which you always have."

New MAPs are completed each August. They feed into the next year's

budget request and program objective memorandum process.

General Fogleman said that the MAPs provide an opportunity to "imagine what we will need to be doing in 2020 . . . then work backwards," so that projects are started in time to meet the anticipated situation.

Composite wings—created along with ACC to further blur the lines between "tactical" and "strategic" forces, as well as to create ready-for-war expeditionary packages—have made their point, but General Ralston said they will not be phased out.

"I have been a big proponent of composite wings from a training point of view," General Ralston said. The training offered by getting dissimilar aircraft working together as they would in wartime is "just superb," he said.

"I don't see us turning back the clock" on the concept, the General continued. "I think people recognize the benefits of that." Besides, he added, with fewer bases, "you're going to have a mixture [at each one] under any circumstances."

Though both SAC and TAC had distinctive "cultures," ACC has not yet developed one, General Ralston said. Because of the merger, though, ACC people have "a far broader perspective of airpower. People understand power projection . . . to a much greater extent than they used to."

The General agrees that the Air Force should continue reshaping itself for the future, but a few aspects of the change give him concern.

"One of the things that hurts . . . as you go through a drawdown is that in many cases you are forced into single-point failures," where everything hinges on a few systems. "And if you happen to be wrong" about where you can do without backup systems, "then you're in bad shape."

He explained that the Air Force has become "very heavily dependent upon information and information flow. What if we guessed wrong on that, and we are not able to do the defensive IW [information warfare] that we'd like to do? And we're so dependent on that information . . . if somehow it is denied, or manipulated, can we recover? I guess I worry about that." ■

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This massive Air Force survey drew responses from 356,409 people. It will be a baseline reference in setting personnel policies.

The Quality of Military Life

By Peter Grier

THE majority of active-duty members of the Air Force plan to remain in the military for at least twenty years.

Most of them have traveled somewhere in the world on temporary duty within the past twelve months, and this TDY has caused problems at home for many.

Some sixty percent of USAF personnel believe that senior officers do not give the greatest weight to job performance when they determine promotions. A substantial majority agrees that the needs of the service should be uppermost when it comes to handing out assignments.

All these assessments come from the 1995 Air Force Quality-of-Life Survey, a ground-breaking poll taken by service officials to gauge how they might improve the day-to-day lot of today's service personnel.

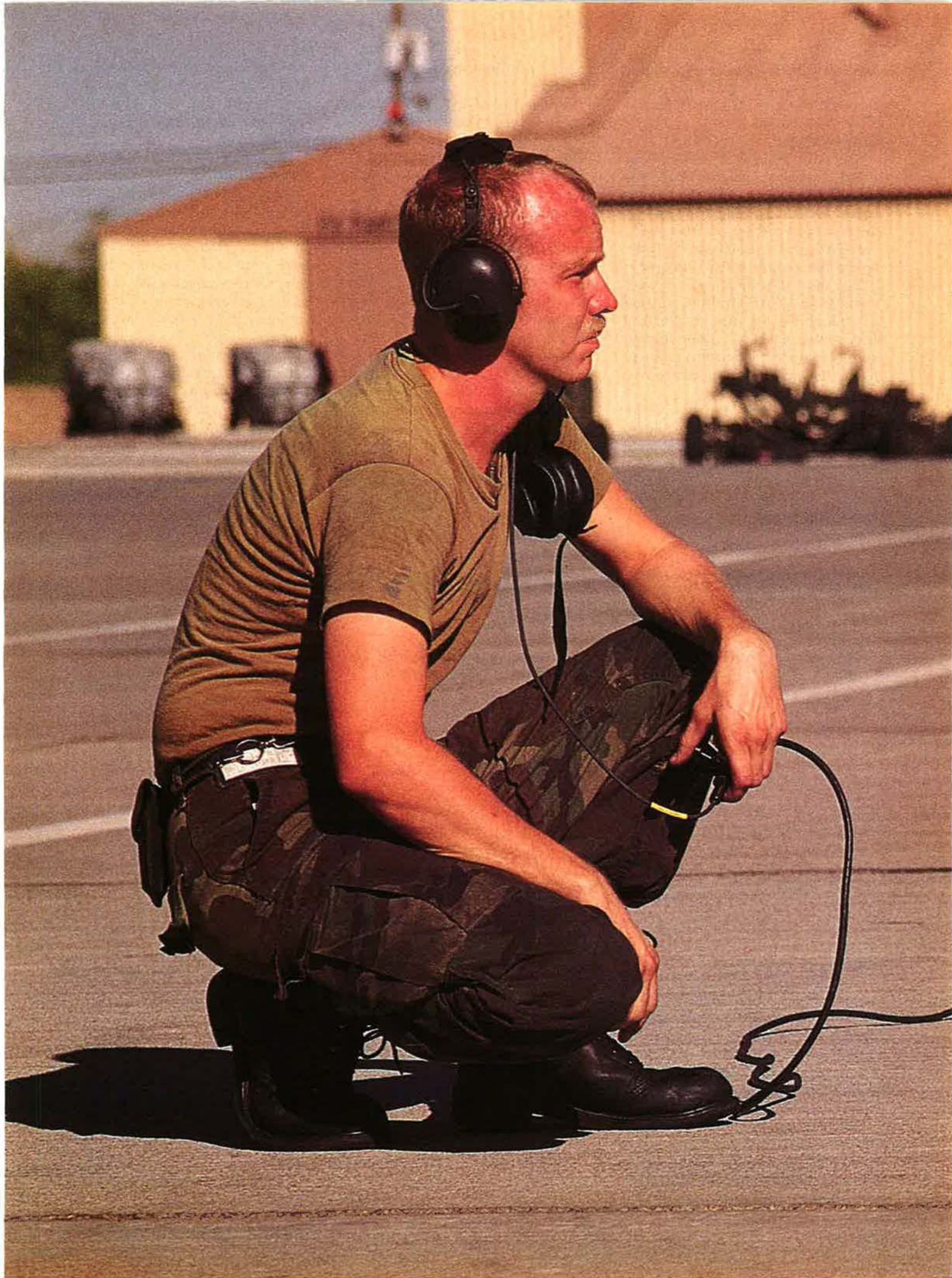
Every member of the Air Force—officer, enlisted, and civilian—had access to a computerized version of the survey and could register his or her opinion. The Air Force Military Personnel Center received 356,409 responses from bases worldwide—meaning two-thirds of the entire Air Force weighed in with their opin-

SSgt. Michael Flanary, a dedicated F-111 crew chief with the 27th Fighter Wing, Cannon AFB, N. M., is part of an enlisted force that responded in overwhelming numbers to the survey, which covered everything from housing to job recognition.

ions about the quality of service life.

Gen. Ronald R. Fogleman, the Air Force Chief of Staff, said the results will give him "a baseline" for further work. The Air Force is "committed to addressing the concerns" expressed in the survey, he said.

Earlier this year, General Fogleman had approved the survey topics. For blue-suiters, the topics included career intent, optempo and personnel tempo, recognition, promotions, evaluations, assignments, housing, and base-level services. The civilian version of the survey dropped ques-



tions about housing and assignments; in their place were questions about flextime and civilian career paths.

Career Intent

Sixty-six percent of active-duty USAF members intend to make the service a career and stay in for at least twenty years, according to the survey. Seventy-four percent of officers expressed this view, compared to sixty-four percent of the enlisted troops.

The most noncommittal response came from USAF's junior enlisted personnel. Twenty-nine percent said they would seek a full career, thirty-six percent said they were eager to leave the service, and thirty-five percent were undecided.

In contrast, Air Force civilian workers were highly motivated to stay; a whopping eighty-one percent indicated that they plan to make a career of the Air Force and stay on the job until it comes time for their retirement parties.

cialties routinely exceed the 120-day limit.

The Quality-of-Life Survey found that, in the past year, ninety percent of all Air Force officers had been on TDY, as had sixty-four percent of enlisted personnel and forty percent of civilians.

Behind these overall numbers lay some statistics that Air Force personnel planners may find disturbing. As Figure 1 shows, more than one-quarter of rated officers spent more than ninety days on TDY. Fourteen percent of rated officers broke the 120-day barrier.

Survey respondents said that the increased levels of operations tempo damaged their "ability to receive professional military education (PME), obtain required training, and complete nonmilitary education."

Many indicated that time away from home caused personal problems and hurt them financially, as shown in Figure 2.

Despite the negative impact of TDY, more than seventy percent of respondents said that their family remained supportive of their Air Force careers.

Recognition

Survey participants were relatively positive about their chances to receive recognition for a job well done. As Figure 3 shows, senior officers were more likely to believe that their job provides opportunity for recognition than were junior officers. Next came civilians and then enlisted personnel.

A majority of respondents in all categories expressed the belief that, if they performed their jobs well, they could expect to receive praise from their superiors. Most also believed that they are usually given an opportunity to present the results of their work to others and that their unit usually recognizes good performance.

Figure 1. The Busy Force

Cumulative TDY 12-month Period	Percent of USAF Serving on TDY						
	Enlisted Members	Rated Officers	Nonrated Officers	Junior Civilians	Midlevel Civilians	Senior Civilians	Senior Executive Service
None	36	5	13	58	35	12	14
1-14 days	22	15	27	34	40	36	15
15-30 days	13	17	22	5	15	26	22
31-60 days	13	22	20	2	7	17	26
61-90 days	7	14	9	1	2	6	17
91-120 days	5	13	5	0	1	2	5
121-179 days	3	10	3	0	0	1	0
180+ days	1	4	1	0	0	0	1

Survey data show that, during the relevant twelve-month period, TDY was served by sixty-four percent of all enlisted troops, ninety percent of all officers, and forty percent of all Air Force civilians.

Optempo, Perstempo

As the Air Force in recent years has shrunk in size, officials have become increasingly concerned about work load. The service has set limits on TDY, stating its desire that no Air Force member should have to spend more than 120 days per year away from home on temporary duty.

The reality is that the Air Force, faced with a smaller force and a rising number of deployments to world trouble spots, is in a bind, and members in some critical spe-

Figure 2. Down Side of High Op/Perstempo

Type of Problem	Percent of Force Experiencing TDY-Related Problems		
	Enlisted Members	Rated Officers	Nonrated Officers
Personal	33	49	35
Financial	37	37	29
Child care	32	35	29
PME	20	41	25
Training	30	44	33
Education	45	55	36

Figure 3. **My job does not give me much opportunity for recognition.**

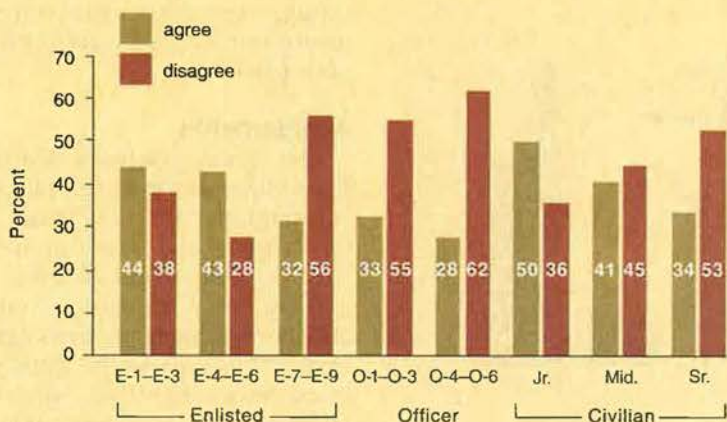


Figure 4. **The promotion system that affects me is fair and equitable.**

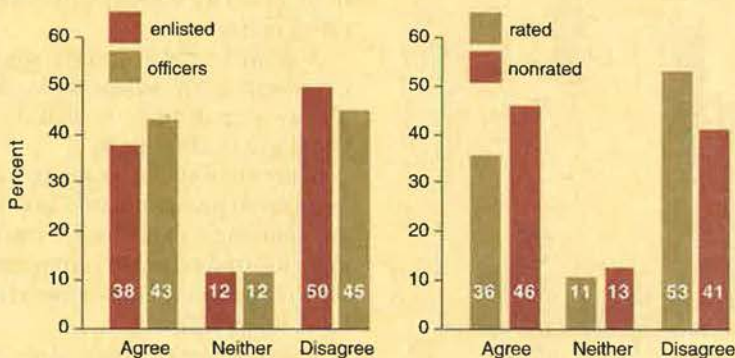
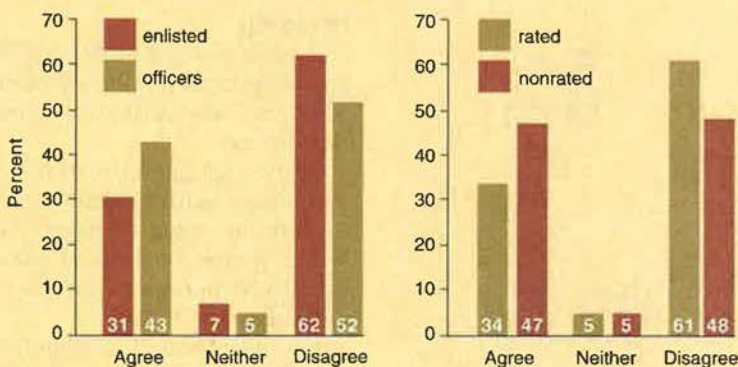


Figure 5. **How well I perform my job is the most important factor in whether or not I will be promoted.**



Promotion

The Air Force's promotion system received mixed reviews. Large majorities of all categories reported that they understood the workings of the promotion system. Most officers expressed a belief that the years-long downsizing of the force had

made USAF promotions more difficult to come by.

Understanding this situation did not necessarily equate with support, however. As pictured in Figure 4, fifty percent of enlisted personnel do not believe their promotion system is fair. Fifty-three percent of

rated officers believe the same thing, though a slim majority of nonrated personnel thought their system equitable.

Sixty-two percent of enlisted respondents and fifty-two percent of officers said they did not believe that the Air Force promotion systems gave greatest weight to individual job performance (Figure 5). Half said they believed academic education, professional military education, and other nonperformance factors carry too much weight in the promotion decisions.

According to the survey results, most blue-suiters do not believe the best people tend, in the end, to rise to the top (Figure 6). In one instance, the survey stated, "The Air Force promotion system selects the best qualified person for promotion" and asked for a response. Seventy percent of enlisted personnel and sixty-two percent of rated officers disagreed.

Many civilians were similarly critical of their promotion systems. Only about one-third of Air Force civilians in junior to senior grades agreed that they would be promoted to a level as high as is warranted by ability and interest.

Senior Executive Service civilians tended to have more confidence about promotion prospects. Sixty percent of these top-level employees judged that they could rise as high as their ability allowed.

The military promotion system criticisms may well have reflected problems of the past rather than the present. However, one survey result appears at odds with a change made to the officer system in response to an earlier review. [See "USAF Evaluation Systems Reviewed," July 1995 "Aerospace World," p. 19.]

Following that review, the Air Force changed back to a "whole person" approach, considering academic and professional military education as well as job performance in making evaluations. The survey results, in contrast, show that sixty-three percent of rated officers and forty-four percent of nonrated officers think nonperformance factors receive too much emphasis.

Air Force personnel officials said that they plan to look at this issue again and are considering another survey to further pinpoint disparities.

Figure 6. The Air Force promotion system selects the best qualified person for promotion.

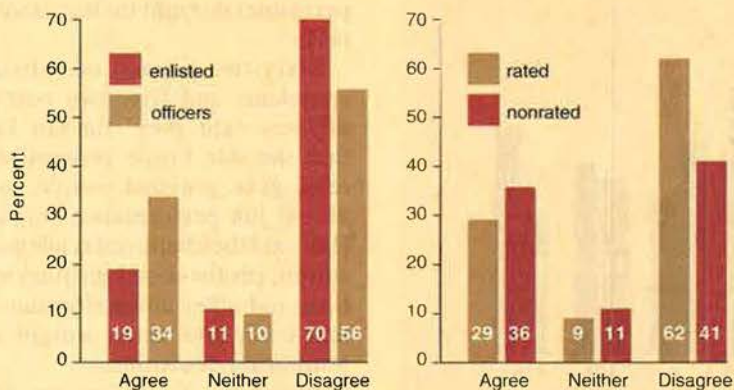


Figure 7. The Air Force evaluation system that affects me is as fair as it can be.

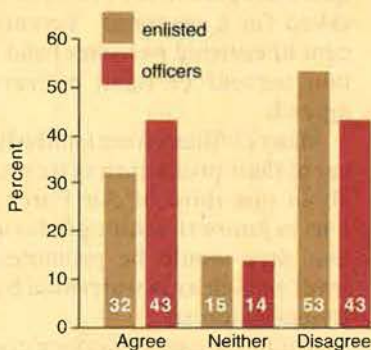


Figure 8. The needs of the Air Force should outweigh personal desires in the assignment process.

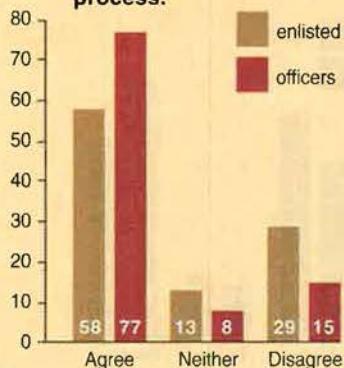
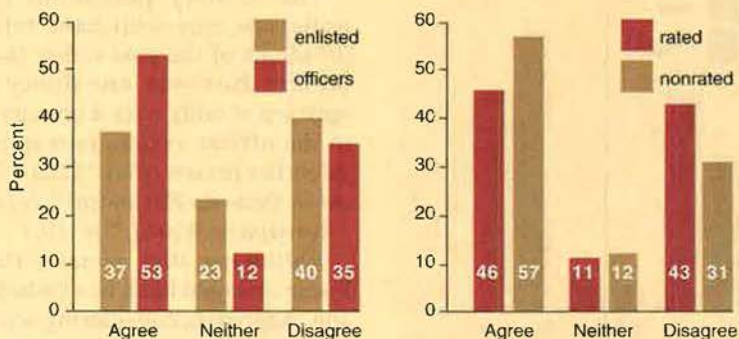


Figure 9. The assignment system provides me the opportunity to achieve my personal goals.



Evaluation

The range of opinion on promotions was mirrored in the survey's findings about evaluations.

Slightly more than half of enlisted respondents felt that their evaluation system is unfair, as did forty-three percent of officers (Figure 7).

Only thirty-two percent of USAF enlisted personnel thought the "right people" get highest ratings. Forty-four percent of officers had reached the same conclusion.

A majority of service members of all ranks said evaluations accurately document individual performances.

On the civilian side, the survey reported, evaluation systems get "poor ratings regarding effectiveness in identifying both good performers and poor performers."

Assignments

The survey disclosed that the officer corps and enlisted ranks held substantially different views about the fairness and worth of their respective assignment systems.

Only forty percent of enlisted members believe that the assignment system gives them the opportunity to move forward in their career fields. Officers expressed a much more positive view; fifty-six percent said that they believe the assignment system gives them the opportunity to advance. However, this view was held more often by nonrated officers than rated officers.

A similar split marked opinions on whether the assignment process allows opportunity to achieve personal goals (Figure 9).

More than twice as many officers as enlisted personnel told survey takers that they discussed career progression and future assignments with their commanders or supervisors at least once a year.

Overall, large majorities of all categories of blue-suiters said that, when it comes to the assignment process, the needs of the Air Force should be paramount (Figure 8).

Housing

Housing is one of the Air Force's most important quality-of-life issues. This fact was reflected throughout the survey.

Sixty-eight percent of officer respondents said that the location of their home, whether on or off base, had a major impact on their morale. Sixty percent of enlisted ranks agreed.

For the most part, respondents living off base said they prefer to live that way all the time. The majority of those who reside on base said that their preference for base housing or private housing was on a case-by-case basis. For most, the major variable is their duty location. Safety, cost, and quality of housing, both on and off base, figure into this decision.

Overall, in the continental US a slightly higher percentage of Air Force people live off base than on,

Figure 10. **Personnel Residing On and Off Base
By Grade Groups**

Grade Groups	Percent CONUS		Percent Overseas	
	On Base	Off Base	On Base	Off Base
E-1-E-3	66	34	76	24
E-4-E-6	42	58	62	38
E-7-E-9	27	73	58	42
O-1-O-3	23	77	48	52
O-4-O-6	20	80	55	45
O-7+	87	13	93	7

Figure 11. **On-Base Housing
Level of Importance and Satisfaction With On-Base Housing Factors**

Factor	Percent Importance			Percent Satisfaction		
	Officer	Enlisted		Officer	Enlisted	
	Family Housing	Dormitory	Family Housing	Family Housing	Dormitory	Family Housing
Maintenance	63	60	69	72	52	68
Number of bedrooms	62	39	67	78	39	76
Size of unit	61	57	65	67	45	69
Privacy	58	82	64	64	45	57
Number of bathrooms	49	39	50	73	40	66
Parking	30	49	42	63	50	62
Government appliances	28	35	44	63	45	63
Playground available	24	15	41	55	24	60

Figure 12. **If not a member of the enlisted or officers' club, which of the following would make you consider joining?**

	Percent Military	Percent Civilian
More family programs	38	47
Sports bar	27	17
Franchised food	18	22
Increased entertainment	17	14

according to the survey. A breakdown by grade and location is shown in Figure 10. Those who are based overseas are more likely to live in government residences. More senior personnel, except for generals, tend to live off base in the States.

Base family housing received gen-

erally good ratings. Enlisted members who live in base dormitories were somewhat less satisfied (Figure 11). Eighty-eight percent of single enlisted personnel who responded to the survey thought that a private sleeping room would improve their quality of life.

Of the officers and enlisted personnel living off base, seventy-five percent cited "increased housing allowances" as the top housing priority.

Base-Level Services

For most Air Force members, the availability of such services as exercise rooms and clubs constitute important factors in determining quality of life. Most military survey respondents judged their on-base services positively, though half felt their suggestions for service improvement usually fall on deaf ears.

Fitness centers were judged the most important service available. Next in order of preference came child development centers, family support centers, golf courses, libraries, and clubs. When non-club members were asked what might make them join, "more family programs" was the top answer (Figure 12).

Civilian Issues

Work scheduling is a perennial topic among Air Force civilian workers. Asked if they liked the idea of flextime, an overwhelming majority (eighty-three percent) of civilian survey respondents said "yes." Civilians approved of flex-days by a similar margin.

The survey suggested that, for Air Force civilians, the level of satisfaction with job-training opportunities depends on grade level. Only thirty-nine percent of junior civilians give the "good" rating to their training opportunities; among those in the Senior Executive Service, the figure comes to almost seventy percent. Similarly, more than half the junior and midlevel civilians were critical of career development counseling opportunities. The senior level and SES civilians were slightly more positive.

Asked if they would relocate to advance their careers, about one-half of Air Force civilians said "yes," one-third said "no," and the remainder was undecided. ■

Peter Grier, the Washington bureau chief of the Christian Science Monitor, is a longtime defense correspondent and regular contributor to Air Force Magazine. His most recent articles, "Aerospace Technology Exposition" and "Looking Back, Looking Ahead," appeared in the November 1995 issue.

Staff photo by Guy Aceto

At Barksdale AFB, La., the 2d Bomb Wing is the college of bomber knowledge for those learning to fly the B-52.

BUFF University

Photographs by Paul Kennedy and Guy Aceto, Art Director



Designed as a high-altitude intercontinental nuclear bomber more than forty years ago, the Boeing B-52 Stratofortress has stood the test of the Cold War and two hot wars—Vietnam and the Persian Gulf. Over the years, the BUFF has adapted to meet the needs of a changing force. Because of this versatility, it will continue to be synonymous with long-range power projection into the next century.



With three B-52 squadrons, the 2d Bomb Wing conducts Barksdale AFB's primary mission. Here, 20th Bomb Squadron members thoroughly prepare for a mission that could take most of the day. Typical training missions last six to eight hours; in wartime, a mission could stretch to thirty hours. Capt. James Coombes (left) works out what he needs for his position as electronic warfare officer, while aircraft commander Capt. Gary Forhan (right) goes over the details of a route. The crew of five will next move on to a target briefing from the 2d Operations Support Squadron. There, they will learn about threats at the target and any peacetime restrictions along the way. During wartime, 2d OSS unit members would handle much of the actual mission planning.

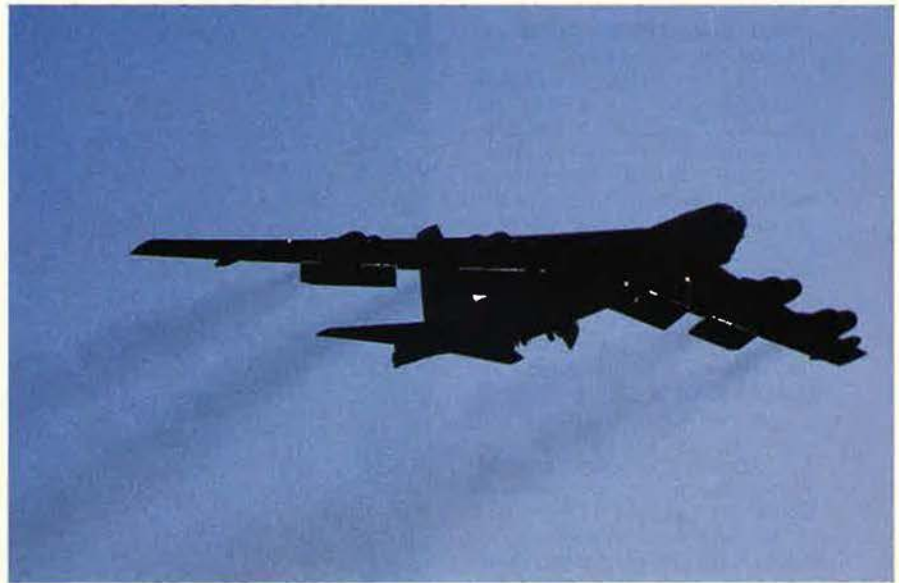
After a day of careful planning, the morning of the actual mission dawns early for the crew. First come stops for final briefings, the weather report, in-flight meals, and life-support preparation, and then (right) it's time to climb into the massive bomber.



Fully loaded, the B-52 can carry more than 70,000 pounds of weapons, including the 500-pound Mk. 82 high-drag bombs that radar-navigator Capt. Tray Hodge of the 20th Bomb Squadron checks here during his walkaround. With packing, preparation, and walkarounds by various crew members, it will be another thirty minutes before engine start for this B-52.



All of the 2d BW's BUFFs are H models, built between January 1961 and October 1962. A total of 102 B-52Hs were built. Today, ninety-four are still in service and contribute greatly to USAF's manned bomber fleet. The BUFF's long-range power-projection abilities were illustrated during the Gulf War, when the 2d BW carried out the longest combat mission in history: Seven B-52Gs flew a thirty-five-hour sortie from Barksdale to launch points in the Middle East, a round-trip journey of more than 14,000 miles. They carried the AGM-86C Conventional Air-Launched Cruise Missile. In August 1994, two 2d Bomb Wing B-52Hs flew the first round-the-world bombing mission. It took 47.2 hours, making it one of the longest military jet flights ever. Long-range power-projection missions are a regular requirement for these BUFF crews. Above, the flagship of the 2d BW prepares for a mission, while at right, a BUFF thunders off on another sortie.





Headquarters for 8th Air Force, Barksdale has a long tradition as a training site. In 1932, the brand-new Barksdale Field received its first combat organization, the 20th Pursuit Group from Mather Field, Calif. Its mission was aerial training of Boeing P-12s against hostile aircraft. Today, the 11th Bomb Squadron is at the heart of Barksdale's training regime. It is the squadron's job to move students who have completed training in the T-1A Jayhawk into the legendary Stratofortress. At Barksdale, the B-52 pilot training course takes five and a half months. It begins with forty-six days of classroom time that includes twenty-one exams in twenty-six subjects. The training also involves simulator work. Above, instructor pilot Capt. Mark Ewart observes as two 14th Bomb Squadron students strap into the cockpit simulator. He will soon move his seat up until he's almost in between the students, to monitor their "mission."

After 358 hours of classroom time, training moves on to the flight line, where students complete fourteen sorties to learn all aspects of flying the B-52. At right is the "first floor office" of the navigator and radar-navigator officers, who are preparing for an actual sortie.



During its long career, the B-52 has adapted to many roles. Its newest is delivery of the AGM-142 Have Nap TV-guided standoff weapon, designed to give long-range bombers a conventional precision-strike capability. Members of the 2d Munitions Squadron (right) conduct a periodic check of one of these weapons.



Photo by Paul Kennedy

Staff photo by Guy Aceto



The 2d BW trains B-52 ground and weapons load crews, and, as the only heavy bomber currently certified for delivery of the complete inventory of conventional and nuclear bombs, the Stratofortress gives them a lot to learn. Conventional munitions for the B-52 range from simple "dumb" bombs as large as the 2,000-pound Mk. 84 to precision guided weapons, such as the AGM-84 Harpoon antiship missile. At left, a weapons load crew discusses the mounting of cluster munitions (in the foreground) onto one of the B-52's heavy external stores racks. The NCOs in blue are acting as judges for the weapons load crew, which is in a quarterly base-wide load competition. Below, the load crew positions the next cluster bomb unit with the "jammer" and will secure it to its rack on the aircraft.



Staff photo by Guy Aceto



Barksdale bills itself as the site of one of the largest and most capable arsenals of firepower in the world, and these B-52s lined up on the ramp underscore the claim. Two generations have flown the BUFF, but the aircraft has undergone countless updates to keep up with the times. One notable change took place in October 1991 when Gen. George Lee Butler, then Strategic Air Command commander in chief, grounded all B-52 tailgunners. Recently, the 20-mm gun was removed as well.

In 1981, the 917th Wing at Barksdale became the first Air Force Reserve unit to be equipped with A-10 Thunderbolt IIs. It also boasts the only AFRES B-52 squadron, the 93d Bomb Squadron. In October, the 93d "Screamin' Indians" brought back from Nellis AFB, Nev., the Gunsmoke '95 top award in the B-52 mission design series. The highly experienced, award-winning crews had a total of 23,000 flying hours among them.



Above, a Reserve BUFF stands ready, while another AFRES aircraft lands in the background. At left, a 93d Bomb Squadron aircraft, with its squadron insignia painted on its external fuel tanks, is a bright spot on the tarmac. This touch helps the Reservists maintain their identity while mixing among the active-duty forces. The 93d numbers seventy-five officers and 319 enlisted personnel, including Air Reserve technicians.

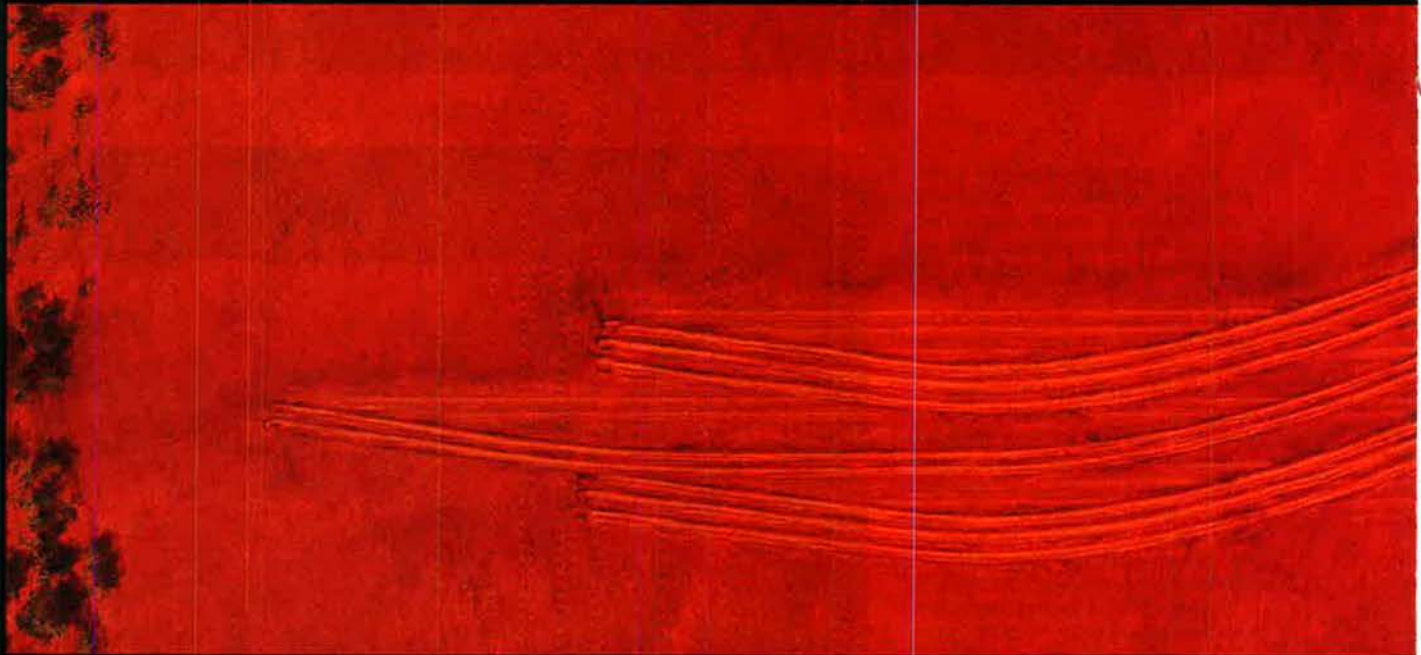


The lineage of the wing's 11th, 20th, and 96th Bomb Squadrons dates back to World War I. The 11th and the 20th were organized in June 1917 as the 11th and 20th Aero Squadrons, respectively. The 96th was organized two months later, as was the wing's Reserve squadron. In 1921, the 2d Bombardment Group participated in Brig. Gen. Billy Mitchell's controversial bomb tests against warships in Atlantic coastal waters, demonstrating airpower against naval vessels. More than seventy years later, bombers still wait on the tarmac at Barksdale, ready to perform their mission. At right, a crew chief prepares the huge bomber, which may be older than he is, for its next sortie.



Always ready to adapt, the venerable B-52 continues to extend the long reach of USAF's airpower, as the 2d BW trains yet another generation of aircrews for the next century. ■

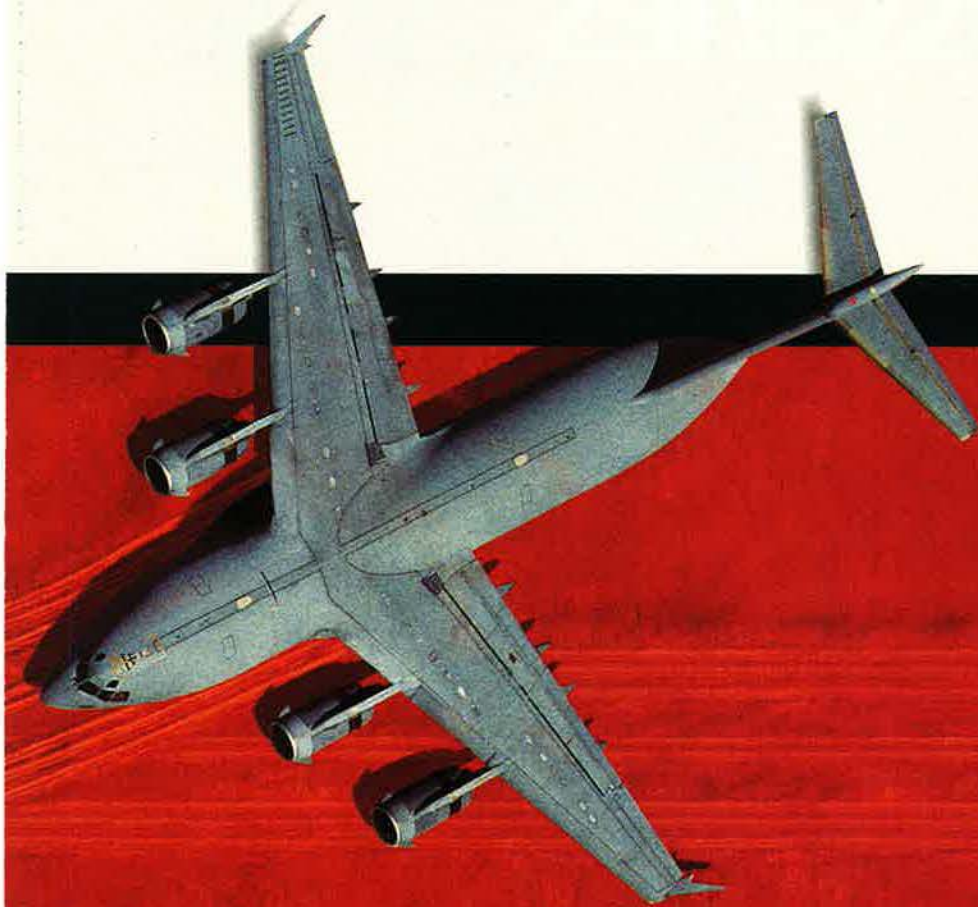
To fully appreciate
this argument
you have to understand it
backwards and forwards.



Imagine an airlifter that could deliver 169,000 pound payloads anywhere in the world. Imagine an airlifter that could land on a dirt runway thousands of feet shorter than any other jet airlifter would need.

Imagine an airlifter that could actually off-load its cargo then back up and turn around under its own power.

Imagine an airlifter that ranks as the most reliable, most maintainable, most



available airlifter in the world.

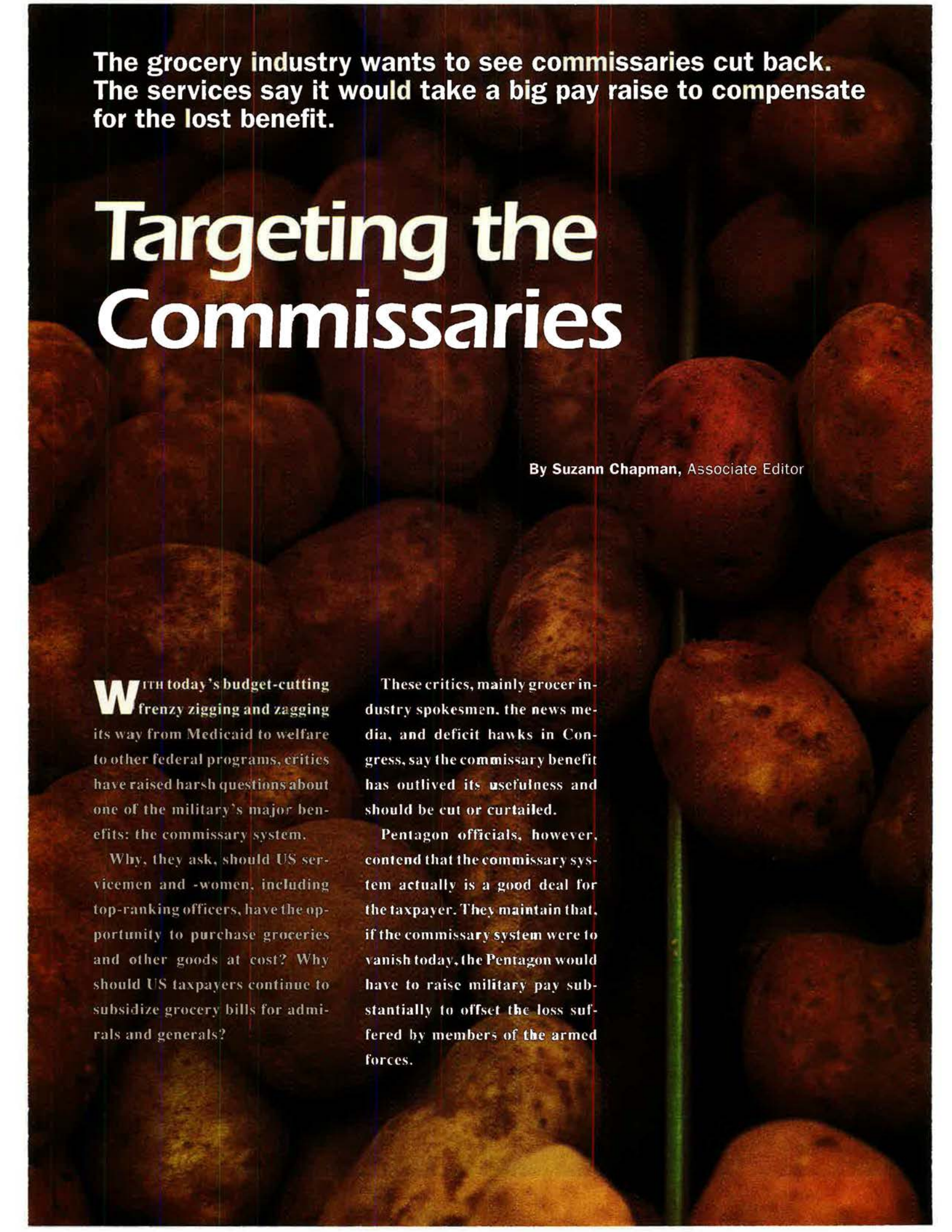
*Imagine an airlifter that will get our
troops the firepower they need, when
they need it, where they need it.*

It's the C-17.

*Now imagine if we didn't have it, or if
we didn't have enough of them.*

MCDONNELL DOUGLAS





The grocery industry wants to see commissaries cut back. The services say it would take a big pay raise to compensate for the lost benefit.

Targeting the Commissaries

By Suzann Chapman, Associate Editor

WITH today's budget-cutting frenzy zigging and zagging its way from Medicaid to welfare to other federal programs, critics have raised harsh questions about one of the military's major benefits: the commissary system.

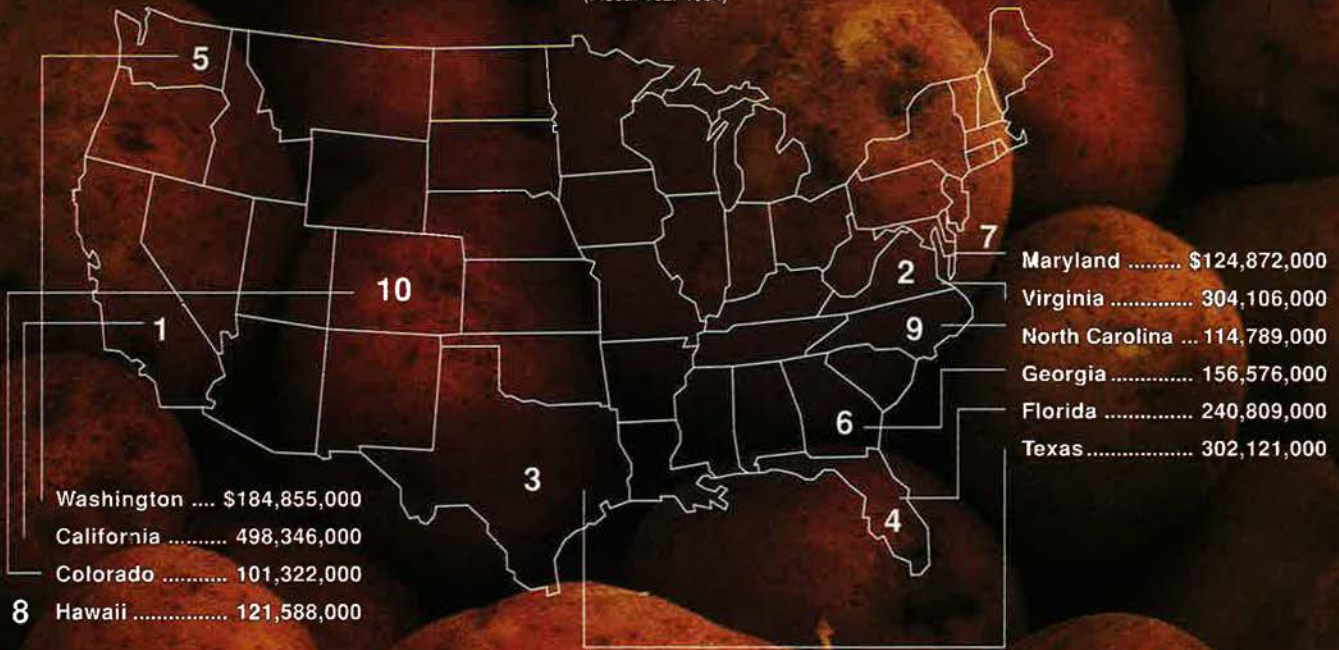
Why, they ask, should US servicemen and -women, including top-ranking officers, have the opportunity to purchase groceries and other goods at cost? Why should US taxpayers continue to subsidize grocery bills for admirals and generals?

These critics, mainly grocery industry spokesmen, the news media, and deficit hawks in Congress, say the commissary benefit has outlived its usefulness and should be cut or curtailed.

Pentagon officials, however, contend that the commissary system actually is a good deal for the taxpayer. They maintain that, if the commissary system were to vanish today, the Pentagon would have to raise military pay substantially to offset the loss suffered by members of the armed forces.

Top Commissary Sales States

(Fiscal Year 1994)



Source: DeCA, March 1995

Top Twenty Commissaries

(Fiscal Year 1994)

Location	Annual Sales
McChord AFB, Wash.	\$57,050,000
Fort Belvoir, Va.	56,542,000
Fort Lewis, Wash.	51,297,000
MacDill AFB, Fla.	50,633,000
Fort Meade, Md.	49,547,000
Fort Bragg, N. C.	48,258,000
Nellis AFB, Nev.	44,361,000
NAS Miramar, Calif.	43,846,000
Fort Bliss, Tex.	43,129,000
McGuire AFB, N. J.	42,618,000
Fort Campbell, Ky.	41,760,000
Randolph AFB, Tex.	41,729,000
Fort Hood, Tex.	41,266,000
March AFB, Calif.	41,103,000
Tinker AFB, Okla.	40,598,000
NS San Diego, Calif.	40,218,000
Fort Sam Houston, Tex.	39,768,000
Langley AFB, Va.	38,917,000
Wright-Patterson AFB, Ohio	37,739,000
Hickam AFB, Hawaii	37,510,000

Source: DeCA, March 1995

Commissary Sales Comparison to Top Food Retailers

(Fiscal Year 1994)

Store	Number of stores	Sales in billions
Kroger	2,126	\$23.0
Safeway	1,062	15.6
American Stores	814	13.8
Albertson's	720	11.9
Winn-Dixie	1,183	11.1
A&P	1,091	10.3
Publix	514	8.7
Food Lion	1,041	7.9
Military Commissaries	311	5.5
The Vons Companies	325	5.1

Source: *Chain Store Guide Directory of Supermarkets, Grocery and Convenience Store Chains*, 60th Anniversary Edition 1935-95. DeCA, March 1995

The annual commissary appropriation came to about \$1.1 billion in Fiscal Years 1994 and 1995 and is expected to drop to under \$1 billion in Fiscal 1996. The Pentagon asserts that this amount, while sufficient to run the major part (the appropriation provides seventy-six percent and a customer surcharge twenty-four percent) of commissary operations, falls far short of what would be needed to make direct payroll compensation for the loss.

"In fact, \$1 billion of commissary subsidy money provides military members the same economic impact as a six percent pay raise—which would cost \$3.5 billion to fund," Lt. Gen. Billy J. Boles, then USAF's deputy chief of staff for Personnel, testified last March.

Defense Commissary Agency (DeCA) officials calculate the savings differently. They say that every tax dollar invested in the commissary provides \$1.60 in value to military personnel because the commissaries provide an average of 23.4 percent in savings over purchases in commercial supermarkets. That translates into about \$1.6 billion in annual savings for military members and their families.

Thus, say the system's proponents, eliminating the benefit would not save money but cost taxpayers an extra \$600 million a year.

Economics aside, said Army Maj. Gen. Richard E. Beale, Jr., DeCA director, "The issue is that the commissary benefit is part of the basic compensation package for the military and has been ever since 1866."

Not a Frontier Creation

Commissaries have been around for nearly 130 years, but contrary to popular belief and oft-reported rationale, they did not originate at—or to support—remote, frontier posts. In fact, the first commissary opened at Fort Delaware in Delaware, hardly the frontier at that time.

In 1866, Congress gave the Army authority to sell foodstuffs, at cost, to officers and enlisted persons. The first official military sales commissary—at Fort Delaware—opened the following year and resembled a civilian dry-goods store of the era. It had a single sales counter at which Army patrons ordered what they wanted from a list of eighty-two items.

Over the years, each service developed its own procedures and systems. This haphazard approach paved the way in 1989 for a Congressionally directed study that urged the services to combine their systems to improve service and save money. DoD thus established the Defense Commissary Agency on May 15, 1990, with the provision that it be fully operational by October 1, 1991.

The consolidation of all service commissaries and other streamlining initiatives have eliminated more than 6,600 federal positions and saved \$353 million. The original study projected savings of only \$90 million.

Critics have claimed that DeCA's appropriation has risen as the overall defense force has drawn down. Commissary officials point out that, when each service ran its own system, support costs were not included in budget figures.

"Comparing apples to apples, in constant Fiscal 1992 dollars, DeCA's operating funds have decreased from about \$1.1 billion in Fiscal 1992 to \$976 million in Fiscal 1995," said a DeCA official.

DeCA has closed 100 stores, dropping from 409 when it first took control to 309 as of October 10. The agency cut twenty-eight as a result of base realignment and closure actions and will close another sixteen based on BRAC 1995 requirements.

One unforeseen element of BRAC deliberations, according to General Beale, has left the agency "running about a half dozen stores out of hide."

He said DoD dropped funding for some commissaries, such as the ones at NAS Moffett Field, NAS Long Beach, NAS Alameda, MCAS El Toro, and the Army's Presidio and Fort Ord, all in California. They are at installations that DoD intended to close but later had to keep partially open. Under DoD policy, any installation with at least 100 active-duty personnel gets to keep the commissary doors open.

"We're being very cautious, after what happened in 1993, to ensure DoD and DeCA are more deliberate about the withdrawal of money from the DeCA budget," said General Beale. He added, "Instead of taking credit for savings at the beginning of the process, we wait until the dust is settled."

Apart from BRAC actions and the original consolidation, DeCA also

has reduced its work force from an initial 21,000 to 18,600. The agency anticipates further reductions in staffing, especially at the regional management level.

Why Kill the Commissaries?

The new commissary agency has been streamlined—and is saving more money than its originators dreamed it would—but critics maintain that the commercial sector could run the stores more efficiently.

This is not a new sentiment. It has surfaced repeatedly over the years.

The latest hue and cry, which has spawned numerous editorials and articles, as well as letters to Congressmen, arose because the Senate Armed Services Committee attempted to provide unlimited shopping privileges for members of the National Guard and Reserve in the Fiscal 1996 defense budget.

Currently, laws restrict their access to periods of active duty and an additional twelve days throughout the year. The House tried a similar move to expand Guard and Reserve access about two years ago, only to withdraw the provision.

In July, the Food Marketing Institute (FMI)—a grocers' lobbying organization—issued a statement claiming, "Commissaries have decided to exempt themselves from the military downsizing by expanding their service for civilians." The statement, widely circulated to the press, described those "civilians" as "more than two million off-duty reservists, retirees, and their dependents."

FMI also cited DoD testimony that "every additional 100,000 commissary patrons requires \$24 million in taxpayer support." The National Grocers Association made the same claim in an "Action Alert," also sent out in July.

Without question, reservist associations stood in line to back the expansion of availability for the Guard and Reserve. In testimony to Congressional committees, they emphasized that reservists deserve full commissary access because of the greater reliance the services have placed on Guard and Reserve forces regarding basic military missions.

They also claim unlimited access would serve as a recruiting and retention tool.

DeCA has no official position on the Senate's Guard and Reserve pro-

Exchanges Try to Hold Their Edge

Although the appropriation-supported commissaries are not actively seeking new customers, their profit-making compatriots—military exchanges—need to generate more business to protect a vital element of their mission.

Civilians and even some service members often confuse the military commissary with the exchange. The stores do not provide the same goods or operate in the same manner.

Commissaries sell groceries plus some household items at "cost," relying on an annual defense budget appropriation and a customer surcharge to finance goods and operations. Exchanges sell hard goods, such as appliances, automotive supplies, clothing, and toys, but must make a profit, basically financing their entire operation through sales.

The overall defense drawdown has reduced the commissary infrastructure and its customer base, but that does not affect its mission, which is to provide a service to military members. For exchanges, the opposite is true.

Maj. Gen. Robert F. Swarts, then Army and Air Force Exchange Service commander, told a Congressional committee in April that force reductions, BRAC actions, and retail market changes "act together to place AAFES at a competitive disadvantage."

Since 1895, exchanges have existed not only to provide merchandise at lower prices to soldiers and airmen around the world, but also to generate revenues to help support Army and Air Force morale, welfare, and recreation programs.

Three cents from every dollar in sales at AAFES stores goes to support MWR programs. In Fiscal 1994, those MWR dividends totaled \$183.7 million, or sixty-eight percent of exchange earnings.

The drawdown has taken its toll on exchange revenues. In 1993 and 1994 alone, the total customer base dropped eleven percent. Active-duty customers, including their family members, declined by more than twelve percent in 1993 and five percent in 1994.

The active-duty decline is even greater in Europe, at twenty-seven percent for the two years.

Exchange sales were "high" in 1993 at more than \$7.7 billion, but officials attributed that to implementation of a new deferred payment plan. Sales for 1994 were \$7.1 billion, a drop of eight percent from 1993 and three percent from 1992. As a result, exchange earnings were \$301 million for 1992, \$315 million for 1993, and dropped eleven percent in 1994 to \$269 million.

This inevitable downward trend cuts directly into the MWR dividends. General Swarts said that to keep MWR support at its current level, AAFES must replace lost active-duty customers with "National Guardsmen, Reservists, and retirees, who often live many miles from exchange stores."

However, exchanges currently cannot compete on a level field because of restrictions on the merchandise they can sell. The former AAFES commander told the committee that the exchange service and the Defense Department are working to develop changes to the Armed Services Exchange Regulation to eliminate cost price limitations and country of origin restrictions.

Increasing its stock assortment and upgrading its facilities provides fresh fodder for many critics who berate Congress for subsidizing these military "department stores."

AAFES does receive some budget dollars. For Fiscal 1996, AAFES has asked for \$153 million, through the Army, to pay for shipping merchandise overseas. Known as the Second Destination Transportation support, the subsidy allows exchanges to keep the lid on prices for US products sold to service members overseas. There are also about eighty-one military members out of 68,000 AAFES personnel that the Army and Air Force must include in their military pay accounts.

Recent news articles and editorials have called for an end to subsidies for both exchanges and commissaries. Particularly for exchanges, with their push to be more competitive, critics believe that the commercial marketplace should prevail.

posals, but agency officials stated that today's budget shortages preclude increased funding for commissaries.

"It won't cost the taxpayer or DeCA any more money because there simply is no more money," said a DeCA spokesman.

DeCA also believes that Guard and Reserve members would not go out of their way to shop at military commissaries. However, its claims did not stop many critics from decrying not only the Senate proposal but also the billion-dollar commissary appropriation itself.

Many people believe that the appropriation is really at the heart of the ongoing controversy.

Families on Edge

"The recent repeated 'threats' to the commissary benefit have already done harm to the morale of families," stated the National Military Family Association's Sydney T. Hickey at a Senate subcommittee hearing last April. She added, military families "are perpetually sitting on the edges of their chairs and waiting for one more attempt to reduce benefits."

She noted that repeated surveys have shown that the commissary benefit is second only to health care as a career incentive for military members.

The Air Force Association's Director of National Defense Issues

Kenneth A. Goss stressed that AFA believes removing the commissary benefit would be another "breach of faith." He said, "The commissary continues to be a major quality-of-life issue for active-duty military and their families as well as the Guard, Reserve, and retirees."

Military support associations and Pentagon officials also emphasized that a primary reason not to eliminate the appropriation is the continuing inequity between military pay and private-sector pay, an inequity that today stands at about 12.6 percent, as measured by the Employment Cost Index.

Aside from the appropriation is-

sue and the proposed unlimited access for Guard and Reserve personnel, there is still the basic question of whether it might make better economic sense to let the private sector run military commissaries. This issue is especially relevant today because DoD is looking at a broad range of potential privatization efforts.

So, why not privatize commissaries?

approximately two cents on every dollar.

Another factor, according to the DeCA chief, is that there are no national grocery chains, rather fifty-two competitive market areas. Even with the large regional chains, the Pentagon would have to contract with about fifteen different grocers to cover the US commissaries. That would introduce contract administration costs, which General Beale

National Training Center at Fort Irwin, Calif., where the nearest town is an hour away."

He also had not found anyone to run overseas commissaries, which account for about forty-three percent of the DeCA budget. The combination of overseas and remote US stores equals about fifty percent of the agency budget.

In its recent lobbying campaign, FMI stated, "Commissaries are outrageously expensive to operate and incredibly inefficient." Based on recent comparisons of common profit and loss expense categories, according to DeCA officials, the total cost of commissary operations is 3.6 percent less than that of the supermarket industry. [See table, at left.]

Some people have suggested that DeCA could save even more money if it would eliminate small stores near larger facilities, especially where there are multiple stores in the area. In the Washington, D. C., area, for instance, there are seven commissaries. However, only the store at Bolling AFB, D. C., is operating at less than maximum capacity.

General Beale said that if that store or any others in the area were eliminated, the remaining stores would not have enough capacity to support the clientele.

He said that with the recent BRAC decision affecting Kelly AFB, Tex., the agency would "have to come to grips with that issue over the next couple of years."

The San Antonio area has large stores at Lackland AFB, Randolph AFB, and Fort Sam Houston, as well as smaller stores at Kelly and Brooks AFBs.

The General said that "in theory" it might be possible to eliminate either of the small stores and still have enough capacity, but "you'd be operating on the margin" because of the number of active-duty personnel in the area.

In the last two years, DeCA has considered the feasibility of eliminating some twenty smaller stores in reasonable proximity to a larger store. However, DoD and each service have asked that the smaller stores remain open to ensure DeCA continues to provide adequate customer support.

General Beale said that the level of anticipated savings from cutting all twenty "is not worth the pain to the patron." ■

Common Measures of Store Operational Productivity

Measure	Commissary	Supermarket
Average weekly sales per employee	\$5,098	\$3,581
Average weekly sales per store	\$328,733	\$194,898
Average weekly sales per square foot	\$18.13	\$8.09
Average store sales per operating hour	\$6,820	\$1,617
Average annual inventory turns	13.5	14.5
Average square feet per store	18,132	23,977
Average number of items stocked	11,000	18,953
Hours open per week	48.2	116.5
Percent of stores using scanners	100	87.5

Source: DeCA, August 1994; *Progressive Grocer*, April 1995

DeCA chief General Beale said, "It would be virtually impossible for a private grocer to come in and run the stores at twenty-three percent lower [cost] than the average of what you pay outside without getting appropriated funds to offset some of their costs."

Dating back to the original Congressional provision and the first store, military commissaries must sell "at cost."

"A commercial grocery firm—full-service grocery—on the other hand has to gross about cost plus twenty-three to twenty-four percent on every item that it sells," the General said. If the grocery sells an item cheaper than that, it must "jack something else up."

If a private-sector grocer does not increase the price on other items to make up the difference, the store will not make its twenty-three to twenty-four percent above gross. General Beale said the gross allows the grocer to make a net profit of

said might well equal the current level of appropriation.

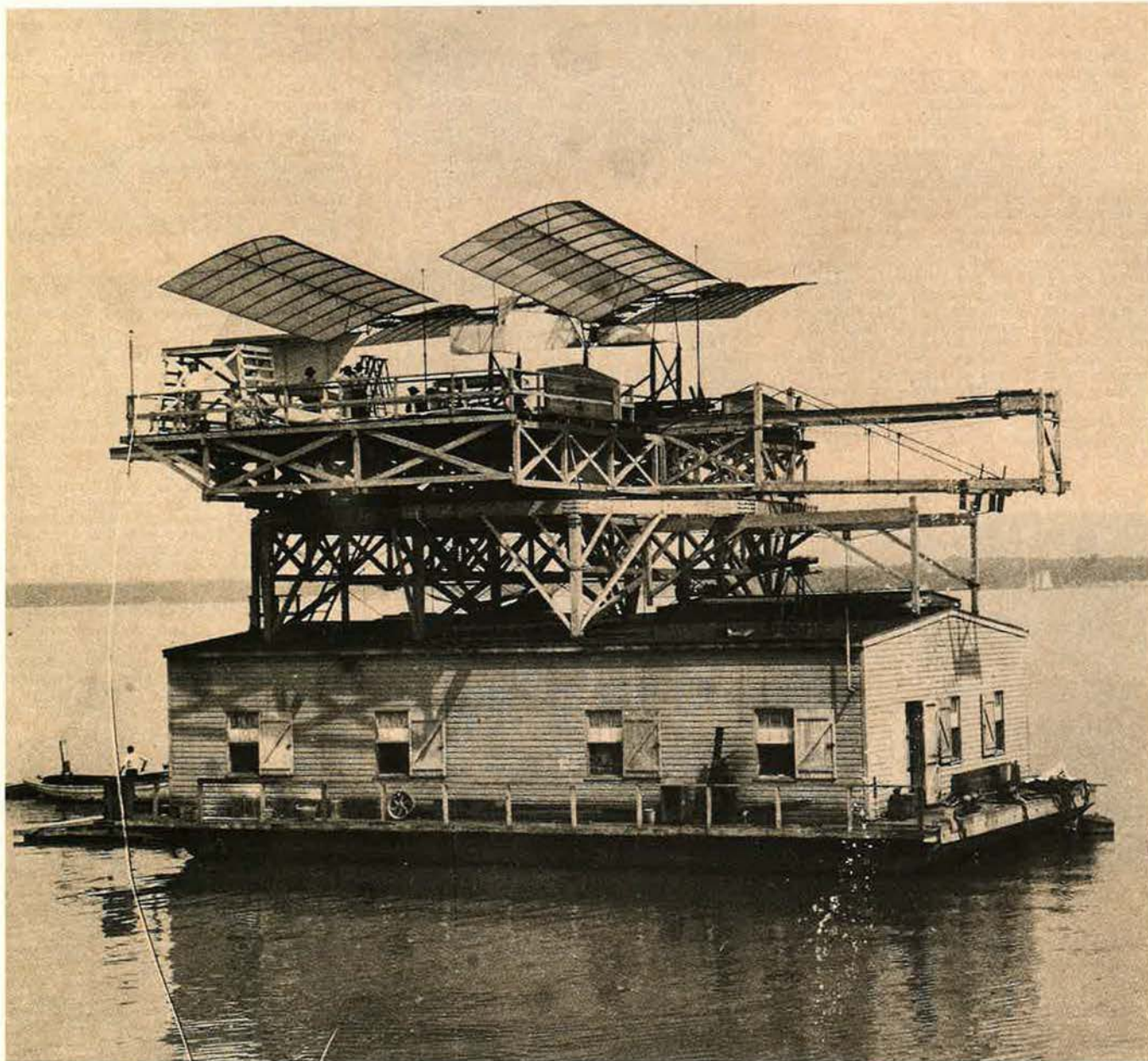
David and Goliath

Considering overall sales, it appears that military commissaries really do not compete with commercial groceries. In FY 1994, commissary sales worldwide totaled \$5.5 billion, compared to US grocery sales of \$401.7 billion. Including overseas sales, military commissaries represent only 1.4 percent of the commercial grocery business.

However, in the cutthroat retail grocery business, the prospect of picking up a large military-market area certainly must appear attractive.

In fact, General Beale said, "You've got a lot of folks who would love to come in and take San Antonio, the military district of Washington, D. C., [or] southern California." He further noted that a privatization scheme would also presume "grocery companies would be willing to step up to the plate to take such stores as the

Dr. Langley's Houseboat



Samuel Pierpont Langley, astronomer, physicist, and Secretary of the Smithsonian, made history in 1896 as the first American to fly an unmanned aircraft. He later attempted manned flight with the "Aerodrome," a larger machine piloted by Charles M. Manly. On October 7, 1903, from a houseboat in the Potomac, the Aerodrome's engine roared, its catapult shud-

dered, and the 850-pound craft "slid into the water like a handful of mortar," wrote a Washington Post reporter. Langley's second try on December 8 proved equally wet. Nine days later, at Kitty Hawk, the Wright brothers made the first sustained, controlled, manned flight in a heavier-than-air vehicle.

World Gallery of Trainers

By John W. R. Taylor and Kenneth Munson

Jet Trainers

Alpha Jet

Dassault and Dornier built 504 production Alpha Jets, including 176 trainers for the French Air Force and 175 as close-support aircraft for the German Air Force. The latter were later fitted with 3,175 lb thrust Larzac C4-C20 engines, improved instrumentation, provision for two Sidewinder self-defense AAMs, a podded 27-mm Mauser gun, and other refinements, but only 30 remain in Luftwaffe service. Based at Fürstenfeldbruck, these are used as lead-in trainers for future Tornado pilots. Fifty were donated to Portugal in 1993 to equip one training (No. 103) and one combat (No. 301) squadron, the latter unit including six Alpha Jets configured for electronic warfare. The rest (approximately 60) of Germany's surviving aircraft are up for sale, with Greece seen as a possible purchaser. Other Alpha Jet customers were Belgium (33), Egypt (30, designated MS1), Ivory Coast (seven), Morocco (24), Nigeria (24), Qatar (six), and Togo (six). Dassault offered an alternative close-support version, with inertial platform, head-up display (HUD), laser rangefinder, and radar altimeter; Egypt ordered 15 (as MS2s) and Cameroon seven. Earlier this year, Australia banned the Alpha Jet as a candidate in its MB-326H replacement program, in protest against French nuclear weapon testing in the Pacific.



Alpha Jet, Belgian Air Force
(P. R. Foster)



AT-3 Tzu-Chung, Republic of China
Air Force (Denis Hughes)



C-101CC-04 Aviojet, Royal Jordanian Air Force (Lindsey Peacock)

Contractors: Dassault Aviation, France, and Dornier Luftfahrt GmbH, Germany.

Power Plant: two SNECMA/Turbomeca Larzac 04-C6 turbofans standard; each 2,976 lb thrust. Two 3,175 lb thrust Larzac 04-C20s retrofitted in German close-support aircraft.

Dimensions (trainer): span 29 ft 10 $\frac{1}{4}$ in length 38 ft 6 $\frac{1}{2}$ in, height 13 ft 9 in.

Weights: empty 7,374 lb, gross 11,023–17,637 lb.

Performance (at 11,023 lb weight, 04-C6 engines): max speed at 32,800 ft Mach 0.95, max speed at S/L 621 mph, stalling speed (gear and flaps down) 104 mph, ceiling 48,000 ft, T-O run 1,215 ft, landing run 1,840 ft, radius of act on at high altitude 764 miles on internal fuel, 901 miles with external tanks, g limits (ultimate) +12/-6.4.

Accommodation: crew of two, on tandem zero height/104 mph or zero/zero ejection seats.

Armament: centerline stores pylon or pod for 30-mm DEFA or 27-mm Mauser gun. Provision for two hardpoints under each wing for 18-tube rocket packs, bombs of up to 882 lb, cluster bombs, 30-mm gun

pods, Sidewinder or Magic AAMs, Maverick ASMs, a reconnaissance pod, drop tanks, and other stores. Max load on five pylons 5,510 lb.

AT-3 Tzu-Chung

Following its first flight, September 16, 1980, the AT-3 entered service as Taiwan's standard basic and advanced military trainer in March 1984. Of 60 built, 20 were later converted to use the 6,000 lb external stores-carrying capability in a close-support role; these 20 aircraft now equip a single Republic of China Air Force squadron.

A single-seat ground and maritime attack prototype known as the AT-3A Lui-Meng was flown in 1989 with upgraded Smiths Industries avionics and a Westinghouse APG-66 radar and fire-control system. Its nav/attack avionics have also been installed in a two-seat close-support trainer prototype designated AT-3B. According to AIDC, further conversions to AT-3A and AT-3B standard are planned. (Data for AT-3.) **Contractor:** Aero Industry Development Center, Taiwan. **Power Plant:** two AlliedSignal TFE731-2-2L turbofans; each 3,500 lb thrust.

Dimensions: span 34 ft 3 $\frac{3}{4}$ in, length (incl probe) 42 ft 4 in, height 14 ft 3 $\frac{3}{4}$ in.

Weights: empty 8,500 lb, gross 11,500–17,500 lb.

Performance (at max gross weight): max speed at S/L 558 mph, max cruising speed at 36,000 ft 548 mph, stalling speed (gear and flaps down) 104 mph, ceiling 48,000 ft, T-O run 1,500 ft, landing run 2,200 ft, max range on internal fuel 1,415 miles.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: two hardpoints under each wing and one under fuselage for up to 6,000 lb of single, cluster, or fire bombs, flare dispensers, or rocket launchers. Centerline hardpoint can be occupied instead by a semirecessed machine gun pack or (in conjunction with outboard underwing pylons) an aerial target system. Provision for infrared AAM at each wingtip.

C-101 Aviojet

Although the Aviojet was developed initially as a trainer, with assistance from MBB of Germany and Northrop of the US, it has an internal bay under the rear cockpit large enough to accommodate guns, reconnaissance and ECM packages, or other combat aids, as an alternative to equipment for every kind of training. The first of four prototypes flew on June 27, 1977, followed by 88 C-101EB basic and advanced trainers for the Spanish Air Force, by which they are known as the E.25 Mirlo. These have 3,500 lb thrust AlliedSignal TFE731-2-2J engines. An armed version, with a 3,700 lb thrust TFE731-3-1J turbofan, was ordered by Chile (14 C-101BB-02s, Chilean Air Force designation T-36 Halcón; "hawk") and Honduras (four C-101BB-03s). All but the first four BB-02s were assembled under license by Empresa Nacional de Aeronáutica de Chile (ENAE), with partial local manufacture. A dedicated light attack version, designated C-101CC-02 in Spain and A-36CC Halcón by the Chilean Air Force, was developed jointly by CASA and ENAE. The first of two prototypes flew November 16, 1983, and 23 production A-36CCs, with more powerful TFE731-5-1J engines, have been built for the Chilean Air Force. Four were supplied from Spain, the other 19 co-produced by ENAE, which also upgraded the T-36s to A-36BB standard for tactical training. Fifteen basically similar C-101CC-04s serve with Nos. 2 and 11 Squadrons of the Royal Jordanian Air Force, at King Hussein Air College, Mafraq. (Data for C-101CC.)

Contractor: Construcciones Aeronauticas SA, Spain. **Power Plant:** one AlliedSignal TFE731-5-1J turbofan; 4,300 lb thrust, with military power reserve (MPR) rating of 4,700 lb thrust.

Dimensions: span 34 ft 9 $\frac{1}{2}$ in, length 41 ft 0 in, height 13 ft 11 $\frac{1}{4}$ in.

Weights: empty 7,650 lb, gross 11,023–13,890 lb.

Performance (at 9,590 lb weight, except where indicated): max speed at 15,000 ft with MPR 518 mph, stalling speed (gear and flaps down) 102 mph IAS, ceiling 44,000 ft, T-O run 1,835 ft, landing run 1,575 ft, mission radius (armed) 287–374 miles, g limits at 10,802 lb weight +7.5/-3.9.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: ventral bay for quick-change packages, including a 30-mm DEFA 553 gun with 130 rds, twin 12.7-mm Browning machine guns, reconnaissance camera, ECM package, or laser designator. Six underwing hardpoints for up to 4,960 lb of stores, including four pods of 5-in rockets, six 550-lb bombs, two Maverick ASMs, or Sidewinder or Magic AAMs.

CM 170 Magister

Around 70 CM 170 Magister first-generation jet trainers still fly with the French Air Force, but the French Navy retired the last 10 of its deck-landing CM 175 Zephyrs on November 25, 1994. Israel's 80 Magisters, which have the local name Tzukit, were rebuilt and upgraded between 1981 and 1986 by IAI's Bedek Aviation Division under a program known as AMIT (Advanced Multimission Improved Trainer). Other Magisters still serve with the air forces of Algeria (20+), Cameroon (10), El Salvador (five), Ireland (six), Lebanon (five), Morocco (22), Senegambia (four), and Togo (four),

often in both training and counterinsurgency roles. Belgium's 11 are on the verge of retirement.

First delivered in 1956, the basic CM 170 has 880 lb thrust Marboré IIA turbojets, but the last 137 production aircraft were fitted with uprated Marboré VIs and are known as **Super Magisters**. (Data for *Super Magister*.)

Contractor: Aerospatiale (originally Fouga), France.
Power Plant: two Turbomeca Marboré VI turbojets; each 1,058 lb thrust.

Dimensions: span over tip tanks 39 ft 10 in, length 33 ft 0 in, height 9 ft 2 in.

Weights: empty 5,093 lb, gross 6,280–7,187 lb.

Performance: max speed at S/L 435 mph, at 30,000 ft 451 mph, ceiling 13,125 ft, T-O run 1,970 ft, range 870 miles.

Accommodation: crew of two, on tandem ejection seats.

Armament: two 7.62-mm machine guns, with 200 rds/gun, in nose; hardpoint under each wing for rocket launcher, wire-guided missile, or bomb.

CT-114 Tutor

Canadair's CL-41A design started life as a private venture jet basic trainer. The first of two prototypes flew January 13, 1960; they showed such promise that the Canadian government reversed its early lack of interest and ordered 190 for the then Royal Canadian Air Force, as CT-114 Tutors. These were powered by J85 engines of greater power than the 2,400 lb thrust Pratt & Whitney JT12A-5s that had been fitted in the prototypes. Production deliveries began in October 1963 and were completed in 1966. Almost 120 remain in service with Canadian Forces, including more than 80 with No. 2 CF Flying Training School, and 14 with No. 431 Squadron, which provides the service's Snowbirds aerobatic display team, all based at Moose Jaw, Saskatchewan; about seven other Tutors equip the Central Flying School at Winnipeg, Manitoba. A late-1970s upgrade of 113 aircraft introduced an improved canopy jettison system, updated avionics, and provision for external fuel tanks. A first batch of 22 aircraft is currently being rewired and otherwise refurbished to extend their service life to 2010.

Contractor: Canadair Group, Bombardier Inc, Canada.
Power Plant: one Orenda-built General Electric J85-CAN-40 turbojet; 2,663 lb thrust.

Dimensions: span 36 ft 6 in, length 32 ft 0 in, height 9 ft 3/4 in.

Weights: empty 4,895 lb, gross 7,397 lb.

Performance: max speed at 28,500 ft 498 mph, stalling speed 81 mph, ceiling 43,000 ft, T-O to 50 ft 2,160 ft, landing from 50 ft 2,330 ft, max range 944 miles.

Accommodation: crew of two, on side-by-side zero-height ejection seats.

Armament: provision for single pylon under each wing for a machine gun or rocket pod, napalm tank, or 500-lb bomb.

G-2A Galeb and G-4 Super Galeb

A few straight-winged G-2A Galebs built for the Yugoslav Air Force during 1963–83 remain in service, including one squadron of the 172d Regiment at Podgorica, but most have been replaced by sweptwing G-4 Super Galebs.

The G-4 Super Galeb has a more formidable light attack capability and has been used in combat (including some captured by Croatia) during the civil war in the former Yugoslavia, together with J-1 Jastreb single-seat light attack counterparts of the G-2A. The first of two G-4 prototypes flew in July 1978, and six preseries aircraft followed. The Yugoslav Air Force received about 150 G-4s, with anhedral tailplanes, to replace T-33s and to reequip most G-2A units on a one-for-one basis. At the Udbina and Podgorica flying schools, pupils receive some 60 hours of basic training on the G-2A followed by 100 hours on the G-4, with a further 60–70 hours for those destined for G-4 close-support squadrons such as the 239th at Golubovci, 249th at Kovin, and 252d at Batajnica. Some school G-4s have been adapted for target towing.

After the Soko ("falcon") factory in Mostar, Bosnia-Herzegovina, closed in May 1992, some G-4 plant and machinery were transferred to the Utva facility at Pančevo, Serbia, which is reported to have built two prototypes of a single-seat development, designated G-5. Optimized for ground attack, this is said to have the GSh-23L gun built in, freeing the centerline station for other weapons, and wingtip rails for R-60 ("Aphid") AAMs. About 30 of the G-2A-Es supplied to Libya in 1975 and 1983–84 are thought to survive, with both training and light attack roles. The air force of Myanmar has 12 G-4s. (Data for *G-4 Super Galeb*.)

Contractor: Vazduhoplovna Industrija Soko, Yugoslavia.

Power Plant: one Rolls-Royce Viper Mk 632-46 turbojet; 4,000 lb thrust.

Dimensions: span 32 ft 5 in, length 40 ft 2 1/4 in, height 14 ft 1 1/4 in.

Weights: empty 6,993 lb, gross 10,379–13,889 lb.



CM 170 Magister, French Air Force (Lindsey Peacock)



G-4 Super Galeb, Yugoslav Air Force (Press-Office Sturzenegger)



Hawk Mk 103, Royal Air Force of Oman

Performance (at 10,379 lb gross weight): max speed at 13,120 ft 565 mph, max cruising speed at 19,700 ft 525 mph, stalling speed (gear and flaps down) 112 mph, ceiling 42,160 ft, T-O run 1,877 ft, landing run 2,674 ft, range with two drop tanks 1,553 miles.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: removable centerline gun pod containing 23-mm GSh-23L twin-barrel gun with 200 rds. Two pylons under each wing for such weapons as napalm tanks, cluster bombs containing eight 35-lb fragmentation munitions, containers for 40 antipersonnel or 54 antitank bomblets, 16-tube rocket packs, triple carriers for 220-lb bombs, 12.7-mm gun pods, or drop fuel tanks. Max weapon load 2,822 lb.

Hawk

Seven years after the Royal Air Force began taking delivery of 176 Hawk T. Mk 1s as Britain's standard basic/advanced flying and weapons trainers, 89 of the original T. Mk 1s, with 5,200 lb thrust Adour 151 turbofans, initiated the development of combat-capable Hawks when they were upgraded to T. Mk 1A standard. Fifty of these are NATO-declared for point defense, to accompany radar-equipped Tornados on air defense missions as part of the RAF's Mixed Fighter Force. A pylon was wired under each wing to carry a Sidewinder AAM, supplementing the standard underbelly 30-mm gun pack. Since 1991, 15 T. Mk 1s and T. Mk 1As have also succeeded Canberras of No. 100 Squadron for target-towing and as "silent targets" for electronic warfare training. From late 1994, seven T. Mk 1s were transferred to the Fleet Requirements and Aircraft Direction Unit to provide target facilities and EW training for the Royal Navy.

Even before its 1981 selection by the US Navy (as the T-45A Goshawk, which see), the Hawk had at-

tracted export orders. Customers for the Hawk 50 series, with a 5,200 lb thrust Adour 851, 70 percent greater disposable load, and 30 percent longer range, were Finland (57 Mk 51/51A, with a 12.7-mm centerline gun), Kenya (12 Mk 52), and Indonesia (20 Mk 53). The further improved Hawk 60 series, with four-position flaps, modified wing leading-edge devices, and other refinements, has been bought by Zimbabwe (13 Mk 60/60A), Dubai (nine Mk 61), Abu Dhabi (20 Mk 63/63C), Kuwait (12 Mk 64), Saudi Arabia (30 Mk 65, with 20 Mk 65A to follow), Switzerland (20 Mk 66), and South Korea (20 Mk 67). Fifteen of the 16 Abu Dhabi Mk 63s have been upgraded to Mk 63A, with Adour 871 and new wings with wingtip Sidewinders.

The two-seat Hawk 100 and single-seat 200 series are more specialized, high-performance strike versions. To date they have been ordered by Abu Dhabi (18 Mk 102), Indonesia (eight Mk 109, 12 Mk 209), Malaysia (10 Mk 108, 18 Mk 208), and Oman (four Mk 103, 12 Mk 203), most with wingtip rails for Sidewinders. The Omani aircraft have FLIR, a Sky Guardian radar warning receiver, and laser rangefinder. (Data for *Hawk 60 series*.)

Contractor: British Aerospace Defence Ltd, UK.

Power Plant: one Rolls-Royce Turbomeca Adour 861 turbofan; 5,700 lb thrust.

Dimensions: span 30 ft 9 1/4 in, length (incl probe) 38 ft 10 1/4 in, height 13 ft 0 1/4 in.

Weights: empty 8,845 lb, gross 20,061 lb.

Performance: max speed at S/L 627 mph, stalling speed (gear and flaps down) 110 mph, ceiling 46,000 ft, T-O run 2,330 ft, landing run 1,800 ft, combat radius with 5,000-lb weapons load 620 miles, with 2,000-lb load 900 miles, g limits +8/-4.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: centerline 30-mm Aden gun with 120 rds, or 12.7-mm gun pack, or pylon, plus two pylons under each wing. Within overall max of 6,614 lb, typical loads can include centerline gun pack or reconnaissance pod and four underwing rocket packs; five 1,000-lb bombs; 36 x 80-lb runway denial bombs; five 600-lb cluster bombs; four Sidewinder or two Magic AAMs; two Maverick ASMs; or two 156-gallon drop tanks.

HJT-16 Kiran

One more year has passed without a long-awaited decision by the Indian government on a replacement for this jet basic trainer. The prototype Kiran first flew in September 1964, and delivery of 118 Viper-engined Mk IIs for the Indian Air Force began in spring 1968. They were followed by 72 Mk IIAs, for the IAF and Indian Navy, with a hardpoint under each wing to carry armament for weapons training. On July 30, 1976, Hindustan Aeronautics flew the first Kiran Mk II, with a more powerful turbojet, updated instruments and avionics, improved hydraulics, and two additional underwing stations. Sixty-one were built for the Indian Air Force and Navy between 1982 and 1989. IAF Kirans equip the Air Force Academy and the Flying Instructors' School; Indian Navy aircraft serve with No. 551 Squadron, which also provides the service's Phantoms aerobatic display team. (Data for *Mk II*.)

Contractor: Hindustan Aeronautics Ltd (Bangalore Complex), India.

Power Plant: one Rolls-Royce Orpheus 701-05 turbojet; 4,200 lb thrust.

Dimensions: span 35 ft 1 1/4 in, length 34 ft 9 1/2 in, height 11 ft 11 in.

Weights: empty 6,603 lb, gross 9,369–11,023 lb.

Performance (at max gross weight): max speed at S/L 418 mph, max cruising speed at 15,000 ft 386 mph IAS, stalling speed (gear and flaps down) 98 mph IAS, ceiling 39,375 ft, T-O run 1,772 ft, landing from 50 ft 4,725 ft, max range (internal fuel) 457 miles.

Accommodation: crew of two, on side-by-side zero-height ejection seats.

Armament: two 7.62-mm machine guns in nose; two hardpoints under each wing for 551-lb bombs, 18-tube rocket pods, or drop tanks.

I-22/M-93 Iryda

The Polish Air Force has a requirement for 50 or more Irydas, to cover the spectrum of pilot, navigation, air combat, reconnaissance, and ground-attack training, with day/night and adverse weather capability. These are intended to replace TS-11 Iskra (which see) and LiM-6 (MiG-17) basic and advanced trainers.

The first of five prototypes flew March 5, 1985, and by the end of 1995 about a dozen production aircraft should have been delivered to the PAF. The first five are I-22s, with 2,425 lb thrust PZL-5 engines and zero height/94 mph Polish ejection seats; the next seven are M-93Ks, with more powerful K-15 turbojets, Martin-Baker zero/zero seats, and modified avionics. A French SAGEM avionics suite has been flight-tested in an M-93S prototype, but not yet firmly adopted for PAF aircraft. Another prototype, with an eye toward possible export orders, is the M-93V, powered by 3,307 lb thrust Folls-Royce Viper 545 engines.

The Iryda ("iridium") was designed from the outset to have considerable potential for reconnaissance and close-support missions. It can operate from unprepared airfields and tolerate substantial battle damage, and PZL Mielec is exploring a number of possible future variants. A two-seat reconnaissance/close-support variant, the M-95, would be an M-93 derivative with larger, slightly swept wings and an internal 30-mm gun. Single-seat ground-attack or dual-role fighter/

Delivery of the initial batch of 18 production IA 63 Pampas to the Argentine Air Force began in April 1988. They were unarmed; but the first six have been fitted with an AAF-developed HUD, which will eventually become standard, together with a new Elbit weapon delivery and navigation system, a podded 30-mm gun, and underwing weapon stations. Present plans call for a further 46 Pampas for the AAF.

FMA teamed with Vought and Loral to offer the Pampa 2000 International as its entry for the USAF/USN JPATS competition. This has a TFE731-2-2B engine, Bendix/King digital avionics, an AiResearch environmental control system, and a modified fuel management system. First flown May 25, 1993, this version is available for export. (Data for standard IA 63.)

Contractor: Lockheed Aircraft Argentina SA (formerly FMA), Argentina.

Power Plant: one AlliedSignal TFE731-2-2N turbocfan; 3,500 lb thrust.



I-22 Iryda, Polish Air Force
(Ryszard Jaxa-Malachowski)



IA 63 Pampa, Argentine Air Force (Press-Office Sturzenegger)

ground-attack derivatives of the M-95 are designated M-97S and M-97MS, respectively; a further development would be the M-99 Orkan ("eagle"), with a larger wing, more powerful turbofans, and ability to carry 8,818 lb of stores on eight external stations. (Data for M-93K.)

Contractor: PZL Mielec, Poland.

Power Plant: two Instytut Lotnictwa K-15 turbojets; each 3,307 lb thrust.

Dimensions: span 31 ft 6 in, length 43 ft 4½ in, height 14 ft 1¼ in.

Weights: empty 10,251 lb, gross 14,771–19,180 lb.

Performance (at 13,007 lb clean gross weight except where indicated): max speed at 16,400 ft 590 mph, stalling speed (gear and flaps down) 127 mph, ceiling 44,950 ft, T-O run 2,199 ft, landing run (with brake-chute) at 14,550 lb weight 1,378 ft, radius at 19,180 lb weight with max external stores 155 miles, g limits +7.3/–4.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: one centerline 23-mm twin-barrel GS-23L gun with 50–200 rds; two multiple stores carriers under each wing for up to 2,425 lb of bombs (up to 1,102-lb size), cluster bombs, gun pods, guided or unguided rockets, camera pods, or (inboard stations only) 100-gallon drop tanks.

IA 63 Pampa

The first of three prototypes of this basic, advanced, and weapons training aircraft flew October 6, 1984.



IAR-109 Swift



K-8 Karakorum 8

Dimensions: span 31 ft 9¼ in, length 35 ft 9¼ in, height 14 ft 1 in.

Weights: empty 6,219 lb, gross 8,157–11,023 lb.

Performance (at 8,377 lb gross weight except where indicated): max speed at S/L 466 mph, stalling speed 106 mph, ceiling 42,325 ft, T-O run (at 8,157 lb weight) 1,390 ft, landing run (at 7,716 lb weight) 1,512 ft, range 932 miles (1,151 miles with external tanks), g limits +6/–3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: hardpoint under fuselage and two under each wing for up to 2,557 lb (with standard fuel) of gun pods, bombs, and rockets. With uprated engine, external load can be increased to 3,748 lb.

IAR-99 Șoim and IAR-109 Swift

About 50 IAR-99 Șoims ("hawks") are currently in service with the Romanian Air Force, as intermediate and advanced trainers, with light attack capability. Meanwhile, the Bedek Aviation Division of Israel Aircraft Industries has assisted Avioane in upgrading the aircraft by installing state-of-the-art avionics in a demonstrator, known as the IAR-109 Swift, which flew for the first time in Israel in November 1993. Two proposed production versions are now available: the IAR-109T "all-through" jet trainer and the IAR-109TF combat trainer/light attack version. Avionics in the TF, compatible with a MIL-STD-1553B multiplex data bus, include EFIS, a mission display processor, HUD, ring-laser gyro INS, HOTAS controls, radar altimeter, IFF transponder, and laser rangefinder. The underwing stations can accept east European or Western weapons, including infrared AAMs and precision guided munitions. (Data for IAR-99.)

Contractor: Avioane SA, Romania.

Power Plant: one Turbomecanica license-built Rolls-Royce Viper Mk 632-41M turbojet; 4,000 lb thrust.

Dimensions: span 32 ft 3¼ in, length 36 ft 1½ in, height 12 ft 9½ in.

Weights: empty 7,055 lb, gross 9,700–12,258 lb.

Performance (at 9,700 lb clean gross weight): max speed at S/L 537 mph, ceiling 42,325 ft, T-O run 1,477 ft, landing run 1,805 ft, max range 683 miles, g limits +7/–3.6.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: centerline 23-mm GS-23 gun pod with 200 rds; two hardpoints under each wing for 550-lb or smaller bombs, two twin 7.62-mm gun pods, four 16 x 57-mm or 32 x 42-mm rocket pods, infrared AAMs, drop tanks (inboard stations only), or other stores.

K-8 Karakorum 8

Design of the K-8 (originally L-8) was initiated by NAMC in China in 1986, and Pakistan agreed to take a 25 percent share in mid-1987. The K-8 is now in initial production by NAMC as a jet basic trainer and light ground-attack aircraft. It made its public debut at the February 1992 Asian Aerospace show in Singapore. The first of three flying prototypes made its initial flight November 21, 1990. The second followed on October 18, 1991, and by the beginning of 1995 the three had completed about 800 hours of flying. Production of an initial batch of 15 began in 1992; these have been delivered to the Chinese PLA Air Force. Six ordered by Pakistan in April 1994 were handed over in China in September and delivered to the Pakistan Air Force Academy at Risalpur in January 1995. Further contracts were expected to follow an initial six-month evaluation. Pakistan's total K-8 requirement is believed to be 75, to replace the Cessna T-37 and possibly also the Chengdu FT-5. Interest has been shown by other countries, including Bangladesh, Eritrea, Laos, Myanmar, Sri Lanka, and Zambia.

Contractors: Nanchang Aircraft Manufacturing Company, People's Republic of China.

Power Plant: one AlliedSignal TFE731-2A-2A turbofan; 3,600 lb thrust.

Dimensions: span 31 ft 7¼ in, length (incl nose pitot) 38 ft 0¼ in, height 13 ft 9¼ in.

Weights: empty 5,924 lb, gross 8,003–9,546 lb.

Performance (at 8,003 lb clean gross weight): max speed at S/L 501 mph, stalling speed (gear and flaps down) 94 mph, ceiling 42,650 ft, T-O run 1,392 ft, landing run 1,641 ft, max range on internal fuel 870 miles, g limits +7.33/–3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament (optional): one 23-mm gun pod under center-fuselage; two hardpoints under each wing for a total 2,080 lb of external stores. Twin-store inboard stations each for two small bombs; single-store outboard stations can each carry a PL-7 AAM, 12-rd pod of 57-mm rockets, a single 550-lb or smaller bomb, or a 66-gallon drop tank.

L-29 Delfin

The L-29 Delfin ("dolphin") first flew April 5, 1959, and was followed by 3,568 production Delfins built between

1961 and 1974. About 3,000 were delivered to the USSR, most of the remainder being supplied as the standard jet basic trainer for all other members of the former Warsaw Pact except Poland. Estimates of current strengths are Bulgaria 84, Czech (13) and Slovak (16) Republics 29, Hungary 24+, and Romania 30+, although Russian and some other inventories have been depleted in recent years by sales to the civil market. Russia's current UTS program, for which the MiG-AT and Yak-130 (which see) are competing, is to find a replacement for that country's L-29s and early production L-39s. At least nine other nations received L-29s, of which Afghanistan (24), Ghana (eight), Mali (six), and Syria (60) still operate the Delfin, often for counterinsurgency roles. An L-29R version was produced for light attack duties, with underwing stores pylons and nose-mounted cameras. (Data for standard L-29.)

Contractor: Aero Vodochody National Corporation, Czech Republic.

Power Plant: one Walter M 701c 500 turbojet; 1,960 lb thrust.

Dimensions: span 33 ft 9 in, length 35 ft 5½ in, height 10 ft 3 in.

Weights: empty 5,027 lb, gross 7,231–7,804 lb.

Performance (at 7,165 lb weight): max speed at S/L 382 mph, stalling speed (flaps down) 81 mph, ceiling 36,100 ft, T-O run 1,805 ft, landing run 1,444 ft, max range with underwing tanks 555 miles.

Accommodation: crew of two, on tandem ejection seats. Rear seat raised.

Armament: single attachment point under each wing for rocket pod, 7.62-mm machine gun pod, 220-lb bomb, or drop fuel tank.

L-39/139 Albatros

Since the L-39 entered production in 1971, deliveries have exceeded 2,800 (including 2,094 L-39C basic and advanced trainers for the former USSR), bringing the Aero factory's jet trainer output to an unrivaled total of more than 6,400. Apart from the Czech and Slovak Air Forces (36), other L-39C recipients include Afghanistan (12), Cuba (30), Ethiopia (20), and Vietnam (24). Ex-Soviet L-39Cs have been acquired by Lithuania and Latvia. Eight examples of the L-39V, a specialized target-towing version, were built for Czechoslovakia in 1976. The L-39Z0, with strengthened wings for additional stores carriage, was exported to the former German Democratic Republic (52, of which 20 transferred to Hungary in 1993), Iraq (81), Libya (181, of which 10 later transferred to Egypt), and Syria (55). The ground-attack/reconnaissance L-39ZA, which adds a centerline 23-mm gun pod to the capability of the Z0, was built for Algeria (32), Bulgaria (36), Czechoslovakia (31), Nigeria (24), Romania (32), and Syria (44). Thirty-six others (designated L39ZA/ART and having Elbit avionics) were delivered to Thailand for Nos. 101, 102, and 401 Squadrons in 1994, and eight were in production for Bangladesh in mid-1995. Cambodia is reported to have acquired six L-39ZAs that had been upgraded by Israel.

Although too late to find a partner to enter the US JPATS competition, the Albatros is being offered in Westernized form for world markets. Principal differences in the L-139 are an AlliedSignal turbofan, Flight Vision HUD, and Bendix/King avionics. First flight was made May 8, 1993. (Data for L-39C, with L-139 in parentheses.)

Contractor: Aero Vodochody, Czech Republic.

Power Plant: one Progress/Ivchenko AI-25TL (Allied-Signal TFE731-4-1T) turbofan; 3,792 lb (4,080 lb) thrust.

Dimensions: span over integral tip tanks 31 ft 0½ in, length 39 ft 9½ in, height 15 ft 7¾ in.

Weights: empty 7,617 lb (7,623 lb), gross 9,976–10,362 lb (10,026–13,113 lb).

Performance (L-39C at 9,921 lb clean gross weight): max speed at S/L 435 mph, at 16,400 ft 466 mph, stalling speed 103 mph, ceiling 36,100 ft, T-O run 1,740 ft, landing run 2,135 ft, range with max internal fuel 683 miles, g limits +8/-4.

Performance (L-139): max speed at 20,000 ft 472 mph, stalling speed 104 mph, ceiling 38,715 ft, T-O run 1,641 ft, landing run 2,000 ft, range with max internal fuel 1,000 miles.

Accommodation: crew of two, on tandem zero height/94 mph (zero/zero) ejection seats. Rear seat raised.

Armament: centerline pod for 23-mm GSh-23 twin-barrel gun. Two underwing pylons for up to 626 lb of practice weapons or drop tanks. L-39Z0 has two underwing stations each side for a total of 2,535 lb of stores including bombs, rocket pods, IR AAMs (outer pylons only), or (port inner pylon only) a reconnaissance pod. External load increased to 2,844 lb on L-39ZA and L-139.

L-59/159 Albatros

First flown in definitive form September 30, 1986, the prototype of this L-39 derivative was originally designated L-39MS; the L-59 designation, acknowledging it as essentially a new type, was adopted in about 1990.



L-29 Delfin, Czech Air Force
(P. R. Foster)



L-139 Albatros, Czech Air Force



L-59E Albatros, Egyptian Air Force



AT-26 Xavante, Paraguayan Air Force

Its new and more powerful DV-2 turbofan, of Russian (Ivchenko/Lotarev) design, is built in the Slovak Republic. Other major differences include a strengthened fuselage with slightly longer nose, enlarged tip tanks, powered aileron and elevator controls, and upgraded avionics. The first five production aircraft were delivered to the Czech and Slovak air forces (three and two, respectively) in 1991–92, and deliveries of 48 L-59Es to the Egyptian Air Force followed in 1993–94. Twelve L-59s are being built for the Tunisian Air Force.

Under development, to fly in spring 1996, is the L-159, a single-seat advanced trainer/light attack derivative of the L-59 to be powered by a 6,300 lb thrust ITC F124 turbofan. Czech government approval was given in April 1995 for 72 to be ordered for the country's air force. Deliveries should begin in 1998. The L-159 will have a nose-mounted radar, armored cockpit, and Western avionics, plus an additional fuel tank in place of the L-59's second seat. (Data for L-59.)

Contractor: Aero Vodochody, Czech Republic.

Power Plant: one ZMKB Progress DV-2 turbofan; 4,850 lb thrust.

Dimensions: span over tip tanks 31 ft 3½ in, length 40 ft 0¼ in, height 15 ft 7¾ in.

Weights: empty 8,885 lb, gross 11,883–15,432 lb.

Performance (at 11,883 lb clean gross weight): max speed at 16,400 ft 537 mph, stalling speed (gear and flaps down) 115 mph, ceiling 38,725 ft, T-O run 1,936 ft, landing run 2,527 ft, range with external fuel 1,243 miles, g limits +8/-4.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: one 23-mm GSh-23 twin-barrel gun in underfuselage pod; four underwing pylons for a total of 2,425 lb of stores, including bombs of up to 1,102 lb, four 16 x 57-mm rocket pods, or two 39.5-gallon or 92.5-gallon drop tanks.

MB-326, Impala, and AT-26 Xavante

The original tandem-seat trainer versions of the MB-326, with a 2,500 lb thrust Viper 11 turbojet, were bought for the air forces of Italy (MB-326 and 326E), Australia (326H), Ghana (326F), South Africa (326M), and Tunisia (326B). The strengthened wings of the E (each with three pylons) were combined with the more powerful Viper 540 to produce the trainer/light attack MB-326GB built by AerMacchi for Argentina, Zaire, and Zambia, and by Embraer for the air forces of Brazil (as the AT-26 Xavante), Paraguay, and Togo. Final Italian-built variants, bought by several earlier custom-

ers and Dubai, were the single-seat MB-326K for operational training/ground-attack and two-seat MB-326L advanced trainer; both have a 4,000 lb thrust Viper 632. Atlas Aircraft Corp. in South Africa built 151 MB-326Ms under license as Impala Mk 1 trainers and a number of MB-326Ks as Impala Mk 2s.

None is thought to remain in use by Argentina and Paraguay. Estimated strengths with other users are: Australia 30+, Brazil 90, Ghana 40, Italy 60, South Africa 30 and 50, Togo 40, Tunisia 10, UAE five, Zaire 15, and Zambia 16. Competition is heating up to replace Australia's Macchis as lead-in trainers for the RAAF's F/A-18s and F-111s, with the Hawk, T-45A Goshawk, and AerMacchi's own MB-339 reportedly the front-runners. South Africa has sold at least 20 of its Mk 1 Impalas, has about half of its 50 Mk 2s in store, and has earmarked the remainder for phase-out once a suitable replacement can be found. (Data for MB-326GB.)

Contractor: AerMacchi SpA, Italy.

Power Plant: one Rolls-Royce Viper 20 Mk 540 turbojet; 3,410 lb thrust.

Dimensions: span 35 ft 7¼ in, length 35 ft 0¼ in, height 12 ft 2 in.

Weights: empty 5,920 lb, gross 10,090–11,500 lb.

Performance (trainer at 8,680 lb gross weight, internal fuel only): max speed 539 mph, max cruising speed 495 mph, ceiling 47,000 ft, T-O run 1,350 ft, landing from 50 ft 2,070 ft, range 1,150 miles.

Accommodation: crew of two, on tandem ejection seats.

Armament: three attachment points under each wing for up to 4,000 lb of gun or rocket pods, bombs, wire-guided missiles, camera pack, or drop fuel tanks.

MB-339

The first production MB-339A for the Italian Air Force flew July 20, 1978; the total of 107 eventually delivered

included three MB-339RM (radiomisure) calibration aircraft (since restored to trainer duties) and 19 MB-339PANs for the Freccia Tricolori aerobatic display team, with added smoke generator but with wingtip tanks deleted to aid formation keeping. Power plant is a 4,000 lb thrust Viper 632-43 turbojet. Italian MB-339As are camouflaged for use as an emergency close-support force. One was converted into the prototype MB-339AM, with upgraded avionics and Marte antiship ASMs. MB-339As were also delivered to Argentina (Navy, 10), Dubai (seven), Ghana (four), Malaysia (13), Nigeria (12), and Peru (16). With Lockheed Martin, AerMacchi entered a "missionized" version named T-Bird II, with 4,000 lb thrust Viper 680-582 and detail improvements, for the recent US JPATS competition.

The A model was succeeded by the MB-339C (first flight December 17, 1985), with uprated engine, new vertical tail surfaces, HOTAS controls, and advanced systems including GEC-Marconi radar and nav/attack computer, Kaiser HUDWAC, Litton INS, Honeywell radar altimeter, FIAR laser rangefinder, Tracor chaff/flare dispenser, and Electronica active ECM pod. The Royal New Zealand Air Force received 18 of this version, which equip No. 14 Squadron and the Pilot Training School.

Later variants are the MB-339CD and MB-339FD, both with the Viper 680-43 power plant. Italy is to buy 15 of the former, with all-digital avionics, HOTAS controls, and provision for in-flight refueling, as lead-in trainers for Tornado crews. The FD (full digital), bidding strongly for Australia's MB-326H replacement requirement, will have twin HUDs, three-color liquid crystal multifunction displays, inertial navigation with embodied GPS, an advanced nav/attack computer, and HCTAS controls. (Data for MB-339C.)

Contractor: AerMacchi SpA, Italy.

Power Plant: one Rolls-Royce Viper Mk 680-43 turbojet; 4,400 lb thrust.

Dimensions: span over integral tip tanks 36 ft 9 1/4 in, length 36 ft 10 1/2 in, height 13 ft 1 1/4 in.

Weights: empty 7,562 lb, gross 10,983-14,000 lb.

Performance (at 10,983 lb weight): max speed at S/L 558 mph, at 30,000 ft 508 mph, stalling speed 98 mph, ceiling 46,700 ft, T-O run 1,608 ft, landing run 1,509 ft, ferry range with two drop tanks 1,266 miles, g limit +7.33.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: six underwing hardpoints for up to 4,000 lb of stores including 12.7-mm or 30-mm gun pods, rockets of 50-mm to 5-in caliber, 500-lb bombs, 100-mm runway demolition bombs, AIM-9L Sidewinder and Magic AAMs, AGM-65 Maverick ASMs, Marte Mk II sea-skimming antiship missiles, and other weapons.

MIg-AT

Five Russian OKBs produced designs for a two-seat advanced jet trainer to replace the Czech-built L-29 Delfin and L-39 Albatros. The two finalists, still awaiting selection, are the MiG-AT and Yak-130. Of these, the MiG is the more conventional design, with unswept, low-mounted wings and twin turbofans in pods above the wingroots. Engines for two prototypes have been supplied by SNECMA of France, in time for the first to be rolled out May 18, 1995, and displayed at the subsequent Paris Air Show, in advance of flight testing. Avionics are being developed and supplied by Sextant (France) and GosNIIAS (Russia), to include two multifunctional CRT displays with buttons, a HUD with input from a color video and TV camera, HSI/ADI, automatic control system, INS, Tacan, ILS, RWR, and IFF. Three versions had been notified by fall 1995:

ATF. First prototype; French avionics.

ATR. Second prototype; Russian avionics.

ATB. Single-seat light attack version.

Design objectives include maneuverability comparable with front-line combat aircraft and a service life of 15,000 flying hours or 30 years, with at least 30,000 landings. The Russian requirement is for 200 to 250 trainers in this category.

Contractor: MAPO-MiG, Russia.

Power Plant: two Turbomeca-SNECMA Larzac 04-R20 turbofans; each 3,175 lb thrust. Production engines to be license-built by Chernyshov.

Dimensions: span 33 ft 4 in, length 39 ft 5 in, height 14 ft 8 1/2 in.

Weights: empty over 7,275 lb, gross 10,163-15,430 lb.

Performance (estimated): max speed at S/L 528 mph, ceiling 50,850 ft, T-O run 1,017 ft, landing run 1,870 ft, ferry range 1,865 miles, g limits +8/-3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: up to 4,410 lb of guided and unguided missiles, guns, and bombs, on seven hardpoints.

Ranger 2000

Like the German turboshaft-powered Fantrainer (which see) from which it was developed, the Ranger 2000 has a cabin section based on a single structural



MB-339A, Royal Malaysian Air Force
(Peter Steinemann)



MiG-AT (Gordon G. Bartley)



S.211

keel beam. The wings, center-fuselage, and engine housing are made of CFRP and GFRP (carbonfiber- and glassfiber-reinforced plastics); the narrow rear fuselage and T tail are all-metal. For the US JPATS competition, DASA's US partner, the North American Aircraft division of Rockwell, redesigned the fuselage to raise the rear seat, embody new US military standard com/nav systems and Collins four-tube EFIS-85 displays based on those in the T-1A Jayhawk, and use Universal Propulsion Co. lightweight ejection seats. The first Ranger 2000 prototype, originally known as the FanRanger, flew January 15, 1993; the second flew June 18 but was lost July 27, 1993, delaying further flight testing until December, but a third prototype flew June 20, 1994, in time for the JPATS flyoff. Upper-wing airbrakes have been relocated to a strengthened rear fuselage, and elevator hinges reinforced. Future status of the Ranger 2000 program, following its failure to win JPATS selection, had not been announced at press time.

Contractors: Rockwell Corporation, USA, and Daimler-Benz Aerospace, Germany.

Power Plant: one Pratt & Whitney Canada JT15D-5C turbofan; 3,190 lb thrust.

Dimensions: span 34 ft 4 in, length 25 ft 9 1/4 in, height 12 ft 10 in.

Weight: gross 5,291 lb.

Performance: max speed at S/L 379 mph, at 30,000 ft 451 mph, ceiling 35,000 ft, range on internal fuel 1,118 miles.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: none.

S.211

The S.211 prototype flew for the first time April 10, 1981; this version was supplied to the air forces of Singapore (30) and the Philippines (24). The first six aircraft for Singapore were delivered as kits and the remainder produced locally. The 27 that survive now fly from RAAF Pearce in Western Australia, where pilots of the Republic of Singapore Air Force receive their basic training. The first four Philippine S.211s were Italian-built; the remainder were assembled in Manila by PADC, but attrition has reduced the fleet to 18, of which only 10 were reported to be airworthy earlier this

year. They are used for advanced training by the 100th Training Wing and for weapons training by the 5th Fighter Wing.

In partnership with Northrop Grumman, Agusta developed an uprated version, the S.211A, with a more powerful (3,190 lb thrust) JT15D-5C turbofan and supercritical wings with drooped tips, for the JPATS competition. This made its first flight September 17, 1992. Compared with the original S.211, the A has higher gross weights (6,393-8,818 lb) and a max speed of 476 mph at 25,000 ft. New wing fittings raise the g limits to +7/-3. (Data for basic S.211.)

Contractor: Agusta SpA (SIAI-Marchetti), Italy.

Power Plant: one Pratt & Whitney Canada JT15D-4C turbofan; 2,500 lb thrust.

Dimensions: span 27 ft 8 in, length 31 ft 2 in, height 12 ft 5 1/2 in.

Weights: empty 4,078 lb, gross 6,063-6,944 lb.

Performance (at 5,511 lb gross weight): max cruising speed at 25,000 ft 414 mph, stalling speed (gear and flaps down) 86 mph, ceiling 40,000 ft, T-O run 1,280 ft, landing run 1,185 ft, max range on internal fuel 1,036 miles, g limits (clean) +6/-3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: two hardpoints under each wing for up to 1,455 lb of gun pods (single or twin guns), rocket launchers, bombs, napalm tanks, cartridge throwers, two camera/IR reconnaissance pods, or two drop tanks. Philippine Air Force aircraft can carry a 0.50-in gun pod under the front fuselage.

Saab 105 (SK60)

Between 1966 and 1969, a total of 150 Saab 105s were delivered to the Swedish Air Force, with which they serve in five slightly different versions: SK60A two-seat primary/basic/advanced trainer; SK60B two-seat light attack/advanced trainer; SK60C two-seat light attack/reconnaissance/advanced training aircraft; SK60D four-seater for liaison duties; and SK60E four-seater for liaison, with civil avionics. Since 1987, the SK60 has been the only training aircraft in the Swedish Air Force. About 140, including 30 SK60Cs, are in service, of which about 70 equip the Basic Flying School of F5 Wing at Ljungbyhed; the other main training unit is No. 5 Light Attack and Basic Tactical Training Squadron at Uppsala. Following a life extension program that included wing strengthening, they are intended to continue in use until at least 2010. New 1,900 lb thrust Williams-Rolls FJ44 turbofan engines are now being installed in 115 SK60s during 1994-98, with options on reengining 20 more. Instruments and avionics will also be upgraded. The first reengined aircraft flew October 6, 1995.

Also in service is the Saab 105XT, with 2,850 lb thrust General Electric J85-17 engines, strengthened structure, more internal fuel, more advanced avionics, and much greater weapon-carrying capability. The Austrian Air Force acquired 40 during 1970-72, under the designation 105OE. About 30 remain operational with Nos. 1 and 2 Squadrons of a fighter-bomber wing, for conversion training, ground-attack, and tactical reconnaissance with an underwing Vinten camera pod. (Data for SK60A; 105OE in parentheses.)

Contractor: Saab Military Aircraft, Sweden.

Power Plant: two Turbomeca/SNECMA RM9B Abusique turbofans; each 1,636 lb thrust.

Dimensions: span 31 ft 2 1/4 in, length 35 ft 5 1/4 in, height 8 ft 10 1/2 in.

Weights: empty 6,404 lb (6,281 lb), gross 9,085 lb (10,218 lb).

Performance (trainer): max speed at S/L 453 mph (602 mph), at 20,000 ft 478 mph (578 mph), ceiling 39,370 ft (44,950 ft), T-O run 3,002 ft (1,247 ft), landing run 1,640 ft (1,969 ft), ferry range 1,180 miles (1,430 miles).

Accommodation: crew of two, side by side on ejection seats (four fixed seats in SK60D/E).

Armament (SK60B/C): up to 1,764 lb on six underwing hardpoints. Two 30-mm Aden gun pods or 12.7-mm practice gun pods; up to 12 x 135-mm rockets or six 60-mm practice rockets. (Up to 4,410 lb on 105OE.)

T-2 and T-2A

First flown July 20, 1971, the XT-2 prototype was the first supersonic aircraft designed and manufactured by the Japanese aerospace industry. Ninety production aircraft were manufactured for the Japan Air Self-Defense Force, of which 28 were configured as T-2 unarmed advanced trainers and the remaining 62 as T-2A armed combat proficiency trainers. Standard equipment includes Mitsubishi Electric AWG-11 radar, HUD, and SIF/IFF. Two were converted into prototypes of the F-1 single-seat close-support fighter, which has similar dimensions, power plant, and performance, but 6,000 lb weapon load. Production ended in 1988.

Contractor: Mitsubishi Heavy Industries Ltd, Japan.

Power Plant: two Ishikawajima-Harima TF40-IHI-801A (license Rolls-Royce Turbomeca Adour Mk 801A) turbofans; each 7,305 lb thrust with afterburning.

Dimensions: span 25 ft 10 1/4 in, length 58 ft 7 in, height 14 ft 5 in.

Weights: empty 13,905 lb, gross 21,616–28,219 lb.

Performance (clean): max speed at height Mach 1.6, ceiling 50,000 ft, T-O run 2,000 ft, ferry range 1,610 miles.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament (T-2A): one JM61 Vulcan multibarrel 20-mm gun in lower fuselage, aft of cockpit on port side. Hardpoints on centerline and two under each wing for up to 4,410 lb of drop tanks or weapons. Wingtip attachments for Sidewinder AAMs.

T-2 Buckeye

The first of 231 T-2Cs was delivered to the US Navy in April 1969. It is now the only version still active in the USN inventory, providing jet pilot, navigator, NFO, and weapons training, plus the carrier qualification part of the strike training syllabus. Its roles are being taken over gradually by T-45A Goshawks.

The Venezuelan Air Force acquired 24 T-2Ds, generally similar to the C except for their avionics and deletion of carrier landing capability. About 19 of these continue in service as advanced trainers, 10 of them with a secondary attack role. The attack kit had been developed originally for 40 T-2Es supplied to the Hellenic Air Force. Most of these are still used for advanced and tactical training, with provision for 3,500 lb of stores on six underwing hardpoints. (Data for T-2C.)

Contractor: Rockwell International Corporation, USA.
Power Plant: two General Electric J85-GE-4 turbojets; each 2,950 lb thrust.

Dimensions: span over tip tanks 38 ft 1 1/2 in, length 38 ft 3 1/2 in, height 14 ft 9 1/2 in.

Weights: empty 8,115 lb, gross 13,180 lb.

Performance: max speed at 25,000 ft 530 mph, stalling speed 100 mph, ceiling 45,500 ft, max range 1,070 miles.

Accommodation: crew of two, on tandem ejection seats. Rear seat raised.

Armament: two underwing hardpoints for up to 640 lb of practice bombs, gun pods, or rocket launchers.

T-4

The first of four prototypes of the T-4 intermediate trainer flew July 29, 1985. The Japan Air Self-Defense Force planned production of about 200, of which 162, including the prototypes, had been ordered and 131 delivered by the spring of this year. As well as equipping Nos. 31 and 32 Flying Training Squadrons of the 1st Air Wing at Hamamatsu, near Tokyo, they are used by the instrument rating and communications flights of combat squadrons. The basic requirements of the specification to which they were designed called for high subsonic maneuverability and provisions to carry external stores under the fuselage and wings. Four underwing hardpoints can carry drop tanks or travel pods; an under-fuselage pylon can be used for target-towing equipment, an ECM/chaff dispenser pod, or air sampling pack.

In readiness for the 1996 display season, eight T-4s have been delivered to the JASDF's Blue Impulse aerobatic team in place of its previous T-2s. These have windscreens more resistant to birdstrikes, increased rudder movement, and one fuel tank replaced by an oil tank for creating smoke trails. Fuji and Mitsubishi each have a 30 percent share in manufacture of the T-4, under Kawasaki's leadership. An enhanced-capability version has been proposed as a replacement for the Mitsubishi T-2 and T-2A for service entry early next century.

Contractor: Kawasaki Heavy Industries Ltd, Japan.

Power Plant: two Ishikawajima-Harima F3-IHI-30 turbofans; each 3,660 lb thrust.

Dimensions: span 32 ft 7 1/2 in, length 42 ft 8 in, height 15 ft 1 1/4 in.

Weights: empty 8,356 lb, gross 12,544–16,535 lb.

Performance (at 12,544 lb clean gross weight): cruising speed Mach 0.75, ceiling 50,000 ft, T-O run 2,000 ft, landing run 2,100 ft, max range with two drop tanks 1,036 miles, g limits +7.33/-3.

Accommodation: crew of two, on tandem ejection seats. Rear seat raised.

Armament: no built-in armament.

T-33A Shooting Star

Nearly 50 years have elapsed since this 4 ft 2 1/2 in, tandem-seat stretch of America's first operational jet fighter first flew (as the TP-80C) on March 22, 1948, yet it is still active with 13 air forces. In addition to T-33A pilot trainers, AT-33A counterinsurgency versions are still flown by Bolivia (32), Ecuador (23), and Mexico (42), while Pakistan still operates four of the RT-33A tactical reconnaissance version. Largest T-33A fleets are those of Canada, whose more than 50 CT-133A Silver Stars have 5,100 lb thrust Rolls-Royce Nene engines; Greece (nearly 50); Japan (40); and Turkey (75+). Other T-33A operators are the air forces of Guatemala (two), Iran (nine), Pakistan (10), the Philippines (six), and South Korea (30+). Japan's T-33As are

now used only for liaison and other duties following their replacement by T-4s. Canada's CT-133As serve with combat support squadrons. Ten are modified as ET-133 "electronic aggressors"; others are used for maritime support. (Data for T-33A.)

Contractor: Lockheed Aircraft Corporation, USA.

Power Plant: one Allison J33-A-35 turbojet; 5,400 lb thrust.

Dimensions: span 38 ft 10 1/2 in, length 37 ft 9 in, height 11 ft 8 in.

Weights: empty 8,084 lb, gross 11,965–14,442 lb.

Performance: max speed at S/L 590 mph, at 25,000 ft 543 mph, ceiling 48,000 ft, max range 1,275 miles.

Accommodation: crew of two, in tandem.

Armament: none in T-33A; provision for 0.50-in twin-gun pod under each wing in AT-33A.

T-37 Tweet

Forty-one years after the first flight of Cessna's Model 318 side-by-side trainer prototype, October 12, 1954, the T-37B major production version continues as USAF's standard primary trainer and will not begin to retire until the JPATS PC-9 Mk II is ready for service. The May 1995 *Air Force Magazine* showed 488 active, with an average age of 31.7 years. All are being upgraded by SLEP kits manufactured by Sabreliner Corp. The majority are operated by AETC, but a number serve at ACC bases. Twelve were due to be transferred to Bangladesh this month.

The T-37C, delivered to fill MAP orders only, is generally similar to the B in its primary and intermediate training roles but also has provision for underwing armament, a gunsight, and reconnaissance camera. T-37Bs and/or Cs are operated today by the air forces of Chile (20+), Colombia (eight), Germany (35, US-based), Greece (31), Pakistan (50+), South Korea (40+), Thailand (15), and Turkey (62). (Data for T-37B.)

Contractor: Cessna Aircraft Company, USA.



SK60, Swedish Air Force (D. M. Stroud)



T-2, Blue Impulse aerobatic team, Japan Air Self-Defense Force (Katsumi Hinata)



T-4, Japan Air Self-Defense Force

Power Plant: two Continental J69-T-25 (license Turbomeca Marbore) turbojets; each 1,025 lb thrust.

Dimensions: span 33 ft 9 1/4 in, length 29 ft 3 in, height 9 ft 2 1/4 in.

Weights: empty 3,870 lb, gross 6,575 lb.

Performance: max speed at 25,000 ft 426 mph, cruising speed at 35,000 ft 360 mph, ceiling 35,100 ft, T-O to 50 ft 2,000 ft, landing from 50 ft 2,545 ft, range at 360 mph with standard fuel 870 miles.

Accommodation: crew of two, side by side on ejection seats.

Armament (T-37C): provision for two 250-lb bombs under wings, or four Sidewinder AAMs, and for fuselage-mounted camera.

T-38 Talon

The YT-38 prototype was the first supersonic aircraft designed from the start as a trainer. It flew for the first time on April 10, 1959, and was followed by 1,187 production T-38As over the next decade. More than 1,100 of these were for USAF, which still had 506 at the start of this year, including some allocated for Companion Trainer Program duty with ACC. The original total included 46 (of which 41 remain) allocated for US-based training of German pilots. NASA has 31; the US Navy received 18 (of which about six remain). Other current T-38A operators are Taiwan (40 leased) and Turkey (69).

A total 132 of the USAF aircraft were modified to T-38B (unofficially AT-38B) configuration for specialized weapons training, with an underfuselage gun pod or practice bomb dispensers. A SLEP named Pacer Classic will extend the service life of USAF's T-38As until 2020. A contractor team to upgrade the avionics of 425 aircraft is expected to be selected in March 1996. (Data for T-38A.)

Contractor: Northrop Corporation, USA.

Power Plant: two General Electric J85-GE-5A turbojets; each 3,850 lb thrust with afterburning.

Dimensions: span 25 ft 3 in, length 46 ft 4 1/2 in, height 12 ft 10 1/2 in.

Weights: empty 7,164 lb, gross 12,093 lb.

Performance: max speed at 36,000 ft more than Mach 1.23 (812 mph), typical cruising speed at 43,400 ft 578 mph, stalling speed (gear and flaps down) 156 mph IAS, ceiling above 55,000 ft, T-O run 2,500 ft, landing run 3,000 ft, range 1,093 miles.

Accommodation: crew of two, on tandem ejection seats. Rear seat raised.

Armament: none in T-38A; SUU-11 0.30-in gun pod or SUU-20/A rocket/practice bomb carrier in T-38B.

T-45A Goshawk

This development of the British Aerospace Hawk was selected in 1981, in preference to five other entries, in a competition for an undergraduate jet pilot

trainer to replace the US Navy's T-2C Buckeye and TA-4J Skyhawk. Initial changes introduced by the US prime contractor, McDonnell Douglas, included a new main and nose landing gear, an arrestor hook, and airframe strengthening to make the aircraft carrier-compatible. The Hawk airbrake and ventral strakes were replaced, avionics and cockpit displays changed for compatibility with USN front-line fighters, and a derated version of the Adour installed to prolong engine life. The handling characteristics suffered from these modifications, leading to the addition of full-span slats, airbrakes, and use of a more powerful model of the engine. The first flight was made April 16, 1988. Production was initiated by an FY 1988 Lot 1 contract for 12 production T-45As. At present, 197 T-45As are

planned to enter USN service by 2003, of which 72 had been contracted and 46 delivered by the beginning of 1995. A prototype with a digital/"glass" Cockpit 21, HUD, and GPS/INS navigation flew March 19, 1994, and this upgrade is intended to be standard from the 73d production aircraft, in 1996, with retrofit on early Goshawks.

A first group of US Navy student pilots began flying T-45A Goshawks of Squadron VT-21, at Kingsville, Tex., in early 1994 and graduated October 5. Clearance for fleet introduction was recommended July 5, 1994, with USS *Forrestal* as primary sea platform. Initial results suggest that the T-45A will meet USN intermediate/advanced training requirements with 42 percent fewer aircraft, 25 percent fewer flight hours, and 46 percent fewer personnel than with the T-2C/TA-4J program.

Contractors: McDonnell Douglas Corporation, USA, and British Aerospace plc, UK.

Power Plant: one Rolls-Royce Turbomeca F405-RR-401 (Adour Mk 871) turbofan; 5,845 lb thrust.

Dimensions: span 30 ft 9 3/4 in, length (incl probe) 39 ft 4 in, height 14 ft 0 in.

Weights: empty 9,834 lb, gross 12,750–14,081 lb.

Performance: max speed at 8,000 ft 625 mph, max Mach number in dive 1.04, ceiling 40,000 ft, T-O to 50 ft 3,610 ft, landing from 50 ft 3,310 ft, ferry range, internal fuel 952 miles, *g* limits +7.33/-3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: one pylon under each wing for practice multiple bomb rack, rocket pod, or drop fuel tank. Provision for centerline stores pod.

TS-11 Iskra-Bis

Developed for the Polish Air Force in preference to the Czech L-29 Delfin, the prototype Iskra first flew in February 1960, and the first of an eventual 423 production examples entered service in 1964. The initial Iskra 100 (31 built) had a 1,720 lb thrust HO-10 turbojet, replaced from 1967 by the 2,205 lb thrust SO-1, from 1969 by the identically rated SO-3, and finally by the SO-3W. In addition to engine variations, the Iskra was built in four basic models. The Iskra 100-Bis A (45 built) and B (134 built) were two-seat primary trainers, with two and four underwing hardpoints, respectively; the Iskra 200 ART-Bis C (five built) was a single-seat reconnaissance version; the 200 SB-Bis DF (208 built) was similar to the B but with a wider range of weapons and had three Soviet AFA-39 cameras in the nose. Six DFs were converted to TS-11R configuration for the Polish Naval Air Force's 7th Regiment, to replace coastal reconnaissance MiG-15UTIs. They have a Bendix/King RDS-81 weather radar in the nose, and the rear cockpit dual controls are replaced by a radar display screen and artificial horizon. Polish Air Force downsizing has resulted in several Iskras being sold in the civil market.

Fifty Iskras, of which 40+ remain, were acquired in 1975–76 for the Indian Air Force Academy at Hakimpet. (Data for Iskra 200 SB-Bis DF.)

Contractor: PZL Mielec, Poland.

Power Plant: one Instytut Lotnictwa SO-3W turbojet; 2,425 lb thrust.

Dimensions: span 33 ft 0 in, length 36 ft 7 in, height 11 ft 5 1/2 in.

Weights: empty 5,655 lb, gross 8,232–8,465 lb.

Performance (at 8,232 lb gross weight): max speed at 16,400 ft 478 mph, normal cruising speed 373 mph, stalling speed (gear and flaps down) 114 mph, ceiling 37,725 ft, T-O run 2,150 ft, landing run 2,330 ft, range 783 miles, *g* limits (ultimate) +8/-4.

Accommodation: crew of two, on tandem lightweight ejection seats.

Armament: 23-mm gun in starboard side of nose; two hardpoints under each wing for gun or rocket pods or small bombs of up to 220 lb.

Yak-130

Designed by Yakovlev in partnership with AerMACchi of Italy, this aircraft is competing with the MiG-AT to replace L-29 and L-39 jet trainers of the Russian Air Force. The prototype, designated Yak-130D, was rolled out November 30, 1994, exhibited at the 1995 Paris Air Show, and expected to fly in fall 1995. It has a three-channel digital fly-by-wire control system but will be inherently stable. Production Yak-130s are intended to have five percent longitudinal instability, to reproduce the handling characteristics of the MiG-29/Su-27 families of combat aircraft, and will be slightly smaller than the prototype.

The advanced configuration of the Yak-130 is designed to permit flight at angles of attack up to 35°. Basic power plant comprises new RD-35M turbofans, with underwingroot air intakes. The tandem cockpits are equipped with CRT displays, with a front cockpit HUD forming part of a collimated flight and sighting display linked with the pilot's helmet-mounted target designator. Roles will include everything from basic pilot training to weapons training and light fighter/



Airtrainer CT4B, Royal Thai Air Force (Denis Hughes)



Bulldog T. Mk 1, Royal Air Force (Lindsey Peacock)



CAP 10, French Air Force (P. R. Foster)

attack/reconnaissance missions. A projected naval version, with folding wings, will make possible aircraft carrier deck training. (Data for prototype.)

Contractor: Yakovlev OKB, Russia.

Power Plant: two RD-35M (Klimov-modified ZMKB Progress DV-2) turbofans; each 4,852 lb thrust.

Dimensions: span 34 ft 11 in, length 39 ft 0 1/2 in, height 15 ft 5 in.

Weight: gross 13,225–18,740 lb.

Performance (estimated): max speed at height 620 mph, ceiling 39,375 ft, T-O run 1,250 ft, landing run 2,200 ft, max ferry range 1,365 miles, *g* limits +8/-3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: provision for seven (optionally nine) hardpoints for weapons training and attack stores.

Piston-Engine Trainers

Air Beetle

Nigeria's first production aircraft, the Air Beetle is a fully aerobatic military primary trainer developed from the US Van's RV-6A homebuilt lightplane with the assistance of Dornier of Germany. It is of basic all-metal construction, with a flat-four engine that can run on either avgas or mogas. Conventional three-axis flying controls are all equipped with electric trim, and the Air Beetle has a Bendix/King IFR package as standard. The first of three prototypes flew in 1989 and, following evaluation of No. 3 prototype, the Nigerian Air Force ordered 60 basic T 18 Air Beetles to replace its BAe Bulldogs. Production of these began in 1993. Future versions will include the 160 hp T 16 and the 200 hp T 20, with export marketing to begin when production builds up to three per month. (Data for T 18.)

Contractor: Aeronautical Industrial Engineering and Project Management Company Ltd, Nigeria.

Power Plant: one Textron Lycoming O-360-A1A piston engine; 180 hp.

Dimensions: span 23 ft 0 in, length 20 ft 2 1/4 in, height 7 ft 6 1/2 in.

Weights: empty 1,100 lb, gross 1,850 lb.

Performance: max speed at S/L 173 mph, max cruising speed at 10,000 ft 178 mph, stalling speed (flaps down) 58 mph, ceiling 20,000 ft, T-O run 476 ft, landing run 722 ft, range 605 miles, *g* limits +6/-3.

Accommodation: crew of two, side by side; baggage space aft of seats.

Armament: none.

Airtrainer CT4

Twenty-three Airtrainers are in service with the Royal Thai Air Force. Five of these are CT4Bs, built to supplement the remaining 18 of 24 CT4As delivered in the 1970s and recently modified by the RTAF to extend their wing-fatigue life. Pupils at No. 1 FTS at Kampensaeng fly 65 hours on the CT4 before changing up to the PC-9s of No. 2 FTS. The Royal Australian Air Force retired its 51 CT4As (nicknamed "Plastic Parrots") in 1993, although 12 CT4Bs built for the BAe/Ansett Flying College in 1991–92 still provide pilot training for the RAAF. The Royal New Zealand Air Force, with 18 of its original 19 CT4Bs, is the only other military operator of this small primary trainer. These serve with the CFS and Pilot Training School at Ohakea.

PAC is developing the CT4E, certified to FAR Pt 23 in May 1992 with a 300 hp Textron Lycoming AEIO-540 aerobatic engine, and the CT4C, which has a 300 shp (throttle-limited) Allison 250-B17D turboprop. (Data for CT4B.)

Contractor: Pacific Aerospace Corporation Ltd, New Zealand.

Power Plant: one Teledyne Continental IO-360-HB9 piston engine; 210 hp.

Dimensions: span 26 ft 0 in, length 23 ft 2 in, height 8 ft 6 in.

Weights: empty approx 1,600 lb, gross 2,650 lb.

Performance: max speed at S/L 166 mph, max cruising speed at S/L 161 mph, stalling speed (flaps down) 51 mph, ceiling 14,500 ft, T-O run 733 ft, landing run 510 ft, max range 691 miles, *g* limits +6/-3.

Accommodation: two seats, side by side. Space to rear for third seat or 115 lb of baggage.

Armament: none.

AS 202 Bravo

A total of 180 AS 202 Bravo piston-engine two/three-seat primary trainers have been delivered. Subtypes include the AS 202/18A2, with higher max T-O and landing weights than the basic 18A, an extended canopy, and electric instead of mechanical trim; the A3, which differs from the A2 in having mechanical trim, and 24V instead of 12V electricals; and the A4, with British CAA-approved special instrumentation. All versions are fully aerobatic. Customers include the air forces of Indonesia (40) and Morocco (10), plus four for the Royal Flight of Oman and eight for the Uganda Central Flying School, of which five remain in service.

First flown July 20, 1992, the AS 202/32TP Turbine Bravo is similar to the AS 202/18A4 but has a 420 shp Allison 250-B17D turboprop. Wingtip fuel tanks increase span to 32 ft 7 3/4 in; length is 25 ft 6 1/4 in. Max T-O weight is unchanged. No military order has yet been announced. (Data for AS 202/18A4.)

Contractor: FFA Flugzeugwerke Altenrhein, Switzerland.

Power Plant: one Textron Lycoming AEIO-360-B1F piston engine; 180 hp.

Dimensions: span 32 ft 1 in, length 24 ft 7 1/4 in, height 9 ft 2 3/4 in.

Weights: empty 1,565 lb, gross (utility) 2,380 lb.

Performance (at max gross weight): max speed at S/L 150 mph, stalling speed (flaps down) 56 mph, ceiling 17,000 ft, T-O run 705 ft, landing run 690 ft, max range 707 miles, *g* limits (aerobatic) +6/-3.

Accommodation: crew of two, side by side in aerobatic version; space behind these in utility version for third seat or 220 lb of baggage.

Armament: none.

Bulldog

The first 98 production Bulldog Series 100s were followed by the Series 120, with a strengthened wing center-section and higher aerobatic takeoff weight. The RAF acquired 130 Model 121s as Bulldog T. Mk 1s. Most of those still in service are with Air Experience Flights or University Air Squadrons. Other current Bulldog operators are Jordan (17 Model 125), Kenya (seven Model 103/127), Lebanon (five Model 126), Malaysia (10 Model 102), and Sweden (60+ Model 101/SK61s). Jordan's Bulldogs serve with No. 4 Squadron at Mafraq; the Swedish aircraft are used for liaison and other nontraining duties. Ghana's surviving eight Model 122s were sold back to Britain earlier this year. (Data for Series 120.)

Contractor: British Aerospace plc, UK.

Power Plant: one Textron Lycoming IO-360-A1B6 piston engine; 200 hp.

Dimensions: span 33 ft 0 in, length 23 ft 3 in, height 7 ft 5 1/4 in.

Weights: empty 1,430 lb, gross 2,238–2,350 lb.

Performance: max speed at S/L 150 mph, max cruising speed at 4,000 ft 138 mph, stalling speed (flaps down) 61 mph EAS, ceiling 16,000 ft, T-O run 900 ft, landing run 500 ft, max range 621 miles, g limits +6/-3.

Accommodation: crew of two, side by side; optional third seat or 220 lb of baggage at rear.

Armament: normally none, but provision for four underwing hardpoints for up to 640 lb of air-to-surface weapons, machine gun pods, bombs, grenade launchers, or other stores.

CAP 10

The prototype of the basic CAP 10 flew in August 1968 and received French certification in September 1970. The later CAP 10B, with an enlarged rudder and a ventral fin, was FAA certificated for day and night VFR operation in 1974. Both models are fully aerobatic. The major military operator is the French Air Force, which acquired 30 CAP 10s and 26 CAP 10Bs. Eight CAP 10Bs serve at Rochefort-Soubise with No. 51 Escadrille de Servitude of the French Navy. The Air Force's CAP 10s are used to pregrade cadet pilots before they proceed to full flying training on the Epsilon or Tucano, although one unit is now replacing its CAP 10s with Epsilons. Twenty CAP 10Bs, equipped almost to IFR standard, were delivered in the early 1980s to the Mexican Air Force's flying school, but 12 of these have been resold in the US civil market. The Republic of Korea Air Force recently received two CAP 10Bs at its Kimpo AB, and may order more to replace its elderly Cessna T-41s. (Data for CAP 10B.)

Contractor: Avions Mudry et Cie, France.

Power Plant: one Textron Lycoming AEIO-360-B2F piston engine; 180 hp.

Dimensions: span 26 ft 5 1/4 in, length 23 ft 6 in, height 8 ft 4 1/2 in.

Weights: empty 1,213 lb, gross 1,675–1,829 lb.

Performance: (at 1,829 lb max gross weight): max speed at S/L 168 mph, max cruising speed 155 mph, stalling speed (flaps down) 50 mph IAS, ceiling 16,400 ft, T-O run 1,149 ft, landing run 1,182 ft, max range 621 miles, g limits +6/-4.5.

Accommodation: crew of two, side by side; space behind seats for 44 lb of baggage.

Armament: none.

Cessna 150/152/172 and T-41 Mescalero

The smallest of this family of high-wing lightplanes is the side-by-side two-seat Model 150, first flown in 1957. Versions up to the 150E had an unswep fin and 100 hp Continental O-200-A engine. A swept fin was introduced on the Model 150F in 1966. From 1977, the 150s were superseded by the Model 152 range, with a 110 hp Textron Lycoming O-235 engine. The four-seat Model 172, first flown in 1955, has a 145 hp Continental O-300-A in its basic form. It, too, acquired a swept fin, in 1960, when the deluxe Skyhawk version also appeared. A more powerful R172E (210 hp Continental IO-360) was introduced in 1964. The basic 172 was updated with a 150 hp Lycoming O-320 in 1968; the standard Skyhawk engine from 1977 was the 160 hp O-320. Production of the 172 is about to resume.

The T-41A Mescalero represented off-the-shelf procurement of 204 Cessna 172s for USAF. It was followed by 255 T-41Bs for the US Army, 52 T-41Cs for USAF, and 238 T-41Ds for MAP export to friendly nations, all based on the civil R172E. About 50 remain in the USAF inventory. Other nations train with about 150 T-41s (mostly Ds), some 50 Cessna 150/152s, and about 50 Model 172s, including Angola, Argentina, Bangladesh, Bolivia (twelve 152s), Botswana, Burundi, Chile (Army, sixteen 172s), Colombia (30 T-41Ds), Dominican Republic, Ecuador, El Salvador, Greece (19 T-41As), Haiti, Honduras, Ivory Coast, Madagascar, Mexico, Peru (14 T-41Ds), the Philippines (12 T-41Ds), Saudi Arabia (thirteen 172s), the Seychelles, South Korea (20 T-41Bs), Sri Lanka, Turkey (Army, 20+ T-41Ds), Uruguay, and Zaire (twelve 150s). (Data for R172E/T-41D.)

Contractor: Cessna Aircraft Company, USA.

Power Plant: one Teledyne Continental IO-360-D piston engine; 210 hp.

Dimensions: span 35 ft 10 in, length 26 ft 11 in, height 8 ft 9 1/2 in.

Weights: empty 1,405 lb, gross 2,550 lb.

Performance: max speed at S/L 153 mph, max cruising speed at 5,500 ft 145 mph, ceiling 17,000 ft, T-O run 740 ft, landing run 620 ft, max range 1,010 miles.

Accommodation: four seats, in tandem pairs; up to 200 lb of baggage aft of rear seats.

Armament: none.

CJ-6A

This tandem-seat primary trainer is a derivative of the veteran Soviet Yak-18, which was itself license-

built at Nanchang, as the CJ-5, between 1954 and 1958. Shenyang's original CJ-6 (first flight August 27, 1958) was underpowered with only a 145 hp Mikulin M-11ER engine, but improved two years later when this was replaced by a 260 hp Ivchenko AI-14R, with which a new prototype flew July 18, 1960. Further redesign by Nanchang, which then took over development, resulted in flight of the first production-standard aircraft October 15, 1961. More than 2,200 CJ-6s have since been built, of which some 1,500 are still in Chinese service. Standard version since December 1965 has been the CJ-6A, with uprated engine, although 10 armed CJ-6Bs were built in 1964–66. The CJ-6A retains the general configuration of the Yak-18A/CJ-5 but has an all-metal airframe and fully retractable landing gear, with low-pressure tires for operation from grass strips. Export examples, with the Westernized designation PT-6A, are currently operated by Bangladesh (35), North Korea (100 or more, including some CJ/PT-5s), and Zambia (12). (Data for PT-6A.)

Contractor: Nanchang Aircraft Manufacturing Company, People's Republic of China.

Power Plant: one SMPMC (Zhuzhou) HS6A radial piston engine (Chinese development of AI-14R); 285 hp.

Dimensions: span 33 ft 6 1/2 in, length 27 ft 9 in, height 10 ft 8 in.

Weights: empty 2,414 lb, gross 3,086 lb.

Performance: max speed 185 mph, landing speed 72 mph, ceiling 20,500 ft, T-O run 920 ft, landing run 1,150 ft, max range 428 miles.

Accommodation: crew of two, in tandem.

Armament: none.

F33 Bonanza

The Model 33 is a conventional-tailed version of Beech's V-tailed Model 35 Bonanza. Versions adopted as pilot trainers by air forces and airlines are the F33C and nonaerobatic F33A. The Islamic Republic of Iran Air Force has a few of each, now used mostly for communications duties. The Mexican Air Force's flying school has more than 30 F33Cs and its Navy's counterpart about 10. The Air Academy of the Spanish Air Force and its 42d Training Group operate some two dozen As and Cs, under the service designations E.24B



Cessna 172, Pakistan Air Force (P. R. Foster)



F33C (E.24A) Bonanza, Spanish Air Force (Paul Jackson)



G 115D2, Royal Navy Flying Grading

and E.24A, respectively. Four F33Cs serve with the Ivory Coast Air Force, and a single example is owned by Haiti. (Data for F33A.)

Contractor: Beech Aircraft Corporation, USA.

Power Plant: one Teledyne Continental IO-520-BB piston engine; 285 hp.

Dimensions: span 33 ft 6 in, length 26 ft 8 in, height 8 ft 3 in.

Weights: empty 2,242 lb, gross 2,800 lb.

Performance: max speed at S/L 209 mph, max cruising speed at 6,000 ft 198 mph, stalling speed (flaps and gear down) 59 mph IAS, ceiling 17,858 ft, T-O run 1,000 ft, landing run 760 ft, max range 1,023 miles.

Accommodation: four seats, in tandem pairs; optional fifth seat in F33A; rear fuselage baggage door in F33C.

Armament: none.

G 115

This handsome, all-composites two-seater has developed a lot more power and a lot more appeal since production of the original 115 hp G 115A was temporarily suspended in 1990, and is now available in six versions with engines of 160 to 260 hp. The baseline G 115C has a 160 hp Lycoming O-320, with 180 hp available in the C2 variant; fully aerobatic versions, with fuel-injection engines and inverted fuel and oil systems, are the G 115D (180 hp) and D2 (160 hp). A special version of the C, known as the Bavarian, is produced for the International Aero Club of Florida. All C and D models have a guaranteed airframe life of 12,000 hours between inspections. Short Brothers of the UK operates five G 115D2s to provide elementary training for cadet pilots at the Plymouth-based Royal Navy Flying Grading Flight.

Top-of-the-range model, developed originally for USAF's Enhanced Flight Screener competition, is the G 115T Acro, which has beaten established competition aircraft in aerobatic contests and has a 15,000-hour life between inspections. Ample power (260 hp), a three-blade constant-speed propeller, and retractable landing gear ensure a greatly enhanced performance. It was first flown June 11, 1992, and production will begin shortly to build 12 for the United Arab Emirates Air Force, which has options on 12 more. They are to be used for ground-attack training. (Data for G 115D2; G 115T Acro in parentheses.)

Contractor: Burkhardt Grob Luft- und Raumfahrt GmbH & Co KG, Germany.

Power Plant: one Textron Lycoming AEIO-320-D1B (AEIO-540-D4A5) piston engine; 160 hp (260 hp).

Dimensions: span 32 ft 9 3/4 in (both), length 24 ft 11 1/4 in (26 ft 10 1/4 in), height 7 ft 10 1/2 in (8 ft 5 1/4 in).

Weights: empty 1,455 lb (1,962 lb), gross 2,183 lb (2,866 lb).

Performance: max speed at S/L 151 mph (205 mph), max cruising speed at 5,000 ft 136 mph (190 mph), stalling speed, flaps down 57 mph (66 mph), ceiling 16,000 ft (18,000 ft), T-O run 1,116 ft (1,021 ft), landing run 591 ft (722 ft), max range with reserves 652 miles (814 miles), g limits +4.4/-1.76 (+6/-4).

Accommodation: two seats side by side.

Armament: none.

HPT-32 Deepak

Designed to replace the veteran HT-2 as the Indian Air Force's standard primary trainer, the fully aerobatic HPT-32 flew for the first time January 6, 1977. Production was delayed, and the first 22-week student grading course on Deepaks did not begin at the Indian Air Force Academy until 11 years later. The key design requirement was to perform two consecutive training missions 50 km (31 miles) from base before needing to refuel. As well as fulfilling the roles of *ab initio*, aerobatic, night flying, and instrument flying training and glider or target towing, the aircraft had to be suitable for such secondary duties as liaison, observation, and search and rescue. Initial orders were placed for 80 HPT-32s for the Indian Air Force Academy and eight for No. 550 Squadron of the Indian Navy. Ten more were delivered in 1993–94.

Contractor: Hindustan Aeronautics Ltd (Kanpur Division), India.

Power Plant: one Textron Lycoming AEIO-540-D4B5 piston engine; 260 hp.

Dimensions: span 31 ft 2 in, length 25 ft 4 in, height 9 ft 5 1/2 in.

Weights: empty 1,962 lb, gross 2,756 lb.

Performance: max speed at S/L 164 mph IAS, max cruising speed at 10,000 ft 132 mph, stalling speed (flaps down) 69 mph, ceiling 18,045 ft, T-O run 1,132 ft, landing run 720 ft, max range 462 miles, g limits +6/-3.

Accommodation: two seats, side by side.

Armament: none.

Iak-52 (Yak-52)

First flown in early 1975, Yakovlev's Yak-52 is a latter-day descendant of the Yak-18 primary trainer, which entered production immediately after World

War II. Production under license, as the **lak-52**, was delegated to Romania, and the type has continued to be built at Bacau since 1979, the Romanian prototype having first flown in May 1978. More than 1,700 have so far been built, mainly for the air forces of Romania and the former Soviet Union, although about 20 secondhand examples were acquired recently by Lithuania. In spring 1994, Aerostar delivered 12 to the Hungarian Air Force Fighter Trainer School at Szolnok. Basic configuration and structure differ little from those of the Yak-18, but a metal semimonocoque rear fuselage replaces the original fabric-covered one, and a smooth cowling encloses the more powerful engine. All three wheels of the tricycle landing gear



lak-52 (Peter J. Cooper)



Mushshak, Pakistan Air Force (Lindsey Peacock)

remain exposed when retracted, to offer greater safety in a wheels-up emergency landing.

Contractor: Aerostar SA, Romania.

Power Plant: one Romanian-built VOKBM (Bakanov) M-14P radial piston engine; 355 hp.

Dimensions: span 30 ft 6 1/4 in, length 25 ft 5 in, height 8 ft 10 1/4 in.

Weights: empty 2,238 lb, gross 2,877 lb.

Performance: max speed at S/L 177 mph, at 3,280 ft 167 mph, stalling speed (flaps down) 56 mph, ceiling 13,125 ft, T-O run 558 ft, landing run 985 ft, max range 341 miles, g limits +7/-5.

Accommodation: two seats, in tandem.

Armament: none.

L-70 Vinka

First flown July 1, 1975, the prototype of the Vinka ("blast") was followed by 30 production aircraft, primarily for service at the Finnish Air Force's Air Academy at Kauhava. Twenty-eight remain in use; their major roles are primary, aerobatic, night, instrument, and tactical training before pupils progress to jet-powered Hawks, but they can be used also for liaison, casevac, search and rescue, supply dropping, weapons training, target towing, and reconnaissance. Fatigue life is better than 8,000 hours, and they are adaptable for ski takeoffs and landings.

Contractor: Valmet Aviation Industries Inc, Finland.

Power Plant: one Textron Lycoming AEIO-360-A1B6 piston engine; 200 hp.

Dimensions: span 31 ft 7 1/4 in, length 24 ft 7 1/4 in, height 10 ft 10 1/4 in.

Weights: empty 1,691 lb, gross 2,293-2,756 lb.

Performance: (at 2,205 lb gross weight): max speed at S/L 146 mph, max cruising speed at 5,000 ft 138 mph, stalling speed (flaps down) 53 mph, ceiling 16,400 ft, T-O run 755 ft, landing run 575 ft, max range 590 miles, g limits +6/-3.

Accommodation: crew of two, side by side; space behind these for two more seats or up to 617 lb of baggage.

Armament: two hardpoints under each wing for (as two-seater) up to 661 lb of bombs, flare pods, rocket pods, machine gun pods, antitank missiles, TV or still camera pods, or life raft/rescue packs and a searchlight.

MD3-160

The MD3-160 basic, aerobatic, and instrument trainer is the outcome of a design concept that originated in the late 1960s, although the prototype was not flown until August 12, 1983. This lengthy gestation reflected care taken by Swiss designer Max Dätwyler to achieve maximum component commonality in its mainly metal construction. Nine identical pieces make up the ailerons, inboard and outboard flaps, elevators, and rudder; five others the aileron, elevator, and rudder tabs;



SF.260MT, Royal Thai Air Force (Denis Hughes)

three more the tailplane halves and fin; and another three the elevator and rudder tips. Wing inner and outer interspar panels can be used on either wing, as can wingtips and the four sections that make up the leading-edge. Further refinement deferred the second prototype's flight until 1990, but FAR Pts 21 and 23 certification was obtained in September 1992.

The MD3 was always intended for manufacture outside Switzerland, and in 1993 the series production rights were sold to SME Aerospace of Malaysia, which is producing an initial batch of 20 for the Royal Malaysian Air Force and a similar batch for Indonesia. Twelve were due for completion by the end of this year. Meanwhile, Swiss activity has included refitting the first prototype to MD3-116 standard, with a 116 hp Lycoming O-235-N2A engine, and constructing an MD3-160A prototype with an aerobatic AEIO-320 engine and modified fuel and oil systems. (Data for MD3-160.)

Contractors: MDB Flugtechnik AG, Switzerland, and SME Aerospace, Malaysia.

Power Plant: one Textron Lycoming O-320-D2A piston engine; 160 hp.

Dimensions: span 32 ft 9 1/4 in, length 23 ft 3 1/2 in, height 9 ft 7 in.

Weights: empty 1,411 lb, gross 1,940-2,337 lb.

Performance: (at 1,940 lb aerobatic gross weight): max cruising speed at 5,000 ft 150 mph, stalling speed (flaps down) 55 mph, T-O run 453 ft, landing run 568 ft, max range 677 miles, g limits +6/-3.

Accommodation: crew of two, side by side; space to rear for up to 110 lb of baggage.

Armament: none.

Mushshak, Safari, and Supporter

The prototype of this family of two/three-seat light aircraft flew in Sweden July 11, 1969, with a 160 hp engine. By 1971 it had a 200 hp engine, and a raised tailplane to avert damage by snow or debris when

operating in winter from unprepared airfields. Variants produced by Saab were the civil **Safari**, with underwing hardpoints for stores, such as relief supplies, food, and medicines for disaster areas, and the military **Supporter** with weapon-carrying capability. Current operators of these aircraft, for training and other duties, include the air forces of Denmark (28, designated T-17) and Norway (17).

Following Pakistan's import of 15 Safari/Supporters from Sweden, 92 more were assembled from kits at Risalpur for the Pakistan Army and Air Force in 1975-81. Meanwhile, in 1981 the Aircraft Manufacturing Factory (AMF) of the Pakistan Aeronautical Complex had been set up as a licensed production center for the aircraft, known locally by the Urdu name **Mushshak** ("proficient"). Subsequent manufacture has been from raw materials, and by January 1995 a further 149 had been delivered, with production continuing. Twenty-five were ordered by Iran, and others were presented in 1994 to Oman (three) and Syria (six); the remainder serve with the Pakistan Army (currently 100+) and Air Force (80+). The wings' 5° of forward sweep enhances the view from the cockpit, and provision is made for full IFR instrumentation, radio, and armament. (Data for *Mushshak*.)

Contractor: Pakistan Aeronautical Complex, Pakistan.

Power Plant: one Textron Lycoming IO-360-A1B6 piston engine; 200 hp.

Dimensions: span 29 ft 0 1/2 in, length 22 ft 11 1/2 in, height 8 ft 6 1/2 in.

Weights: empty 1,424 lb, gross 1,984-2,645 lb.

Performance: (at 2,205 lb utility gross weight): max speed at S/L 148 mph, stalling speed (flaps down) 63 mph, ceiling 15,750 ft, T-O run 493 ft, landing run 460 ft, endurance 5 h 10 min, g limits (aerobatic) +6/-3.

Accommodation: two seats, side by side; provision for rearward-facing seat or 220 lb of baggage to rear.

Armament: provision for six underwing hardpoints for up to 661 lb of external stores; typical loads can include two 7.62-mm or 5.56-mm machine gun pods, two pods of seven 75-mm or 2.75-in rockets, four pods of seven 68-mm rockets, eighteen 75-mm rockets, or six wire-guided antitank missiles.

SF.260

More than 860 piston-engine SF.260s, in various forms, have been delivered to civilian customers and to more than 20 air forces worldwide, with production continuing. The basic military SF.260M flew for the first time October 10, 1970, and subsequently became the Italian Air Force's standard primary trainer, capable of basic flying training, instrument flying, aerobatics including spinning, night flying, navigation instruction, and formation flying. From the SF.260M was developed the SF.260W **Warrior** dual-role trainer/tactical support version, with two underwing pylons for up to 661 lb of weapons or other stores when flown solo. Countries operating the M, the W, or a mix of both include Belgium, Bolivia, Brunei, Burkina Faso, Burundi, Chad, Ecuador, Ireland, Italy, Libya, Nicaragua, the Philippines, Singapore, Sri Lanka, Thailand, Tunisia, Uganda, Zaire, Zambia, and Zimbabwe. Forty improved and updated civil SF.260Ds, 34 of them assembled locally by Tusas Aerospace Industries, were delivered to the Turkish Air Force in 1991-93. In a reorganization of its flying training system, the Belgian Air Force acquired 15 SF.260Ds to supplement survivors of its original 36 SF.260Ms. (Data for SF.260M.)

Contractor: Agusta SpA (SIAI-Marchetti), Italy.

Power Plant: one Textron Lycoming O-540-E4A5 piston engine; 260 hp.

Dimensions: span over tip tanks 27 ft 4 1/4 in, length 23 ft 3 1/2 in, height 7 ft 11 in.

Weights: empty 1,797 lb, gross 2,425-2,645 lb. (SF.260W, max gross 2,866 lb.)

Performance: max speed at S/L 207 mph, max cruising speed at 4,925 ft 186 mph, stalling speed (gear and flaps down) 79 mph, ceiling 15,300 ft, T-O run 1,260 ft, landing run 1,132 ft, max range 1,025 miles, g limits (aerobatic) +6/-3.

Accommodation: two seats, side by side, with third seat to rear.

Armament: none.

Su-39

Known formerly as the Su-32, this tandem two-seat primary trainer and general-purpose aircraft embodies many features of the outstanding Su-26 and Su-29 aerobatic aircraft. The first prototype is scheduled to fly in the second half of 1996. If all then goes according to plan, it will be followed by 1,500 Su-39s, to succeed Romanian-built lak-52s (Yak-52s), in two initial models. The basic aircraft will be delivered to DOSAAF; those for the Russian Air Force will have more extensive equipment. Composites are used widely in the structure. The fuselage longerons and wing spars are made of CFRP; wing, fuselage, and tail unit skin panels are Kevlar-type and GFRP. The cockpit is air-conditioned and pressurized, with a raised rear seat. The landing gear is fully retractable and is pneumatically

actuated like that of the Yak. Also similar is the Su-39's aging but reliable M-14PF nine-cylinder radial engine, which is expected to give way speedily to a license-built Klimov/P&WC PK6A-25 turboprop if funding permits. Sukhoi quotes a price of \$500,000 for the piston-engine Su-39. Options include provision for a radar pod, an integral gun, bombs, antitank missiles and AAMs for combat use.

Contractor: Sukhoi OKB, Russia.

Power Plant: one VOKBM M-14PF radial piston engine; 395 hp.

Dimensions: span 27 ft 10 $\frac{3}{4}$ in, length 23 ft 10 $\frac{1}{4}$ in, height 8 ft 6 $\frac{1}{2}$ in.

Weights: empty 1,874 lb, gross 2,866–3,307 lb.

Performance (estimated): max speed 230 mph, stalling speed (flaps down) 56 mph, ceiling 22,965 ft, T-O run 755 ft, landing run 820 ft, range with max payload 745 miles, with external tanks 1,242 miles.

Accommodation: two seats, in tandem, with SKS-94 ejection system (through canopy, without seats).

Armament: none in primary trainer.

T-25 Universal

A total of 140 all-metal side-by-side two-seat Universals were built for the Brazilian Air Force in two forms: the T-25 basic and advanced trainer and the T-25A for light attack and reconnaissance roles. About 60 currently serve with the 2d Air Training Squadron at Pirassununga; others are used in observation, light transport, and search and rescue roles by a variety of units. Neiva also built 10 T-25s for Chile, of which five were passed on to the Paraguayan Air Force.

Contractor: Sociedade Construtora Aeronáutica Neiva Ltda, Brazil.

Power Plant: one Textron Lycoming IO-540-K1D5 piston engine; 300 hp.

Dimensions: span 36 ft 1 in, length 28 ft 2 $\frac{1}{2}$ in, height 9 ft 9 $\frac{1}{4}$ in.

Weights: empty 2,535 lb, gross 3,306–3,747 lb.

Performance (at 3,306 lb aerobatic gross weight): max speed at S/L 186 mph, max cruising speed at S/L 177 mph, stalling speed (flaps down) 65 mph, ceiling 20,000 ft, T-O run 1,148 ft, landing from 50 ft 1,970 ft, range 621 miles.

Accommodation: crew of two, side by side; space for baggage or optional third seat at rear.

Armament: two underwing hardpoints for 7.62-mm machine gun pods.

T-35 Pillán and T-35DT Turbo Pillán

The Pillán is a fully aerobatic and instrument flying trainer that was designed by Piper to embody components of the PA-28 Dakota and PA-32 Saratoga. The first of two Piper-built prototypes flew March 6, 1981. Production was then started in Chile by ENAER. Three Pilláns were assembled from kits delivered from the US; after changes to the tail unit and deepening of the canopy, series manufacture began in September 1984. Sixty T-35A primary trainers and 20 T-35B instrument trainers were delivered to the Chilean Air Force. Kits for 41 T-35Cs (of which 37 remain) were supplied by ENAER to Spain, where they were assembled by CASA for the Spanish Air Force; equipped as primary trainers, they have the Spanish designation and name E.26 Tamiz. Ten T-35D instrument trainers were delivered to the Panamanian Air Force and 15 to the Paraguayan Air Force.

In March 1991, Soloy Corp. of Olympia, Wash., flew the T-35DT Turbo Pillán conversion, with a 420 shp Allison 250-B17D turboprop. The conversion kit is available to Pillán operators but has not yet been ordered. The T-35DT offers a max speed of 264 mph, ceiling of 25,000 ft, T-O and landing runs of 640 and 420 ft, respectively, and max range of 472 miles. (Data for T-35A.)

Contractor: Empresa Nacional de Aeronáutica de Chile, Chile.

Power Plant: one Textron Lycoming IO-540-K1K5 piston engine; 300 hp.

Dimensions: span 29 ft 0 in, length 26 ft 3 in, height 8 ft 8 in.

Weights: empty 2,050 lb, gross 2,900–2,950 lb.

Performance: max speed at S/L 193 mph, max cruising speed at 8,800 ft 166 mph IAS, stalling speed (gear and flaps down) 72 mph, ceiling 19,160 ft, T-O run 940 ft, landing run 780 ft, max range 748 miles, g limits +6/-3.

Accommodation: two seats, in tandem. Rear seat raised.

Armament: none.

T67M and T-3A Firefly

Winning USAF's Enhanced Flight Screener (EFS) program to replace T-41s, and the award of a British Design Council prize, set the seal on the already successful career of this elegant GFRP trainer, more than 160 of which had been delivered to military and commercial customers in 13 countries by mid-1995.

The basic T67C3, with a carburetor version of Textron Lycoming's 160 hp engine and fixed-pitch propeller, is

used for primary training of Canadian military and Dutch naval and airline pilots. The lowest-powered military model is the T67M Mk II, with 160 hp fuel-injected Lycoming AEIO-320-D1B, two-blade constant-speed propeller, 42-gallon increased fuel capacity, and fuel and oil systems suitable for inverted flight. Seventeen are in service at RAF Barkston Heath, West Yorkshire, where Hunting Aircraft Ltd operates a Joint Elementary Flying Training School for student pilots of the RAF and Royal Navy. The intermediate T67M200, serving government and private agencies in Hong Kong (four), Netherlands (four), Norway (six), and Turkey (16), has a 200 hp AEIO-360-A1E and three-blade propeller.

The top-of-the-range T67M260, designed specifically to meet the EFS requirement, first flew May 1991, and USAF should by now be receiving the last of 113 as the T-3A, all except the first few shipped as kits for assembly by Northrop Worldwide Aircraft Services at Hondo Airport, Tex. Half (57) are for the 3d Flying Training Squadron at Hondo, where student pilot training started in March 1994; the remaining 56 are for the USAF Academy (557th FTS), Colorado Springs, Colo., for training courses that began in early 1995. Extra features include electric elevator trim. (Data for T67M260/T-3A.)

Contractor: Slingsby Aviation Ltd, UK.

Power Plant: one Textron Lycoming AEIO-540-D4A5 piston engine; 260 hp.

Dimensions: span 34 ft 9 in, length 24 ft 10 in, height 7 ft 9 in.

Weights: empty 1,780 lb, gross 2,525 lb (aerobatic and max).

Performance: max speed at S/L 175 mph, max cruising speed at 8,500 ft 173 mph, stalling speed (flaps down) 68 mph, ceiling 19,000 ft, T-O run 913 ft,

landing run 1,226 ft, max range 469 miles, g limits +6/-3.

Accommodation: two seats, side by side.

Armament: none.

TB 20 Trinidad

First flown in late 1980 and certificated by the FAA in early 1984, the Trinidad is essentially a higher-powered, retractable-gear version of Socata's TB 10 Tobago, and both have been selected by a number of civil or government agencies, such as SFACT in France and CAAC in China, to provide flying training for air traffic controllers and airline pilots. Dual controls are standard at the two front seats, and the flight deck can be equipped for VFR or IFR flying. The three-person rear bench seat is removable. Six Trinidads were delivered during the early months of 1995 to Topel, Turkey, to fulfill an FMS sale to the Turkish Navy. These came from the Texas assembly line of Socata's parent company, Aerospatiale, which will also deliver a more recent order from Israel for 22 Trinidads. Intended to replace Cessna U206 Stationairs, the French aircraft will be known in IDF/AF service as Pashosh ("lark").

Contractor: Socata (subsidiary of Aerospatiale), France.

Power Plant: one Textron Lycoming IO-540-C4D5D piston engine; 250 hp.

Dimensions: span 32 ft 0 $\frac{1}{4}$ in, length 25 ft 3 $\frac{1}{2}$ in, height 9 ft 4 $\frac{1}{4}$ in.

Weights: empty 1,763 lb, gross 3,086 lb.

Performance: max speed 192 mph, max cruising speed at 8,000 ft 188 mph, stalling speed (flaps and gear down) 62 mph, ceiling 20,000 ft, T-O run 968 ft, landing run 755 ft, max range at 10,000 ft 1,109 miles.

Accommodation: four or five persons.

Armament: none.

TB 30 Epsilon

The prototype of this all-metal basic and primary trainer first flew December 22, 1979, followed by the first production Epsilon in June 1983. Delivery of 150 to the French Air Force began one year later. Direct entry pupils (as opposed to career officers) complete full *ab initio* and basic training on these aircraft with Groupeement École 315 at Cognac/Chateaubernard, then progress directly to an operational type without needing intermediate transition training. Epsilons are also replacing some CAP 10Bs of Groupeement d'Instruction 312 at Salon-de-Provence.

Esquadrão 101 of the Portuguese Air Force still has 16 of Portugal's original 18 Epsilons, of which 17 were assembled locally by OGMA. Togo's three (originally four) Epsilons are of an armed version, which can loiter for 30 min at low altitude over a combat area 195 miles from base.

Contractor: Socata (subsidiary of Aerospatiale), France.

Power Plant: one Textron Lycoming AEIO-540-L1B5D piston engine; 300 hp.

Dimensions: span 25 ft 11 $\frac{1}{4}$ in, length 24 ft 10 $\frac{3}{4}$ in, height 8 ft 7 $\frac{1}{2}$ in.

Weights: empty 2,046 lb, gross 2,756 lb.

Performance: max speed at S/L 237 mph, max cruising speed at 6,000 ft 222 mph, stalling speed (gear and flaps down) 73 mph, ceiling 23,000 ft, T-O run 1,345 ft, landing run 820 ft, range at 184 mph at 12,000 ft 783 miles, g limits +6.7/-3.35.

Accommodation: crew of two, in tandem. Rear seat raised.

Armament (Togolese aircraft only): four underwing hardpoints for up to 661 lb of stores when flown as a single-seater. Typical loads can include two gun



T-25A Universal, Brazilian Air Force (Ronaldo S. Olive)



T-35DT Turbo Pillán



TB 20 Trinidad

Pods (each with two 7.62-mm machine guns), two 275-lb bombs or grenade launchers, four packs of six 68-mm rockets, or four survival kit pods.

Zlin 142 and 242

The Zlin 142 is the current production version of the Z 42/42 M/43 family of lightplanes that have been used over the past quarter-century for *ab initio* training and other duties. Construction is basically all-metal, with composite skin panels on the center-fuselage. Options include an auxiliary tank on each wingtip and equipment for night flying and IFR training. The prototype flew December 29, 1978, and 374 of all versions had been built by the beginning of 1995, including three Textron Lycoming-powered Z 242 Ls for the Slovene Army. The Czech Air Force's eight military examples are designated Z 142 CAF. The Bulgarian Air Force recently acquired four Z 142s, with more to follow, to provide some 20 hours of preselection training for civilian candidates for military service. Other Z 142s are used by the pilots of Canada's Snowbirds aerobatic display team. (Data for Z 142; Z 242 L in parentheses. Aerobatic category in both cases.)

Contractor: Moravan AS, Czech Republic.
Power Plant: one Avia M 337AK piston engine; 210 hp (Textron Lycoming AEIO-360-A1B6; 200 hp).

Dimensions: span 30 ft 0 1/2 in (30 ft 7 3/4 in), length 24 ft 0 1/2 in (22 ft 9 3/4 in), height 9 ft 0 1/4 in (9 ft 8 3/4 in).

Weights: empty 1,609 lb (both), gross 2,138 lb (both).
Performance: max speed at 1,640 ft 143 mph IAS (146 mph CAS), stalling speed (flaps down) 55 mph IAS (59 mph CAS), ceiling 15,580 ft, T-O run 758 ft (689 ft), landing run 624 ft, range 325 miles (both), g limits +6/-3.5 (both).

Accommodation: two seats, side by side.

Armament: none.

Turboprop Trainers

EMB-312/S312 Tucano and Super Tucano

The Embraer EMB-312 Tucano prototype flew August 16, 1980. Deliveries to the Brazilian Air Force (designation T-27, or AT-27 in armed configuration) began in September 1983 and now total 133. Excluding British-built versions, orders totaled 523 by mid-1995, most of which have been delivered. Export customers include the air forces of Argentina (30), Colombia (14), Egypt (54), France (80), Honduras (12), Iran (25), Iraq (80), Paraguay (six), Peru (30), and Venezuela (31). The French EMB-312F version, which entered service this year, has a strengthened airframe and ventral airbrake like those of the S312, improved deicing and demisting, and French avionics.

The S312 license-built by Shorts in the UK has a different engine, ventral airbrake, strengthened structure, new cockpit layout, and mainly British equipment. A total of 130 production T. Mk 1s for the Royal Air Force were delivered between June 1988 and January 1993, of which about 80 are active and the remainder in store. Strengthened flying controls, modified com/nav equipment, and structural improvements to extend fatigue life to 12,000 hours have been retrofitted. Twelve Shorts-built T. Mk 51s were delivered to the Kenyan Air Force in 1990-91; 16 T. Mk 52s, built for No. 19 Squadron of the Kuwait Air Force before the Persian Gulf War, were delivered earlier this year following the rebuilding of their base facilities.

On September 9, 1991, Embraer flew a proof-of-concept EMB-312H Super Tucano, teaming with Northrop Grumman to bid this version in the USAF/USN Joint Primary Aircraft Training System competition. Equipped with a 1,600 shp PT6A-67R turboprop, stretched fuselage, modified wings and tail, pressurized cockpit with zero-zero seats, pressure refueling, and OBOGS (On-Board Oxygen Generating System), it can cover the whole primary and half of the advanced training syllabus of a jet trainer. Two production-standard EMB-312HJs, with a 1,250 shp PT6A-68A, five-blade propeller, and "glass" cockpit, flew for the first time May 15 and October 14, 1993. Although unsuccessful for JPATS, a light attack (ALX) version is now under development for a major Brazilian border surveillance program. (Data for standard EMB-312, with Super Tucano in parentheses.)

Contractor: Empresa Brasileira de Aeronáutica SA, Brazil.

Power Plant: one Pratt & Whitney Canada PT6A-25C (PT6A-68-5) turboprop; 750 shp (1,300 shp). S312 has a 1,100 shp AlliedSignal TPE331-12B-701A.

Dimensions: span 36 ft 6 1/2 in (both), length 32 ft 4 1/4 in (37 ft 5 3/4 in), height 11 ft 1 3/4 in (12 ft 9 1/2 in).

Weights: empty 4,123 lb (5,335 lb), gross 5,622-7,000

lb (5,335-7,033 lb). S312 approx 750-800 lb heavier than EMB-312 empty, 850 lb heavier gross.

Performance (EMB-312 at 5,622 lb clean gross weight): max speed at 10,000 ft 278 mph, stalling speed (gear and flaps down) 77 mph EAS, ceiling 30,000 ft, T-O run 1,250 ft, landing run 1,214 ft, max range on internal fuel 1,145 miles, g limits +6/-3.

Performance (S312 at 6,393 lb clean gross weight): max speed at 10,000 ft 319 mph, at S/L 310 rph, stalling speed (gear and flaps down) 81 mph EAS, ceiling 34,000 ft, T-O run 1,190 ft, landing run 1,180 ft, range on max internal fuel 1,099 miles, g limits +6.5/-3.3.

Performance (Super Tucano at clean gross weight): max speed at 20,000 ft 346 mph, stalling speed (gear and flaps down) 90 mph EAS, ceiling 35,000 ft, T-O run 1,148 ft, landing run 1,805 ft, max range on internal fuel 974 miles, g limits +7/-3.5.

Accommodation: crew of two, on tandem zero height/81 mph (zero/zero) ejection seats. Rear seat raised.

Armament (both): four underwing hardpoints for up to 2,205 lb of stores, including (typically) two 0.30-in machine gun pods, four 250-lb bombs, or four seven-tube rocket launchers. Optional max stores load on S312 increased to 2,315 lb.

Fantrainer 400, 600, and 800

Only one Royal Thai Air Force squadron (No. 402 at Takhlai) is now believed to operate Fantrainers. These are of the higher-powered 600 version (see data), with German-built GFRP wings and metal fuselages, 15 of which were assembled locally by RTAF engineers and entered service in January 1987. Despite more recent completion (1986-91), the 30 Fantrainer 400s, with Thai-built metal wings and 420 shp Allison 250-C20B engines, appear to have been superseded at Kompensaeng Flying Training School by the Pilatus PC-9.

A prototype Fantrainer 800 was converted in 1993 as a more powerful version of the 600, with its Allison 250-C30 uprated to 800 shp. Production 800s would also have had a GFRP keel and forward fuselage, only the rear fuselage and tail remaining as metal structures, but no orders have yet been forthcoming. (Data for RTAF-built Fantrainer 600.)



Zlin 242 L, Slovenian Air Force



S312 Tucano T. Mk 1, Royal Air Force (Ministry of Defence)



Fantrainer, Royal Thai Air Force (Denis Hughes)

Contractors: Rhein-Flugzeugbau GmbH, Germany, and Royal Thai Air Force, Thailand.

Power Plant: one Allison 250-C30 turboprop; 650 shp; driving five-blade wooden ducted fan.

Dimensions: span 31 ft 11 1/2 in, length 31 ft 1 1/4 in, height 10 ft 4 1/2 in.

Weights: empty 2,921 lb, gross 3,637-4,122 lb.

Performance (at 4,122 lb gross weight): max cruising speed at 3,000 ft 214 mph, stalling speed (flaps down) 95 mph, ceiling 25,000 ft, T-O and landing run 820 ft, range on internal fuel 645 miles, g limits (aerobatic) +6/-3.

Accommodation: crew of two, in tandem. Rear seat raised. Rocket-assisted escape system standard.

Armament: none, but provision for four underwing drop tanks.

KTX-1 Yeo-Myoung

The first two prototypes of this tandem-seat primary trainer have been under test since December 12, 1991, and spring 1992, powered by a 550 shp PT6A-25A and 950 shp PT6A-60 turboprop, respectively. Subsequent prototypes will have an AlliedSignal TPE331 for comparative evaluation. Development is shared with Korean Air, with series production of 100 trainers required by the Republic of Korea Air Force scheduled to begin in 1998. They will have a more powerful engine, increased wing and fin areas, and provision for carrying guns and rockets for weapons training. The name Yeo-Myoung means "dawn." (Data for second prototype.)

Contractor: Daewoo Heavy Industries Company Ltd, South Korea.

Power Plant: one Pratt & Whitney Canada PT6A-60 turboprop; 950 shp.

Dimensions: span 33 ft 3 1/2 in, length 33 ft 9 1/2 in, height 12 ft 3 1/4 in.

Weights: empty 3,153 lb, gross 4,250 lb (aerobatic), 5,470 lb (max).

Performance: max speed at 10,000 ft 357 mph, ceiling 38,000 ft, T-O to 50 ft 1,300 ft, landing from 50 ft 1,680 ft, range 1,036 miles.

Accommodation: crew of two, in tandem. Rear seat raised.

Armament: provision for guns and rockets.

L-90 TP Redigo

After testing prototypes with Allison 250 and Turbomeca TP 319 turboprops, Valmet chose the Allison for production Redigos. It optimized the design to cover primary and basic, aerobatic, night, instrument, navigation, formation, and tactical flying training. The Finnish Air Force, however, allocated its 10 Redigos to replace Piper Arrows in liaison and communications roles. Exports comprised 12 aircraft for the Mexican Naval Aviation School at Bajadas, Vera Cruz, and six for the Eritrean Air Force. Production has now ended.

Contractor: Valmet Aviation Industries Inc, Finland.

Power Plant: one Allison 250-B17F turboprop; 450 shp (flat rated).

Dimensions: span 34 ft 9 1/4 in, length 27 ft 11 1/4 in, height 10 ft 6 in.

Weights: empty 2,183 lb, gross 2,976-4,189 lb.

Performance (at 3,527 lb weight): max speed 258 mph CAS, max cruising speed at 10,000 ft 220 mph, stalling speed (flaps down) 65 mph, ceiling 20,800 ft, T-O run 700 ft, landing run 710 ft, max range 743 miles, g limits (aerobatic) +7/-3.5.

Accommodation: crew of two, side by side; space behind these for two more seats or 440 lb of baggage. Zero/zero rocket escape system optional.

Armament: none specified, but three hardpoints under each wing can (when aircraft is flown solo) carry up to 1,764 lb of photographic, TV, radar, or reconnaissance pods and two flares, or other stores.

PC-7 Turbo-Trainer and PC-7 Mk II Astra

The PC-7, first flown August 18, 1978, is a fully aerobatic trainer suitable for primary, transition, and aerobatic training and, with added equipment, for IFR and tactical training. More than 440 have been delivered to nearly 20 countries, for the air forces of Abu Dhabi (24), Angola (18), Austria (16), Bolivia (36), Botswana (seven), Chile (Navy, 10), Guatemala (12), Iran (35), Iraq (52), Malaysia (44), Mexico (75), Myanmar (17), the Netherlands (10), Suriname (one), Switzerland (40), and Uruguay (five). South Africa has inherited the three delivered earlier to Bophuthatswana.

The most significant recent contract was from the South African Air Force in 1993, for 60 PC-7 Mk II Astras to replace its veteran T-6 Harvard primary trainers. To avoid conflict with UN sanctions then in force, Pilatus developed the Mk II with two (instead of six) underwing hardpoints, plumbed only for auxiliary fuel tanks. The airframe is based largely on that of the aerodynamically cleaner PC-9 and fitted with a 700 shp PT6A-25C turboprop and mainly South African avionics. Martin-Baker CH-11A ejection seats replace the usual fixed or optional CH-15A ejection seats. The Mk II prototype first flew September 28, 1992. Pilatus kits are being assembled and outfitted by Atlas in South

Africa; deliveries to the SAAF began in 1994. (Data for standard PC-7.)

Contractor: Pilatus Flugzeugwerke AG, Switzerland.
Power Plant: one Pratt & Whitney Canada PT6A-25A turboprop; 550 shp (flat rated).

Dimensions: span 34 ft 1 in, length 32 ft 1 in, height 10 ft 6 in.

Weights: empty 2,932 lb, gross 4,188–5,952 lb.

Performance (at 4,188 lb clean gross weight): max cruising speed at 20,000 ft 256 mph, stalling speed (gear and flaps down) 74 mph EAS, ceiling 33,000 ft, T-O run 787 ft, landing run 968 ft, max range 745 miles, *g* limits +6/-3.

Accommodation: two seats, in tandem; lightweight ejection seats optional. Space for 55 lb of baggage aft of seats.

Armament: Swiss law prohibits export of aircraft equipped for combat duties, but PC-7s operated by some air forces can be seen carrying a wide variety of stores on underwing weapon pylons installed under separate contract by armament manufacturers.

PC-9 and PC-9 Mk II

A more powerful turboprop, raised rear cockpit, ejection seats as standard, a ventral airbrake, modified wing airfoils and tips, new ailerons, a longer dorsal fin, larger wheels with high-pressure tires, and mainwheel doors are ample evidence of the differences between the PC-9 and its PC-7 predecessor, despite their similar outward appearance. The first of two preseries PC-9s flew May 7, 1984, and total sales now exceed 200. Customers include the air forces of Angola (four), Australia (67 PC-9/As), Iraq (20), Myanmar (four), Saudi Arabia (30), Slovenia (three), Switzerland (12), and Thailand (20); the Cyprus National Guard has two, and the German Air Force leases 10 PC-9Bs from a private company to provide target-towing services. Mexico's use of armed PC-7s last year led the Swiss government to veto a 1995 order for 48 PC-9s. The RAAF PC-9/As have Bendix/King EFIS cockpit displays, PC-7 low-pressure tires, and bulged mainwheel doors. Two were supplied in flyaway form, 17 as kits, and 48 were built in Australia. They equip the Central Flying School and Roulettes display team at East Sale, Victoria, and No. 2 FTS at Pearce, Western Australia; those of No. 76 Squadron have taken on the forward air control role previously performed by Winjeels; and one is allocated to the RAAF Chief of Air Staff's office at Fairbairn, near Canberra.

For the USAF/USN JPATS competition, Pilatus teamed with Beech (now Raytheon) in offering the PC-9 Mk II, which was selected as the winning candidate in June 1995. Beech built two "missionized" production prototypes with a 1,200 shp flat-rated PT6A-68 engine, modified tail unit, increased fuel, single-point fueling, new Bendix/King digital avionics, and a pressurized cockpit with birdstrike-proof canopy and Martin-Baker Mk 16 zero/zero ejection seats. These were first flown December 23, 1992, and July 29, 1993. Current requirements are for up to 711 JPATS trainers (USAF 372 to replace the T-37B, USN 339 to replace the T-34C). Initial production contracts were awaited as this "Gallery" was being written; service entry is planned for 1999 and 2002, respectively. (Data for basic PC-9.)

Contractor: Pilatus Flugzeugwerke AG, Switzerland.
Power Plant: one Pratt & Whitney Canada PT6A-62 turboprop; 950 shp (flat rated).

Dimensions: span 33 ft 5 1/4 in, length 33 ft 4 3/4 in, height 10 ft 8 1/2 in.

Weights: empty 3,715 lb, gross 4,960–7,055 lb.

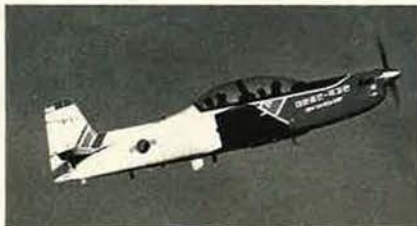
Performance (at 4,960 lb aerobatic gross weight): max speed at S/L 311 mph, at 20,000 ft 345 mph, stalling speed (gear and flaps down) 81 mph EAS, ceiling 38,000 ft, T-O run 745 ft, landing run 1,368 ft, max range 1,020 miles, *g* limits +7/-3.5.

Accommodation: crew of two, on tandem zero height/70 mph ejection seats. Rear seat raised. Space for 55 lb of baggage aft of seats.

Armament: see remarks under PC-7 entry.

PZL-130 Orlik

The original turboprop-powered Orlik ("spotted eagle"), with a PT6A-25A engine, flew July 13, 1986, but was subsequently lost. Two further prototypes, designated PZL-130TM and PZL-130TP, were completed with, respectively, a Czech 750 shp Walter M 601 E power plant and a 550 shp PT6A-25A. These made their first flights in January 1989 and early 1990. The PZL-130TB, first flown September 18, 1991, was the initial Polish Air Force production model. Based on the TM, it had a fully aerobatic M 601 T engine, increased span and incidence, double-slotted flaps, new ventral fin, Polish ejection seats, six (instead of four) underwing stations, and other changes. The PZL-130TC-1, with Bendix/King avionics and Martin-Baker seats, is the current Polish Air Force production standard. By June this year, the PAF was due to have received 31 Orliks: two TMs, 18 delivered as TBs but subsequently upgraded to TC-1s, and 11 new-build TC-1s. An export TC prototype, first flown June 2, 1993, has the TC-1



KTX-1 Yeo-Myoung



PC-9, Royal Thai Air Force



T-34C-1, Peruvian Navy

improvements plus a 950 shp PT6A-62 engine and Flight Vision HUD; a TC-2 prototype, similar except for a 750 shp PT6A-25C turboprop, was due to fly this year. (Data for PZL-130TC-1.)

Contractor: PZL Warszawa-Okęcie, Poland.

Power Plant: one Walter M 601 T turboprop; 750 shp.
Dimensions: span 29 ft 6 1/4 in, length 29 ft 6 1/4 in, height 11 ft 7 in.

Weights: empty 3,527 lb, gross 4,409–5,952 lb.

Performance (at 4,409 lb aerobatic gross weight): max speed at 19,685 ft 311 mph, max speed at S/L 282 mph, ceiling 33,000 ft, T-O run 729 ft, landing run 604 ft, range on internal fuel 602 miles, *g* limits +6/-3.

Accommodation: crew of two, on tandem zero/zero ejection seats. Rear seat raised.

Armament: six underwing hardpoints for up to 1,764 lb of 220-lb bombs, 7.62-mm twin-gun pods, launchers for 57-mm or 80-mm rockets, or infrared AAMs.

SF.260TP

The SF.260TP is identical to the piston-engine SF.260 (which see) except for the power plant, automatic fuel feed system, and an inset rudder tab. It first flew July 1980. More than 60 have been sold to various air forces, several of which use them in a secondary light attack role. Current operators include Burundi (four), Dubai (five), Haiti (five), the Philippines (18), and Sri Lanka (11). At least three Sri Lanka SF.260TPs have been lost. The survivors are assigned to No. 1 FTW at Anuradhapura, but several have been detached for use in a counterinsurgency role at Jaffna. No. 6 Squadron of the Air Force of Zimbabwe has some SF.260TPs converted locally from piston-engine SF.260s. (Data as for SF.260, except as follows.)

Power Plant: one Allison 250-B17D turboprop; 350 shp (flat rated).

Dimensions: length 24 ft 3 3/4 in.

Weights: empty 1,654 lb, gross 2,645–2,976 lb.

Performance (at 2,645 lb gross weight): max speed at 10,000 ft 265 mph, max cruising speed at 10,000 ft 248 mph, stalling speed (gear and flaps down) 70 mph, ceiling 24,600 ft, T-O run 978 ft, landing run 1,007 ft, max range 589 miles.

T-5

The T-5 primary trainer is the latest in a series of aircraft developed by Fuji from the Beech T-34 Mentor, for which it obtained a manufacturing license 42 years ago. The prototype was produced by replacing the piston engine of a KM-2 primary trainer version with an

Allison 250 turboprop. First flown June 28, 1984, as the KM-2D, this aircraft persuaded the Japan Maritime Self-Defense Force to replace its existing KM-2s with T-5s, after embodying additional changes to the cockpit structure and equipment. Deliveries began in August 1988. By January 1995, a total of 32 T-5s had entered service with No. 201 Squadron of Ozuki Air Training Group, of 34 funded.

Contractor: Fuji Heavy Industries Ltd, Japan.

Power Plant: one Allison 250-B17D turboprop; 350 shp (flat rated).

Dimensions: span 32 ft 11 1/4 in, length 27 ft 8 1/4 in, height 9 ft 8 1/2 in.

Weights: empty 2,385 lb, gross 3,494–3,979 lb.

Performance (at 3,494 lb aerobatic gross weight except where indicated): max speed at 8,000 ft 222 mph, econ cruising speed at 8,000 ft 178 mph, stalling speed (gear and flaps down) 65 mph, ceiling 25,000 ft, T-O run 990 ft, landing run 570 ft, range (at 3,979 lb max gross weight) 587 miles.

Accommodation: crew of two, side by side, in aerobatic configuration. Second pair of seats behind these in utility version.

Armament: none.

T-34C

The US Navy inventory still lists more than 300 of the 353 production T-34Cs it received from November 1977. They are scheduled to be replaced eventually by the PC-9 Mk II, the successful JPATS candidate. About 120 T-34C-1 armament systems trainers, with FAC and light attack capability, continue in service with Argentina (Navy, 10), Ecuador (20), Gabon (three), Indonesia (24), Morocco (12), Peru (Navy, six), Taiwan (40+), and Uruguay (Navy, two). Original piston-engine T-34A/Bs remain in service with some air forces in Central and South America. (Data for T-34C, except where indicated.)

Contractor: Beech Aircraft Corporation, USA.

Power Plant: one Pratt & Whitney Canada PT6A-25 turboprop; 400 shp (550 shp version optional).

Dimensions: span 33 ft 4 in, length 28 ft 8 1/2 in, height 9 ft 7 in.

Weights: empty 2,960 lb, gross 4,300 lb.

Performance: max cruising speed at 17,000 ft 246 mph, stalling speed (gear and flaps down) 61 mph, ceiling 30,000 ft, T-O run 1,155 ft, landing run 740 ft, max range 814 miles, *g* limits +6/-3.

Accommodation: crew of two, in tandem.

Armament (T-34C-1): four underwing hardpoints for total of 1,200 lb of stores, including practice bomb/flare containers, LAU-32 or LAU-59 rocket launchers, Mk 81 bombs, SUU-11 Minigun pods, BLU-10/B incendiary bombs, AGM-22A wire-guided antitank missiles, and target-towing equipment. ■

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Into the Balkans . . .

If we want the killing [in Bosnia] to stop, if we want to end the worst conflict in Europe since World War II, then we must follow through on the strategy that brought us to this point. . . . This is our best chance in four years to achieve peace. . . . Future generations would neither understand nor forgive us if we carelessly turned our backs on this opportunity. America must continue to lead. We have this opportunity because America *has* exerted determined leadership on behalf of peace. Had we not been prepared to do so, we could not possibly have made it this far.

Secretary of State Warren M. Christopher, in October 17, 1995, testimony to the Senate Armed Services Committee as Congress opened major hearings on Administration plans to deploy US ground troops into the Balkans as peacekeepers.

. . . The Mission . . .

The objective of the implementation force [IFOR, composed of US and NATO troops] will be to ensure compliance with the military aspects of the peace plan. The force's main task will be to oversee withdrawal of the [Croat-Muslim] Federation and Bosnian Serb forces to their respective territories . . . as laid out in the settlement. . . . Once the warring parties have moved to their designated areas, the IFOR will monitor a narrow zone of separation along the internal borders between the Bosnian Federation and the Bosnian Serb Republic. The IFOR mission will not include reconstruction, resettlement, humanitarian relief, election monitoring, and other nonsecurity efforts that will need to be undertaken in Bosnia.

Secretary of Defense William J. Perry and Gen. John M. Shalikashvili, Chairman of the Joint Chiefs of Staff, in an October 17, 1995, joint statement to the Senate Armed Services and the Senate Foreign Relations Committees on preparations in the Balkans.

. . . A Dissent

I am mindful of the effort by some

in the Administration to dismiss as an isolationist anyone who is skeptical about an American Bosnian deployment. . . . If there have been isolationists on the question of Bosnia, they are to be found, in my view, in an Administration that has compiled a thirty-two-month record of weakness, vacillation, and hollow threats followed, only now, by a month and a half of a preferable—but still inadequate—use of airpower to compensate for the imbalance of power in favor of the Serbs—an imbalance that has prolonged this tragic war.

Now we are faced by an Administration effort to enlist support for the dispatch of 25,000 Americans to Bosnia to keep a peace that has not yet been made or defined. They would be sent on a hopelessly ill-defined mission, under circumstances that have not yet been negotiated, to administer a territorial partition of Bosnia that would reward Serb aggression. . . . In all likelihood, our young men and women will find themselves guarding the perimeter of a Bosnian ghetto whose viability as an independent state is far from assured. This is not a purpose for which they should be asked to risk their lives.

Richard N. Perle, former assistant secretary of defense for International Security Policy, in October 17, 1995, testimony to the House National Security Committee.

Falling Interest

There's a declining interest among our nation's youth in serving in the military. . . . We're particularly concerned about a marked decrease in the propensity of young African-Americans to enlist. . . . What we have seen [from nationwide surveys] is that there has been five times the decline among young blacks in this measure than we've seen among . . . young whites. This concerns us. . . .

I have a concern within this larger issue; that is, with the number of African-Americans who are entering Air Force pilot training . . . [which] has really never exceeded or even reached five percent of total entrants.

Our best two years were in 1992 and 1993, when we stood at four percent. Last year, that number declined to three percent.

Gen. Ronald R. Fogleman, USAF Chief of Staff, in an August 12, 1995, speech to the Tuskegee Airmen Convention in Atlanta, Ga.

Caution Flag For Retirees

Wholesale conversion of military health care to FEHBP [Federal Employees Health Benefits Program] is not a good idea. It would be disastrous to readiness and unacceptably expensive for our beneficiaries. . . . It would increase the risk to the health of our troops whom we send into harm's way. Furthermore, to continue the patient benefit at the same level we provide within the military health-services system . . . will cost the government an additional \$3.1 billion. . . . The FEHBP is significantly more expensive than Tricare. . . . Let me be clear on this point: By our estimates, and without a significant infusion of new federal funds, military retirees face significantly increased out-of-pocket costs under FEHBP.

Dr. Stephen C. Joseph, assistant secretary of defense for Health Affairs, in September 12, 1995, Congressional testimony on increased calls to transfer some health-care beneficiaries out of the military system and into the federal civil service program.

What to Expect

The Secretary [of Defense] asked the Defense Science Board, . . . the following question: "If you were an enemy of the United States in the next century, what would you do?" . . . What do they buy? They buy information for information warfare. They buy weapons of mass destruction. They buy the capability so they can hide much of what they have. They look to psychological warfare. And they look to drones.

Deputy Defense Secretary John P. White, in a September 18, 1995, speech to delegates to the AFA National Convention, Washington, D. C.

In Congressional testimony, family members and retirees blast the military medical system.

On the Health-Care Front

The plight of dependents and retirees in today's military health-care system was the subject of a recent Congressional hearing. Critics say the system increasingly shortchanges family members and retired personnel. The following testimony was given by five witnesses at a September 12, 1995, hearing of a House Government Reform and Oversight subcommittee.

Susan Jones

"I am the wife of an active-duty Air Force member who has served eighteen years in the military. We have been married almost seventeen years. . . .

"We are stationed at Fort Meade, Md. Unfortunately, they don't have an obstetrics clinic in the hospital, and pregnant women are given the choice of being treated and [delivering] at Andrews AFB, Md., Bethesda Naval Medical Center, Md., or Walter Reed Army Medical Center, Washington, D. C.

"Since all three are approximately

the same distance from our house—forty-five minutes—and we are an Air Force family, we chose to be treated and [to deliver] at Andrews.

"For eight months I was seen at Andrews. Five weeks before I was due to deliver, the Officer in Charge of the OB clinic told me they would no longer treat me or deliver my baby at their hospital.

"I was told that this was because Walter Reed closed its OB clinic and had to refer its OB patients to Andrews and Bethesda. Therefore, the number of deliveries at Andrews for September is beyond what they feel they could handle. Their limit is 100 deliveries, and the extra patients they have taken on have brought them up to 114 deliveries.

"They don't feel they can give quality medical care to each patient due to the overcrowding. To bring their quota down, dependent OB patients are being bumped out since active-duty OB patients have priority.

"I was told to see the CHAMPUS advisor and that I had to go out into the civilian community and find my own doctor and hospital for the remainder of my maternity care. My challenge was to find an obstetrician who was not only an approved CHAMPUS provider but who also accepted the CHAMPUS allowable charge.

"While I was able to find an obstetrician, I found it difficult to find an anesthesiologist and pediatrician who met both requirements.

"The problem is that I don't know who will be on call when I go to deliver, and by then it will be too late. If they don't meet the CHAMPUS requirements, then I am responsible for paying their fees. What if something goes wrong with either me or my baby and specialists have to be called in? I will be responsible for paying their fees also.

"After three days of trying to find someone to treat me, I finally called Bethesda Naval Medical Center to see if they would accept me as a patient. I was told they weren't ac-



cepting any new patients through November.

"I then called Bolling AFB, D. C. They told me they would accept me for OB visits, but they didn't deliver there, that deliveries were done at Andrews, which sort of put me back at square one.

"Another Air Force spouse suggested I try DeWitt Army Community Hospital in Fort Belvoir, Va. Thankfully, they took me on as a patient and will deliver [my baby]. Unfortunately, the hospital is more than an hour away from my home. I have since learned they are no longer accepting new patients.

"As the budget is cut, so are the services that the military clinics and hospitals provide to military members. . . . Increasingly, military families must either travel to another military facility or go into the civilian community and find a CHAMPUS provider who meets the CHAMPUS requirements.

"As military families, we are constantly uprooted—moving from one place to another every few years. We must deal with constant separations due to deployments, TDY, remote tours, and double shifts for which we are not compensated.

"In exchange for these sacrifices, we were promised, among other things, care at military health facilities for little or no cost to us. Now it is being slowly taken away from us, and we are increasingly asked to pay out of our own pockets for civilian health care, or we must buy private health insurance.

"My husband and I are reluctantly looking at private health insurance. I say 'reluctantly' because private health insurance is expensive. Also, it seems ridiculous to pay for health insurance when we can be treated at a military health facility for little or no cost to us. However, we are willing to pay these high costs, even though it will be a financial burden to us, because we don't want to go through this ordeal again."

DeAnn D. Shaw

"We were stationed at [MCAS] El Toro, Calif., from 1989 through 1993. One week after we arrived, both of my sons became ill with viral meningitis. They were both admitted to Children's Hospital of Orange County. . . .

"There were payment problems and

mountains of paperwork before the billing was finally resolved two years later. Although California had CHAMPUS Prime and CHAMPUS Extra at the time, my particular medical problems [a decade-long struggle with Hodgkin's lymphoma] made it necessary for us to remain with standard CHAMPUS. Also, we did not want to upset the delicate balance we had finally managed to achieve between CHAMPUS and our supplemental carrier by joining these new programs, which only served California and Hawaii. We knew that we would have to come back to regular CHAMPUS eventually.

"During this time, another administrative headache came about. Congress enacted the catastrophic cap, designed to limit out-of-pocket expenses to \$1,000 per family per year. Unfortunately, these costs were tabulated differently by CHAMPUS and the supplemental carrier. The result was that my supplemental insurance refused to pay when its records showed that the cap had been met.

"It now fell to me to prove to CHAMPUS that the cap had been met so that CHAMPUS would increase its payments. I had to write many letters in order to finally get reimbursed by CHAMPUS. This was a nightmare. . . .

"Since 1993, we have been stationed at [MCCDC] Quantico, Va. After my previous experiences with military hospitals, . . . I was determined to have my own doctors so that continuity could be maintained.

"However, upon arriving in Virginia, I found that very few local doctors accepted CHAMPUS assignments. By now, my oldest son was diagnosed with Attention Deficit Disorder [ADD], and my youngest son had partial loss of hearing caused by meningitis.

"I investigated the branch clinic on base to see if it could meet some of our needs. I found that it would take months to get my oldest son an appointment to see a doctor about getting medication for his ADD. As far as my youngest son's hearing was concerned, Quantico only had hearing-test equipment for adults. When I checked with Fort Belvoir, I found that there were similar problems with long waiting periods and lack of personnel and equipment. . . .

"I was finally able to line up an acceptable network of physicians



"My circumstances are unique, but the frustration I feel is shared by all military families."

—DeAnn D. Shaw

who took CHAMPUS assignments and who were close to home. In Virginia, I was confronted with a problem I had noticed in El Toro. I could no longer get my two major prescribed medications at military pharmacies. This forced me to resort to civilian pharmacies and CHAMPUS.

"My circumstances are unique, but the frustration I feel is shared by all military families.

"My husband was told at the outset of his career that the military would take care of his family's health care. Yet, over the years, he and I have had to struggle to protect ourselves."

Tami Littleton

"My husband is an active-duty Army officer stationed at the Pentagon, and our family is eligible for health care at military treatment facilities on a space-available basis or under the CHAMPUS health-benefits program. . . .

"In the spring of 1994, our son, Patrick, then seven years old and in the second grade, had suffered for several years from recurrent sinus infections that left him with chronic headaches, sinus pain, fatigue, and difficulty breathing. . . .

"Because of the headaches and

fatigue, Patrick had difficulty keeping up with the work load in his new class and spent many afternoon recesses inside trying to catch up on daily classwork. On those days when he got to go outside, Patrick had trouble keeping up with his new classmates on the playground because of his breathing problems. . . .

"Having exhausted all possible treatments with Primus pediatricians, we were referred to a civilian allergist. (It was a six-month wait to see a military allergist.) Patrick quickly exhausted the allergist's therapies and so [the doctor] referred us to an ear, nose, and throat [ENT] specialist.

"The ear, nose, and throat doctor did participate in several common civilian insurance plans but did not participate in CHAMPUS because its reimbursement was too low. We decided to see her anyway and pay the extra cost for consultations out of our pocket because she was so highly recommended.

"The diagnosis: Patrick required surgery to drain and repair his sinuses and to remove his adenoids, which were obstructing most of his airway. We had developed a relationship with our civilian ENT by this point and would have preferred that she do the surgery, but we were willing to have a military doctor perform the surgery as long as it could be done soon.

"The health-benefits advisor at Fort Belvoir told us to fax the information so that they could review it for a nonavailability statement (NAS). If you live within forty miles of a military hospital, you must get a nonavailability statement from that hospital before CHAMPUS will cover inpatient care. We were told that we would have a decision within ten days.

"It was a struggle for Patrick to get out of bed in the morning now. He cried every day. We anxiously counted the ten days on our calendar but heard nothing from the hospital. On the eleventh day, I called the health-benefits advisor, who told us that she had never received our fax, . . . and so nothing had been done yet.

"Patrick was now struggling for breath even when sitting to read a book. We scrambled to get the information to the health-benefits advisor, and she told us that since there were no military ENTs available for several months, it would almost certainly be approved for an NAS. We

received verbal approval three days later and called CHAMPUS to find out their fee schedule so that we would know beforehand what our portion of the medical bills would be.

"We were shocked to find that CHAMPUS would pay a total of \$697.44 to cover procedures for which local doctors charge between \$2,000 and \$3,000.

"As this was a preexisting condition, our supplemental insurance policy would not pay on this bill. Somewhat embarrassed, we told our ENT that we could not afford her fee and would have to find a surgeon who would accept CHAMPUS.

"Calling the list of CHAMPUS providers only brought further humiliation. I was refused by the first one (who had left CHAMPUS two years before because the fees were too low) and told by the second office, 'We can't do [the surgery] for that kind of money, and we won't. I don't care what our contract says!'

"The third office said it would see Patrick and would abide by its contractual obligations to CHAMPUS. . . .

"Patrick's doctor was not a CHAMPUS provider but, after discussions with her billing staff, agreed to accept a greatly reduced fee. We paid the balance, some \$700 from money saved in our children's college fund. Patrick's surgery was successful and produced almost immediate improvements.

"However, neither my husband nor I felt particularly good about having been reduced to a charity case to obtain the care our son needed. This time we were able to handle the problem ourselves, but what about the next major medical problem we encounter?"

Laura Colbert

"My husband was Spec. Jeffrey C. Colbert. He was killed on April 14, 1994, when two F-15 pilots mistakenly identified two [Army UH-60] Black Hawk helicopters as Iraqi Hinds and shot them down. Jeff was the crew chief on the lead helicopter. We have two children, ages five and six.

"On May 1, 1995, our five-year-old daughter, Beth, was flown from Frederick Memorial Hospital to Johns Hopkins Hospital and diagnosed with acute lymphocytic leukemia. She spent seven weeks there undergoing practically every test and procedure

they have and beginning chemotherapy.

"She must now return every other week for forty-eight to seventy-two hours of chemotherapy for the next six months. After that, her treatments will be monthly. If she runs a fever over 100°, or her blood counts fall too low, she must be admitted to Johns Hopkins.

"As you can see, she will be admitted to Johns Hopkins quite a few times over the next two and a half years, the length of her treatments. Her prognosis is good. Her chances for a full recovery are in the eighty to eighty-five percent range.

"Apparently she was 'lucky' to have developed this type of leukemia when she did; it is easiest to treat between the ages of two and six.

"Until April 14, 1995, we were covered with full medical benefits. Once the [first] anniversary of Jeff's death passed, our benefits were reduced to retiree benefits.

"My responsibility for Beth's medical bills is twenty-five percent of each bill, with a cap of \$7,500. If Jeff had not been killed, our cap would have been \$1,000.

"Beth's medical bills to date are \$198,000 to Johns Hopkins Hospital [and] \$22,000 for sixteen of the forty-eight doctors she has seen, and there are many more treatments and bills to come.

"These bills have been submitted to CHAMPUS insurance, and it has paid its portion. However, my part is now due. I am being faced with a collection company for the doctors' bills. The hospital has been working with me to set up monthly payments, but with two children to provide a home for, expenses of food, clothing, medications, travel to and from Johns Hopkins, etc., I cannot afford the payments in excess of \$500 per month that the hospital would like. I am receiving travel and medication assistance from the Leukemia Society (\$125 every three months)."

Pamela M. Gildersleeve

"My husband, Ross, retired from the Marine Corps on September 1, 1989, after a total combined Navy-Marine Corps service of twenty-one years. Just eighteen months later, in January 1991, he was diagnosed with advanced-stage, terminal prostate cancer. He was forty-three years old. . . .

"Ross had been accepted into an experimental program at the National Institutes of Health, so for the next two years most of his medicines and care were taken care of by them. . . . As we started 1993, it became very apparent that Ross was not winning this battle. He was discharged from NIH's care and returned to our family doctor for terminal care. As our cost-share responsibility for his medicines and medical care increased, so did our problems with CHAMPUS.

"Each time Ross required admission to the hospital, the doctor's office had to call MacDill AFB, [Fla.], and get permission for that admission, though the base readily admitted they had no one to care for him. Our doctor finally wrote MacDill a letter stating that, with [Ross's] poor prognosis, more admissions were likely, and [asked] what the people at MacDill could do to help. MacDill finally gave us a one-year non-availability statement.

"During this same time, a lump was found in my breast. I was immediately referred to a surgeon who arranged to biopsy it the next day. He called MacDill. We were denied civilian care, though they couldn't tell us when a biopsy could be done or even when I

might be able to see a doctor. We explained our situation to them to no avail. They did suggest that I have the surgery and then apply for an appeal after my claim was denied.

"I did all this and then wrote to the hospital [commanding officer] about my denial. I reminded him that Ross was on continuous narcotic pain medication, and it was unsafe for him to drive the one hour and ten minutes needed to get to the base. If I had had surgery there, he would have had to drive me home. To no avail again. I paid the bill.

"During the spring of 1993, Ross's medical bills began to have a significant impact on us.

"He wore duragesic patches—a narcotic-coated patch for pain control. He wore four patches at all times and changed them every three days. At \$150 a box, and ten boxes a month, our bill was climbing. Charging this every few days required that I use three credit cards and rotate my purchases. . . .

"Ross had had many X rays and received many radiation treatments since this started. The hospital took CHAMPUS. I never thought to ask, but found out at work one day [that] the radiologists didn't take CHAMPUS. They called me to ask for the \$1,800 that was my share.

"I was up to six credit cards with which to rotate Ross's drug purchases. His monthly drug bills were reaching \$3,000 to \$5,000. CHAMPUS averaged six to eight weeks for repayment of a claim, provided there were no errors. . . .

"August 1993 marked the end of the second year that Ross had collected [Social Security Disability Insurance]. This meant he would be eligible for Medicare and lose CHAMPUS. My anxiety heightened. If we lost CHAMPUS, we would have no drug coverage. . . .

"Within eighteen months, the law had changed; CHAMPUS now was a second payer to Medicare, but I had a CHAMPUS supplement, and no one could tell what would happen to it. If it was switched to a Medicare supplement, I would be responsible for twenty-five percent of Ross's drug bills per month—a hefty amount.

"We decided to see if we could get some of his more expensive drugs from military pharmacies. We were already getting a few from the VA clinic. Ross was taking an oral chemo—\$125 a pill. He took two a day. . . . Andrews

AFB, [Md.], and Keesler AFB, [Miss.], had this drug. They refused to ship it to us or to MacDill. I could go to Andrews or Keesler monthly and get it. Ross required care constantly; how was I going to do that?

"In December of 1993, our supplemental company [said] we would be given a choice in what we wanted the policy to cover. We opted to move it back to a CHAMPUS supplement, giving us 100 percent coverage for our drugs.

"Now that Ross was on Medicare, admissions to the hospital were harder to get. Ross looked into getting care at the oncology clinic at [James A. Haley Veterans Hospital]. He waited for an appointment to the medical clinic. Then he waited for an appointment to the oncology clinic. The oncologist worked Mondays only, from 7:00 a.m. to 11:30 a.m. He saw her once. She ordered tests. Before they were completed, Ross was sick again. After two days of trying to reach her, Ross was admitted to our local hospital again. . . .

"By January 1994, Ross had had a stroke due to the cancer. He required almost constant care. He was confused and fell frequently. I could no longer work and be there to care for him. We tried hospice [care], but I was unable to get the amount of care he needed. Back to Medicare we went. I tried every way I could think of to have CHAMPUS help me. There was no way they were going to provide Ross with home care.

"Back to the VA we went. There was a program called nursing home intervention, and we could get thirty-six hours of home care every two weeks. That was better than nothing. I worked forty hours every two weeks. If we arranged the Medicare nursing visits to coincide with the VA home care, he was just about covered. I paid nurse's aides myself to care for him every other night so I could get some sleep. . . .

"Ross became very sick again in early June. . . . We were able to admit him to a VA hospital on a Wednesday. Friday, he died there.

"This all was only a small part of the difficulties we had while Ross was sick. . . . It made for a very long four years. My children don't remember their father dying; they remember how much time I spent on the phone trying to straighten out the problems." ■



"Neither my husband nor I feel particularly good about having been reduced to a charity case to obtain the care our son needed."

—Tami Littleton

The Air Force Association lays out its positions on issues affecting people.

Obligations to the Force



OVER TWO decades ago, this nation made a landmark decision; it created an all-volunteer military force. That decision marked a dramatic departure from an American tradition that eschewed a professional military and relied instead on citizen-soldiers. In a little more than twenty years, what started as an experiment evolved into the finest fighting force in the world. Desert Storm was a triumph of the All-Volunteer Force, a triumph of people operating the most sophisticated military technology the world has ever seen.

In its short history, however, the All-Volunteer Force has seen ups and downs, from the neglect of the 1970s to the rebuilding of the 1980s to the massive drawdown of the 1990s. That drawdown, which is nearly complete, has reduced the ranks by 600,000 people—people who

had volunteered and hoped for a full career in the military.

From all indications, though the military has lost many dedicated, well-trained men and women, it has also been able to retain top quality people—for now. To retain this quality force in the future, our national political and military leaders, our Congressional leaders, and the American public must recognize what kind of force it is and provide the resources needed to sustain it.

The military force today is a professional force, but its people do more than perform a “job.” Military people are on duty twenty-four hours a day; they deploy all over the globe; they are not paid as well as their private-sector counterparts; and they must be ready and willing to put their lives on the line for their country.

The Ten-Year Squeeze

USAF components, 1987–96 (in thousands)

Element	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Active duty	607	576	571	539	511	470	444	426	400	388
AFRES	80	82	83	81	84	82	81	80	79	74
ANG	115	115	116	117	118	119	117	114	116	110
Civilian	252	241	249	238	222	214	202	197	190	184
Total	1,054	1,014	1,019	975	935	885	844	817	785	756

The total Air Force at the end of Fiscal 1996 will have 298,000 fewer personnel spaces and be 28.3 percent smaller than it was a decade earlier.

Source: US Air Force

A Changing Force

While the nature of the military has remained relatively constant, its composition has not. Today's volunteers are more diverse than the force of the past. They are more often married, and there are couples where both serve and a greater number of single parents than ever before. That means more families, more children, and a greater emphasis on quality-of-life issues.

At the same time, the operational demands placed upon today's smaller force put more stress on service members and their families. On average, four times as many Air Force people are deployed today as there were in 1989, from no-fly zones in Iraq, to airdrops in Bosnia, to humanitarian relief in Rwanda, to drug interdiction in South America. The average AWACS crew is spending 165 days out of the year operating in major contingencies or exercises—forty-five days longer than Air Force leadership recommends. These demands also increase the need for an adequate family-support infrastructure.

The Air Force Association applauds the efforts of the Secretary of Defense to substantially increase the resources devoted to quality-of-life programs. However, years of neglect have created a situation that threatens the future of the All-Volunteer Force.

Even with the 2.6 percent military pay raise Congress provided last year, the gap between private-sector pay and military pay has increased to 12.6 percent. That gap will widen to eighteen percent by the turn of the century. Adequate pay is essential to maintaining a quality force. Moreover, housing allowances should reflect the realities of the marketplace. Today, young airmen with families often have to absorb up to twenty-two percent of their housing costs. To make matters worse, when an Air Force member and his or her family move for a change of duty station, they are typically reimbursed for only sixty-five percent of their expenses.

The Association believes the time has come to ante up. If the Administration wants to maintain a quality, All-Volunteer Force, it, along with Congress, must pay for it and explain to the American public why it is necessary to provide adequate pay to the men and women who protect this country's very way of life and, with it, every individual's potential to prosper.

Our leaders in government and Congress must also recognize that an infrastructure designed for draftees in the 1940s and 1950s will not serve the diverse, volunteer force of the 1990s and beyond. From safe, affordable housing to health care and child care, the needs of today's force require substantial resources—far more than are currently allocated.

In the Air Force, waiting periods for substandard base housing range from weeks to years. The average age of Air Force housing is thirty-two years, and more than 60,000 units require improvement or replacement. With current levels of funding, it will take twenty-four years to satisfy the demand for family housing. AFA supports a range of private-sector financing initiatives that will help solve this problem more quickly.

New Requirements

The child-care issue is a good example of how changes in the composition of the force have led to new requirements in the support infrastructure. With the changing demographics of the Air Force family, demands for child

care have skyrocketed. The Department of Defense is now the nation's largest day-care provider, but it still only serves half of its eligible families.

In the Air Force, there are thousands of children on the waiting lists for care in child development centers, and for those lucky enough to have a spot, the hours of operation sometimes do not match military work days. The Air Force is not a "9 to 5" job, and child care that is only available during daytime hours does little good when mission dictates evening or night hours.

Air Force members rank quality health care as the number one noncash benefit for themselves and their families. They have also traditionally viewed it as a benefit that would continue when they retired from service. AFA believes that under Tricare, active-duty members and their families must maintain full access to military health care with no enrollment fees. In addition, there must be seamless health-care coverage for military retirees regardless of age. AFA supports changes to Medicare that will provide more resources to Veterans Administration and Defense Department facilities that treat military retirees who are over sixty-four.

Retirement benefits have also been a key to retention of quality service members. AFA deplors the erosion of retirement benefits and the continual attacks on the military retirement system. Reductions in cost-of-living adjustments (COLAs) and threats to access to health care are just two of the problems facing retirees. Retirees are not simply "entitled" to these benefits; they earned them during twenty or more years of dangerous service to this country. Irresponsible attacks and well-intentioned tinkering do little to encourage current members to stay for a full career, and they do a grave disservice to those who have already served honorably and kept their part of the bargain.

As the active force has been reduced in size, the role of the Air National Guard (ANG) and Air Force Reserve (AFRES) has increased. Guard and Reserve forces have played critical roles in all recent military contingencies and continue to do so. Increased deployments have highlighted hardships for employers and problems for individual Guardsmen and Reservists who lose income after activation. AFA strongly supports tax incentives for employers and mobilization income insurance for members of the Guard and Reserve.

While the military drawdown is nearly complete, the Air Force civilian work force still faces cuts and uncertainty. The Association reminds government and Congressional leaders that the same care must be taken with the remaining phase of the civilian drawdown as has been taken with the military drawdown. The civilian work force plays a vital and increasing role as part of the Air Force team. Its quality must be maintained.

As Secretary of Defense William Perry has said, "We put a lot of time and money into our people. Our people in uniform are walking investments. If we lose them, we've lost a valuable asset." The same applies to our civilian work force.

People are the backbone of the All-Volunteer Force. Retention of quality people is more important than ever to the survival of the volunteer force. Past investments have continually fallen short, and the cumulative effect threatens the future force. It is time to pay bills that are long past due. Otherwise, our collective investment may rapidly lose its value.

What follows is a summary of major issues and needs.

Compensation

The services must be able to offer competitive compensation and benefits to assure service members a reasonable quality of life. AFA supports:

- Funding annual pay raises.
- Fully reimbursing members for permanent change of station moves.
- Continuing funding for cost-of-living adjustments in the continental United States.
- Recognizing active-duty death with Survivor Benefit Plan benefits for survivors.
- Establishing payment of quarters for members of ANG and AFRES when serving away from home.
- Changing the Joint Federal Travel Regulations permanent station requirements affecting ANG members.
- Exempting military members from pension plan status for the IRS.

Health Care

Under Tricare, active-duty members and their families must maintain full access to military health care with no enrollment fees. In addition, there must be seamless health-care coverage for military retirees regardless of age and with no erosion to the guarantee of military health care for life.

Under the new system DoD will implement, health-care initiatives must improve access and services and provide benefits that are comprehensive, equitable, and affordable. AFA supports:

- Enacting Medicare subvention.
- Maintaining the Federal Employees Health Benefits Program for civilian employees.
- Providing access to medical care at Base Realignment and Closure (BRAC) locations.
- Expanding the mail-order pharmacy program.
- Improving efforts to streamline and provide more efficient, quality care for veterans.
- Covering incapacitated adult children for health care.
- Improving access to dental care for Guard and Reserve members.

Housing

Service members must have access to safe, affordable housing. Housing needs to be available on base or through adequate allowances for comfortable, secure communities. The need to improve existing housing and build new units remains. New programs that address improving housing for service members are being explored, and housing is a top priority in the Air Force. AFA supports:

- Providing adequate living quarters for personnel.
- Enacting the one-plus-one standard for unaccompanied members.
- Improving base housing.
- Reforming the housing allowance.
- Allowing tax-free rollover of benefits under the Housing Assistance Program.

Incentives

Incentives are key tools for recruiting and retention and enhance quality-of-life programs. These programs keep the military competitive and enable the Air Force to attract and retain high-caliber individuals with critical skills. AFA supports:

- Providing tax incentives for employers of Guardsmen and Reservists.
- Offering mobilization income insurance for members of the Guard and Reserve.
- Increased funding for morale, welfare, recreation, and services.
- Maintaining funding levels for commissaries and increasing accessibility for Guard and Reserve members.
- Increasing access to child-care facilities for Air Force personnel.

Retirement

The retirement system has been a top retention incentive for personnel. Issues in the forefront regarding retirement include retirement pay with full annual COLAs and source tax legislation. AFA is a strong supporter of maintaining quality and attractive retirement benefits as the centerpiece of a benefits package used to offset the extraordinary demands and sacrifices of service. AFA supports:

- Maintaining the retirement system and benefits.
- Ensuring COLAs for full retirement pay.
- Implementing source tax legislation.
- Allowing concurrent receipt of military retired pay and veterans disability compensation.
- Adjusting annually the Medal of Honor Pension with COLAs.
- Increasing the maximum allowable reserve retirement points.

POW/MIA Issues

AFA supports:

- Furthering normalization of relations between the United States and Vietnam, providing measurable progress is achieved in accounting for missing American servicemen.
- Granting presumption of service-connected disorders for former POWs.

Education, Training

Continued education and training keep Air Force people mission ready. AFA supports:

- Funding impact aid for school districts affected by military service members' children.
- Continuing tuition assistance for qualified active-duty personnel.
- Improving the Montgomery GI Bill.
- Maintaining readiness and training standards equal to the active component for the Guard and Reserve.
- Expanding Air Force Junior Reserve Officers Training Corps in our high schools.
- Retaining the Air Force as the executive agent for the Civil Air Patrol program.

Force Structure

The drawdown in force structure has gone too far but is programmed to continue. If the Air Force is to meet both its operational requirements and end strength goals, it must have the flexibility to manage wisely its active-duty, Guard, and Reserve forces, as well as its civilian work force. AFA supports:

- Funding Air Reserve technician programs.
- Continuing the Voluntary Separation Incentive and Special Separation Benefit and early retirement programs.
- Developing attractive civilian separation options. ■

By John L. Frisbee, Contributing Editor

The First Air Force Cross

When the Cold War threatened to become hot, the President called on USAF's U-2 pilots to get proof of Soviet missiles in Cuba.

IN JULY 1960, Congress honored an Air Force proposal to establish the Air Force Cross as a decoration parallel to the Army Distinguished Service Cross and the Navy Cross. The first Air Force Cross was awarded for gallantry during the Cuban Missile Crisis in October 1962, when the United States and the USSR stood on the brink of nuclear war. Air Force U-2 pilots of Strategic Air Command's 4080th Strategic Reconnaissance Wing played a major role in preventing what might have become a global tragedy. One of them, Maj. Rudolf Anderson, Jr., was the first ever to be awarded the new decoration.

During the summer of 1962, shipments of Soviet military equipment and personnel to Cuba increased dramatically. MiG-21s and SA-2 surface-to-air missiles—similar to those that had shot down Francis Gary Powers's U-2 over the USSR two years earlier—were in place. Both were defensive systems, hence acceptable, but unconfirmed reports of offensive ballistic missile sites under construction soon began to reach the White House. These missiles were not acceptable to the US. Despite Premier Nikita S. Khrushchev's denial of the latter, President John F. Kennedy directed Strategic Air Command to begin U-2 high-altitude reconnaissance flights over the island. The U-2 flights were made by Major Anderson and Maj. Richard S. Heyser and were supplemented later by low-altitude RF-101 coverage.

On October 14, Major Anderson returned from one of his missions with pictures of ballistic missile sites and nuclear storage facilities under construction. The Soviet threat had to be removed with the least possible likelihood of war with the USSR. The President assembled a group of ad-

visors that included the cabinet secretaries most closely associated with the situation, and they met in tight secrecy during the next two weeks.

The range of options offered to President Kennedy by this group, known as "Ex Comm" (Executive Committee of the National Security Council), boiled down to three: a "surgical strike" to destroy the missile sites, a full-scale invasion of Cuba, or a blockade to prevent completion of the sites and to force withdrawal of offensive weapons already there. Grave dangers were associated with all three options, extending from a Soviet invasion of NATO member Turkey to remove the obsolete US Jupiter missiles there, to a Soviet blockade of Berlin, to a limited war that could escalate to a nuclear exchange with the USSR. Whatever option President Kennedy adopted inevitably would involve the US's NATO Allies and the members of the Organization of American States. They all would have to be convinced beyond a doubt of the rapidly growing Soviet threat. Continued photographic coverage was essential.

While the debate over options continued, Soviet construction in Cuba accelerated. Soviet officials, including Premier Khrushchev, Foreign Minister Andrei A. Gromyko, Soviet Ambassador Anatoly F. Dobrynin, and Soviet Ambassador to the UN Valerian A. Zorin insisted that there were not and would not be offensive weapons in Cuba.

President Kennedy finally rejected both the surgical strike and an invasion that, it was believed, would result in thousands of US, Cuban, and Soviet casualties. Either of those options could lead immediately to war with the USSR. The third alternative—a naval blockade—was accepted as less risky, to be followed by military action if it failed.

As a precautionary measure, strong land and air forces were moved to the southeastern US, and naval forces were sent to the Caribbean. B-52s were put on continuous airborne alert, and ICBMs were prepared for launch.

On October 22, the President addressed the nation, describing the threat and the action to be taken. He expressly warned the Soviet government: "It shall be the policy of this nation to regard any nuclear missile launched from Cuba against any nation in the western hemisphere as an attack by the Soviet Union on the United States, requiring full retaliatory response upon the Soviet Union."

In the six tense days that followed, work on the missile sites and B-28 bomber bases continued night and day. More than forty missiles were now in Cuba. Inbound Soviet ships apparently were going to challenge the blockade. War seemed inevitable. The United States was prepared to invade Cuba, probably on October 29, if Premier Khrushchev did not agree to remove the missiles immediately.

It is clear from the Premier's memoirs that, faced with US nuclear superiority and the censure of most non-Communist nations, he finally realized he had opened a Pandora's box that only he could close. On October 28, he agreed to recall his ships and remove the missiles if the United States would pledge not to invade Cuba. The crisis was over, but it was, as Wellington said of Waterloo, "the nearest run thing you ever saw."

On October 27, while negotiations between President Kennedy and Premier Khrushchev were still under way, Major Anderson's U-2 was shot down by an SA-2 missile and he was killed. By personal direction of the President, Major Anderson was posthumously awarded the first Air Force Cross. (By regulation, the Bronze Star was then the highest combat decoration that could be made for Cold War action.) The photographs provided by him and other Air Force pilots had rallied worldwide support behind the US refusal to allow Soviet nuclear-armed missiles in the western hemisphere. Without that support, the Cuban Missile Crisis might have had a different, perhaps catastrophic, outcome for the world. ■

The US Air Force Academy operates one of the world's largest aviation programs, comprising 33,000 glider flights and 18,000 parachute jumps annually.

Airmanship Spoken Here

By Col. Walter D. Miller, USAF (Ret.)

EVERY morning, as dawn breaks in Colorado and Pikes Peak starts to glow pink in the morning sun, motorists on Interstate 25 can see a long line of yellow gliders, each waiting its turn to launch behind a 180-horsepower Bellanca Scout tow plane.

The first glider lifts off the west runway, and a small, white Slingsby Aviation Ltd. T-3A Firefly can be seen launching on the east runway. The sound of another T-3 "going around" can be heard as yet another T-3 approaches "the break."

Meanwhile, a blue and white UV-18B Twin Otter holds on Runway 16, ready to ascend with fourteen student parachutists and their young jumpmaster. Another Otter is climbing through 7,500 feet; it holds a load of students ready to make their first free-fall parachute jump.

And so it goes, all day, seven days a week, at one of USAF's busiest airfields—the airfield of the US Air Force Academy.

The Academy is home to the largest glider training program in the world, one that features 33,000 glider sorties per year. In addition, USAFA conducts 16,000 pilot screening sor-

ties a year in small aircraft. The airfield is also the site of the largest free-fall parachute training program in existence, averaging 18,000 jumps each year.

This is the "Airmanship Program," a series of Academy courses. Though many parts of the Academy's curriculum contribute to officer development, airmanship plays a special role. It is the responsibility of Brig. Gen. John D. Hopper, Jr., commandant of cadets, himself a graduate of the Academy's parachute program.

Much of the training is specifically targeted at cadets who will never become rated officers. The objective is to enhance character development, deepen the cadet's knowledge



Soaring and parachuting are mandatory for every cadet at the Air Force Academy, which boasts one of the world's largest aviation programs. Above, cadets practice emergency procedures before the day's jump. Opposite, against a majestic Rockies backdrop, a cadet and instructor prepare for a run in an Academy glider.

Photos © Walter D. Miller 1995



of basic mission skills, and teach him or her a bit about flying, for perhaps the first and last time in a career.

The Basic Thing

Aviation and airmanship courses cover a wide spectrum of activities, but parachuting and soaring form the program core.

The Airmanship Program, according to Col. Al Parrington, 34th Operations Group commander, develops character, self-reliance, and courage.

"The air is our primary focus," he says. "That's where we work in the Air Force. Whether an officer flies or doesn't fly, a knowledge of 'the air' is essential—and that knowledge must extend to understanding what the flight-line environment is all about."

Airmanship training is mandatory during each of a cadet's four years at Colorado Springs. To graduate, each must have had exposure to aircrew duty, whether or not the cadet is physically qualified to enter pilot or navigator training after commissioning.

According to Academy officials, surprisingly few incoming cadets have been exposed to aviation. That's

why "understanding the flight line" is viewed as an important objective.

Instructing, then jumpmastering, other cadets in a tough, free-fall, pull-your-own-rip-cord parachute program provides personal, if untraditional, leadership experience, said one cadet jump instructor. The same applies to cadet glider instructor pilots (IPs) who make sure other cadets, for whom they have been the only instructor, can solo.

When cadets cross the bridge on Academy Drive and head to the airfield, everything is new—runway "hold" lines, Dash One tech orders, bold-faced instinctive-reaction procedures, the physical stress of aerial decision-making, maintenance delays, whirling propellers, stand-up briefings, and virtually everything else on a modern flight line.

At first glance, activity at the airfield seems dispersed and disorganized. That impression is deceiving. A closer look reveals small groups of people, each focusing intently on its own mission.

A pervasive "Let's move it" attitude prevails. There is no wasted motion, no "slack," and not much "classroom." The training is disci-

plined, hands-on, and strictly performance-oriented. Everything is graded.

"Soar for All" is the largest of the Academy's airmanship courses. Twenty-six gliders of four types, from basic Schweizer 2-33 trainers to high-performance, spin-capable ASK-21s, are involved in the soaring program of the 94th Flying Training Squadron.

Its goal is to expose every new third classman—regardless of physical qualification for pilot training—to approximately ten glider flights and for at least half of them to solo.

In July, the 94th flew a record 4,959 sorties—289 in one day. Over the summer training period, 528 cadets—nearly ninety-two percent of summer enrollees—soloed.

In the mid-1980s, only 150 cadets per year flew gliders. This year, all 1,300 third classmen will participate in the required "Soar for All" glider training course.

For most cadets, this initial glider training marks the first time they have ever "held the stick" of an airplane.

The course also comes complete with preflight inspections, morning stand-up briefings, tech orders, check-

lists, flight organization, responsibility for individual performance, and, most important, training in self-reliance, leadership, and in-flight decision-making.

For a nineteen-year-old cadet to bear the responsibility for soloing another cadet in the Academy's confined, complicated, and congested airspace is a major challenge, and it was designed to be that way.

Cadets Training Cadets

"Soar for All" begins with a motor glider flight. An attached Academy faculty or staff pilot is at the controls for this first orientation flight, designed for cadets to get their initial feel of a glider.

From that point on, upper class cadets take over, and trainees fly to specific performance standards. Cadet instructors are officially designated military instructor pilots at the completion of their instructor training. Some also hold civilian glider credentials.

Ninety-five percent of all training in the soaring program is given by these upper class cadets. Of more than 250 IP applications this year, ninety graduates of the basic soaring program were selected for the 100-flight glider instructor upgrade program. They are trained by experienced cadet instructors.

To a remarkable degree, the Airmanship Program is cadet-taught. Student performance is graded by cadet IPs. They recommend whether or not a particular student should solo. Training and flight-line supervisory schedules are drawn up by cadets. Even the training records are kept by the cadets themselves.

In 1994, the Academy created—out of what had been only a sparsely manned flight in another squadron—the 98th Flying Training Squadron, commanded by Lt. Col. Joe Drew. Its unique mission is to conduct free-fall parachute training as a part of USAFA's Airmanship Program.

Use of a new rectangular parachute, rather than the more traditional, relatively unstable round parachute, has improved the cadet program completion rate from sixty-eight percent to eighty-eight percent, reduced ground training requirements from forty-two to twenty-three hours, cut injuries from six in every 1,000 jumps to near zero, and completely eliminated off-site landings.

Training lost to weather and parachute repack time has been cut in half, and equipment life has doubled. Trainees now land in winds of up to fifteen knots; the old limit was eight knots.

After trainees leap out of the jump airplane, radios attached to each student jumper's chest strap come alive with the voices of Academy jump instructors, guiding their students with instructions, such as, "Give me a 360° turn to the left."

Each drop-zone instructor has an aircraft manifest listing the number of the student's jump, the parachute color, and the order in which he or she will jump from the airplane.

Another instructor makes a videotape of each student's free-fall with a telescopic video camera using slow-motion videotape. Debriefings take place after every jump, and each student's performance is critiqued.

Each year, the basic parachute course attracts twice as many volunteers as can be accommodated. It presently has some 600 basic students. They and the more advanced cadets make more than 18,000 jumps per year.

Under current plans, the course by 1997 will graduate twice as many students, including some AFROTC cadets.

Cpts. John Oates and Judy Babcock command the 98th's basic training and instructor upgrade flights, respectively. Each was an Academy jump instructor and member of the

Academy's "Wings of Blue" parachute team as a cadet. Both are pilots who routinely fly the UV-18B for student training and are experienced jumpers with more than 800 free-falls each.

Handpicked Instructors

The squadron's handpicked parachute instructor force numbers only about seventy-five, sixty of whom are upper class cadets. Their primary job is to teach other cadets in the parachute course.

Cadets who perform successfully in a rigorous ground training program and complete five graded free-fall jumps are awarded the Air Force Parachutist's Badge.

Last year, more than 150 cadets volunteered for parachute instructor duty. Of the twenty-six selected who entered training, twenty-three graduated from the nine-month jump instructor training course.

Thirty new third classmen were accepted into jumpmaster training this fall. After qualification, they will serve during their last two years at the Academy as instructors in the primary course and be allowed to participate on the demonstration and competition parachute teams.

Cadet 1st Class Piotr Blazeusz, a 300-jump instructor and exchange cadet from the Polish Military Academy, said, "I want people to understand that we do not come here to have fun. I've been here since 5:30 this morning. I might get only one



"A first jump is quite an event for most people," says Cadet 1st Class Piotr Blazeusz. His duties as a jump instructor force him to give up much of the little free time that is afforded to Academy cadets.

Photo © Walter D. Miller 1995

jump today, but jumping is not my job. My job is to teach other cadets. . . . A first jump is quite an event for most people."

Another cadet jumpmaster said, "It is a big responsibility to train . . . and then put someone out the door of a perfectly good airplane at 11,000 feet on their first parachute jump. They have to do it by themselves and pull their own rip cords."

Volunteer instructor duty requires cadets to give up much of their Saturdays and Sundays, at least two afternoons a week, and, for those who are involved in advanced programs, many holidays and most of their spring break every year. They are also barred from significant participation in other extracurricular activities while serving as instructors. The same is true for cadet soaring IPs.

Although overall program management is provided by experienced officers and NCOs, cadets themselves furnish the airmanship "product." They conduct virtually all training in the basic parachute course.

During the 1994-95 school year, Academy "Wings of Blue" parachute team members—all cadet instructors—performed more than forty demonstrations for more than two million spectators at civilian sites, Air Force bases, and other military installations.

Also contributing to the volume of aviation activity around the Academy is Air Education and Training Command's 557th Flying Training Squadron, with sixty assigned and fifty attached instructors. The 557th FTS conducts "pilot screening" for volunteer cadets physically qualified for Undergraduate Pilot Training (UPT).

The Academy is one of two pilot screening locations. The other is the 3d Flying Training Squadron at Hondo, Tex.

Each potential UPT cadet flies eighteen sorties in about twenty-five flying hours. The 557th will fly approximately 24,000 hours a year to accomplish its mission.

Formerly, pilot screening was conducted in the T-41C, similar to a Cessna 172. Now, the new \$300,000 T-3A Firefly, manufactured in the United Kingdom, is used. The T-3A has markedly changed pilot screening, according to officials in the program.



Photo © Walter D. Miller 1995

Injury rates are near zero and off-site landings are history, now that cadets use the new rectangular parachutes. Although not all cadets become pilots, the Airmanship Program makes sure they all have some hands-on flying experience.

"For one thing, the airplane now allows fully aerobatic screening in three dimensions," according to one instructor. "It also permits overhead landing patterns—a traditional problem in T-37s—and much more intensive training than the T-41" allowed.

Aerobatics

In the T-3A, students are introduced to aerobatics at only six hours of total flying time. Aerobatics were not even included in T-41 screening.

Aerobatics include aileron rolls, barrel rolls, loops, lazy eights, cloverleaves, Immelmans, and a variety of maneuvers performed in UPT.

Students must demonstrate proficiency in spin-prevention and recovery from unusual flight attitudes—in less than twenty-five hours of flying time.

"The cadets we see today are highly competitive and motivated because of the limited UPT slots available recently," said one instructor. "Combine this with a much more capable airplane and many more landings, . . . and you have a higher-qualified pilot trainee."

Lt. Col. Vince Wisniewski, the 557th's commander, said, "Our objective in pilot screening is to evalu-

ate whether a cadet can successfully complete Air Force Undergraduate Pilot Training—formation and instrument flying excluded. We don't do those here."

Upon successful completion of pilot screening, physically qualified volunteer cadets compete for the opportunity to attend UPT—and the competition is fierce. Traditionally, former cadet soaring IPs have done "tremendously well" in both pilot screening and UPT, said Colonel Wisniewski.

Lt. Col. Randy Muncy, a recent commander of the 94th, was a glider IP at the Academy as a cadet. He finished first in his UPT class and, prior to assignment as the 94th's commander, was chief of the Air Combat Command Inspector General Team's Fighter Operations Section.

"I think airmanship programs are invaluable preparation for potential officers, regardless of what they do after graduation. Soaring instructor experience, in particular, is great preparation for UPT," said Colonel Muncy. "To the best of my knowledge, no pilot trainee with Academy soaring instructor experience has ever failed to complete UPT because of a flying deficiency." ■

Col. Walter D. Miller, USAF (Ret.), was a pilot and a squadron commander. He served as executive director of the National Aeronautic Association and taught aviation tactics at the Air Force Academy. This is his first article for Air Force Magazine.

Perspectives From the Chairman

Excerpts from testimony by Army Gen. John M. Shalikashvili to the Senate Armed Services Committee, September 21, 1995, prior to his confirmation for a second term as Chairman of the Joint Chiefs of Staff.

Worried About Weapons

"The whole procurement of equipment, the whole design of the procurement account, is a concern of mine. And so, when I testified before this committee last year, I made the point that the [Fiscal] '96 [Defense Department] budget was the last . . . before we need to turn up the procurement accounts.

"I think that's absolutely necessary for long-term readiness. And if that does not occur, then not only will our long-term readiness suffer, but certainly it will put pressures on those quality-of-life aspects, like housing and whatnot.

"So it all hinges on whether, in fact, in the '97 budget we are able to turn up the procurement accounts. . . .

"My worry is not today's readiness but tomorrow's readiness. We are counting a lot on being able to increase our procurement accounts and the benefits that we will derive from acquisition reform, from financial reform, and so on. I have this fear that in the past we have not always realized the savings that we have projected, and I am very concerned that the same thing will be true now and that the necessary acquisition accounts that we now project will not be there in sufficient numbers.

"So, no, as I sit here before you today, I don't have a high confidence that that can be done."

Two-War Strategy Proven

"The experience of these past two years has highlighted a number of important lessons. The first is that we were correct in our earlier decision to reshape our armed forces to be able to fight and win nearly simultaneously [wars] against two major adversaries.

"Last year in June, in anticipation

of potential hostilities on the Korean peninsula, we began to deploy forces to the Pacific. In September we deployed to Haiti and in October found ourselves rushing troops to Kuwait to stop Saddam Hussein, who apparently thought that he could take advantage of our preoccupation elsewhere.

"That sequence of events should have dispelled any last thoughts about whether preserving this kind of capability is a luxury or a need. Our global interests demand no less."

No BUR II, Please

"I believe firmly that the sizing requirement for our force as articulated in [the 1993] Bottom-Up Review is correct, that a nation with our worldwide interests must maintain, as a minimum, the requirement to engage two adversaries widely separated in geography but very close in time. I think that would be true even if tomorrow Saddam Hussein would no longer pose a threat.

"I believe that our nation, with these kinds of interests, . . . must retain that force because we never know where the threats will materialize, [but] we know how quickly they materialize, and you never have the time to build up. . . .

"I sometimes worry that we are too fixated on the Middle East or North Korea, and we need to keep in mind that we very seldom have fought our wars where we expected them to be fought. And so I think that no future

Bottom-Up Review will change that view. So then we come to the structure. I think the work we have done since the last Bottom-Up Review has reconfirmed that the structure is the minimum required to do the job, providing we enhance the force."

Balkan Air Operation Worked

"I think the air strikes have been very successful when measured by what [the on-scene commander] set out to do—what he wanted to do to the command-and-control system, what he wanted to do to the integrated air defense system, what he wanted to do to the munitions stocks, to the lines of communications. . . .

"Second, it was very successful from the standpoint of target analysis. I am very glad that you have not been seeing in newspapers or on television horror stories about collateral damage, of hospitals hit or schools hit, and so on. I think that speaks volumes for the competence of those who selected the targets, for the pilots who flew the missions, [and] for the technology that is now in our hands with your help and your support all of these years. There has not been any collateral damage that I'm aware of, and I think if there had been, we would have seen it all over the news media."

The "Zero-Casualty" Trap

"That is an outgrowth of [Operation] Desert Storm, followed on by

our experience in Somalia, and I am very concerned about it. That doesn't mean that we should not do everything we can . . . to not only protect our own people to the maximum [but] also to minimize civilian casualties. . . .

"But I am also worried not only that we are setting a standard by which this country will judge us. That will only lead to, I think, very unfortunate consequences, a standard that cannot be maintained; . . . it [also] might begin to have an impact on our young leaders in particular, as they go into an operation, [causing them] to sense that if they, despite their best efforts, suffer casualties, that somehow someone is going to be looking over their shoulders. How tragic it would be if we did that, because we would grow a group of leaders who, through hesitancy, would begin to endanger people."

No Russian Veto on NATO

"NATO has stated, and so has this Administration, that the Alliance will expand but that right now is the time to discuss the modalities. . . . Whether Russia in the end will acquiesce to it, I think Russia knows full well that they have no veto on that issue. . . . I'm sure the process will go on as NATO has outlined, but I think it is important that we take all prudent steps to show Russia that we are not building a new divisive line and that NATO expansion brings stability to all of Europe."

Yes to Missile Defense

"Our first priority now needs to be theater ballistic missile defense because the threat to our forces has existed . . . and certainly exists today, and there is every indication that that threat is growing. I believe that there is today a threat from ballistic missiles, and that's essentially the same threat that existed during the Cold War, although reduced, from the systems of the former Soviet Union. China also possesses systems. I believe that those threats have been deterred as they have been in the past.

"I do believe, however, that there is a likelihood that, by the middle of the next decade, additional and rogue-state threats could affect parts or all of the territory of the United States, and therefore it is incumbent on us to move forward with all deliberate speed to develop the technology and the systems for a national missile defense.

"I believe that [this] effort is ongoing. My discussions with those who

are involved with it are that [it] cannot be significantly speeded up, but additional funding to that program could, in fact, reduce the technical risk of development. We should be far enough along with the system in the next few years where we can decide on basing . . . and other deployment [issues]. I believe that the system . . . in existence, in fact, carries us forward in that direction."

No Limits on Theater Defense

"[Administration officials have been seeking] agreement on a demarcation to make it clear that the ABM Treaty does not apply to theater missile forces. . . . We, as the Chiefs, met on a number of occasions during this period when demarcation—and particularly specific limits on interceptors—was discussed, and we were always of the view—all of us—that we should not place any limits on that.

"When it came to the decision, everyone in the Administration was aware of my view—and the view of the Joint Chiefs—that we should not put any limits on it.

"The debate and the decision went the other way. At the earliest opportunity, I raised the issue that we need to reopen that point. . . . I believe that is essentially where we are today, so I feel very good that my view in the long term has prevailed. . . . It's my understanding that the position we hold today places no limits on interceptors."

North Korean Threat

"The framework agreement is proceeding on schedule. I'm very mindful that the implementation of that framework agreement will take a very long time, that we will be challenged by the North Koreans along the way, but that it is still the best way I know to deal with that issue.

"I frankly would therefore not wish to impose conditions that might derail that agreement. What I would like to concentrate on is that very extensive conventional capability that North Korea maintains, and maintains very close to the DMZ.

"We have to remember that, throughout this period, while we're working the nuclear issue and trying to resolve it, we also must never take our eye off the vast conventional capability."

UN Command Sometimes OK

"I have said in the past, and I guess

this still holds true, that sometimes, in very narrow circumstances, Americans could serve under the United Nations, and I know that's a very unpopular thing to say. We have, for instance, created conditions in Haiti where American troops are serving under the United Nations, but the commander is an American. The conditions are such that the kind of fighting that is too much for a United Nations force to handle is very unlikely, and, either way, we have reaction forces there that are robust enough, and under American control, to handle that.

"On the other hand, . . . I have always maintained that Americans should not serve in Bosnia[-Herzegovina] under the United Nations. And I have for two years resisted any discussion or any attempts to put Americans on the [UN Protection Force] in Bosnia . . . [because] I did not think the United Nations command structure, rules of engagement, communications system, whatever, were up to the task, and we should not endanger American soldiers."

A US General Staff?

"A general staff is one that has a directive authority. The [US] Joint Staff does not have any directive authority—any more than I have directive authority. I act in the name of the Secretary. And so it sounds good to make that statement [that the US Joint Staff is turning into a general staff, a la Germany's], but in fact, it isn't true because the Joint Staff does not in itself have the authority to direct action, and a general staff does. It is an advisory staff, and that's what the law intended, and I think it's working very well."

The Odds on Balkan Peace?

"I think the first impulse you have when you hear a question like that is to say that it's going to be very difficult. But I must tell you, if I can take you to another part of the world, I felt the same way about the Middle East, and yet . . . conditions can be created where it's advantageous to all to reach some accommodation. You also have to consider the alternative. What if you don't try, and what if that region continues to fester and fight? And how long can you keep this thing confined before it really spreads and grows? I'm not as pessimistic as history will tell us that we ought to be." ■



National Report

AFA on Key Health Care Task Force

AFA has been focusing on an issue that affects many of its members: access to health care. Service members, retirees, and dependents want to know how health care will be administered under TRICARE. The Department of Defense has acknowledged that access to health care in the future is on everyone's mind.

AFA Executive Director John Shaud is one of the leaders of a task force created by the Military Coalition to identify alternative health care for military members and dependents.

The advent of TRICARE and the limited access for dependents prompted the Military Coalition's 26 military-oriented associations to study alternatives for health care in the military system. TRICARE is the Department of Defense's comprehensive managed health care program for active-duty and retired families. It is designed to expand access to care, to maintain quality and control costs for patients and taxpayers.

The Coalition's Health Alternative Reform Task Force was formed after it became clear that TRICARE would shortchange retired service members who are 65 or older by relegating them to a space-available only option in military facilities or by consigning them to the Medicare system. AFA and the Coalition believe that TRICARE violates the promise of lifetime health care for retirees who have reached age 65.

The options AFA and the Task Force are pursuing include health care alternatives for Medicare-eligibles and options aimed at improving care for all dependents who are currently in the military medical system. The goal: improve access for beneficiaries in DoD-sponsored health care and better meet the health needs of retired beneficiaries.

The Task Force identified four alternatives for those who participate in the military health care system; Medicare Subvention, Worldwide Rx Drug Coverage, CHAMPUS Second Payer to Medicare, and Federal Employees Health Benefits Program (FEHBP).

Medicare Subvention is the reimbursement by the Health Care

Financing Administration (HCFA) to DoD for any Medicare reimbursable care provided. Current law prohibits DoD from receiving reimbursement for the medical care it provides to Medicare-eligible military retirees and

"AFA has long supported health care reform initiatives that would provide 'seamless' care to those reaching age 65."

dependents. Medicare subvention would allow military retirees under age 65 who are enrolled in TRICARE to maintain this health care when they turn age 65.

In the area of Worldwide Rx Drug Coverage, CHAMPUS-eligible beneficiaries still have access to an affordable prescription benefit. But Medicare does not provide drug coverage, and only three of the ten authorized Medigap supplemental insurance policies pro-

vide a prescription benefit. A worldwide prescription drug benefit for Medicare-eligible beneficiaries would address the loss of this benefit by those who are forced out of TRICARE at age 65 under the current system.

CHAMPUS Second Payer to Medicare is any approach aimed at supplementing Medicare coverage by coordinating benefits or using a "benefits less benefits" formula. Using either method, Medicare must first pay all allowable amounts before a claim can be filed with CHAMPUS. Similarly, CHAMPUS deductibles must be met before CHAMPUS pays.

Finally, the Federal Employees Health Benefits Program (FEHBP) option involves incorporating the entire military community except active-duty members into this program, including Medicare-eligibles. FEHBP provides several types of health insurance plans including fee-for-service and prepaid managed care programs (HMOs). It also has the widest choice of the alternatives considered by the Task Force: seven national plans and over 100 plans in local areas.

AFA will continue to work these important issues and to keep its members abreast of the progress.

Attention Online Users!

Over the past few months, we have reported on AFA's Home Page on the World Wide Web (<http://www.afa.org/>). We have also noted that access to the Internet's World Wide Web can be gained through established online services, like America Online, Compuserve, and Prodigy, or through direct connections to the Internet.

During a two-week period in October, America Online users were unable to reach AFA's Web site on the Internet. The problem affected AFA and others who maintain sites in a certain sector of the Internet. America Online ultimately corrected the problem; however, the trade press continues to report problems with AOL's e-mail, with its Internet connections, and with the standards built into its Web browser. AOL is trying to correct these problems, but rapid expansion continues to take a toll on its services.



By Frances McKenney, Assistant Managing Editor

Running For the Memorial

Dressed in patriotic red shorts and a white and blue singlet, Navy Cmdr. Roy Harkins ran off with first prize in the first Air Force Memorial 5K Classic.

The Air Force Memorial Foundation, backed by the **Nation's Capital** and **Donald W. Steele, Sr. (Va.), Memorial Chapters**, sponsored the road race in Arlington, Va., in October. The event attracted a field of 200 runners.

Air Force Secretary Sheila E. Widnall biked ten miles from home to attend the race. Vice Chief of Staff Gen. Thomas S. Moorman, Jr., joined her in presenting awards at the post-race festivities.

The out-and-back course began near AFA headquarters, with the Pentagon as the turnaround. It passed the site of the future Air Force Memorial on Arlington Ridge and covered a stretch of road familiar to Marine Corps Marathon runners.

Commander Harkins, stationed at the Pentagon in the Office of the Secretary of Defense Program Analysis and Evaluation Office, said he used this race as part of "tuning up" for that late October marathon. He finished in 16:36. Cathy Ventura-Merkel, the overall women's winner, came in at 19:20. A well-known area runner, she regularly takes first place in the women's master's category age forty to forty-nine in local road races.

AFA's Executive Director John A. Shaud had three comments on his second-place finish in his age category. First, he said, he wanted to finish. Second, "I gave new meaning to the phrase 'Women and children first.'" Last, he joked, he understood that it was better for morale if the new boss didn't win the race.

For America's Ace of Aces

By downing forty enemy aircraft in the Pacific in World War II, Maj. Richard I. Bong earned the title of America's Ace of Aces. He died on August 6, 1945, while testing a Lockheed P-80 Shooting Star in Burbank, Calif.

USAF donated to the fighter ace's hometown of Poplar, Wis., a P-38



A week after celebrating his first-place finish in the Air Force Memorial 5K with Air Force Secretary Sheila Widnall and Gen. Thomas Moorman, Jr. (right), Navy Cmdr. Roy Harkins went on to win a half-marathon in Maryland.

Lightning like those flown by Major Bong. In 1955, the plane became part of a memorial to the Medal of Honor recipient and has been on display outdoors since then. Over the years, it has been severely damaged by the weather, so volunteers from the 148th Fighter Group (ANG), Duluth IAP, Minn., and a group of civilians, backed by the **Richard I. Bong (Minn.) Chapter**, have been restoring it since 1994.

TSgt. Pat Clancey said that the airplane's brakes and backing plates are gone, its five landing gear doors are missing, and the front two and a half feet were cut off when it was originally mounted. "We're still looking for tires for it," he added.

Once the restoration is complete, the P-38 will be the main attraction at the Richard I. Bong Heritage Center to be built in Poplar, near the twin cities of Superior, Wis., and Duluth, Minn.

Saying Goodbye

The **Edward A. Stearn (Calif.) Chapter** hosted a golf tournament and a gala reunion dinner for 600 people in San Bernardino, Calif. It

marked the end of Detachment 10 of the Space and Missile Systems Center, Los Angeles AFB, Calif.

Once called the Ballistic Missile Organization (BMO) and also the Ballistic Systems Division, at Norton AFB, Calif., Detachment 10 was deactivated September 28. Its civilian employees moved on to Kirtland AFB, N. M., and to other units at Los Angeles AFB, and its ICBM programs went to Hill AFB, Utah.

The Stearn Chapter organized the salute because those who worked for the BMO were among the charter members of the chapter, which now has 1,045 members. Former unit members and contractors were invited to the September salute.

"It was like a family reunion," said Col. Daniel A. Dansro, Detachment 10's commander. He said the guests stayed at the dinner until 1:00 a.m.

Three former commanders of the organization attended the reunion-deactivation: Lt. Gen. Aloysius G. Casey, USAF (Ret.), Lt. Gen. Edward P. Barry, Jr., USAF (Ret.), and Maj. Gen. Ralph G. Tourino, USAF (Ret.). General Casey delivered a keynote address focusing on memo-

ries of the BMO. Special guest speaker Brig. Gen. William F. Moore, Program Executive Officer, Bombers, Missiles, and Trainers, spoke about supporting the ICBM function and where it is heading.

Colonel Dansro invited the chapter namesake's widow, Mrs. Pat Stearn, and her daughter Pat as his guests.

Pride in a Native Son

He was the only native South Dakotan awarded the Medal of Honor during World War II. He also served as governor of the state and founded the South Dakota Air National Guard. He has led several national organizations and is a former President of AFA. No wonder the Mount Rushmore State is proud of Joe Foss.

In August, **Dacotah (S. D.) Chapter** members, National Vice President (North Central Region) Vic Sea-



Vic Seavers (left) and John Kittelson (right) joined South Dakotans in honoring Joe Foss at the August dedication of a bronze statue of Foss, a Medal of Honor recipient and former AFA President.



Former WASP Ann Hamilton Tunner, subject of a documentary shown at the Langley (Va.) Chapter's Salute to Air Combat Command, gives a thumbs up to a backseat ride in an F-15D at the 1st Fighter Wing, Langley AFB.

vers, and John E. Kittelson, a former National Vice President (North Central Region) and National Director, joined the city of Sioux Falls, S. D., in dedicating a life-size statue of Joe Foss at Joe Foss Field.

The ceremony was part of the city's three-day remembrance of the end of World War II. Dacotah Chapter members served on the city's organizing committee for the celebration, helping to plan everything from a fly-in, barbecue, and pass-in review, to a dinner, awards ceremony, and memorial service. The chapter also

raised funds for the statue—receiving donations from millionaires Lamar Hunt and H. Ross Perot—and is collecting for a Joe Foss scholarship.

Lead Disney sculptor Blaine Gibson created the bronze likeness of Mr. Foss, depicting him as a World War II fighter pilot.

Saluting ACC

The **Langley (Va.) Chapter's** annual Salute to Air Combat Command Gala at the Virginia Air and Space Museum attracted 1,000 military and civilian guests, reported Bill Fedor,

chapter Vice President (External Communications).

The highlight of the event was the documentary "Four Who Flew" by Col. Jay Welch, USAF (Ret.). It featured four local aviators: Col. Joel Thorvaldson, USAF (Ret.), a P-40 and P-47 fighter pilot in the South Pacific; Lt. Col. James O. Tyler, USAF (Ret.), a fighter ace in North Africa and Italy; Lt. Col. Bill Russell, USAF (Ret.), who flew fighters, bombers, and transports in the European theater; and Ann Hamilton Tunner who learned to fly at Tulane University, La., and logged more than 1,600 hours with the WASPs.

Same Name, Different Party

North Carolina State President Alton V. Jones worked with the father; now he works with the son. Mr. Jones first knew Rep. Walter Jones, Sr. (D-N. C.), who served in the US House of Representatives from 1966 until his death in 1992. Today he maintains ties to Rep. Walter Jones, Jr. (R-N. C.), who was the featured speaker at the North Carolina State Convention.

Another convention speaker was William Goodyear, from Northrop Grumman Corp.'s B-2 Division.

Goldsboro, N. C., teacher Norma Griffin of the **Scott Berkeley Chapter** was named Member of the Year for her leadership as state coordinator of the Young Astronauts Program. Other honored guests included Brig. Gen. Lance L. Smith, new commander of the 4th Wing, Seymour Johnson AFB, N. C., and Col. D. L. Johnson,

vice commander of the 23d Wing, Pope AFB, N. C.

The convention reelected its current state AFA leaders: President Jones, Vice President (East) John White, Vice President (Central) Homer Hayes, Vice President (West) Jim Mulligan, Secretary Bill Michael, and Treasurer Ed Greene.

USAF's Musical Message

The student newspaper spared no superlatives, describing it as a "flawless and majestic performance."

With a program covering everything from John Philip Sousa to Broadway and including highlights from more than a dozen operas, the US Air Force Band and the US Air Force Singing Sergeants performed before an appreciative audience at a University of Connecticut concert in October.

The **General George C. Kenney (Conn.) Chapter** and Connecticut State AFA helped sponsor the event, held at the university's Storrs campus. Connecticut State President Joseph A. Gosselin and Vice President (Communications) Joseph A. Zaranka attended the concert. Mr. Zaranka reported that the audience asked for two encores from the band and the official USAF chorus.

The US Air Force Honor Guard provided a color team for the concert.

Chapter News

Maxine Donnelly, director of Aerospace Education for the **Nassau Mitchel (N. Y.) Chapter**, and other AFA members attended the groundbreaking ceremony in Duxford, UK,



AFA National Director Mary Ann Seibel (left) and retired Maj. Gen. Jeanne Holm, USAF's first female general, met at ground-breaking festivities for the Women in Military Service For America Memorial at Arlington National Cemetery. Ms. Seibel has spearheaded AFA's support of the memorial.

for the American Air Museum in Britain. The museum is being built to honor Americans based in the UK during World War II and is scheduled to be completed in 1997. US ambassador to Britain, Adm. William J. Crowe, Jr., USN (Ret.), attended the ceremony, along with Col. John Doolittle, son of Gen. Jimmy Doolittle.

Air Force Secretary Widnall received a crystal clock at the Congressional breakfast hosted by Massachusetts at the AFA National Convention in September. The gift presentation was the idea of Winston S. Gaskins of the **Pioneer Valley Chapter**, who was

then Massachusetts State President. He thought it would give "a more formal flavor" to the Bay State's breakfast, explained State Vice President (Communications) Maj. James Joyce, an Air Reserve technician at Westover ARB, Mass. Other guests at the breakfast included National Director R. L. Devoucoux Jay Contis, legislative director for Rep. Peter Blute (R-Mass.); and Steve Wolfe, defense legislative assistant to Sen. Edward M. Kennedy (D-Mass.).

Ivan L. McKinney, former Louisiana State President, recently presented Brenda K. Collins with the Teacher of the Year Award for the South Central Region. Mrs. Collins, a second grade teacher at Sun City Elementary School in Bossier City, La., received \$500 from AEF as part of her award. Mr. McKinney said that AFA's South Central Region chose Mrs. Collins because she is a role model and an excellent teacher and is devoted to her students.

Still trim in her World War II uniform, former WASP Vi Cowden was the featured speaker at the September meeting of the **General Doolittle Los Angeles Area (Calif.) Chapter**. She described her determination to become a pilot—despite accidentally buzzing some chickens in an early solo flight—and her experiences in ferrying all types of aircraft.

At this meeting, Sally Moretti received one of ten Air Force Spouse Scholarships that AEF awarded this fall. She is the wife of Capt. George Moretti from Los Angeles AFB and will use her scholarship to pursue graduate degrees in psychology. Hon-



SrA. Brad Johnson, TSgt. Pat Clancey, SSgt. Dave Chinander (l-r), other Minnesota ANG members, and the Richard I. Bong (Minn.) Chapter are restoring a P-38 for the Richard I. Bong Heritage Center to be built in Poplar, Wis.

ored guest J. Royden Stork, who was a copilot in the Doolittle raid over Tokyo, presented the award to Mrs. Moretti.

Longs Peak (Colo.) Chapter invited the Collings Foundation to bring its fully restored B-17 Flying Fortress and B-24 Liberator to the Fort Collins Downtown Airport. Chapter President James S. Strickland said a huge publicity campaign—including eighty radio announcements, 400 posters, and announcements at local clubs—brought more than 6,000 visitors to see the vintage aircraft. Many veterans came in their World War II uniforms, and the airplanes were fully booked for rides.

When Holloman AFB, N. M., began planning a "Victory in the Pacific" celebration, it called Frank S. Gentile, then AFA State President, for help. Mr. Gentile, a member of the **Fran Parker Chapter**, served on a committee to find pilots from World War II ace Richard I. Bong's 49th Fighter Group and other veterans who trained during World War II at what

was then Alamogordo AAF. New Mexico State AFA also donated \$300 to help the project get under way.

In Indianapolis, Ind., fourth grade teacher Lee Ann Richardson came across "Space Almanac" in *Air Force Magazine's* August 1995 issue and immediately recognized it as a great teaching tool. She called **Central Indiana Chapter** President Ted Wells for help in getting thirty copies of the magazine. Educational resources are at a premium, she pointed out, and the magazines will be an invaluable asset for her students.

We Just Keep Growing

Former National Treasurer and National Director Jack B. Gross has established a cash award to encourage chapters to recruit new members.

Five awards range in amount from \$500 to \$1,500. They will be given annually to chapters with the most new members as a percentage of chapter size at the beginning of the membership year and with a minimum of

ten new members. The traditional size categories will apply, with an extra category for chapters over 1,500.

Seeking Korean War Photos

The "World War II Scrapbook" in the September 1995 issue proved to be such a popular feature that *Air Force Magazine* is planning a "Korean War Scrapbook."

For this feature, the magazine seeks personal snapshots (rather than official photos), from 1950 to 1953, of current AFA members who are veterans of the Korean War. The photos will be copied and the originals returned promptly.

Please mail photos and their descriptions before March 15 to *Air Force Magazine*, Attn: Scrapbook, 1501 Lee Highway, Arlington, VA 22209-1198.

Have AFA/AEF News?

Contributions to "AFA/AEF Report" should be sent to *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 274-5855. ■

Unit Reunions

Pilot Class 43-H, Marfa, Tex. February 8-10, 1996, in Orlando, Fla. **Contact:** Lt. Col. Raleigh H. McQueen, USAF (Ret.), 50 Ramsgate Rd., Savannah, GA 31419. Phone: (912) 925-6575.

Cadet Classes 44-E/F, Western Flying Training Command. May 23-26, 1996, at the Doubletree Hotel in Tucson, Ariz. **Contact:** Pilot Class 44-E/F, P. O. Box 105, Mt. Vernon, VA 22121.

Pilot Training Class 52-C. May 1-4, 1996, at the St. Anthony Hotel in San Antonio, Tex. **Contact:** Hugh B. Foster, 1434 Copperfield Rd., San Antonio, TX 78251. Phone: (210) 647-5218.

63d Station Complement Squadron, 9th Air Force (World War II). June 21-23, 1996, at the Riverside Inn in Portland, Ore. **Contact:** Verl Tunison, 339 Telford Rd., Oregon City, OR 97045. Phone: (503) 656-8749.

65th Fighter Squadron, 57th Fighter Group (World War II). March 28-31, 1996, in Columbia, S. C. **Contact:** Col. James C. Hare, USAF (Ret.), 1700 Chimney Swift Lane, West Columbia, SC 29169-5418. Phone: (803) 796-0751.

316th Fighter Squadron (World War II). June 4-6, 1996, at the Hilton Hotel in Wilmington, N. C. **Contact:** Col. James T. Johnson, USAF (Ret.), 201 Pelican Walk, Hampstead, NC 28443. Phone: (910) 270-4635.

613th, 847th, and 848th Squadrons, 511th Aircraft Control and Warning Group. May 9-11, 1996, at the Marriott Hotel in Dayton, Ohio. **Contacts:** Capt. Donald D. Simmons, USAF (Ret.), 704 S. Grove Rd., Richardson, TX 75081. Phone: (214) 231-6518. CMSgt. Richard A. Nell, USAF

(Ret.), 16012 Big Ridge Rd., Biloxi, MS 39532-2758. Phone: (601) 392-6519.

3558th Combat Crew Training Squadron. May 1-2, 1996, in San Diego, Calif. **Contact:** Harry Parker, 3816 Lake Tree Dr., Fallbrook, CA 92028. Phone: (619) 728-8292.

3917th Air Base Group, 3931st Air Base Squadron, RAF Stations Manston and East Kirkby, England. May 31-June 2, 1996, in Natchez, Miss. **Contact:** MSgt. George J. McNally, USAF (Ret.), 123 School Rd., Bethel, PA 19507. Phone: (717) 933-4849. Fax: (717) 933-5839.

Oklahoma State University, Detachment 670, AFROTC. For a fiftieth-anniversary reunion in 1996, seeking contact with alumni and cadre. **Contact:** Fiftieth Anniversary, Oklahoma State University, 218 Thatcher Hall, Stillwater, OK 74078-0207. Phone: (405) 744-4009 or (405) 744-7744.

RAF Welford, Newbury, Berkshire, England. Seeking veterans who served at RAF Welford to plan a reunion in late summer 1996, in St. Louis, Mo. **Contacts:** Boyd Oliver, P. O. Box 81, Erath, LA 70533. Phone: (318) 937-8237. CMSgt. William M. Poe, USAF (Ret.), 220 Dominica Cir., Niceville, FL 32578-4068. Phone: (904) 897-4163.

19th Casualty Staging Flight, Clark AB, the Philippines (1965-67). Seeking former members for the purpose of compiling a roster for a future reunion. **Contact:** Douglas F. Strecker, 411 Wisconsin Dr., #301, Jefferson, WI 53549.

Pilot Class 55-E. Seeking former members interested in a reunion in 1996. **Contact:** Donald R. Paul, 11955 State Rte. 47E, West Mansfield, OH 43358. Phone: (513) 355-4201.

Pilot Class 56-D. Seeking former members interested in a reunion in 1996 or 1997. **Contact:** Robert W. Hall, P. O. Box 4124, Honolulu, HI 96812-4124. Phone: (808) 949-3200.

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.

857th Medical Group, Clinton-Sherman AFB, Okla. (1960s era). Seeking contact with former members to plan a reunion in summer 1996. **Contact:** Henry Clerval, 1021 Richfield Dr., Newark, DE 19713.

3225th Drone Squadron. Seeking enlisted personnel interested in obtaining reunion information for mid-1996, in Orlando, Fla. **Contact:** George B. Pittelkau, 5670 S. W. Fernbrook Way, Lake Oswego, OR 97035-7726. Phone: (503) 639-5077. ■

Bulletin Board

Seeking information on Army Special Forces Sgts. George R. Brown, Alan Boyer, and Charles Huston or anyone with knowledge of a **20th Special Operations Squadron** CH-3 helicopter's unsuccessful rescue attempt of a special operations group spike team in March 1968 near Tchepone, Laos. **Contact:** Jack Kull, 3228 Cambridge Ct., Fairfax, VA 22030.

Seeking contact with Harold J. Gorrell of Jackson, Mich., Robert E. Renkert of Kent, Ohio, and Joseph R. Schlenker of Compton, Calif., all former members of the **54th Troop Carrier Squadron** (World War II) in Alaska. **Contact:** Richard T. Short, 11466 Queens Dr., Omaha, NE 68164-2229.

Seeking the whereabouts of **Lieutenant Trenck**, 71st TCS, 434th TCG, who piloted a C-47 on which **Joseph Kenny** was jump master. **Contact:** G. Paul Gerbracht, 2114 W. 29th St., Erie, PA 16508.

Seeking USAF special operations and rescue unit **patches**, pre-Vietnam War era through present day. **Contact:** SSgt. James R. White, Jr., 1604 Ashby Square, Apt. J, Edgewood, MD 21040.

Seeking contact with **1st Lt. Leon Oliver**, 359th Fighter Squadron, 356th Fighter Group, who shot down a German Ar-234 April 18, 1945. **Contact:** Charles W. Getz, P. O. Box 412, Burlingame, CA 94011.

Seeking the whereabouts of **Lts. Kenneth Geyer, Charles Reinke, Arthur Sortore, and James Walton**, former members of the 27th Fighter-Bomber Group. **Contact:** Bob Bryant, 10395 S. W. 76th St., Miami, FL 33773.

Seeking information on **Swan Islands**, Honduras, 1984-87, when Seabee detachments extended the runway for Contra supply operations and training. Also seeking information on military women awarded the Distinguished Flying Cross. **Contact:** Gale J. Raymond, P. O. Box 35695, Houston, TX 77235.

Seeking the whereabouts of **Sgt. Walter Wright**, stationed in Cambridgeshire, UK, in 1963. **Contact:** Pauline Loftus, Flat #4, 3 Robertson Terr., Hastings, East Sussex, UK.

Seeking patches for, photos of, and information on the **B-58 Hustler**. **Contact:** Capt. Charles K. Svec, USAF, 2138-B Rockwood Rd., Scott AFB, IL 62225-1425.

Seeking information on and contact with anyone who worked on the **Beech T-36A** program in the early 1950s. Also seeking photos of subassemblies and the first T-36A. **Contact:** Wayne Saunders, 4542 Chateau Pierrefonds, Pierrefonds, Quebec H9K 1L6, Canada.

Seeking the whereabouts of **Hank Mohler**, a navigator at Hickam AFB, Hawaii, and at Scott AFB, Ill., in the 1960s. **Contact:** SMSgt. Thomas W. Pennington, 177 S. Carlisle Ave., Lehigh Acres, FL 33936-1143.

Seeking **patches**—especially the wing patch—from the 509th Bomb Wing, Pease AFB, N. H. **Contact:** SSgt. Anthony M. Ford, 70 Triton Ave., Winthrop, MA 02152-1452.

Seeking contact with **Dennis Card**, from Erie, Pa., who was stationed at Carswell AFB, Tex., 1963-64. **Contact:** Shirley Shaw, 307 S. Dodson Dr., Urbana, IL 61801-4505.

Seeking SR-71, A-12, and YF-12 "Blackbird" **patches**, photos, and memorabilia. **Contact:** William L. Dahlstedt, 250 Lee Ave., Hicksville, NY 11801-5859.

Seeking a **patch** for the 681st Air Control and Warning Squadron. **Contact:** Dan Grace, 35B Oakbrook Dr., Amherst, NY 14221.

Seeking information on **Sgt. Ben Gurule**, from Raton, N. M., and stationed in Seoul, South Korea, in 1952. **Contact:** Art Rideout, 2235 Gum Tree Lane, Fallbrook, CA 92028.

Seeking contact with **Private Alexander Schneider**, originally from Brooklyn, N. Y., who was stationed at Camp Creswell, UK, in summer 1944. **Contact:** Margie Turner, Flat 2, 12 Queen St., Cheadle, Staffordshire ST10 1BJ, UK.

Seeking the whereabouts of **George R. Janissee**, originally from Toledo, Ohio, and **Joseph Kennedy**, from Lawrence, Kan., who were with the 490th Bomb Group, World War II. **Contact:** Robert Tennenberg, 28 Meadow Lane, Riverhead, NY 11901.

Seeking contact with former **Operation Linebacker F-4 crew members**, including chaffers, strikers, and escorts. **Contact:** Marshall Michel, 6815 Blue Curl Cir., Springfield, VA 22152.

If you need information on an individual, unit, or aircraft, or if you want to collect, donate, or trade USAF-related items, write to "Bulletin Board," Air Force Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be brief and typewritten; we reserve the right to condense them as necessary. We cannot acknowledge receipt of letters. Unsigned letters, items or services for sale or otherwise intended to bring in money, and photographs will not be used or returned.—THE EDITORS

Looking for someone? Comprehensive phone books are now available on CD-ROM. They list eighty million residential phone numbers from every directory in the US. Your local library may have this resource to help put you in contact with your friends and relatives.

Seeking a report by **Maj. Eugene B. Mechling, Jr.**, or contact with anyone with knowledge of the shootdown of **Capt. Robert L. Simpson** near My Tho, Vietnam, August 28, 1962. **Contact:** Eugene D. Rossel, 6083 Rosa Ct., Chino, CA 91710.

Seeking information on, stories about, and photos of **special operations forces** in World War II. **Contact:** William T. Y'Blood, 7421 Ridge Oak Ct., Springfield, VA 22153.

For a museum, seeking information on and photos of **C-130A #57-0457**. Also seeking contact with its flight and ground crews. **Contact:** SSgt. Damon E. Blair, 3245 S. Wilmot Rd., Apt. #2107A, Tucson, AZ 85730.

Seeking contact with **Fred L. Doggmayer**, who was stationed at RAF Sculthorpe, UK. **Contact:** Margaret Flannery, 9 Wallers Close, Woodford Bridge, Essex IG8 8BL, UK.

Seeking the whereabouts of **James McNamara** and **C. B. Clark**, who were stationed at Brooks Field, Tex., 1940-42. **Contact:** Bill Chaffin, 7301 Winnell Way, North Richland Hills, TX 76180.

Seeking contact with **485th Tactical Missile Wing** veterans who were stationed at Florennes AB, Belgium. **Contact:** MSgt. John Rudzianski, USAF (Ret.), P. O. Box 339, South Montrose, PA 18843-0339.

For a book, seeking to interview **Vietnam War** veterans. **Contact:** John Maddux, 116 Rowland Pl., Tyler, TX 75701.

Seeking information on **Sgt. Joe Atchley**, a B-17 gunner in Europe who also served in the Pacific area. **Contact:** Paul W. Cox, 2386 E. Wayland St., Springfield, MO 65804-3333.

For a unit history, seeking contact with and memorabilia from veterans of the **381st Bomb Group**, 381st Strategic Missile Wing. **Contact:** Commander, 381st Training Group, 1472 Nevada Ave., Vandenberg AFB, CA 03437-5314.

Seeking contact with members of **Pilot Training Class 52-G**. **Contact:** Lt. Col. Randy Presley, P. O. Box 1238, Mt. Pleasant, TX 75456-1238.

Seeking contact with flight or ground crew members from the **16th Reconnaissance Squadron**, 16th Reconnaissance Group, who were stationed in North Africa and Foggia, Italy. **Contact:** Steve Fisanick, 3031 McKinley Ave., Dearborn, MI 48124.

Organization members seeking to correspond with former or current **service members**. **Contact:** Mary Schanz, P. O. Box 54831, Cincinnati, OH 45254-0831.

Seeking a **patch** and aircraft markings for the 8th Photoreconnaissance Group, World War II, and silhouettes of the unit's F-5G (P-38). **Contact:** Arthur Augspurger, 2212 S. Prospect Ct., Springfield, MO 65804-3110.

Seeking **patches** from the 3615th and 3617th Pilot Training Squadrons, Craig AFB, Ala., 1962-63. **Contact:** Col. Ray Hunter, USAF (Ret.), 1601 Dicken Dr., Ann Arbor, MI 48103.

Seeking **patches** for North American Air Defense Command and the 453d Bomb Group. **Contact:** Lt. Col. Seth Heywood, USAF (Ret.), 284 Webster St., Manchester, NH 03104.

Seeking the whereabouts of **MSGT. Thomas Tabor** and Melba Tabor, from Michigan, who were stationed at Edwards AFB, Calif., in 1964. **Contact:** Evelyn Mairs, P. O. Box 24743, Dayton, OH 45424.

Seeking information on and photos of **Maj. Paul H. Dane**, who made the first liquid-fueled Jet-Assisted Takeoff flights in the US in April 1942. **Contact:** Henry Matthews, c/o Walt Roberts, 131 Alameda Ave., Fircrest, WA 98466.

Bulletin Board

Seeking photos of and contact with former commanders of the **39th Wing** and its units, including **Cols. Paul N. Chase, Curtis H. Emery II, and Clyde H. Garner** and **Lt. Cols. Warren P. Bullock, James Giannatti, and James M. Smith**. **Contact:** SSgt. Patrick D. Longe, 39th Wing/HO, Unit 7090, Box 110, Incirlik AB, Turkey, APO AE 09824-0110.

Seeking contact with **Ben Allen**, a base operations dispatcher at Williams AFB, Ariz., 1953-54, originally from Prescott, Ariz. **Contact:** Tom Hegre, 3800 Ballard Dr., Carmichael, CA 95608.

Seeking information on and **photos** of the F-14, F-15, F-111, F-117, SR-71, B-2, A-10, AH-64, and the SuperCobra. **Contact:** Murat Yildirim, 3 Ana Jet Üs Kom., Astsubay, Misafirhanesi, Konya 42302, Turkey.

Seeking information on the **63d Bomb Squadron**, 43d Bomb Group, and contact with anyone who knew **Lt. James E. O'Brien** in the Pacific area, 1943-44. **Contact:** Al O'Brien, 538 N. Stone Ave., LaGrange Park, IL 60525.

Seeking contact with F-100 instructors **Maj. Duane R. Mill, Capt. Robert A. Preciado**, and **1st Lts. Steve Braswell, Robert J. Cameron, and Bob Johnston** or others with knowledge of F-100 transfers to Taiwan in the 1950s. **Contact:** Clarence Fu, P. O. Box 112-129, Taipei, Taiwan.

Seeking aerial photos of **DaNang AB**, South Vietnam, taken around 1969, and **Kimpo AB**, South Korea, in 1960. **Contact:** CMSgt. Charles L. McCarn, USAF (Ret.), 842 Ravenwood Ct., Biloxi, MS 39532.

Seeking the whereabouts of **Jack or Kathy Brown**, who were stationed at Keesler AFB, Miss., 1950-51, originally from Covington, Ky. **Contact:** CMSgt. A. W. Hammer, USAF (Ret.), 1549 Indian Dr., Sebring, FL 33872.

Seeking information on **Operation Little David** at Tyndall AFB, Fla., in 1958. **Contact:** Lt. Col. Nick Apple, USAF (Ret.), 1170 Cymar Dr. E., Beavercreek, OH 45434.

Seeking **patches**, insignia, and pins from all services. **Contact:** Rod Gerhardt, 45014 Denmore Ave., Lancaster, CA 93535.

Collector seeks **identification tags** from Stalag Luft POWs (World War II). **Contact:** James J. Iverson, 18W074 Williamsburg Ln., Villa Park, IL 60181.

Seeking information on **air base security battalions** in World War II and **military police** (avia-

tion) companies, 1941-47. **Contact:** John W. Brokaw, University of Texas at Austin, Department of Drama, Austin, TX 78712.

Seeking contact with **Sgt. Gene Novak** (or Novack), stationed at Burtonwood, UK, in World War II. **Contact:** Maj. Jack E. Harden, USAF (Ret.), 1035 156th Ave. N. E., #28, Bellevue, WA 98007.

Seeking contact with **SSgts. Harold L. DeLay** and **Harold W. Beaver** of the 714th Bomb Squadron, 448th Bomb Group, or anyone who knew **1st Lt. John M. Williams**. **Contact:** Theresa L. Jones, Hq. USAREUR, CMR 420, Box 1952, APO AE 09063.

To anyone affiliated with Gulfport AAF, Miss., offering for free a bound copy of **Wings Over America**, published in 1944. **Contact:** CMSgt. Thomas W. Baer, 5 Oakwood Lane, #6, Goffstown, NH 03045-2598.

Seeking contact with the crew of a **774th Bomber Squadron B-17**, based at Celone AAF, Italy, shot down April 24, 1944, on a Ploesti raid. Also seeking contact with anyone who knew its navigator, **2d Lt. John G. O'Keefe**, or pilot, **2d Lt. Robert Masperi**. **Contact:** Francis H. Hoar, 90 Hilltop Dr., Sunapee, NH 03782.

Seeking contact with former members of the **6th Night Fighter Squadron**, 7th Air Force Night Fighter Association. **Contact:** Alan Davilla, Pacific Coast Air Museum, 2330 Airport Blvd., Santa Rosa, CA 95403.

Seeking **patches** from Tiger and William Tell meets and 2d and 4th ATAFS. Also will trade for foreign pilot and parachutist wings. **Contact:** Gordon Biss, Site 50, Comp. 19, R. R. #1, Comox, British Columbia V9N 5N1, Canada.

Seeking Strategic Air Command flying and missile unit **patches**, 1946-73. Also seeking aircraft photos, unit histories, and memorabilia. **Contact:** Charles R. Orr, 11404 Turnmill Lane, Reston, VA 22091-3618.

Seeking **restorable** World War II liaison aircraft **L-2, L-3, L-4, or L-5**. **Contact:** Maj. Charles T. McLaurin, 116 Loch Laurin Lane, Rockingham, NC 28379.

Seeking contact with members of any unit in the **68th Air Service Group**, China (World War II). **Contact:** MSgt. Bob Pierce, USAF (Ret.), P. O. Box 150061, Lakewood, CO 80215-0061.

Seeking **patches** and photos of F-106s. **Contact:** Mike Cooley, P. O. Box 729, Indian Springs, NV 89018.

Seeking old-style USAF master sergeant **patches**. **Contact:** Ken McNall, 1114 First St., Cheney, WA 99004.

Seeking the whereabouts of **Harold Martin Knorr**, an ATC pilot who flew the Hump in World War II. He may have been an engineer at Vandenberg AFB, Calif., in 1976. **Contact:** Col. Ronald E. Mintz, USAF (Ret.), 4917 Ravenswood Dr., #1214, San Antonio, TX 78227.

Seeking information on or photos of **helicopters** surrendered to US forces in southern Germany in May 1945. **Contact:** Steve M. Coates, 150 Upplands Rd., West Moors, Ferndown, Dorset BH22 0EY, UK.

Seeking photos of **RF-4C, #64-1067**. It was at Shaw AFB, S. C., Tan Son Nhut, South Vietnam, and Birmingham Airport, Ala., and also flew in the Persian Gulf War. **Contact:** Col. Wayne C. Pittman, Jr., 498 Carthage Dr., Beavercreek, OH 45434-5865.

Seeking the whereabouts of **Gary Cummins** (or Cummings), originally from Ohio, who attended Ryebank High School, Liverpool, UK, and whose father was stationed at Burtonwood, 1954-57. **Contact:** Christopher J. Helliar, 19 Wychwood Ave., Knowle, Solihull, West Midlands B93 9DF, UK.

Seeking contact with anyone who knew **Lieutenant John P. Priecko**, who flew B-17s and B-29s during and after World War II. **Contact:** Col. John P. Priecko, USAF, 5921 Queenston St., Springfield, VA 22152-1721.

Seeking the whereabouts of **Phillip Paul Milano**, from Connecticut, a second lieutenant in Ninth Air Force during World War II, stationed at Aldermaston, UK. He knew Muriel Bishop of Reading, Berkshire. **Contact:** Maria W. Craig, 66 Lonsdale Dr., Rainham, Gillingham, Kent ME8 9HZ, UK.

Seeking **patches** from USAF fire departments for a collection of the Fire Section, RAAFB Tindal, Australia. **Contact:** Gary A. McIntosh, 914 SUG/CEF, 2250 Franklin Dr., Niagara Falls, NY 14304-5050.

Seeking contact with crew or passengers of Strategic Air Command **C-124, #0090**, which crashed at CFB Mount Hope, Canada, April 17, 1956, en route to Benguerir AB, Morocco. **Contact:** Bradley L. Oswald, 5920 Tollgate Rd., Somerset, OH 43783.

Seeking contact with members of **Pilot Class 45-E**, Luke Field, Ariz. **Contact:** Robert J. Ferguson, 3042 Executive Hills Rd., Las Cruces, NM 88011-4718.

Seeking the whereabouts of 36th Fighter Group members stationed in Panama, 1945-48, including "Cotton" Addis, Dwaine Franklin, Nick Kowtko, "Pinky" Lavender, "Bones" Marshall, and H. P. K. Walmsley. **Contact:** Maj. George E. Kammerer, USAF (Ret.), 6800 Greenleaf Dr., Citrus Heights, CA 95621.

Seeking chest or cap **patches** from the 497th Reconnaissance Technical Group, 1972-74. **Contact:** Lee B. Devine, P. O. Box 10850, Merrillville, IN 46411.

For POW and MIA research, seeking contact with **91st Strategic Reconnaissance Squadron** members who served at Yokota AB, Japan, 1950-55. Also seeking information from Navy or air-sea rescue units familiar with the 91st's operations in the Far East. **Contact:** Don Walsdorf, P. O. Box 245, Spokane, WA 99210-0245.

For a display, seeking information on, photos and slides of, and memorabilia from the **34th Fighter**

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Squadron, Hill AFB, Utah. **Contact:** 1st Lt. Gretchen Lee, USAF, 34 FS/CCQ, 7274 Wardleigh Rd., Hill AFB, UT 84056-5137.

Seeking **posters** of EC-135J aircraft and decals and patches from the former 9th ACCS, Hickam AFB, Hawaii. **Contact:** Edwin A. Sagucio, P. O. Box 27502, San Antonio, TX 78227.

Seeking B-36 and B-52 flight hour **lapel pins** and Strategic Air Command world bombing competition **patches**. **Contact:** Maj. Jerry D. Byers, USAF (Ret.), 10885 S. Santa Fe Lane, Goodyear, AZ 85338.

Seeking crew rosters, documents, and primary witnesses of US aerial defense sorties from **Hawaii, December 7, 1941**. **Contact:** David Aiken, 502 Ball St., Weatherford, TX 76086-2408.

Seeking anyone from the **73d Bomb Wing** who crashed on Eniwetok in a C-54 in November 1944, en route to Saipan. **Contact:** William J. Carruth, 255 W. Fourteen Mile Rd., #A1505, Clawson, MI 48017-1955.

Seeking contact with anyone who knew **John "Jack" Ralph**, who flew on C-74s from 1946 to 1951. **Contact:** Lt. Col. John H. Ralph, USAF (Ret.), 1402 Quail Creek Dr., Enid, OK 73703.

Seeking photos of and information on the **11th Bombardment Squadron** (World War I to present) and **B-17G, #42-97124**, assigned to the 384th Bomb Group, Grafton Underwood, UK, February to April 1944. **Contact:** TSgt. Carol A. Stayer, 5406 Hollyhock Lane, Bossier City, LA 71112.

Seeking the whereabouts of **Steven Webb**, whose father served in Vietnam, in Germany during the 1970s, at Picatinny Arsenal, N. J., and in Italy. **Contact:** Karol van Bingaman, 28-A Englands Lane, London NW3 1PU, UK.

Seeking the whereabouts of **Debbie Caldwell**, who was stationed at North Charleston AFS, S. C., 1973-76. **Contact:** George W. Johnson, Jr., 921 Bridge Ave., Waynesboro, VA 22980.

Seeking a 431st Fighter-Interceptor Squadron **patch**. **Contact:** Richard L. Beltzhoover, 8330 Woodfield Crossing, Suite 130, Indianapolis, IN 46240.

Seeking the whereabouts of **Bill Bouick** (or Borick), an airman first class in 1963 whose last known assignment was at Holloman AFB, N. M. **Contact:** Gisele Voilleurin, 11/37 Rue Robespierre, 52000 Chaumont, France.

To share medical information, seeking contact with **Palomares Broken Arrow** veterans. **Contact:** CMSgt. Victor B. Skaar, USAF (Ret.), 6130 Eisner Dr., Las Vegas, NV 89131-2303.

Seeking photos of and information from those who worked with **ALQ-119** electronic counter-measures pods. **Contact:** John W. McCarty, 514 Southwell Rd., Linthicum, MD 21090-2041.

Seeking the whereabouts of **Billy** who was in Marseille, France, in 1946 and who knew **Paula and Monique Jamet**. **Contact:** Monique Picard, 3 impasse du Logis, 17138 Puilboreau, France.

Seeking the whereabouts of **Fred S. Kramer**, a CFC on B-29s, who was with the 45th Bomb Squadron in India, 1944-45. **Contact:** George W. Heller, 808 Ellington Ct., Indianapolis, IN 46234.

Seeking information on or contact with crew members of a **WB-50** from Detachment 2, 55th Weather Reconnaissance Squadron, Hickam AFB, Hawaii, that flew a high-altitude detonation mission above Johnston Island July 31, 1958. **Contact:** Lt. Col. William A. McKinney, USAF (Ret.), 318 Burgh Westra Dr., Hampton, VA 23669-1760.

Seeking contact with Flight Officer **Peter De Peyster Brown**, an RCAF pilot who joined USAAF in 1942. He was last known to be in California in 1957. **Contact:** Peter E. Vincent, 5 Mountfield Rd., Tunbridge Wells, Kent TN1 1SG, UK.

Seeking contact with anyone who knew **Major Dunlap** or **Captain Madison** and who flew with the **36th Bomb Squadron**, Kodiak Island, Alaska, during World War II. **Contact:** John O. Burcham, 12204 E. 40th St., Independence, MO 64052.

For a USAF recruiting office display, seeking fighter and bomber wing **patches** or other patches of historical significance. **Contact:** TSgt. Steven E. Long, USAF Recruiting Office, 219 E. Main St., Mechanicsburg, PA 17055-6518.

Seeking the whereabouts of **Otis Davis** who was stationed with the Corps of Engineers at Carswell AFB, Tex., 1945-46. **Contact:** Victoria Y. Salinas, 1321 N. Jones St., Fort Worth, TX 76106.

Seeking information on **P-51 Mustangs**, named *Setonia I, II, and III*, that were bought during World War II through Seton Hall Preparatory School fund drives. **Contact:** Bernard J. Reilly, 58 Grant Ave., New Providence, NJ 07974.

Seeking information on USAAF units stationed in **India** during World War II. Also seeking contact with any Air Force officer who has been stationed in India. **Contact:** Vijay Seth, 538, Sector II, Sadiq Nagar, New Delhi 110049, India.

Seeking photos of and information on the **451st Bomb Group's** bombing of Milan, Italy, October 20, 1944. Also seeking contact with 451st unit members **Captains Collins and Kacena** and **Lieutenants Coley, Elahey, and Ingram**. **Contact:** Achille Rastelli, via Gaspare Aselli 20, 20133 Milan, Italy.

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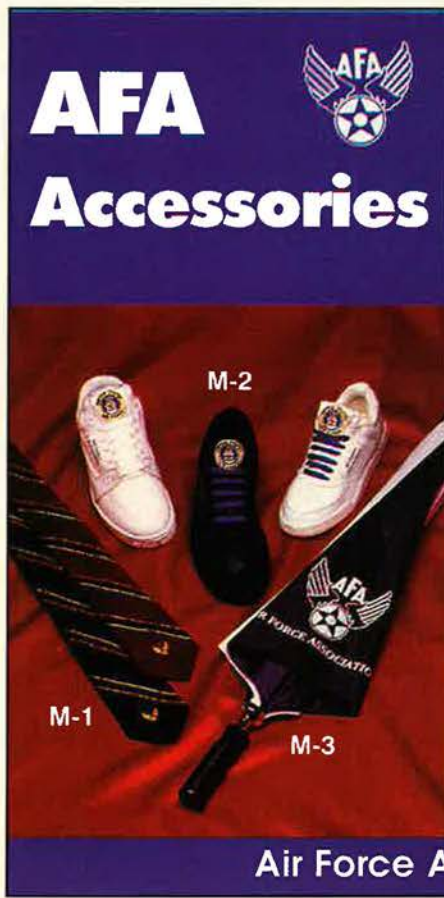
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