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JULY 1989/\$2

Defense Posture Begins to Drop

AND THE REAL

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About the cover: This F-14 Tomcat from VF-31, preparing to move up for launch from the USS Forrestal, introduces a special section on the Military Posture of the US, beginning on p. 40. (Photo © Lans Stout)



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# An Editorial

# **The Embattled Soviet Economy**

### By John T. Correll, EDITOR IN CHIEF

THE WORLD'S most popular man is in trouble at home. Soviet leader Mikhail Gorbachev enjoys one success after another in foreign affairs. In the eyes of the international community, it seems, he can do no wrong. Recent opinion polls give him approval ratings of seventy-one percent in the United States and better than ninety percent in West Germany.

On the domestic front, however, Mr. Gorbachev is struggling. His program of economic reform is a shambles. He has been unable to modernize industry or boost its performance. Growth of GNP is about the same as it was during the Brezhnev "Era of Stagnation." The economy would be flatter still if Mr. Gorbachev had not retreated from his antibooze campaign and allowed production of alcohol to increase in 1988. Before that, a surge in home distilling had led to a loss in alcohol sales taxes and contributed to a sugar shortage.

According to the Soviet press, "interruptions in the supply of beef" affect eighty percent of the major cities. Standards of living have not improved, and dissatisfaction is on the rise. In Siberia, Mr. Gorbachev faced crowds angry about the shortage of consumer goods.

A report on the Soviet economy, delivered to the Joint Economic Committee of Congress April 14 by the Central Intelligence Agency and the Defense Intelligence Agency, paints a dismal picture. In 1988, the report estimates, the fiscal deficit rose to roughly nine percent of Soviet GNP.

"The crucial machinery sector continued to lag as even high-priority state orders for many types of machinery were not fulfilled," the report says. Much of the machinery produced in 1988 did not live up to quality expectations. Almost a quarter of the new machines purporting to meet world technological standards failed to do so.

Entrenched ministries continue to prop up unprofitable enterprises and undermine reform. State orders accounted for forty percent of industrial production last year, despite an effort to drive down that percentage. The plan for 1989, which projects state orders at no more than forty percent of the total, appears to be another flop in the making. Unsatisfied demand for consumer goods last year was the equivalent of about twenty percent of the total output of consumer products and services. Goods that were available were often priced higher than before.

Industrial efficiency reforms having failed, Mr. Gorbachev says he will shift some defense-production resources to consumer output and reduce military spending by 14.2 percent. According to the CIA-DIA report, Soviet military spending rose by three percent after inflation in 1988 with emphasis on procurement of new weapon systems. This is about the same rate of growth as in the past.

There is no doubt that military spending is a major drain on the Soviet economy, but the actual amount of that spending is uncertain. As recently as March, Soviet Defense Minister Dmitri Yazov repeated the transparent fiction that the military gets only three percent of GNP. Mr. Gorbachev revised the party line May 30, admitting to military expenses at nine percent of GNP. In their report, CIA and DIA reaffirm their previous estimate that the Soviets spend fifteen to seventeen percent of GNP on defense.

An independent analysis, published May 16 by the Committee on the Present Danger, finds that, in fact, Soviet military costs are between twenty-three and twenty-five percent of GNP and consume about half of the Soviet budget. Other estimates, the Committee explains, do not count expenses—such as most military R&D, pensions, relevant parts of the space program, and the war management system—which would be included in a Western defense budget and which are part of the overall Soviet defense effort. By this analysis, Soviet military spending is rising at seven percent a year.

In a program this large, relatively untouched by reform so far, Mr. Gorbachev should be able to find significant savings from marginal sacrifices. If he can draw down forces deployed along the NATO and Chinese borders, he may be able to reallocate appreciable resources to his economic problem without severe penalty to arms production or the defense industrial base.

The truth is that nobody—including Mr. Gorbachev knows for sure what the USSR spends on defense. There is no way to account for the many special advantages and services provided free. It is obvious, however, that Soviet military power continued to grow while Mr. Gorbachev preached peace and brotherhood abroad. It is also reasonably clear that he is running out of options for dealing with a mess that he cannot ignore.

Less apparent is the extent to which these factors explain Mr. Gorbachev's international maneuverings and how his reform movement fits into long-range Soviet plans. The prevailing indication, however, is that military power retains its traditional priority in the Soviet scheme of things. Unfortunately, we cannot confirm from hard evidence that a basic transformation is yet under way.

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The new radar system designed for U.S. Navy F-14Ds will extend the aircraft's life into the 21st century. The APG-71, under development by Hughes Aircraft Company, will combine the long-range, multipletarget advantages of the F-14A's AWG-9 weapon control system with better electronic countercountermeasures, beyond-visual-range target identification, and raid assessment modes. The new radar's design maximizes proven performance by retaining selected components of the AWG-9 weapon control system and by incorporating modern digital elements from the U.S. Air Force's APG-70 system while meeting Navy performance and reliability specifications. The radar is designed and built under contract from Grumman Aircraft Company.

<u>Aerospace technology will be used to test and analyze</u> improved automobile control systems. Hughes will apply the technology, known as real-time hardware-in-the-loop simulation, to the testing of anti-lock braking systems, traction control systems, and active suspension systems being designed for General Motors cars. In real-time hardware-in-the-loop testing, the vehicle's control system "thinks" it is controlling a real car when, in fact, it is connected to a simulator. The simulation helps avoid design problems and is an economic way of obtaining accurate data even before full working models of the systems are built and tested. Real-time hardware-in-the-loop testing was pioneered at Hughes 20 years ago as part of its missile design and development activities.

<u>Higher performance focal plane arrays are one potential result of research into superconductivity</u> being performed at Hughes. Focal plane arrays form the core of infrared sensor systems used in a variety of space, airborne and battlefield defense systems. For maximum sensitivity, the detector elements in the arrays must be cooled to extremely low temperatures. But scientists at Hughes are working with new ceramic materials which exhibit superconductivity at much higher temperatures. By making arrays from these new ceramics, some of the requirements on the cooling equipment could be reduced. This would cut the power requirements of the system, increase its performance, and decrease the cost.

A computerized, voice-output system will automatically pick the proper radio network and frequency, and talk back to the air crew of an advanced helicopter. The Communications and Identification Subsystem, under development at Hughes for the U.S. Army's Light Helicopter Experimental (LHX) Program, also includes an over-the-horizon, high frequency communications radio with an anti-jam feature. The subsystem has a number of radio frequencies that can be used under a variety of conditions, including ultra high frequency and very high frequency FM and AM channels. By switching channels, the subsystem reduces the chances of enemy jamming interrupting critical communications.

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# Airmail

### **Escaping the "Box"**

[Regarding] your editorial in the May '89 issue of AIR FORCE Magazine, I couldn't agree more, but the question is where would you have our leaders take us and what would you have our legislators do? It seems to me that before we leap off this cliff we had better have some idea of what is likely to happen.

For example, let us assume ("Read my lips") no new taxes. I also doubt that a kinder and gentler administration is going to significantly reduce payouts to "widows and orphans," etc. That leaves defense. Since the guts of the argument is that we cannot tolerate further reductions in defense *effectiveness*, we need to move toward a more *efficient* defense posture and the means to get there.

As for ideas on precisely what needs to be done, there are plenty around—not all of which may make sense—but in the interest of getting the job done they bear looking into.

One such idea is a concept I refer to as "managing by the bottom line." Simply stated, that means first determining what we need in the way of defense capability and then devising a coherent system to integrate all the activities of the military-industrial complex to achieve that objective; something that must be done dynamically in response to changing political, economic, and military factors.

The problem now is that in spite of numerous initiatives, we are still hampered by what is essentially an inputoriented process. We are prone to overcapitalize on what we [already] have in the way of knowledge (doing what we already know how to do) and capital investment (using existing resources); in effect, maintaining the status quo.

The process is further constrained by alliances, roles and missions, and cultural/political acceptability. Finally, it is constrained fiscally by being treated as just another government program with funding limits bearing little or no relation to need.

What is needed is an outputoriented system—one that takes its cue from national goals and objectives—from which is derived the nation's strategy for dealing with an evolving world situation. The national-security aspects of that strategy, designed to address worldwide military imperatives, would form the basis of the country's military force requirement.

These requirements need to be harmonized among the services and prioritized. Funding constraints and their impacts need to be assessed with regard to the ability of the force to accomplish the assigned military task and, hence, the national security strategy. Once that is settled, and only then, we should proceed to acquire the needed capability. In doing so, we need to ensure that fielded forces are ready and fully sustainable. Such acquisitions should be undertaken only when they are determined to be fully justified and then only in the most efficient manner possible.

Clearly, an effort should be undertaken with DoD to define and install such a process before the "box" you so well describe wreaks further havoc on our nation's defense posture. That is an objective we can all support and one I heartily urge the Air Force Association get solidly behind.

James P. Mullins Del Mar, Calif.

• General Mullins, USAF (Ret.), is a former Commander of Air Force Systems Command.—THE EDITORS

### Guns vs. Tanks

In my opinion, the photograph that shows a tank "being chewed up by

Do you have a comment about a current issue? Write to "Airmail," AIR FORCE Magazine, 1501 Lee Highway, Arlington, Va. 22209-1198. Letters should be concise, timely, and preferably typed. We are sorry we cannot acknowledge receipt of letters to "Airmail." We reserve the right to condense letters as necessary. Unsigned letters are not acceptable. Photographs cannot be used or returned.—THE EDITORS rounds from a GAU-8 rapid-fire gun" [see "Destroying Enemy Armor," by F. Clifton Berry, Jr., April '89 issue, p. 49] leads readers to erroneous conclusions regarding the effectiveness of 30-mm guns against main battle tanks. Contrary to the belief of many, most notably those who advocate the Mudfighter as a follow-on to the A-10, the evidence, I believe, suggests that the GAU-8/13 is unlikely to be a particularly effective weapon against Soviet tanks, especially the latest models.

My guess is that the photograph came from one of a series of late 1970s LAVP tests during which A-10s fired thousands of GAU-8 30-mm API rounds against M47 tanks. While the pyrotechnics of those rounds striking (and occasionally penetrating) the tanks were impressive, the results achieved were not.

One particular test with which I'm familiar (December 4, 1979), and which I presume to be representative of all the LAVP tests, illustrates my contention. During that test, A-10 pilots made ten passes, each at one of ten primary tanks. Those relatively old M47 tanks, with armor far less effective than that possessed by modern Soviet tanks, were loaded with ammunition, fuel, and oil. The tanks were deployed in open, flat, desert terrain with no cover and little concealment. The weather conditions were ideal: unlimited ceiling and visibility, nearcalm winds. No enemy defenses were simulated, although the pilots did employ low-altitude, low-angle, minimum-exposure attacks. Opening fire at an average slant range of about 2,300 feet, the pilots fired 381 rounds of API antitank ammunition, scoring 139 hits.

Was the 30-mm gun effective? Against stationary tanks that were lightly armored by today's standards and loaded with fuel, oil, and ammunition, under perfect weather conditions, with an open fire slant range of about 1/3 of a nautical mile, and with seven of the ten attacks coming from the side of the tank formation, not one single tank suffered a catastrophic kill.

If 30-mm rounds fired from rela-



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### Airmail

tively close-in ranges can't kill undefended, stationary, and lightly armored M47 tanks, I wonder what kind of results we can realistically expect if the targets are heavily defended, heavily armored, and rapidly moving T-72s, T-80s, or FSTs?

> Ross L. Meyer Fort Worth, Tex.

### **The Harrier's Merits**

In your April article about the USAF search for a CAS airplane [see "What's Bogging Down the AirLand Fighter?" by John T. Correll, p. 40], there were several glaring errors about the AV-8B. The most severe was the statement, "Flying the same profile and carrying the same payload as an A-16, the Harrier would have thirtyfive percent less range and forty percent less loiter time." Not true, unless the A-16 is a dramatic improvement over the F-16.

If your author was referring to the British-built 1960s and '70s AV-8A, he may have been close. The AV-8B Harrier II, however, is a different airplane altogether, based on the same propulsion concept but manufactured in this country and incorporating 1980s technology. It is so different that, as the Navair AV-8 program manager, I tried to get the name changed. Unfortunately, we were too far into the program by then. The myth continues, however, of the Harrier as a shortlegged little airplane that won't go very far or carry very much. I've flown both the A and B, and it just ain't so.

The truth is that, by the USAF's own calculations, the AV-8B and F-16C have nearly identical range/payload curves. By judicious selection of ground rules, either can be shown to be slightly superior, but only by a small percentage—not thirty-five or forty. The biggest difference is in the takeoff distance required, typically 1,200 feet for the AV-8B vs. 2,800 for the F-16C with 11,400 pounds of weapons each.

Harrier detractors claim that the airplane cannot make a vertical takeoff (VTO) with a full load. Can an F-16? An A-7? An A-10? A VTO is a great crowd-pleaser, and in some situations it may be the only usable takeoff mode. In those rare cases, the AV-8B has consistently demonstrated delivery of 3,000 pounds of ordnance fifty miles away using a lo-lo profile. However, we prefer to use a STOVL mode when there is enough open space for a few hundred feet of takeoff roll.

Incidently, if you are interested in such things as survivability, effectiveness in the target area, and air-to-air capability during ingress and egress, please ask your folks who run Red Flag. You may be surprised.

I am concerned that your senior leadership may be making some decisions based on bum dope. Furthermore, someone had better come to grips with runway vulnerability. Without benefit of much analysis, I'll bet a retirement check that the Warsaw Pact can crater and mine runways faster than we can restore them to service.

> Col. James W. Orr, USMC (Ret.) Burke, Va.

### Space as a Mission

According to your article, "Space Comes Into Its Own," by James W. Canan in the March '89 issue, you say the USAF now regards space as a mission. How can it be a mission if the space effort isn't totally operational? For the USAF to become more aggressive in the space arena, they need to . . . turn over the launching of DoD expendable vehicles to Space Command and make it a total blue-suit launch operation.

I've been in USAF for more than twelve years, spending more than eleven in the enlisted ranks as an aircraft electrician. This last year, I became an officer and an engineer for USAF. From my experience on the flight line and now at Cape Canaveral, I see no technical reason why the USAF space effort couldn't be totally operational like a fighter wing. (These birds are almost like jets, except they're pointed up.)

Becoming totally operational would be beneficial to both the USAF and the commercial space program the contractors' hands would be freed to carry out their more lucrative commercial business, and the USAF could truly say that space is a mission.

2d Lt. J. M. Bruce, USAF Satellite Beach, Fla.

### Soviets in Simulators

The article entitled "Readiness, Soviet Style" [by Richard D. Ward, March '89 issue, p. 50] dealt with aircraft maintenance. You touched on, but totally glossed over, an issue that reads in part, "In peacetime, only a small percentage of Soviet fighters is used for training, the bulk of the training taking place on simulators." If that statement is true, then I jump for joy. Everyone knows (and I am not a rated person) that a simulator is no substitute for real flying. It seems to me that part of the reason [the Soviets']

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### Airmall

maintenance system appears to be effective is that they don't fly that much, relying more on simulator time.

Unfortunately, I see the US military operating similarly. Simulator time is cheaper, bottom line.

It just won't work. . .

Capt. Lynn Woodlee, USAF Hickam AFB, Hawaii

### The Soviet "Bogeyman"

I read William F. Scott's article "Illusions of Change," March '89 issue, p. 71, dismayed that AIR FORCE Magazine would print such a biased piece without a rebuttal or companion article presenting a different view. Dr. Scott is one of those "Soviet watchers" who says simultaneously that we must take the Soviets at their word (e.g., "We will bury you!") yet at the same time cannot trust a word they say (e.g., the Soviet claim to be adopting a defensive doctrine). Demanding that the Soviets produce evidence, he cannot, or does not want to, believe the evidence before his eyes.

While I agree we should not base our defense policies on words alone, it is hard to deny that a fundamental debate about Soviet national-security policy has been occurring and continues to occur among the Soviet leadership. Dr. Scott seems to think that the Soviets can undertake such drastic changes almost instantaneously and that since they have not, as of yet, met his criteria for proof, they cannot be believed.

I suppose Dr. Scott would dismiss all the evidence of the downgrading of the influence of the military (the defense minister being reduced to a nonvoting member of the Politburo, the elimination of the five-star rank during peacetime, the almost total turnover of the Soviet high command, the forcing of the unilateral troop reductions down the high command's throat, etc.) as part of a plot to lull the West into complacency so the Soviets can get on with their world-conquering.

Dr. Scott also implies that the reason the Soviets are unilaterally reducing their troop levels is that the Soviets are facing major demographic problems resulting from low birthrates. Really! I suppose the decrepit state of the Soviet economy has nothing to do with it! The fact of the matter is that the Soviet political leadership realizes it has got to reduce defense spending to get the economy moving. . . .

The difficult part has been getting a reluctant military leadership to go along. [Regarding] the fact that they are slow to coming around to addressing this problem, I suggest Dr. Scott look at our own Defense Department to see how reluctant large bureaucracies are to see their share of the pie reduced. I understand why Dr. Scott feels the way he does, though. There are many in and out of DoD who have a lot at stake in maintaining the overinflated threat of the Soviet bogeyman.

> Capt. Thomas A. Fries, USAF Scott AFB, III.

### Soviet-Style Readiness

The article "Readiness, Soviet Style" by Richard D. Ward in the March '89 issue of AIR FORCE Magazine was interesting and well researched, and astonishing if all the facts are right. By now you have been deluged by letters from USAF maintenance personnel saying, "Overhaul airplanes at 300 hours of service-are they made out of gum wrappers?" "Fix it if it ain't broke?" "Ninety-five percent in-commission rate of a thirty percent unit-possession rate isn't a ninety-five percent combat readiness rate, it's a disaster-good for a RIF or at least another year in grade!"

As a pilot, I also wonder about the conclusion that in peacetime, only a small percentage of Soviet fighters are used for training, and the bulk of the training takes place on simulators. The B-58 and F-4 simulators helped to teach procedures, aircraft systems, and crew coordination. That's not flying. Are the Russians short of unit pilots? Can't they afford the fuel? They can't believe that simulator time is going to get that F-16 jock off their tail or bombs on the target.

	C	December 31, 198	8	December 31, 1987		
	General Fund	Life Membership Fund	Total	General Fund	Life Membership Fund	Total
Assets						
Current Assets Cash plus marketable securities at lower of						
cost or market Receivables, prepaid expenses, etc.	\$ 7,258,633 1,509,874	\$7,015,649 620,104	\$14,274,282 2,129,978	\$ 8,006,920 2,001,090	\$6,272,721 722,196	\$14,279,641 2,723,286
Fixed Assets (land, building, etc.)	7,839,023		7,839,023	7,017,156		7,017,156
Funds on Deposit and Other Assets	3,481,059		3,481,059	2,123,812		2,123,812
Total Assets	\$20,088,589	\$7,635,753	\$27,724,342	\$19,148,978	\$6,994,917	\$26,143,895
Liabilities and Fund Balances						
Current Liabilities (including payables, accrued expenses, etc.)	\$ 3,518,513		\$ 3,518,513	\$ 3,050,071		\$ 3,050,071
Deferred Revenue (including advance membership dues and magazine						
subscriptions)	1,463,327		1,463,327	1,300,153		1,300,153
Long-Term Debt	4,589,000		4,589,000	4,743,375		4,743,375
Fund Balance						
Unrestricted	8,154,603		8,154,603	7,790,802		7,790,802
Restricted	2,363,146	\$7,635,753	2,363,146 7,635,753	2,264,577	\$6,994,917	2,264,577 6,994,917
Total Liphilities and Eurod Balances	003 990 009	\$7 635 753	\$97 794 349	\$10 148 078	\$6 004 017	\$26 143 805

Perhaps the Soviets' fighter overhaul cycle is more like a periodic inspection and repair as necessary. They may want substantially more airframes than pilots [to cover] attrition and may assume they will recover most of their downed pilots. This is realistic if they are fighting over their own ground.

One of the nicest individuals and most skilled pilots I ever helped train was Col. Dick Leppla, German Air Force, in the mid-1950s. Colonel Leppla had been a Bf-109 squadron commander in World War II, operating on the Russian front. He said his engineering officer was contemptuous of Russian fighters they captured, the machine tolerance in their engines was so loose. The Bf-109s had more powerful engines machined to tight tolerances. Winter came, the Bf-109s would not start even with blowtorches heating their engines, and the Russian fighters continued to fly. . . .

> Robert M. Byrom Crozet, Va.

### **An Overseas Perspective**

[There were] lots of letters in the April '89 issue about "\$6 Million Men" and considerable disagreement with the Air Force leadership's approach to pilot retention. I believe it's important to put an overseas, active-duty perspective on the issue.

First of all, we should all agree that putting tactical fighters as close as possible to potential threats to our freedom and safety is a critically important job-a job that has to be done. We can use all the help we can get to do that job. For those that assure me they'll be here when the war starts, I would offer that we are at war. Right now. The lack of a great deal of shooting and dying suggests that we are even with or slightly ahead of our enemies. Our frequent, away-fromour-families deployments to forward operating locations confirm very clearly the presence of a formidable, multinational threat.

I must also point out the absolutely outstanding capabilities of the fighter pilots in this wing. Far from being au-

AIR FORCE ASSOCIATION COMPARATIVE STATEMENT OF REVENUES AND EXPENSES

	Year Ended		
	Dec. 31, 1988	Dec. 31, 1987	
General Fund			
Revenue			
Aerospace Development Briefings	\$ 1,147,583	\$ 1,084,846	
Convention	399,596	394,503	
Data Processing Services	47,743	38,949	
Industrial Associates	183,430	197,670	
Insurance Programs	2,214,421	2,413,831	
Investment	511,552	285,677	
Land Rental	115,164	111,525	
Magazine	2,941,112	2,903,747	
Membership	3,239,581	3,162,881	
Patrons	241,866	262,861	
Other	534,434	604,078	
Total Revenue	11,576,482	11,460,568	
Expenses <sup>1</sup>	- A CONTRACT		
Aerospace Development Briefings	506,664	530,636	
Convention	557,133	517,780	
Data Processing Service	174,055	210,295	
Industrial Associate Program	114,081	109,532	
Insurance Programs	3,006,135	2,849,156	
Magazine	2,653,669	2,591,720	
Membership	3.826,851	3.589,506	
Patronship	293,194	285,146	
Total Expenses	11,131,782	10,683,771	
Excess (Deficit) of Revenue over Expense	\$ 444,700	\$ 776,797	
		TOTAL TRACTICE	
Life Membership Fund			
Revenue from Investments	520,629	448,447	
Less: Transfer to General Fund for			
annual dues and other costs	552,559	518,029	
Net Income (Loss), Life Membership Fund	(\$ 31,930)	(\$ 69,582)	
	Manufactor and an an	State Barrier State State Street St.	

Treasurer's Note: The figures presented herein have been extracted from audited financial statements submitted previously to the Board of Directors of the Air Force Association.

<sup>1</sup>Expenses include chapter commissions, state commissions, and other direct support for field units totaling \$669,232 in 1988 and \$653,398 in 1987.

tomatons or pilots unable to make the "smart" decision to go to the airlines, the lieutenants who have extended or the captains who have decided to stick around are among the very best. I'm sure some of these officers will provide outstanding senior leadership for the United States Air Force of the future. I also know that, temporarily, some of them will effectively integrate themselves into headquarterslevel staffs that, without them, would not have a clue about the real mission of the Air Force. Even Robin Olds had a staff job for a while and killed MiGs afterward.

So what's the answer to pilot retention? I'm not sure. I envy the airline and reserve guys who spend more time in the States and with their families than I do with mine. I think the pilot bonus has certainly rewarded good people in my squadron and encouraged some to stay in the business.

I do know this. We're doing... one of the toughest and most important jobs in the free world. I also know we're flying the finest fighters in the entire world. It's not easy sometimes, but we're here.

> Lt. Col. Bruce A. Wright, USAF 612th Tactical Fighter Sqdn. Torrejon AB, Spain

### **Keeping Pilots Flying**

The interesting comments from six readers on the "\$6 Million Men" General Welch referred to in "Tough Choices for Hard Times" are of great significance to our ability to engage in future brushfire-type wars.

It seems to me that the top brass are convinced, after the Korean and Vietnam Wars, that the next war would still be a war of "attrition." Therefore, they would like all midrank officers (majors to colonels) to be crosstrained as managers who could command the newly mobilized forces and lead them to combat. However, I do not believe that we could ever go through another Vietnam-type war of attrition. Americans simply won't tolerate that.

It is far more likely that we might be engaged in "short" and "low-intensity" wars against terrorists and some crazy regimes. We don't worry and shouldn't worry about the potential task of training thousands of replacement pilots like we did in the second World War. We should stress quality instead of quantity, as the Israeli Air Force is doing. They have a small cadre of air force pilots, but they are top-notch ones.

Some of our major corporations have already discovered that promoting research engineers to the man-



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TV: LOOKING AHEA

### Airmail

agement position might not work. Research engineers got bored behind desks and longed to go back to their laboratories, where they felt comfortable and were productive in developing new techniques and products. Company bylaws were changed, allowing research engineers to earn salaries comparable to midlevel management positions. The research engineers are happy and remain productive to their companies' R&D work. This is analogous to the cases of some sergeants who declined to be promoted to second lieutenant and were happy staying sergeants.

Is it really necessary to rotate some top-notch pilots against their will to other job functions like maintenance, security, and staff positions? Some of our pilots would probably do anything to remain on flying duty, even if it might mean they would have to retire as lieutenant colonels. They probably wouldn't give a damn. Wouldn't it be nice for them to be top-gun pilots for twenty years serving their country and then "retire" to a commercial airline for another fifteen more productive years? They would remain happy for all thirty-five years, instead of [experiencing] frustration after frustration staying in the Air Force.

There is nothing wrong with keeping top pilots as they are, as squadron and deputy wing commanders, if that's what they want. Don't force them to switch to management positions....

I sincerely urge the top brass and our civilian chiefs in the Pentagon to adopt an Israeli-type attitude and keep the scores of good squadron commanders, Army battalion and regimental commanders, and Navy skippers in the jobs they feel comfortable with and are most efficient at. Maybe we could keep good midgrade officers from quitting. We will desperately need their skills and leadership in any future low-level conflicts around the world. [By keeping them] we might be able to avoid unnecessary disasters like the Mayaguez incident in the Gulf of Siam, the Son Tay (North Vietnam) prison camp rescue mission, the Marine barracks explosion in Lebanon, the Iran hostage rescue mission in 1980, and the fatal accidents (drownings and death by friendly fire) during the Grenada campaign.

> Dr. Henry N. Chuang University of Dayton Dayton, Ohio

### **Confuse or Enlighten?**

John Correll's editorial, "Ready for

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ELECTRONICS

Unreadiness," in the April '89 issue was refreshingly direct. It was common sense and good strategic reasoning.

I especially agree with Mr. Correll that strategist Edward Luttwak "occasionally has some good ideas." I'd put it more bluntly: Mr. Luttwak is lost in his own fog. For instance, his theories in his 1987 book, *Strategy: The Logic* of War and Peace, did far more to confuse the student of strategy than to enlighten. Mr. Luttwak introduced the ivory-tower concept of "paradoxical logic"—merely a muddled method of saying that strategists do different things in reaction to the changing contexts of war.

Now Mr. Luttwak thickens the fog. He suggests that long-term strategic planning is served by (a) trusting Mr. Gorbachev's promises to keep his paws to himself and (b) cutting force readiness.

Look what this "logic" would mean if applied by a trainer to a champion boxer. First, he'd advise the boxer to trust his strongest opponent's state-



# Industrial Associates

Div.



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### Airmail

ments that he would never try for a knockout punch. Second, he'd advise the champ that sloppier training would be in his "long-term" interest. I submit that a champion who took that advice wouldn't be champion for long.

E. G. Ross Eugene, Ore.

### MARS Program

Thank you very much for publicizing the often-overlooked service provided by the Air Force MARS pro-gram. [See "Our Affiliates from MARS," April '89 issue, p. 80.] As the article stated, many times a MARS station has been the only communications avenue into or out of a disaster-stricken area. Personally, I've found the MARS program to be very rewarding by passing morale/welfare traffic and participating in simulateddisaster exercises. I encourage any licensed amateur radio operators who are interested in becoming MARS affiliates to contact their local Communications Group/Squadron or Hq. AFCC/DOOCM, Scott AFB, III. 62225-6001. If you're not yet a licensed amateur radio operator, contact the American Radio Relay League, 225 Main St., Newington, Conn. 06111, and it will be glad to send you information on this fascinating hobby.

> Capt. Jeffrey C. Miller, USAF Honolulu, Hawaii

### **Competition's "Blessings"**

With reference to the April '89 AIR FORCE Magazine article titled "Competition Is a Mixed Blessing": The article cites an example provided by John O'Brien, President and Chairman of the Board of Grumman Corp. He is quoted as saying, "But in this devilishly complex world of government contracting ... creating competition is also causing some secondorder effects that I think we all should pay attention to." He then goes on to tell the story of Grumman awarding a contract to the low bidder without realizing it could not provide the 2,400 tools and the drawings necessary to do the work.

Mr. O'Brien, don't blame Grumman's poor planning on competition or the "devilishly complex world of government contracting." If you don't have your act together before soliciting bids, only you are to blame. My employer knows the status of the tooling and reviews the drawing package before issuing competitive solicitations. That was all that Grumman needed to do to avoid that problem. Of course, continuing to award solesource would have avoided the problem, too . . . but at the taxpayers' expense.

Calvin C. Berger Carmichael, Calif.

### The Navy in Space

I hate to sound so smug, but there is a very simple answer to Mr. Guidry's letter wondering why the Navy space presence is so profound. [See "Airmail," March '89 issue, p. 9.] Being a Navy A-6E bombardier/navigator with 1,000 hours and 400 traps, I've noticed significant differences between Navy and Air Force pilots. Catapulting off the carrier deck at night and landing aboard at night after the oh-so-prevalent thirty-hour shipboard day develops a pilot second to none. It's quite a bit more demanding than landing on 15,000 feet of pitching, rolling, concrete Air Force runway.

The Navy still allows a pilot some free thought; his every move is not dictated by regulations as the Air Force pilot's is. There are no Navy directives telling him how many seconds he is allowed to climb his boarding ladder and what color ascot to wear with which airplane he flies. Would you guys in the Air Force believe that Navy pilots are still allowed to sign their own flight plans?

All kidding aside, space is still an unknown frontier. The ideal individual to travel in space is someone who has not had the ability for free-thinking lobotomized from his psyche. It is sad to say that Air Force training and policy tend to straitjacket the individual, while Navy/Marine Corps pilots can adapt to the new and unexpected without grabbing for the warmth of a reference manual.

> Lt. Barrett Craig, USN NAS Pensacola, Fla.

### Sunny San Vito

I was reading your May 1989 issue and noticed a major error in the basedescription section. After spending four years stationed at San Vito Dei Normanni AB, Italy, I know that they do have base housing. Also, US presence began in 1961, not 1978.

San Vito AB is a host to the 6917th Electronic Security Squadron, ESC. It is a "real fun" tour, and I hope the errors you have made do not discourage anyone from pursuing an assignment to "sunny San Vito."

Sgt. Johanne Fogle, USAF Scott AFB, III.



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# Washington Watch

# **The Climate of Distrust**

By James W. Canan, SENIOR EDITOR

Harsh laws and suspicion that verges on paranoia make top government jobs so undesirable that wellqualified candidates to fill them are getting harder and harder to find.



Washington, D. C. Norman R. Augustine, Chairman and CEO of Martin Marietta Corp., recalls a flight from Ottawa to Washington some time ago on which he and several colleagues discussed

how pleasant it had been to do business with Canadian government officials.

"We agreed that we'd just had a refreshing experience," Mr. Augustine says. "We asked ourselves what had been so different about it and why. We came to the conclusion that it was because of the Canadians' attitude. They assumed, as an outside possibility at least, that we, as representatives of the US defense industry, might actually be honest.

"Unfortunately, that does not seem to be the assumption of the US government."

Mr. Augustine, who has held a rich variety of executive positions in government and the defense industry for more than thirty years, related this vignette to make a point about an increasingly worrisome problem—the climate of distrust that is blighting relations between the Defense Department and the defense industry.

It's getting to be a bad scene. In the opinion of a growing number of thoughtful officials both in and out of government, the defense acquisition system is suffering more from suspicion of dishonesty than from dishonesty itself. They claim that the system is now so sick with suspicion that it is verging on paranoia and paralysis.

The crumbling of trust as the foundation of commerce between government and industry is seen as both the cause and the effect of procurement rules and regulations that now threaten to strangle the system. The climate of distrust is also blamed for the increasingly restrictive conflict-of-interest and "revolving-door" laws that make talented decision-makers with much-needed experience and expertise get out of, or stay out of, government.

No one makes light of malfeasance in government or industry. The Justice Department's "Operation III Wind" investigation of dirty doings in defense acquisition is widely regarded as justifiable and maybe cathartic. There is a contrary body of opinion that III Wind was initially overplayed as being of gale force and that it now looks to be just a lot of hot air. The investigation, however it finally turns out, has already left an ineradicable mark on the military acquisition establishment.

That mark is not all black. III Wind is given much credit for fostering developments in industry that augur well for a restoration of trust in due course. Don Fuqua, President of Aerospace Industries Association of America Inc., declares that "industry is working very hard to get its ethics in order" as a result of III Wind and in response to reforms recommended by the Packard Commission.

"We're hopeful," Mr. Fuqua says. "We see a different climate out there. Companies that never had ethics programs are developing them now. In many companies, questions of how ethically departments are being operated have become as important as financial questions."

Mr. Fuqua is quick to insist, however, that the defense industry has always been upright, by and large, and that "most of the problems" bared in recent years were the products of the industry's more distant, inarguably less ethical, past. Besides, he says, it is a huge, high-stakes industry, and some bad things are bound to go on here and there.

"Take a company that employs 80,000 people. I don't know of any town that size that doesn't have a jail," the AIA president declares.

Martin Marietta's Mr. Augustine, apparently expressing the consensus of his counterparts, declares that "the emphasis on ethics programs and ethics training in both government and industry is healthy and beneficial." With regard to III Wind, he testified on Capitol Hill that "we should all be deeply concerned by the apparent actions of a few who have brought so much embarrassment to so many dedicated, well-meaning individuals serving the defense acquisition process."

Mr. Augustine also reflects the sentiments of his fellow executives, however, in sticking up for the defense industry's fundamental integrity. Noting his long experience as a decisionmaker in the US government and with an assortment of companies doing business with the government, the Martin Marietta CEO declared: "I have found no evidence whatsoever that those working in defense procurement are in any way substandard when it comes to matters of ethics. I must, however, confess that those of us who are involved in government procurement and to whom many people report-in my case, some 70,000 people-greatly fear having our reputations besmirched by allegations which, if true, involve matters of which we would not approve.'

In his congressional testimony, Mr. Augustine also deplored extremism in revolving-door legislation. He declared: "It is most unfortunate that a stigma has been placed on a process that is vital to good government, namely, drawing from all possible sources the talent to manage the complex machinery of an increasingly complicated economic and technological world."

He said that he and others looked on their government employment in terms of serving their country, not in

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terms of feathering their nests against the future, and he added:

"Today, several of my former closest colleagues in government lead major corporations, not because of their government contacts but because of their talents. It should be noted that our government had the direct benefit of some years of their extraordinary abilities."

Ever-harsher laws aimed at precluding conflicts of interest and economic opportunism on the part of government executives are taking a tremendous toll even now at the Pentagon. Such statutes are said to be responsible, along with considerations of pay and lifestyle, for the long delays that have become par for the course in filling key Pentagon posts, most notably—and ironically—that of Under Secretary of Defense for Acquisition.

Last May, Robert B. Costello, the holdover interim occupant of that post, sounded a warning on vacating it. Mr. Costello referred to measures then afoot in Congress to toughen revolving-door and conflict-of-interest laws and make them more punitive. Unless this tendency is reversed and such laws are ameliorated, the government will no longer be able to at tract or keep knowledgeable decisionmakers and thus will be deprived of "one of the greatest assets we have," Mr. Costello declared.

Observing that new laws making it harder for government officials to accept choice jobs in the private sector were scheduled to go into effect May 15, Mr. Costello pointedly stated: "I'm getting out May 12."

He was not alone. His deputy, Milton L. Lohr, also departed, enlarging the acquisition-leadership void in the Office of the Secretary of Defense at a particularly bad time—just as the Bush Administration finished rearranging the defense budget and as Congress geared up to have at it.

The Pentagon was not unique in the exodus of its experts. Many other midlevel and top executives elsewhere in government, including a score or so at the National Aeronautics and Space Administration, chose to chuck government service before their chances for top jobs in the private sector were choked off.

At about the time of the flight from government, Deputy Secretary of De-

fense Donald J. Atwood, lately of General Motors, used the occasion of his first public speech as a Pentagon official to address the so-called "integrity issue." Conflict-of-interest roadblocks had caused him to experience "an excruciating transition" from industry to the Pentagon, and "I've personally come to the conclusion that we've gone too far" with legislation that inhibits such transition, Mr. Atwood declared.

The top man at the Pentagon, Defense Secretary Richard B. Cheney, was at least as emphatic. Mr. Cheney left no doubt about his conviction that the law, as applied to his numbertwo man, was indeed an ass. Incredulously, the Defense Secretary declared, "Don Atwood has got to buy an insurance policy against the failure of General Motors so that he doesn't have a conflict in trying to keep General Motors alive just because General Motors owes him a pension when he finally retires."

Such utterances from on high indicate that the Defense Department's civilian leadership is in a mood to stand and fight on the ethics front in an attempt to check the onslaught of

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congressional reformers. Mr. Cheney seems ready to lead the way.

Not long after taking command at the Pentagon, he discussed the many drawbacks of government service, such as intrusions on privacy, relatively low pay, and foreclosures on careers. All such negatives add up to "a hell of a problem" of recruitment and retention, the Defense Secretary asserted, adding:

"I think we've gone overboard. There used to be the assumption that people wanted to come serve in government because they felt they had an obligation, especially if the President asked them to. Now it has reached the point where it's difficult."

To illustrate "the absurd standards that are now applied," Mr. Cheney referred to his "first official act" as Secretary of Defense-"signing a recusal saying I would have no dealings with Citicorp."

He continued: "The reason I had to do that is that I have a CD [certificate of deposit] with Citicorp. A very modest CD, an IRA [individual retirement account] that I took out with a savings and loan in the District [of Columbia] some years ago. Citicorp acquired that savings and loan, and now I have to recuse myself.

"That's not stock in Citicorp. It's not going to be affected by the future of Citicorp. It's guaranteed by Uncle Sam-by the federal governmentand it's money they owe me at a fixed rate of interest on a date certain.

But that is perceived as a conflict of interest by today's standards, so I had to sign a recusal. That is stupid. And it's just one minor example of the problems we have to deal with.'

In Mr. Cheney's view, "the concern over ethics in government has led to the adoption of a whole set of restrictions and requirements and limitations that make it very difficult" for top men and women to "contribute their talents to government for a few years and then return to the private sector."

He asserted: "Nobody wants to run a revolving door, but the people you'd like to have involved ... within the Department of Defense are people who have some knowledge about defense matters. One place you get knowledge about defense matters is in the defense industry. But if a person has no prospect that he can ever go back, or if he can't go back for a period of time after he leaves here, he's going to be very reluctant to come here in the first place."

Pay is another problem, a big one. Industry executives who agree to serve at the Pentagon don't exactly laugh all the way to the bank.

They aren't the only ones who take a beating. Mr. Cheney noted that his move from the House of Representatives to the Pentagon "cost me a net of about \$20,000 a year" and that, as a member of Congress, he was "not overly well paid" to begin with.

What it all comes down to, the Defense Secretary said, is that government decision-makers must now be willing "to come serve at low rates of pay, under extraordinary circumstances in terms of financial disclosure, and at the risk of personal, intimate details of [their] lives being spread all over the newspapers. And when they get all through, they can't find work in the private sector in an area that they've got some expertise in."

Given all that, he declared: "Who the hell wants the job? It's tough."

Mr. Cheney emphasized that "I feel strongly" about this subject, and asserted: "We need to go back and take a look at some of the standards we've imposed, because we're ... discouraging able, competent people from serving in government. I would



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guess that ... some of the giants in the national security area over the last forty years would not have served, were they given the opportunity today, because of the current requirements."

In Chicago, near the end of May, at a conference of the Defense Industry Initiatives Organization that was formed to foster ethics in industry, the Pentagon's Mr. Atwood said that the defense acquisition system may be doomed unless, among other things, revolving-door and conflict-of-interest strictures are softened.

Deploring the "terrible confrontational atmosphere" between government and industry, the Deputy Defense Secretary called for greater introspection and voluntary selfpolicing on both sides in order to ease tensions and improve relations.

Rules and regulations won't do the trick, Mr. Atwood said. Why? "You can't operate very efficiently if you assume that people are basically dishonest." To create a climate in which honesty is assumed and regulations become unfashionable, "we must elevate the moral tone of our work willingly, voluntarily, and wholeheartedly," Mr. Atwood said.

He also declared that laws constraining the passage of executives from the Pentagon to industry are helping create "a talent void" in the acquisition system. "The penalties far outweigh the benefits to many" who might otherwise serve, Mr. Atwood said.

In the House of Representatives, even as he spoke, three leaders of the congressional Military Reform Caucus moved to put another stopper in the revolving door. Their action was a reaffirmation of reformist sentiment—ill-conceived or not—that the defense acquisition system is plagued more by sweetheart deals and golden handshakes on the sly, in subversion of trust, than it is by rules and regulations that take no chances on trust.

Reps. Charles E. Bennett (D-Fla.), Barbara Boxer (D-Calif.), and Les AuCoin (D-Ore.) introduced a bill that would prohibit government officials from signing on with any company doing at least \$10 million worth of business each year with the Defense Department. The ban would cover about 1,300 military contractors and would be in effect for general and flag officers, as well as senior civilians, until they have been two years out of government service.

Existing law, although tough enough, is much narrower. It rules out post-Pentagon hiring of a government official by a company only if the official had dealt directly with that company as a major player in the contracting process.

In such legislation and in Federal Acquisition Regulations (FARs) promulgated by the executive branch, including the Pentagon, definitions can be a problem. For example, the directness and the scope of a Pentagon official's dealings with a contractor may be open to interpretation on which his future employability in industry may hinge.

Questions of interpretation also lurk in ambush for industry officials. For example, one such regulation says that executives of defense contractors cannot "represent" their companies in dealings with the Defense Department if they were "personally and substantially involved" during their DoD employment with "the particular matter" now at hand. As Mr. Augustine puts it, "Does 'represent' mean actually 'negotiate'? Or does it mean going up to someone from the Pentagon at a party and introducing yourself with 'I'm from Martin Marietta' or what? And what does it mean to be personally and substantially involved? What does 'particular' mean?

"Many of us in industry are terribly concerned about all these things being subject to administrative interpretations. Well-meaning and decent people could find themselves crossing [legal] lines without realizing it. This situation is having a chilling effect on our industry. It is keeping good people out and causing good people to leave. Stronger laws and regulations may be necessary and can be healthy. But let's make them clear enough so that people know exactly when they're violating them."

Because of such misgivings about its vagueness, a new procurementintegrity FAR was put on hold from mid-May until mid-July to give the defense industry time to propose changes to the Office of Federal Procurement Policy.

Among thorny issues being addressed by industry is the one of specifying when a procurement action actually begins during the acquisition process. This issue is also germane to revolving-door and conflict-of-interest questions about the roles of individuals, and their timing, in the acquisition process.

"The revolving-door issue is triggered by the when-does-procurementbegin question, because a company can't hire someone if he or she has been involved in its procurement," Mr. Fugua explains.

The whole affair is sorely in need of fresh perspective—or, perhaps, of sage advice from the past, offered by former President Dwight D. Eisenhower, that somehow never took hold.

In his congressional testimony, Mr. Augustine noted the heavy play given over the years to President Eisenhower's "admonition against improper relationships between government and industry." But there was another, largely ignored side to that legendary Eisenhower dissertation on the "military-industrial complex."

As Mr. Augustine tells it, President Eisenhower remarked on the need for "close working relationships and cooperation between what he referred to as 'military and civilian resources,' " and "called for a 'leveling of barriers' to permit constructive working relationships between personnel in the public and private sectors."

That same call is being heard today throughout the defense industry, and those who sound it claim that the situation is dire and the hour late.

One such is Donald A. Hicks, a former Under Secretary of Defense for Research and Engineering, who heads the defense consulting firm of Hicks & Associates. He claims that many problems besetting the defense acquisition system come down to "lack of trust."

This is hardly surprising, Mr. Hicks continues, because "we are becoming a contentious, suspicious society in which everybody sues everybody and nobody trusts anybody." The upshot, he maintains, is a defense acquisition system in which fewer and fewer officials are willing to take risks for fear of being penalized for mistakes, and which now involves "an incredible number of people performing auditing and oversight functions who are absolutely nonproductive."

Industry executives who shout "amen" are legion. Dana B. Badgerow, Honeywell's vice president for corporate contract management and compliance, is one of them. She deplores "the tendency to criminalize behavior that, in a less adversarial environment, would be seen as honest mistakes, mistakes that inevitably result from trying to perform extremely demanding work in a climate where the rules are ambiguous and everchanging."

In Ms. Badgerow's view, all too many of the defense acquisition system's various agonies "are symptoms" of its true sickness—"lack of trust."

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# **Capitol Hill**

### By Brian Green, CONGRESSIONAL EDITOR

### Washington, D. C. B-2 Controversy Grows

Rep. Les Aspin (D-Wis.), Chairman of the House Armed Services Committee, recently wrote a letter to Secretary of Defense Richard B. Cheney in which he maintains that the B-2 Stealth bomber program "may cost an estimated \$75 billion," a figure that "raises considerable concern and questions about its value and affordability." Representative Aspin claims that DoD spends disproportionately on the bomber and strategic submarine legs of the triad compared to ICBMs. Sen. John McCain (R-Ariz.) of the Senate Armed Services Committee (SASC) and Sen. Ernest Hollings (D-S. C.) of the Senate Appropriations Defense Subcommittee, both with strong prodefense voting records, are among others who have made recent critical statements about the cost of the B-2. Former Under Secretary of Defense for Acquisition Robert Costello recently called for cancellation of the B-2 program.

Potential B-2 difficulties stem from a number of causes. A tight budget is forcing Secretary Cheney to cancel some programs and carefully assess others, sending congressmen scrambling to protect programs important to their districts. B-2 costs, which Congress estimates as being \$550 to \$700 million per plane, give rise to "sticker shock."

Under these pressures, a classic case of strange political bedfellows is emerging. Some congressmen who focus primarily on the deficit see the B-2 as a big-ticket item whose cancellation could save money. Others frequently oppose defense spending on principle. A third group, ordinarily supportive of Pentagon requests, sees the B-2 as a competitor for scarce defense dollars with other bigticket programs, such as SDI.

Information provided by Gen. John T. Chain, Jr., Commander in Chief of Strategic Air Command, to Sen. J. James Exon (D-Neb.), Chairman of the SASC Strategic Forces and Nuclear Deterrence Subcommittee, contests many of the criticisms and concerns (see "Aerospace World," p. 28).

### Budget Passes, More Woe

The House and Senate both passed a compromise Fiscal Year 1990 (FY '90) budget resolution that includes \$305.5 billion in defense budget authority (BA, the amount DoD and other defense agencies can obligate to spend) and \$299.2 billion in outlays (the amount that will actually be spent in FY '90). The resolution is based on the assumption of a 3.6 percent raise for military and civilian personnel.

In constructing the specifics of the budget, however, defense authorizers and appropriators will be using Congressional Budget Office projections that show outlays underestimated by nearly \$4 billion. According to congressional staffers, the committees will have to resort to a combination of further budget cuts and accounting tricks to meet the outlay limit without savaging the BA target.

### Agent Orange Decision

A US District Court ruled that the Veterans Administration improperly interpreted provisions of the 1984 Veterans' Dioxin and Radiation Exposure Compensation Standards Act. The decision has the effect of voiding the VA's denial of claims to benefits made on the basis of exposure to Agent Orange. The Court ruled that the VA criterion for awarding claims-proof of a causal relationship between disease and exposure-was "impermissibly demanding." For several years, Congress has urged VA action to compensate claimants who had been exposed to Agent Orange.

Secretary of Veterans Affairs Edward Derwinski announced that the decision would not be appealed and that regulations governing Agent Orange claims would be revised. AFA strongly approves the VA's change of direction.

### Herres, Dickinson on ICBMs

At a hearing just before his reconfirmation as the Vice Chairman of the Joint Chiefs of Staff, USAF Gen. Robert T. Herres testified that the Small ICBM would add "very marginally" to US deterrent capability. He favors continuing the program, now scheduled to follow deployment of the rail-garrison Peacekeeper. General Herres is a candidate to succeed Adm. William Crowe as Chairman of the Joint Chiefs.

Rep. Bill Dickinson (R-Ala.), ranking Republican on the House Armed Services Committee, announced that he would oppose attempts to reprogram funds from the Peacekeeper program to the Small ICBM. Last year's budget provided \$600 million for the rail-garrison Peacekeeper (of which \$350 million could be obligated only after March 1) and \$250 million to the Small ICBM. Congressional support for the SICBM comes principally from Democrats. Representative Dickinson is insisting that the additional SICBM funds come from real growth in defense budgets approved by the Democrat-controlled Congress.

### **Rice Confirmed**

Donald B. Rice, the new Secretary of the Air Force, testified during his confirmation hearing that the B-2 was "correctly a very high priority." He also argued that both the rail-garrison Peacekeeper and Small ICBM would contribute to strategic stability. He noted that cost is the key issue in ICBM modernization, but said he would work to make both systems affordable. Secretary Rice, the former chief executive of the RAND Corp., was confirmed by the Senate without opposition.

### Seniors Oppose CatCap

A recent poll sponsored by AFA and other groups indicates widespread opposition to the Medicare Catastrophic Coverage Act. The act imposes a controversial tax surcharge to finance the cost of the program that hits many military retirees hard (see "Capitol Hill," June 1989, p. 28). The poll shows that seniors sixty-five years of age or older oppose the act by a margin of five to three, more than half believe that the benefits of the act are not worth the cost, and even a plurality of those who support the act do not believe that the benefits are worth the cost. Two-thirds favor a new long-term approach.

# Aerospace World

### By Jeffrey P. Rhodes, AERONAUTICS EDITOR

### Washington, D. C.

★ Air Force Systems Command commander Gen. Bernard P. Randolph revealed some details about the Northrop B-2 Advanced Technology Bomber in his speech before the Aviation/Space Writers Association's national conference in Phoenix, Ariz., on April 29. On May 11, Sen. J. James Exon (D-Neb.) released further information that had been given to him by Strategic Air Command officials. Here are the highlights:

The bomber, a flying wing, has two large, side-by-side weapons bays with rotary launchers capable of carrying a payload of between 40,000 and 75,000 pounds, but it will have a Single Integrated Operational Plan (SIOP, the nation's nuclear war plan) load of about 25,000 pounds.

The B-2 can carry up to twenty B61 nuclear gravity bombs (between 100and 500-kiloton yield); or sixteen AGM-69A Short-Range Attack Missiles (170-kiloton yield), AGM-131A SRAM II (reportedly in the 170-kiloton range), or B83 nuclear gravity bombs (between one- and two-megaton yield); or a combination thereof. In a conventional role, it can carry eighty 500-pound bombs or various other conventional weapons, including sea mines. There are no plans to include the AGM-129A Advanced Cruise Missile on the B-2.

The aircraft will have a maximum gross takeoff weight of between 240,000 and 376,000 pounds and an unrefueled range of between 4,250 and 7,500 miles. It has a landing gear track of forty feet, enabling it to use any runway that can handle a Boeing 727 jetliner. General Randolph says the B-2's wingspan is 173 feet, one foot more than early releases estimated. The B-2 uses a guadruple-redundant fly-by-wire digital flight-control system. Directional control is provided through differential drag, and control is available through elevons on the trailing edge of the wing. General Randolph said that "the flyirg wing is near neutrally stable."

The B-2A will carry less fuel than the B-1B does, but SAC says it will have "an equivalent unrefueled range" because of its low wing loading—less than that of any military aircraft except the U-2—and because of the B-2's design for high-altitude subsonic cruise. SAC also says that "although very difficult to track and shoot down individually, the presence of a significant force of B-2s would be detected because the aircraft is not invisible to radar."

The plane's first flight (now expected in early summer) will be crewed by one Air Force and one Northrop test pilot. The crew will perform functional checks on the instrumentation systems during climb out from Air Force Plant 42 in Palmdale, Calif. Once at altitude (near 10,000 feet), the crew will perform functional checks of the airplane's subsystems and aerodynamic flight envelope expansion maneuvers.

The crew will make two approaches to Edwards AFB, Calif.—one at altitude and one for landing. The flight will last for up to 180 minutes, and the landing gear will remain down throughout as a safety precaution. In

At General Dynamics's Space Systems Division in San Diego, Calif., employees review fabrication data for the transition skin of the Centaur upper stage booster. The stainless steel section ties Centaur's two cryogenic propellant tanks together. an understatement, General Randolph said, "Following the flight, the pilots will have an extensive debrief." The aircraft will be completely checked at Edwards, and that will mean at least a six-week stand-down before the second flight in the fouryear test program.

★ The countdown clock had reached T-minus-31 seconds, but a faulty fuelrecirculation pump and a pinhole leak between the orbiter and its external tank scrubbed the planned April 28 launch of the space shuttle Atlantis. The weather finally cleared on May 4, and after an abbreviated countdown, STS-30 got under way at 2:47 pm EDT with just five minutes left in the launch window.

The \$530 million Magellan probe was released by Air Force Maj. Mark Lee, a rookie astronaut, on *Atlantis's* fifth orbit, six hours and eighteen minutes after liftoff. The probe floated clear of the payload bay, and, about an hour later, the Air Force-developed



Inertial Upper Stage ignited and started Magellan on its fifteen-month trip to Venus. Magellan is the first US interplanetary probe to be launched in eleven years, and it is the first of its type to be launched from the shuttle.

The twenty-one-foot-tall, 7,604pound Magellan will make 1,852 mapping passes of Venus with its synthetic aperture radar. The Hughes-built radar will be able to resolve features as small as 250 meters at the equator through the planet's clouds. Magellan, designed and built by Martin Marietta, will map about ninety percent of Venus's surface. As of May 22, Magellan was 2,642,052 miles from earth and was traveling at 5,802 mph in relation to its home planet.

The launch of Magellan was so critical that Atlantis carried 4,000 pounds less equipment than usual so the crew could use the fuel saved to steer to the point in orbit required to deploy the spacecraft. Consequently, the rest of the crew-Navy Capt. David Walker, Air Force Col. Ronald Grabe, Dr. Norman Thagard, and Dr. Mary Cleaveperformed only a handful of experiments, but searched for lightning as part of a research project, took pictures, and became office machine repair technicians. A faulty text and graphic system-an outer-space facsimile machine-could not be fixed, but the crew did replace a broken computer (a first for the shuttle program) in a five-hour operation.

The orbiter's crew made a crosswind landing on Runway 22 (a concrete strip) at Edwards AFB, Calif., at 3:43 pm EDT on May 8. Atlantis sustained minimal damage on its fourth flight, which was the twenty-ninth shuttle mission. This was also the first flight in a number of years during which the US astronauts had earth orbit to themselves. The Soviet Union has put its Mir space station in a parking orbit and has left it unmanned for the first time in two years. The reasons for the abrupt hiatus are unclear.

In other shuttle news, President George Bush chose the name *Endeavour* for OV-105, the replacement orbiter ordered in the wake of the 1986 *Challenger* disaster. *Endeavour* was the name of the first ship commanded by British explorer James Cook. On the ship's maiden voyage in 1769, Captain Cook observed and recorded the transit of Venus. The new orbiter's first flight will be STS-54, scheduled for 1992.

The name was chosen through a nationwide contest that involved more than 71,000 elementary, middle, and high school students. The winning name was submitted by the fifth graders of Senatobia (Miss.) Middle



McDonnell Aircraft Co. workers put the finishing touches on the upper cockpit section of the first C-17 airlifter. After completion, the section was shipped from St. Louis, Mo., to the Douglas Aircraft Co. plant in Long Beach, Calif., where the entire airlifter is undergoing assembly.

School and a team of math students from the Tallulah Falls (Ga.) School. More than 6,000 entries were submitted.

STS-31, the mission scheduled for this December to launch the Hubble Space Telescope (see "Aerospace World," p. 30, June '89 issue), has been postponed at least until February 1990. The rescheduling was necessary because of the delay in the refurbishment of the orbiter Columbia and the critical October launch window for the Galileo probe, which will orbit Jupiter.

★ Under the general category of "things that are launched," here is a rundown of recent missile and unmanned space booster items:

The first launch of the MGM-134A Small ICBM (unofficially called "Midgetman") on May 11 was unsuccessful. The missile was cold-launched from an above-ground silo at Vandenberg AFB, Calif., and the test appeared normal through first-stage separation. Approximately seventy seconds into launch, the missile began tumbling and was then destroyed by the range safety officer. The Air Force is investigating.

The Navy has begun design modifications to the first-stage nozzle of the Lockheed UGM-133A Trident II, or D5, sea-launched ballistic missile. A mechanical linkage that transmits position commands to the nozzle was determined to be the cause of the March 21 missile test failure. The linkage redesign, a labor dispute at Kaiser that has stopped delivery of second- and third-stage nozzles, and an explosion at the Hercules plant in Utah where second-stage propellant is cast all contributed to the Navy's decision to push initial operational capability with the missile back three months to March 31, 1990. Trident II underwater tests are to resume this summer.

The Navy has also decided to withdraw from the joint-service Northrop AGM-136A Tacit Rainbow loitering antiradiation missile program in FY '90. The Air Force will continue the missile's full-scale development effort. However, with fewer missiles to be procured now, the need to qualify a second-source manufacturer is being questioned.

India successfully carried out the first test of its first medium-range intercontinental ballistic missile on May 22. The missile, named Agni (the Hindi word for fire), lifted off from the newly developed Balasore test range and headed out over the Bay of Bengal. The missile reportedly has a range of 1,500 miles, putting targets in Pakistan and southern China within range. India is one of only a handful of countries that have developed both nuclear weapons and the capability to deliver them over long distances.

On May 10, the Air Force successfully launched a Martin Marietta Titan 34D with a classified payload from

### Aerospace World

Launch Complex 40 at Cape Canaveral AFS, Fla. Air Force officials had previously said that the payload for the first Titan 34D from Cape Canaveral in 1989 would be a pair of Defense Satellite Communications System (DSCS, or "discus") satellites, but US Space Command said after the launch that the payload had been a single satellite, designated USA 37. It is said to be designed for gathering signals intelligence from geosynchronous orbit.

★ A Tale of Two StarLifters: It was the worst of times in January 1987 when a C-141B skidded off a snow-covered runway at MCAS Iwakuni, Japan, sheared off its main landing gear, and severely damaged its belly before coming to rest in deep mud. A fire also damaged the right wing. Meanwhile, another "StarLizard" (as the crews call the camouflaged transports) was sitting at Travis AFB, Calif., following an earlier mishap in which its left wing was clipped off and badly burned.

A team from the 2955th Combat Logistics Support Squadron at Robins AFB, Ga., was sent to Japan to begin salvage operations there while a team from the Warner Robins Air Logistics Center was dispatched to Travis to remove the right wing from the other C-141B. It was an ordeal to get the aircraft out of the mud in Japan, and repair work had to be done in the open because Iwakuni didn't have a hangar big enough for a C-141. It was the best of times when the wing transplant and other repairs were finished (at a cost of \$4 million, \$1 million under budget), and the aircraft flew to Warner Robins ALC on March 27 of this year.

The story doesn't end there, though. Additional repair work on the C-141B (serial number 67-0029) is now nearing completion. When that work is done, the aircraft will go through the Pacer Center wing box modification, but come next Marchthree years after it was nearly written off-the C-141B will return to Norton AFB, Calif., and rejoin the Military Airlift Command fleet. Salvage work on the now wingless StarLifter at Travis began in May, and it should be flying again in two years, after Warner Robins ALC technicians build up a new set of wings from spare parts.

\* APPOINTED-Dr. William B. Lenoir, currently a member of the board of directors and vice president of the consulting firm Booz-Allen & Hamilton, Inc., has been named to head NASA's space station program. Dr. Lenoir, who was a member of the astronaut class selected in August 1967, did not get to fly until STS-5, the first operational shuttle mission, in 1982. Dr. Lenoir will lead the reorganized space station program management team. One of his main tasks will be to secure continued funding from Congress for the space station (to be named Freedom).

Dr. Thomas J. Welch, former Depu-



Exactly twenty years after the first Hawker-Siddeley Harrier GR.1 was delivered to the British Royal Air Force, the operational conversion unit at RAF Wittering put up this formation of the newest Harriers (British Aerospace/McDonnell Douglas Harrier GR.5). No. 1 Squadron will become operational with the GR.5 this October.

ty Assistant Secretary of Defense for Atomic Energy (Chemical Matters), has been **appointed executive director of the Defense Science Board.** Dr. Welch has previously served in key management positions at the Army's Aberdeen (Md.) Proving Ground. The DSB is the senior technical advisory body in the Department of Defense and is composed of members appointed from the private sector.

\* HONORS-The 1988 Collier Trophy, the most prestigious award in American aviation, was presented to retired Rear Adm. Richard H. Truly on May 19. Admiral Truly was honored for his contributions in bringing the space shuttle program back to working order last year in his role as NASA's Associate Administrator for Space Flight. Admiral Truly's confirmation as head of the space agency is pending at this writing. The Collier Trophy has been presented annually since 1911 (except for the years 1917-20) by the National Aeronautic Association.

The Omaha Trophy, awarded annually since 1970 to the top wing in Strategic Air Command, was presented to the 2d Bombardment Wing at Barksdale AFB, La., on April 18. The 2d BMW was cited for its role in conventional weapon employment improvements, its superior performance in inspections, its sterling safety record, and its demonstrated combat capability in exercises. The Omaha Trophy is given by the SAC Consultation Committee, a group of Omaha business executives who serve in a consulting capacity to the SAC Commander in Chief.

The Air National Guard Noncommissioned Officer Academy Graduate Association awarded its Mai. Gen. I. G. Brown Command Excellence Trophy to Col. Edward L. Sykes (Kansas ANG), Lt. Col. William G. Hendrickson (Minnesota ANG), Col. William D. Lackey (North Carolina ANG), Lt. Col. Glenn B. Pusey, Jr. (Delaware ANG), and Col. Fred N. Larson (Ohio ANG). The Command Excellence Trophy is presented annually to ANG commanders who have performed in an exemplary manner during the previous year. The award is named for the late Maj. Gen. I. G. Brown, a former Chief, Air Force Division, National Guard Bureau, and founder of the Guard's enlisted professional military education program.

★ PURCHASES—Air Force Systems Command's Human Systems Division at Brooks AFB, Tex., awarded **Boeing**  Advanced Systems a \$15.5 million contract in late April for full-scale development of an improved life-support system for F-15 and F-16 pilots. Called "Combat Edge," the system will give aircrew members an assisted positive pressure breathing capability to reduce the probability of G-induced loss of consciousness. Hardware for each crew member will include a partial pressure vest, modified helmet, oxygen mask and regulator, G-valve, and connectors. Low-rate production will start this summer, and test and evaluation will start next March. One F-16 wing will be equipped with Combat Edge next August.

In a nonpurchase, the Navy has decided not to exercise any more of its options with Boeing Military Airplanes for replacement wingsets for Grumman A-6E Intruder attack planes. Boeing will now build only the 174 production wingsets plus five test wings and four spares already ordered. Production will be completed in 1992. The Navy had options for 327 wingsets. Delays in the composite wing's development, the cancellation of the A-6F, termination of the A-6E line, and the advent of the A-12 Advanced Tactical Aircraft were the reasons the Navy didn't pursue the additional wingsets. The first rewinged A-6E flew on April 3 and has demonstrated a 6.5-G maneuver. Testing of the wings is now under way at the Naval Air Test Center at NAS Patuxent River, Md. Grumman will install the new wings on the last twenty-one new-build A-6Es, and the remainder will be installed at Navy depots.

Two Air Force Systems Command divisions awarded contracts for the

A test dummy, modeling the latest in lifesupport equipment, "Combat Edge," awaits wind-blast testing in an F-15 ejection seat. Combat Edge, now being developed by Boeing Advanced Systems, is designed to reduce the probability of G-induced loss of consciousness.

Rapid Execution and Combat Targeting (**REACT**) program, which will improve, upgrade, and modernize Strategic Air Command's communications and missile launch capabilities. AFSC's Ballistic Systems Division at Norton AFB, Calif., awarded Ford Aerospace a \$71.3 million contract for the weapon system control element of REACT, to include rapid retargeting,



The Navy will not exercise any more contract options with Boeing for composite replacement wingsets for the Grumman A-6E. The new wings have a titanium spar, offer an eighteen percent increase in gross weight, and have an 8,000-hour service life.

ment, and launch control center (LCC) integration. Electronic Systems Division awarded **GTE Government Sys**tems Corp. a \$34 million contract to upgrade communication systems by integrating command authority communications and providing rapid message processing. Work on the REACT program will extend to 1993.

weapon system computer replace-

In late April, Lockheed and Northrop, the team leaders for the Air Force's Advanced Tactical Fighter (ATF) effort, received their first funding for development work on the Navy's ATF variant, or NATF. AFSC's Aeronautical Systems Division at Wright-Patterson AFB, Ohio, awarded each team a \$50 million increase to its ATF contract for demonstration and validation of the NATF. The Navy has announced that the NATF will perform ground attack in addition to its primary role of air superiority. The NATF will eventually replace the Navy's F-14 Tomcat in the air-superiority role and will supplement the F/A-18 Hornet in the ground attack role.

★ DELIVERIES—Pratt & Whitney shipped the first two flight-test engines for the McDonnell Douglas C-17A transport on May 5. The F117-PW-100 engines were sent to LTV's plant in Dallas, Tex., where they will be





### Aerospace World

fitted with nacelle and thrust-reverser hardware. From Dallas, the powerplants will be shipped to the Douglas Aircraft plant in Long Beach, Calif. The other two flight engines were scheduled to be shipped to LTV by early June. The F117 is a version of the P&W's PW2040 turbofan now used by five airlines on their Boeing 757 aircraft. The C-17 is scheduled to roll out early next fall.

South Korea's Ambassador to the US, Tong-jin Park, recently said that the Soviet Union has supplied fifty advanced fighters to North Korea within the past year. The jets include the Mikoyan-Gurevich MiG-29 Fulcrum dual-role fighter and the Sukhoi Su-25 Frogfoot ground attack aircraft. Ambassador Park also said the North Koreans now have SA-5 Gammon surface-to-air missiles.

The 405th Tactical Training Wing at Luke AFB, Ariz., received its first Low-Altitude Navigation and Targeting Infrared for Night (LANTIRN) system navigation pod on May 17. The 405th TTW's 461st Tactical Fighter Training Squadron began F-15E crew instruction with the navigation pod shortly after delivery. The 550th TFTS (F-15E) and Luke's 58th TTW's 310th TFTS (F-16C) will begin training with Four Rockwell B-18 bombers from the 96th Bomb Wing at Dyess AFB, Tex., sit on the ramp at Elmendorf AFB, Alaska, during Fifteenth Air Force's "Giant Warrior" exercise. The recently concluded Giant Warrior saw the largest deployment of B-18s to date.



the pod this summer. Martin Marietta is scheduled to deliver the first targeting pod to the Luke "schoolhouse" next July.

★ MILESTONES—Strategic Air Command's Fifteenth Air Force com-

### **July Anniversaries**

July 27, 1909: Orville Wright, with Lt. Frank P. Lahm as passenger, makes the first official test flight of the Army's first airplane at Fort Myer, Va.

July 18, 1914: The Aviation Section of the Signal Corps is created by Congress.
Sixty officers and students and 260 enlisted men are authorized.

• July 8, 1924: In the continuing story of the Douglas World Cruisers (see April through June "Anniversaries"), the three crews arrive at the Royal Air Force aerodrome at Baghdad with sunburned knees, as the pilots and "mechanicians" had earlier substituted RAF-issue shorts for their US uniform trousers. The crews reach Paris by July 14, Bastille Day.

 July 5, 1944: The Northrop MX-324, the first US rocket-powered airplane, is flown for the first time by company pilot Harry Crosby at Harper Dry Lake, Calif.
July 17, 1944: Napalm incendiary bombs are dropped for the first time by American P-38 pilots on a fuel depot at Contances, near St.-Lô, France.

 July 27, 1944: The executive committee of the National Advisory Committee on Aeronautics discusses robots and their possibilities for military and other uses.
July 15, 1954: The Boeing Model 367-80 makes its first flight at Renton, Wash.,

with company pilot Tex Johnson in the left seat. The progenitor of the Air Force's KC-135, the airplane will later evolve into the 707 passenger liner.

 July 1, 1959: The first experimental reactor (Kiwi-A) in the nuclear space rocket program is operated successfully in a test at Jackass Flats, Nev.

• July 8, 1959: Army Maj. Dale Buis and Sgt. Chester Ovnand are killed by guerrillas at Bienhoa, South Vietnam. They are the first American soldiers to be killed on the ground by the enemy in what will become the Vietnam War.

 July 1, 1969: Air Force Service Numbers are replaced by Social Security Account Numbers for all personnel.

 July 20, 1969: At 10:56 p.m. EDT, Apollo 11 astronaut Neil Armstrong becomes the first human to touch another heavenly body as he puts his left foot on the surface of the moon. Air Force Col. Edwin "Buzz" Aldrin climbs out of the lunar module about fifteen minutes later. After twenty-one hours and thirty-six minutes total time on the moon, the duo rejoins the command module pilot, Air Force Col. Michael Collins, for the trip home.

 July 9, 1979: The Voyager 2 probe flies within 399,560 miles of Jupiter's cloud tops. Launched in 1977, Voyager 2 is scheduled to fly by Neptune next month. pleted its largest Pacific deployment since 1975 in late April. More than 2,000 people and 163 aircraft, including the largest-ever deployment of Rockwell B-1B bombers, participated in the thirty-day Giant Warrior exercise. The B-1Bs (from Ellsworth AFB, S. D., and Dyess AFB, Tex.) along with B-52s from Mather AFB, Calif., Andersen AFB, Guam, Fairchild AFB, Wash., and Minot AFB, N. D., dropped more than 1,600 practice and live bombs on training ranges in Nevada, Alaska, and the Pacific. Counting tanker, reconnaissance, and theater support aircraft, more than 900 sorties were flown during the exercise.

One of the most successful Air Force operations in history, the rotational deployment of Boeing E-3 Sentry Airborne Warning and Control System (AWACS) aircraft to Saudi Arabia, ended on April 17 as the last two E-3s returned to Tinker AFB, Okla. The Elf One deployments began at the request of the Saudi government in October 1980. In that period, E-3s flew more than 86,500 hours for a total of 34,000,000 miles, while SAC tankers flew approximately 6,800 refueling sorties. The Royal Saudi Air Force now owns and operates five E-3s. In a related note, all of the E-3As have now been modified and brought up to E-3B or E-3C standard. The last of the thirty-four AWACS aircraft was modified earlier this year.

The McDonnell Douglas F-15 Short Takeoff and Landing/Maneuvering Technology Demonstrator (S/MTD) made its first flight with rectangular thrust-vectoring, thrust-reversing U.S.A.F. Operational Reliability Climbs To New Levels With A Start From Teledyne Continental's Ground Power Generator System

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Italian Futurism, the first modern art movement to embrace technology as subject matter, is the focus of a new exhibition at the National Air and Space Museum in Washington, D. C. Started in 1909, the movement showed a love of danger, speed, motion, and technology. This 1938 watercolor, Spanish War, is by Mario Sironi. The exhibition will continue through mid-September.



## Senior Staff Changes

PROMOTIONS: To be ANG Major General: Charles R. Driggers; Joe H. Engle.

To be ANG Brigadier General: Tandy K. Bozeman; Nelson E. Durgin; Adolph P. Hearon; Fred R. Helms; Johnny J. Hobbs; Thomas W. Napolitan; Richard E. Pezzullo; James H. Renschen; David J. Rist; Dan A. Robar; William J. Stockwell; Terrence P. Woods.

RETIREMENTS: M/G Archer L. Durham; B/G Wayne W. Lambert; M/G Harold W. Todd.

CHANGES: B/G Charles L. Bishop, from Dep. ACS/C-2, CFC, and ACS/ Intel., J-2, USKOREA, Hq. United Nations Cmd. Korea/CFC/USKOREA, Yongsan, Korea, to DCS/Intel., and Cmdr., 7455th TIW, Hq. USAFE, Ramstein AB, Germany, replacing B/G Richard J. O'Lear... Col. (B/G selectee) Jay D. Blume, Jr., from Spec. Ass't to C/S, SHAPE, Casteau, Belgium, to Cmdr., E-3A Component NATO, Airborne Early Warning Force Cmd., SHAPE, Geilenkirchen, Germany... B/G (M/G selectee) John L. Borling, from Ass't DCS/Ops., Hq. SAC, Offutt AFB, Neb., to DCS/Ops., and Dep. Dir., Ops., STRACOS, Hq. SAC, Offutt AFB, Neb., replacing M/G Alan V. Rogers... B/G Edward N. Brya, from Dep. Cmdg. Gen., Joint Spec. Ops. Cmd., USSOCOM, Ft. Bragg, N. C., to Dir., Resources, J-8, Hq. USSOCOM, MacDill AFB, Fla., replacing M/G William J. Porter ... Col. (B/G selectee) Fredric N. Buckingham, from Cmdr., 317th TAW, MAC, Pope AFB, N. C., to Vice Cmdr., 21st AF, McGuire AFB, N. J., replacing retiring B/G John F. Sievertson ... Col. (B/G selectee) Hiram H. Burr, Jr., from Dep. for Security Assistance, J-4/7S, Hq. USCENTCOM, MacDill AFB, Fla., to Dep. Cmdr., Joint Task Force Middle East. USCENTCOM, Navy Mobile Units, replacing B/G Philip W. Nuber ... B/G Clifton C. Clark, Jr., from DCS/08R, Hq., ATC, Randolph AFB, Tex., to Cmdt., Sqdn. Officers School, Hq. AU, Maxwell AFB, Ala., replacing B/G Ellwood P. Hinman III ... M/G John R. Farrington, from Chief, US Mil. Training Mission to Saudi Arabia, USCENTCOM, Dhahran, Saudi Arabia, to Vice Cmdr., 15th AF, SAC, March AFB, Calif., replacing retiring M/G Jack K. Farris.

B/G Bruce L. Fister, from Ass't DCS/Ops., Hq. MAC, Scott AFB, III., to Dep. Cmdg. Gen., Joint Spec. Ops. Cmd., USSOCOM, Ft. Bragg, N. C., replacing B/G Edward N. Brya...Col. (B/G selectee) Phillip J. Ford, from IG, Hq. SAC, Offutt AFB, Neb., to Ass't DCS/Ops., Hq. SAC, Offutt AFB, Neb., replacing B/G (M/G selectee) John L. Borling...B/G James F. Grant, from DCS/Irtel., Hq. TAC, Langley AFB, Va., to Dep. ACS/C-2, CFC, and ACS/Intel., J-2, USKOREA, Hq. United Nations Command Korea/CFC/USKOREA, Yongsan, Korea, replacing B/G Charles L. Bishop...B/G (M/G selectee) Richard E. Hawley, from DCS/Plans, and Staff Dir., Plans, PACOPS, Hq. PACAF, Hic kam AFB, Hawaii, to Dir., Ops., DCS/P&O, Hq. USAF, Washington, D. C., replacing M/G Walter E. Webb III...B/G Ellwood P. Hinman III, from Cmdt., Sqdn. Officers School, Hq. AU, Maxwell AFB, Ala., to Dir., AF Pers. Council, Dep. Ass't Sec'y, Reserve Affairs, OSAF, Washington, D. C., replacing retiring B/G Donald C. Metz... Col. (B/G selectee) James L. Hobson, Jr., from Crdr., 39th SCW, MAC, Eglin AFB, Fla., to Vice Cmdr., 23d AF. MAC, Hurlburt Field, Fla., replacing B/G Hanson L. Scott. . . **B/G James M. Hurley**, from Dir., Pers. Plans, DCS/Pers., Hq. USAF, Washington, D. C., to DCS/Ops., 2d ATAF, AFCENT, Rheindahlen, Germany, replacing B/G (M'G selectee) Billy G. McCoy . . **B/G (M/G selectee) Donald L. Kaufman**, from Dir., Int'l Prgms., and Cmdr., USAF Ctr. for Int'l Prgms., DCS/P&R, Hc. USAF, Washington, D. C.,  $\varpi$  Chief, US Mil. Training Mission to Saudi Arabia, USCENTCOM, Dhahran, Saudi Arabia, replacing M/G John R. Farrington.

B/G Charles D. Link, from Dep. Dir., Politico-Military Affairs, J-5, OJCS, Washington, D. C., to Cmdt., Air Cmd. & Staff College, Hq. AU, Maxwell AFB, Ala., replacing B/G (M/G selectee) David C. Reed ... Col. (B/G selectee) John G. Lorber, from Cmdr., 432d TFW, PACAF, Misawa AB, Japan, to DCS/ Plans, and Staff Cir., Plans, PACOPS, Hq. PACAF, Hickam AFB, Havaii, replacing B/G (M/G selectee) Richard E. Hawley ... Col. (B/G selectee) Richard B. Myers, from Ass't DCS/Plans, Hq. TAC, Langley AFB, Va., to IG, Hq. TAC, Langley AFB, Va., replacing B/G Joseph J. Redden ... M/G Michael A. Nelson, from ACS/Ops., SHAPE, Casteau, Belgium, to Cmdr., Sheppard TTC, ATC, Sheppard AFB, Tex., replacing retiring M/G David W. Forgan ... B/G Philip W. Nuber, from Dep. Cmdr., Joint Task Fcrce Middle East, US-CENTCOM, Navy Mobile Units, to Dir., Int'l Prgms., and Cmdr., USAF Ctr. for Int'l Prgms., DCS/P&R, Hq. USAF, Washington, D. C., replacing B/G (M/G selectee) Donald L. Kaufman ... B/G Richard J. O'Lear, from DCS/Intel., and Cmdr, 7455th TIW, Hq. USAFE, Ramstein AB, Germany, to Dir, Intel., J-2, Hq. USEUCOM, Vaihingen, Germany, replacing M/G Gary W. O'Shaughnessy....M/G Gary W. O'Shaughnessy, from Dir, Intel., J-2, Hq. USEUCOM, Vaihingen, Germany, to Cmdr., Hq. ESC, and Dir., JEWC, Kelly AFB, Tex., replacing retiring M/G Paul H. Martin ... M/G William J. Porter, from Dir., Resources, J-8, Hq. USSOCOM, MacDill AFB, Fla., to Dir., Pers. Plans, DCS/Pers., Hq. USAF, Washington, D. C., replacing B/G James M. Hurley

Col. (B/G selectee) Everett H. Pratt, Jr., from IG, Hq. PACAF, Hickam AFB, Hawaii, to Ass't DCS/Plans, Hq. TAC, Langley AFB, Va., replacing Col. (B/G selectee) Richard 3. Myers ... B/G Joseph J. Redden, from IG, Hq. TAC, Langley AFB, Va., to Cmdt. of Cadets, USAFA, Colorado Springs, Colo., replacing B/G (M/G selectee) Sam W. Westbrook III ... M/G Alan V. Rogers, DCS/Cos., and Dep. Dir., Ops., STRACOS, Hq. SAC, Offutt AFB, Neb., to ACS/Ops., SHAPE, Casteau, Belgium, replacing M/G Michael A. Nelson ... B/G Ervin J. Rokke, from US Defense & Air Attaché, USDAO American Embassy, Moscow, USSR, to Assoc. Dep. Dir., Ops. for Mil. Support, NSA, Ft. Meade Md.... B/G Hanson L. Scott, from Vice Cmdr., 23d AF, MAC, Hurlburt Field, Fla., to Cmdr., Spec. Ops. Cmd. Pacific, PACOM, Camp Smith, Hawaii... Col. (B/G selectee) James L. Vick, from C/S, 15th AF, SAC, March AFB, Calif., to IG, Hq. SAC, Offutt AFB, Neb., replacing Col. (B/G selectee) Phillip J. Ford ... M/G Walter E. Webb III, from Dir., Ops., DCS/ P&O, Hq. USAF, Washington, D. C., to Vice Dir., Ops., J-3, OJCS, Washington, D. C. ... B/G (M/G selectee) Sam W. Westbrook III, 'rom Cmdt. of Cadets, USAFA, Colorado Springs, Colo., to DCS/O&R, Hq. ATC, Randolph AFB, Tex., replacing B/G Clifton C. Clark, Jr.
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### Aerospace World

engine nozzles on May 10. Company pilot Larry Walker flew the modified F-15B to an altitude of 20,000 feet and a maximum speed of Mach .9 during the ninety-minute flight. The nozzles, fitted to the plane's Pratt & Whitney F100-PW-220 engines, were operated in the conventional mode throughout the flight. After several flights near the McDonnell Aircraft plant in St. Louis, Mo., the aircraft will be flown to the Air Force Flight Test Center at Edwards AFB, Calif., where testing will continue into 1990. One F-15 S/MTD test will entail taking off and landing on a fifty-by-1,500-foot runway at night in a thirty-knot crosswind.

The first General Dynamics



The F-15 STOL/Maneuvering Technology Demonstrator makes its first flight with Pratt & Whitney thrust-vectoring/thrust-reversing engine nozzles. The S/MTD program is managed by the Wright Research and Development Center at Wright-Patterson AFB, Ohio, an agency of Air Force Systems Command's Aeronautical Systems Division.

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FB-111A modified with a new digital flight-control system flew for the first time on May 4. Two Air Force pilots, Maj. Ken Hasenbein and Capt. Tim Seeley, flew the aircraft on the ninetyminute sortie. Lear Astronics developed and built the aircraft's digital flight-control computer, which operates on a GD-developed software program. The new system will provide a number of improvements when it replaces the analog system currently used. The FB-111A will be flown to the Air Force Flight Test Center after several flights at the GD plant in Fort Worth, Tex., to begin its year-long test program. GD will modify an EF-111A with the new system later this year. The Air Force wants to upgrade the entire F/FB/EF-111 fleet between 1990 and 1994.

The first laboratory flight test of a three-axis stabilized projectile was successfully carried out on April 24. The twenty-one-second test of the vehicle (a scaled-down version of the Space-Based Interceptor spacecraft) was carried out at the Strategic Defense Initiative Organization's facility at the Air Force Astronautics Laboratory at Edwards AFB, Calif. The 154pound, six-foot-long vehicle lifted off the launch cradle with a 450-millisecond pulse from a 350-pound-thrust liquid-fueled rocket engine. Using divert engines and attitude control thrusters, the projectile held a thirtyfoot altitude while maintaining "lockon" to a computer-generated target before falling into a net after running out of fuel. The vehicle operated autonomously, relying on preprogrammed instructions. Rockwell's Rocketdyne Division built the projectile and the facility and ran the test.

The Air Force's fleet of Learjet C-21A operational support aircraft recently passed the 235,000-flighthour plateau. The eighty-three C-21s operated by active-duty and Air National Guard units have logged more than 114,000,000 miles of travel and have a mission-capable rate in excess of ninety-five percent. The aircraft are stationed at twelve US bases and three overseas locations. The first C-21A was delivered to the Air Force in 1984.

★ NEWS NOTES—The Smithsonian Institution's National Air and Space Museum will celebrate the twentieth anniversary of the Apollo 11 lunar landing this July 20 by replaying the network news coverage of the event. The museum will remain open late and replay the coverage, complete with commentary, on closed-circuit monitors at the same time of day that the events happened in 1969. There will also be a public ceremony cosponsored by NASA earlier that day during which the Apollo 11 astronauts will be recognized.

The 4950th Test Wing at Wright-Patterson AFB, Ohio, saved the Air Force approximately \$500,000 by building its own simulator. The test wing, a part of Air Force Systems Command's Aeronautical Systems Division, built the shell of the F-16 cockpit, then added a head-up display, instruments, and a seat that simulates G-forces. The simulator was built to demonstrate a new training-system concept that calls for using interchangeable computer modules among different types of flight simulators. Nicknamed "Have Module," the cockpit will be delivered to Boeing, where its computers will be installed. Upon completion of the current tests of the modular concept next year, the simulator will be used for human-factors testing and simulator networking research.

A subcommittee of the House Armed Services Committee noted in a report released May 6 that the military's five intermediate command and staff schools and the five senior war colleges need to be improved. The congressional report called for tougher coursework and more graded examinations, papers, and reports at the schools, as well as small discussion seminars rather than large lecture classes. The two Air Force schools were criticized for having the most classroom hours devoted to symposia, lectures, and films. Sixtytwo percent of the core curricula at the Air War College, for instance, relied on these "passive learning" techniques. This was the first comprehensive congressional review of the military "graduate schools.'

A series of severe thunderstorms ravaged the flight line at Fort Hood, Tex., on May 13. The Army said that 190 of the 495 helicopters (mostly AH-64 Apaches) stationed at the base near Killeen, Tex., were damaged, and sixty to seventy-five aircraft must undergo depot repair. Costs for the damages range between \$500 million and \$1 billion. Several hundred rotor blades were damaged. The storms could have had a worse effect, but ground crews, despite little warning, got fifty percent of the helicopters into hangars. Normally, only fifteen to twenty percent of the assigned aircraft are hangared.

\* DIED-Frank (Bud) Kelley, one of the first Americans to fly a jet-powered aircraft, of a stroke on May 3 at Laguna Beach, Calif. He was seventyfour. In November 1942, Mr. Kelley, a test pilot for Bell Aircraft, was one of the first pilots to fly the XP-59A Airacomet, America's first jet, at Muroc Dry Lake (now Edwards AFB), Calif. Earlier, he was a Naval aviator assigned to the USS Lexington, (CV-3) and he took part in the search for Amelia Earhart and her navigator. Fred Noonan, after the duo disappeared in 1937. After stints at Vought-Sikorsky and Hughes, Mr. Kelley went to the flight standards division of the Federal Aviation Administration in 1979, where he worked until his retirement in 1979.

Dolores Waldorf, a pioneering aviator, of a stroke on May 8 at a hospital in Oakland, Calif. She was eightyeight. An original member of Amelia Earhart's Ninety-Nines, an organization made up of ninety-nine noted female pilots in the US that thrilled crowds with its barnstorming exploits, Mrs. Waldorf also founded the Monarch Flying Service in the early 1930s. Monarch trained hundreds of pilots during World War II, and Mrs. Waldorf served as one of the instructors.

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## FEEL OF THINGS TO COME ADVANCED PILOT.

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environment ideal for effective training throughout all mission profiles.

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Could an Air Force in such splendid condition today have serious concerns about the future? Unfortunately, the answer is yes.

# A Little Lower on a Little Less

BY JOHN T. CORRELL, EDITOR IN CHIEF

THE US Air Force closed out 1988 with the highest missioncapable rates in its history. Fighter forces could generate almost eighty percent more sorties than in 1980, and the readiness of the bomber force was at an all-time high. The cargo-carrying capacity of airlifters was up seventy percent since 1980.

Superlatives continue to mount about the accuracy and reliability of systems and support equipment. The replacement of Vietnam-era F-4 fighters in the active-duty force with F-15s and F-16s is almost complete. The Air National Guard and the Air Force Reserve are well along with conversion to newer aircraft. The Advanced Tactical Fighter development is essentially on track (see "Washington Watch," June '89 issue, p. 19).

The B-1B bomber is in service. The Air Force says that it is meeting or exceeding expectations in every respect except for a chronic but solvable problem with electronic countermeasures. The first fifty Peacekeeper ICBMs are on alert.

For the time being, the US Air Force is in grand shape. The fact that so many indicators are glowing so favorably might suggest that little real damage was done by the massive budget reductions of the past two years. If so, the appearance is deceiving.

### **Trying Times Ahead**

Between 1985 and the early 1990s, the active-duty Air Force will have shrunk by about thirty operational squadrons. There will be a net loss of 116 aircraft from the fleet this year alone.

Military manpower is down, too, partly because the smaller force requires fewer personnel and partly because of a shortage of money. The enlisted force was cut by 30,000 members last year—two-thirds of them let go strictly for financial reasons. As directed by Congress, officer strength is already 6.2 percent below the 1986 level. By the end of 1991, Air Force active-duty military strength will be 566,800, its lowest level in ten years.

The cracks will begin showing up soon in readiness and the ability of the force to sustain combat. Because the procurement lead time for spare parts is three years or more, units today are consuming spares At right: A T-38 pilot, typifying the military pilots who are being lured to the airlines in greater and greater numbers. Last year, USAF was able to retain only forty-three percent of its pilots (sixty-three percent is the level necessary to sustain the flying force).



ordered in the relatively good years of 1986 and 1987. The flow of parts through the pipeline will diminish sharply about a year from now.

The strategic modernization plan is mired in political and financial muck. The compromise brokered in 1983 by the Scowcroft Commission—a combination of 100 MX Peacekeeper ICBMs and a substantial number of mobile Midgetman missiles—did not hold. The Air Force may never get the second fifty Peacekeepers. Midgetman, which the Reagan Administration tried to kill outright a year ago, is once again a live possibility.

If Midgetman is resurrected, \$24.8 billion will have to be found to pay for it. Moreover, the Air Force is asking for additional appropriations of \$1.4 billion to make modifications and corrections to the B-1B.

### Losses in Revised Budget

The B-2 Stealth bomber was among the programs hardest hit in the latest budget revision. Its 1990–91 funding was cut by \$4 billion. The Bush Administration wants to slow development until its

The strategic modernization plan is mired in political and financial muck. Meanwhile, though the last of the B-1Bs was delivered on schedule last year, the furor about the system goes on. concerns about B-2 cost estimates and technical performance are satisfied.

The new budget also terminated the procurement of F-15E longrange interdictors at 200 rather than 392 as originally planned. The fastmoving A-16 attack aircraft, which the Air Force wanted as a replacement for its A-10s, was eliminated as well.

A further personnel strength reduction of 3,200 in 1990 will not affect net effectiveness much, because of the lower requirements that go along with drawdowns in force structure.

Declaring insufficient funds to support the National Aerospace Plane, the Air Force proposes sending the development to NASA along with a \$100 million contribution toward its continuation.

Even worse may be yet to come. Further reductions of at least \$44.3 billion must be made from the fiveyear defense plan by 1994. President Bush has conceded that much, but Congress may insist on cuts that go deeper still. The next big money scramble in the Pentagon will be over how to allocate these reductions.

### **Bombers in Controversy**

Details about the B-2 have been trickling out since November, when the public was permitted its first look—from 200 feet away—at the bat-winged bomber. In April, the Air Force revealed that the B-2 has a maximum takeoff weight of more than 250,000 pounds and a range of 6,000 nautical miles at high altitude without refueling. It can carry 50,000 pounds of weapons in two side-by-side internal bays. (The payload of the B-1B is 134,000 pounds.)

Aerodynamically, the B-2's flying wing design "is almost as efficient as the high-flying U-2," according to Gen. Bernard P. Randolph, Commander of Air Force Systems Command. "It is also fifty percent more efficient than the B-1."

General Randolph further says that critical speculation about the flying wing's lack of stability is unfounded: "While a conventional aircraft gains directional stability from its horizontal and vertical tail surfaces, the tail assembly also creates undesired drag. The flying wing is near neutrally stable." Confidence in the design is backed up by 24,000 hours of wind-tunnel testing, General Randolph says.

If need be, the B-2 could conduct such long-range operations as the Libyan raid of three years ago from a long distance and with great advantages in surprise. "With precision munitions and one or two tankers, three to four B-2s could have done the same job direct from Stateside bases," General Randolph says.

The major controversy on the B-2 is its cost. The Air Force has acknowledged sixteen percent escalation and now says that the flyaway cost per aircraft will be \$305 million (\$516 million if R&D expenses are prorated). There is some disagreement within the Pentagon on the cost estimate, and a figure of \$750 million is making the rounds of the Washington rumor mill.

The last of the B-1Bs was delivered on schedule in April 1988, but the furor about the system goes on. The Air Force says that the most critical electronic countermeasures do work, but that a design deficiency precludes full performance by the defensive avionics system. The plan is to develop a separate radar warning receiver for the B-1B while efforts to improve the existing ALQ-161 ECM suite continue.

The independent radar warning receiver would cost \$489 million. The Air Force will also ask new appropriations of \$250 million for ECM support equipment, \$485 million for capabilities (such as adapting the B-1B to employ SRAM II missiles) not in the original program baseline, and \$202 million for antiicing equipment for the engine intake system, new antennas, and other improvements.

If approved, this spending would finally take the B-1B program cost over the cap (\$20.5 billion in 1981 dollars) established eight years ago. Correction of the core system would be covered by \$476 million previously appropriated.

### Missiles and Politics

All of the facts and arguments on ICBM modernization are familiar. From here on, it's a matter of which approach the Administration will accept and who has the votes in Congress. Going into this year's round, fifty Peacekeepers were on alert in silos, having achieved full operational capability in December 1988. The fate of a second fifty Peacekeepers was uncertain, as was the future of the Small ICBM, Midgetman. The proposal at year's end was to put the second contingent of Peacekeepers on rail cars at military bases, moving them onto the rail network in time of crisis.

Support for the small missile remains strong in Congress. The roadmobile Midgetman, carrying a single warhead, is seen as less provocative as well as more survivable than Peacekeeper. A major drawback with the small missile is cost. Midgetman requires 500 missiles to provide 500 warheads, whereas the multiple-warhead Peacekeeper does it with fifty missiles.

After some intramural confusion, the Bush Administration decided that its preferred approach would be to take the first fifty Peacekeepers out of their silos and redeploy them in the rail-garrison mode, then push on with Midgetman.

"Instead of trying to do both simultaneously, we'll sequence them," Secretary of Defense Richard B. Cheney said. "That is, we'll do [Peacekeeper] rail garrison first, put a little bit of money in the budget next year for the Small ICBM, and then as we get the rail garrison deployed, we'll start to ramp up on the Small ICBM." The ICBM modernization plan is far from decided, though, and promises to be a hotly contested issue in this term of Congress.

### **Operations and Maintenance**

Operations and Maintenance the account that pays for training, spare parts, munitions, and everyday running of the force—lost \$777.5 million in the 1990–91 budget revision.

This O&M allocation will be sufficient to sustain 19.5 hours of flying per month for pilots in the tactical air forces. Most other readiness training—including Red Flag exercises at Nellis AFB, Nev.—can proceed as well.

This, however, is not altogether attributable to generous funding. Flying hours per crew remain the same as before, but the total flying time for the force will decrease by The average USAF facility is more than thirtyone years old, with some of the physical plant dating back to World War II. By 1992, the real property maintenance backlog will be \$1.5 billion.

94,000 hours between 1989 and 1991. This is the result of the deactivation of three B-52 squadrons, the transfer of a KC-135 squadron to the Air National Guard, retirement of SR-71 reconnaissance aircraft, deactivation of an F-15 interceptor squadron, and drawdown of the tactical forces by three fighter wings. The Air Force of 1990 will have 6,008 aircraft, compared to the 6,368 it had in 1978.

Of some concern in the O&M area are base operating support functions—everyday services, supplies, and equipment—and upkeep of facilities. Base operating support has been kept to a level described as "extremely austere" for the past two years and, with the latest reductions, will now be held down for two more years.

The average Air Force facility is more than thirty-one years old. Some of the physical plant dates from World War II and the Korean War. Money is not available, and has not been for some time, for adequate care of these facilities. By the end of 1991, the backlog in real property maintenance will have risen to \$1.5 billion.

### People

There are a few major problems pilot retention the worst of them by far—but overall, the Air Force personnel system is in pretty good condition. As always, however, when money is short and numbers are going down, personnel turbulence is making a mess of force configuration.

Last year's enlisted force cut of 30,000 provides a good example. Had the Air Force chosen to achieve the total reduction by limiting the number of new people it recruited, the 1988 group would have started out with fewer than 30,000 members. That would have created a thin layer in the force structure that would have carried forward until the class of 1988 reached retirement age twenty years later. At every point in between, the 1988 group would have posed a skill shortage at its level.

Instead, the Air Force spread out the reduction, but most of the loss was in first-term airmen anyway. As a consequence, the ratio of firsttermers to career airmen changed. Forty-eight percent of the enlisted force today is in the top five grades—two percent higher than authorized. Grade authorizations are a function of total force size, which dropped suddenly by 30,000. One consequence of this is that last year's promotion rates were the lowest in ten years, and this year will not be much better.

The personnel problem of greatest concern is that pilot retention last year was forty-three percent. It was the fourth year in a row that the Air Force failed to reach sixty-three percent retention, the level necessary to sustain the flying force. In all, 2,263 pilots left the Air Force in 1988. That was 750 more than the total coming out of undergraduate pilot training.

If this trend continues, the Air Force says it will be short 2,500 pilots by 1994. One factor obviously contributing to the decline is the lure of the airlines, which pay better and which continue to hire pilots at more than triple the rate they did before 1983—a year, coincidentally, in which Air Force pilot retention was seventy-eight percent. It took a decade to regain the edge at sea. The question now is how to hold on to it.

# Back Into Harm's Way

BY ROBERT S. DUDNEY, EXECUTIVE EDITOR

U S NAVAL forces are in the throes of what may prove to be a major challenge to their newly reestablished command of the seas.

The Navy and Marine Corps face problems that could undermine the maritime supremacy of today's rebuilt, 568-ship armada of fourteen carriers, 100 submarines, four battleships, and amphibious and other units.

Unless the erosion is checked, argues Adm. Carlisle A. H. Trost, Chief of Naval Operations, "much of what we have gained over the past years could . . . be dissipated."

Even as President Bush reviewed US defense policy, concerns for the future of US dominance at sea were being fueled by:

• Pressure on force structure especially aircraft carriers.

• The persistence of gaps in surface warship capabilities.

• A far-reaching Soviet challenge in antisubmarine warfare.

• Problems acquiring new aircraft and ships for amphibious war.

• Political and diplomatic threats to naval weapons.

Navymen, determined to protect

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the fleet, are preparing for a protracted fight to arrest the trends. They expect heated controversies in Congress, the Pentagon, and their sister services.

What they want to preserve is the global supremacy of today's force. The fleet has staged an abrupt turnaround since 1981, when Adm. Thomas B. Hayward, then CNO, charged it had lost even a "slim margin of superiority" and was in fact "on the ragged edge of adequacy."

Today, by contrast, Admiral Trost reports the Navy "has never been more ready." Even against massed Soviet might in the Northwest Pacific or Norwegian Sea, notes Adm. William Crowe, the Joint Chiefs of Staff Chairman, "we would fare well." Marines win similarly high praise.

Central to the fleet's revival has been its expansion in size. Compared with the 475-ship Navy of 1980, today's is larger by a net of nearly 100 warships. Added to the fleet have been two massive aircraft carriers, USS *Carl Vinson* and USS *Theodore Roosevelt*; four battleships packing sixteen-inch guns



Fourteen carrier battle groups form the heart of today's US naval strategy. The flattops are potent conventional weapons, and the size of the carrier fleet determines the size of the entire Navy. At right, catapult officer Lt. Steve Tobia gives the two-finger signal indicating final readiness before the Grumman KA-6D is shot off the deck of the USS Forrestal (CV-59). Meanwhile (above), an A-7D aviator from VA-105 "Gunslingers" waits to be readied for his "cat shot."



Photo by William G. Lotz

and cruise missiles; and twenty-five more nuclear-powered attack submarines, among other ships.

Equally critical to the turnaround was a decade of success in recruiting and retaining top-caliber servicemen and women. The result, say officers, is that the quality of today's force of 592,000 sailors and 197,000 Marines is at an all-time high.

### **Headaches on Three Fronts**

Naval forces also have benefited from vastly improved readiness. Since 1980, the proportion of materially ready surface ships has risen to seventy-five percent, up from fifty percent. Measurements of overall ship readiness are up 100 percent. For aircraft, the figure is 250 percent. The Navy has largely completed building stocks of war reserve spares and expanded its stockpile of munitions by fifty percent.

Tomorrow's problem can be put in a phrase: events in the Soviet Union. The adroit diplomacy of President Mikhail Gorbachev, plus major Soviet military advances, are creating headaches on three fronts.

First, a sharp decline in public anxiety about the "Soviet threat" has sparked growing resistance to defense outlays. Budget-cutting fever brought a cumulative \$5.8 billion cut in Navy and Marine Corps budgets for Fiscal Years 1990 and 1991.

Second, despite US resistance, Moscow is stepping up pressure to include certain US naval forces in East-West arms negotiations.

Third, Soviet technological advances strike at the heart of Navy might—in particular, its power to wage undersea warfare.

The combination of fiscal, diplomatic, and technological threats, experts agree, poses a big challenge to maintaining the seapower that the Navy and Marine Corps insist the US must have.

Few problems are viewed with more alarm than pressure on force structure—the far-flung collection of ships and aircraft that backs up commitments from the nearby Caribbean to the distant Indian Ocean.

Budget woes are raising risks. Some foresee a rerun of the time in the 1970s when, in Admiral Hayward's words, Washington was "trying to meet a three-ocean re-



A basic tenet of carrier aviation: If you need it for the mission, you have to bring it with you. Deck space must be allotted to mission-support aircraft as well as to fighters and attack aircraft. Here, a Grumman E-2C Hawkeye early warning radar aircraft taxis up to the starboard catapult on the USS Midway (CV-41).

quirement with a one-and-a-halfocean Navy."

This concern might be only slightly exaggerated. Already abandoned are plans for further fleet expansion. The goal of a "600-ship Navy"-set by Adm. James Holloway in 1974, embraced by President Reagan in 1981, pursued by former Navy Secretary John F. Lehman, Jr., and recently within the Navy's grasp-is in history's dustbin. Achievement of the goal, first frustrated by the earlier-thanplanned retirement of sixteen frigates in 1988, was stopped dead in program revisions carried out by Defense Secretary Richard B. Chenev in April. In coming years, for example, the Navy will shift up to twenty-four more FF-1052-class frigates to the reserves and retire DDG-2 and DDG-37 destroyers earlier than planned.

"There is no way that you can make the decisions I've made," says the Secretary, "and reach a 600-ship Navy anytime in the near future."

Indeed, the question now is whether the Navy can escape a decline that would hamper forward operations underlying its maritime strategy.

One source of concern: leaner shipbuilding budgets, which provide the funds for future warships to offset retirements. Though the Navy faces block obsolescence of some surface and undersea ships, there will be a drop in the notional purchase rate of about twenty-five ships a year to twenty in FY '90 and fifteen in FY '91. Already lost in FY '90 are two mine-hunters and one SSN-688 submarine.

### **Challenge to the Carriers**

The Navy frets, too, about an essentially political threat—the prospect that Bush policymakers will choose to make do with a smaller fleet. In its defense review, the Administration explored options for placing many ships in reserve and deploying the rest closer to home.

A developing challenge to the great aircraft carrier—the sun around which all US maritime schemes orbit—lies at the heart of Navy unease about the future of its force structure.

Controversy over the carrier fleet, which seemed to die out in the mid-1980s, has been resurrected. Future numbers and tasks more and more are called into question.

The reason Navy concern focuses on the carrier is simple. Not only is it the most potent conventional weapon afloat; in addition, the carrier fleet determines the size and budget of the entire Navy. Each ship, with ninety airplanes and 5,000 men, puts to sea with surface escorts, submarines, and trains of supply ships. When a carrier goes down, its task force sinks too.

Now, Navy worries along these lines increasingly appear to be justified. The country's relentless, tenyear pursuit of a big carrier buildup—from twelve deployable decks to a fifteen-carrier level it was to have achieved this year—has been thrown into neutral, if not reverse.

One major setback: Secretary Cheney's cost-cutting order to accelerate retirement of two World War II-vintage decks. His new timetable calls for retiring USS *Coral Sea* this fall, two years earlier than planned, and USS *Midway* in 1992, five years ahead of schedule.

Under the Navy's now-defunct plan, later retirements would have allowed attainment of a fifteen-deck force and left it intact in the 1990s. Now, the retirements of *Coral Sea* and *Midway* will coincide, respectively, with the commissionings of USS *Lincoln* and USS *Washington*, two Nimitz-class ships. This onefor-one tradeout will freeze the force at fourteen carriers at least until 1997, the earliest date that another new deck will go to sea.

The schedule is but one problem. Even the fifteen-carrier goal has been abandoned. Cheney has reset the objective at fourteen. His decision—if it holds—will slow the pace of new carrier buys.

Internal Navy plans call for seeking at least one carrier in Fiscal '96 and more later, to hold its numbers. The Navy faces the start, in 2000, of massive carrier retirements. Because they take years to build, replacements must be started soon.

However, some Navy analysts report sentiment among White House aides for keeping as few as twelve decks. Rep. Les Aspin, the Wisconsin Democrat who chairs the House Armed Services Committee, seems similarly inclined.

Apprehensions are compounded by trends enveloping carrier air wings. The number of fighter and attack planes, long on a downward trajectory, might now be going into a steep fall.

Many experts say today's aircraft purchases are insufficient to support even the truncated force structure of thirteen active and two reserve wings that budget austerity has obliged the service to accept and that it views as a minimum for fourteen carriers.

"It looks to me," Aspin informed the Navy hierarchy, "like you're setting up for a smaller fleet than fourteen carriers."

### Pain of the Budget Cuts

While the Navy disputes his assessment, there is no denying the pain inflicted by budget cuts that chopped \$1 billion from Navy tactical aircraft funds for FYs '90 and '91. Each year, for example, the Navy will buy six fewer F/A-18 strike fighters than planned.

Taking the biggest blow, however, is Grumman's F-14 Tomcat air-superiority fighter, the Cadillac of Navy warplanes. New production of 127 advanced F-14Ds, a \$6.3 billion program, was axed. What is left is a modest plan to upgrade 400 existing F-14As into D models. Service lives are not extended.

With Grumman leading a battle in Congress to save the F-14D, the Tomcat's prospects are uncertain. The Navy predicts that, without the new aircraft, it will be fifty-six Tomcats short by 1999. The Congressional Research Service puts the figure at 110 F-14s.

Tomcat woes come on top of the death, in 1988, of Navy plans to buy new F-model A-6 medium bombers. A-6Fs were to replace A-6Es, which, aging none too gracefully, won't last much longer. Prospective shortages pose what Former Navy Secretary William Ball calls "a certain risk."

The gamble, in both fighter and attack areas, is that a new generation of stealth airplanes will come along as advertised. Navymen concede that, without the F-14D or A-6F, they must hope that the navalized variant of the USAF Advanced Tactical Fighter (ATF) and the Navy's own A-12 medium bomber won't hit performance, schedule, or cost snags. Both are richly funded to keep them on course for the mid- to late 1990s.

Even if the Navy remained at present size, future domination at sea might be threatened by a gaping hole in capability that stems from spot shortages of certain surface combatants. The most optimistic plans provide no early solution to the fleet's insufficient numbers of cruisers and destroyers cast for major roles in fleet air defense and antisubmarine warfare. The Navy has little alternative but to live with a weakness that, while manageable today, could grow more serious in the future.

Budget pressures are key. The Navy's Surface Combatant Force Requirements Study, finished in 1988, sets a revised objective of 224 vessels, down from 242 in the preceding plan and far under needs. A reduced total of 120 is to be cruiser or destroyer "battle force combatants." In practical terms, however, the plan is moot.

"Fiscal constraints," former Defense Secretary Frank Carlucci conceded in his last Pentagon budget report, "continue to preclude the achievement of even the Navy's reduced...objective of 224 ships."

A deficit in antiair warfare combatants, now at but sixty-four percent of required numbers, is seen as especially acute. The mounting threat of high-speed cruise missiles, says Admiral Trost, makes wider deployment of new AEGIS air defense systems "my top surfacecombatant priority."

But procurement of AEGISequipped DDG-51 Burke-class destroyers is faltering. The Navy, which wants to buy twenty-five in the next five years, is sixteen months behind schedule on the lead ship. The other part of the AEGIS team, the twenty-seven-ship force of CG-47-class cruisers, is paid for but will arrive late. Delays and overruns are afflicting construction.

### **Soviet Submarine Stealthiness**

Another threat to US power—potentially the greatest—can be seen in the increasing stealthiness of Russia's 300-strong submarine force. At issue may be the US Navy's very ability to operate beyond home waters in a global war.

Today, notes Admiral Crowe, Russia's wolf pack could be overcome only after "an all-out effort by the bulk of [US] Atlantic and Pacific fleets." It is still possible because the typical USSR sub, fielded in greater numbers, is noisy and can be "heard" and located by acoustic listening devices of US antisubmarine warfare (ASW) forces. Now, this edge is eroding and may be headed for oblivion. Future USSR boats, say experts, will be difficult if not impossible to hear. If intelligence estimates are any guide, recent submarine types are displaying big gains in acoustic dampening. The trend first became apparent with the Soviet launchings, in 1983, of Sierra- and Mikeclass boats. The emergence one year later of superquiet Akula-class subs, comparable in stealthiness to the best US boats, confirmed it.

The trend is a body blow to US ASW power. That power is deeply reliant on passive acoustic devices—underwater microphones that detect sounds of engines and propellers—which quiet subs would make obsolete.

The danger, concludes a recent study for Congress by a high-level panel of experts, is urgent. "We must build what will amount to an entire new ASW capability by the time the Soviet Union has built a significant number of new submarines," the group reports.

Costly though that may be, the price of not doing so might be higher still. Experts say that, in a general war, hundreds of Soviet submarines roaming free might cut sea-lanes over which the US could reinforce European and Far East allies, sink carriers and other warships, and even launch missile attacks on US coasts.

Admiral Trost concedes the severity of the ASW challenge, which he terms his "top warfighting priority." Though the US lead in ASW continues to be "substantial," he asserts, it is now "narrowing more rapidly than [had been predicted in] earlier estimates."

Future ASW techniques, always a closely guarded activity, are impossible for an outsider to discern. What is clear is that the US is spending billions. Prospects cited in open studies range from greater use of active sonar to nonacoustic techniques such as magnetic anomaly detection.

Even so, Admiral Trost warns that "there are no silver bullets or easy, pat answers to ASW." Defeating a large submarine threat, the CNO adds, will always require superiority throughout US ASW forces—submarines, aircraft, surface ships, space systems, and tactics.

### Complications of Tighter Budgets

Tighter budgets will complicate matters. For example, cost-cutting moves will compel the Navy to retire seventy-three P-3 sub-hunter



Two mechanics duck as a Grumman F-14A Tomcat from VF-131 "Tomcatters" is catapulted off the bow of the Forrestal on maneuvers in the Atlantic. The Navy's plan to produce a new F-14D model is in serious trouble and may be killed. The Tomcat fleet is scheduled to be replaced by a Navy version of the Air Force's Advanced Tactical Fighter.

planes over the next few years before the new P-7A Long-Range Air ASW Capable Aircraft phases in. Purchases of the SH-60F inner-zone antisubmarine warfare helicopter were reduced.

The newest Navy attack sub may also be sensitive to money problems. The Navy is banking heavily on the controversial SSN-21 Seawolf, which it sees as a revolutionary advance, to counter the Soviet challenge. The thirty-boat Seawolf program is projected to cost \$32 billion. Non-Navy experts assert that, at that price for those numbers, the US may be hard pressed to hold a force of 100 submarines, which only recently has been achieved and which is seen as the minimum requirement.

The most singular facet of US maritime supereminence—ability to project Marine infantry ashore— may prove especially hard to sustain.

Making an opposed amphibious landing has always been a unique, dangerous task. In a future world where "smart" weaponry and effective warning sensors dominate, storming across the beach may be even dicier. The Corps says it needs swifter, longer-range transports to help Marines "hit 'em where they ain't." This type of hard-to-see, over-the-horizon assault has become a cardinal tenet of the future Marine Corps.

Now, achievement of this power looks shaky. The aircraft on which the Marine Corps has pinned high hopes, the new V-22 Osprey, is in trouble. The tilt-rotor Osprey, which takes off and lands like a helicopter but cruises like an airplane, is expensive—some \$27 billion for 627 planes. It was because of cost that Secretary Cheney, last April, decided to terminate the program after the current fiscal year ends. He says that the mission, ferrying Marines from ship to shore, is too "narrow" to justify the outlay. The Marines, he says, must make do with slower current and planned helicopters.

A top naval analyst, Scott Truver, regards this move as a "grave challenge to the Marines as they ponder their ability to remain 'relevant' to naval warfare" for the rest of the century.

The Osprey program, which enjoys strong congressional support, may be kept alive. Whatever the outcome of the furor in 1989, however, the plane is sure to remain vulnerable for years.

The same holds true for the Navy's force of amphibious warships, specialized ships needed to get Marines and supplies to a crisis zone. Plans developed early in the Reagan Administration call for sufficient sealift to move assault echelons of a Marine Expeditionary Force and Marine Expeditionary Brigade simultaneously. Capacity, which had risen from seventy-one to eighty-one percent since 1980, may be headed back down. Former Secretary Carlucci's view: "Block obsolescence of aging ships will make [such lift] a difficult capability to sustain.'

Offsetting these problems, somewhat, are bright spots in Marine combat aviation (see box) and first deployments of what eventually may be a force of 100 sea-skimmer Landing Craft Air Cushion vehicles.

Also troubling the fleet, as it seeks continued dominance, is a danger that its power may be snarled in global politics.

Foreign political complications no longer can be written off as minor. Gorbachev's demonstrated determination to pursue his broad arms-control agenda, mixed with changing European views, creates pressures not encountered before.

Most conspicuous is Moscow's call for including US naval forces in the twenty-three-nation talks now taking place in Vienna on conventional reductions. Washington deflects the demand, saying naval power is not directly relevant to the faceoff on the Central Front. While this stance contradicts long-standing Navy claims that it would play a decisive role in defeating Warsaw Pact forces, Washington believes it can finesse the issue, for the moment.

### **The Cruise Missile Problem**

The problem for an important Navy weapon, the long-range conventional cruise missile, may not be so easily overcome. This weapon either today's Tomahawk or the Excalibur planned for tomorrow—is cast for a starring role in maintaining Navy might. Deployed in thousands on aircraft, ships, and subs,

### Marine Corps Tools of the Trade

In an invasion, Marines will be the first on the beach and first over it, too. Ongoing Marine aviation programs include:

 Bell-Boeing V-22 Osprey; This aircraft, combining the vertical takeoff and landing capability of a helicopter with the speed and carrying capacity of fixed-wing aircraft, is top Marine priority. The Pentagon, however, is trying to cancel it. First flight was delayed eight months, but Osprey has ended first stage of flight-testing and will make helicopter-to-airplane conversion this year. The Air Force and Navy plan to buy some, but 522 of the 627 go to the Marines.

 McDonnell Douglas AV-8B Harrier II: The West's only production VTOL attack aircraft is made in cooperation with British Aerospace. Harrier production is to continue at a rate of twenty-four a year until FY '91. This will give the Marines 276 aircraft, forty-seven short of the requirement of 323. Production after FY '91 is possible. Delivery of first production models of the night-attack type will begin in August. AV-8Bs are stationed at MCAS Cherry Point, N. C., and MCAS Yuma, Ariz.
 McDonnell Douglas F/A-18 Hornet: USMC's other front-line tactical aircraft.

• McDonnell Douglas F/A-18 Hornet: USMCs other front-line factical aircraft, the F/A-18 is replacing F-4s and A-7s. Marines have 140 Hornets assigned to four Marine Air Groups formed or activating. The first Marine Reserve Squadron will get its first aircraft this summer. In October, delivery of the first two-seat, night-attack F/A-18D Hornets will begin. The stick will be removed from the Radar Intercept Officer station and will be replaced by two hand-stick controllers.

 Bell Helicopter AH-1W Sea Cobra: The "Super Cobra" is a far cry from the AH-1s used by the Army in Vietnam. Thirty new Cobras are on order. Production may continue because the Marine Reserve needs forty-two replacements for AH-1Js. Modifications to the Super Cobra will include night-targeting sight—jointly funded by USMC and Israel—and new navigation system with Doppler radar.

 Grumman EA-6B Prowler: Production of the tactical jamming aircraft includes twenty-four new Improved Capability (ICAP II) jets bought in FY 1988–89. ICAP II modifications include a universal exciter, a threat identification system, and a programmable jammer.

-Jeffrey P. Rhodes

the Tomahawk/Excalibur will disperse over a "triad" of forces the strike power now concentrated in a handful of carriers.

The problem is how to deploy conventional versions without upsetting Soviet ability to verify numbers of the nearly identical nuclear variant. The Kremlin insists it must be able to do this as part of a Strategic Arms Reduction Treaty. The US resists limits on conventional Tomahawks and may have to pay a price—perhaps abandonment of the Navy nuclear types.

The sum of pressures now crowding in on the Navy and Marines presents a challenge to the newly minted maritime edge bought at great cost in the Reagan years. Risks, as these organizations see it, are high. If President Bush harbors any doubts on that score, the sea services are only too prepared to persuade him.

Already, the naval services are embarked on a drive to convince Washington of the problems that they say will flow from any failure to give adequate support—and budgets—to maintain the fleet's power.

One argument is that the US could still come up short in a major

war against Russia. The position of the Navy hierarchy is that Gorbachev's "new look" in military affairs is at best a modest change and at worst a ruse. Observes Admiral Trost: "We have seen little slackening in their building efforts." As a result, US naval needs are unchanged.

Navy leaders also advance a second argument: While the decline of Soviet power may be an illusion, the apparent rise of other dangers is not. They say a turbulent global environment—Third World threats to US interests, loss of foreign bases, terrorism, drug trafficking—all argue for preserving if not expanding a hard-hitting, mobile, and unilateral military force. Not doing so, in their view, may lead to a kind of strategic impotence.

In light of these and other factors, some navalists claim the Pentagon should reexamine budget allocations made to the sea services on one hand, and the Air Force and Army on the other—a scheme whose chances must be viewed skeptically on the record of the past. The outcome of that struggle will leave a lasting imprint on the course of US naval power.



When it comes to providing close air support for America's troops, nothing comes close to the F-16 attack fighter.

Small, agile and fast, the F-16 can be in and out of the battlefield before the enemy knows what hit him. And before he can hit back.

In its new close air support role, this multimission aircraft will be hardened and equipped with the latest technologies including an Automatic Target Handoff System, a Digital Terrain System, and a Navigation/Attack FLIR.

And the F-16's advanced weaponry and allweather avionics can deliver a lethal mix of ordnance, day and night, with pinpoint, first-pass accuracy.

All of which makes the best fighter in the sky, the best fighter down in the dirt.

### GENERAL DYNAMICS





What exactly is a 'single-engine mentality'? Here's the way we see it...

## We make every engine as if it's the only one you've got.

## And that's true for every single engine we make.

You told us what you need to keep America strong. We read you loud and clear.



At its lowest strength since 1950, the Army warns that it may not be able to perform its missions for lack of troops and resources.

# **The Army**<br/>**Signals Danger**

### BY JAMES W. CANAN, SENIOR EDITOR

THE US Army is probably in finer fighting trim than at any time since World War II. By and large, its soldiers are sharp. Its modern tanks, mechanized-infantry and armored-infantry fighting vehicles, attack and transport helicopters, and artillery pieces for rockets and shells endow the Army with unprecedented firepower and mobility.

All is far from rosy, however. The Army is losing the numbers game. It is spread thin and shrinking. Now smaller than it has ever been since 1950, at the onset of the Korean War, the Army will have its ranks thinned even more as a result of the latest round of defense budget cuts.

Thus the Army may soon be in over its head unless its missions are arbitrarily scaled down in accordance with its size—never mind the threat—or unless those missions become more manageable through a lessening of the threat.

Army leaders are leery of political proposals to withdraw US forces from Europe. They emphasize that those forces are in Europe as stewards of US interests as well as to help NATO allies defend their soil. For all that, there is hope and cautious optimism in the upper reaches of the Army that NATO can strike a treaty with the Warsaw Pact to cut both sides' conventional forces in Europe and bring them into something approaching symmetry. There is also considerable interest in Soviet General Secretary Mikhail Gorbachev's proposal to make unilateral cuts of Soviet forces on the continent.

### More Than It Can Handle?

The way things now stand in Europe and elsewhere in the world, it is entirely possible that the Army already has more than it can handle. Army leaders freely confess their concerns. They claim that the Army is no longer large enough to do everything that it may be called on to do, given the worldwide scope and widening variety of its land-warfare responsibilities.

"The array of challenges for which the Army must prepare has never been more complex," asserts the posture statement for Fiscal Years 1990 and 1991 that the service's leadership issued early this year. Firepower firmly in hand, this combat-ready infantryman symbolizes the US Army's fighting trim. The Army has made great gains in modernization and readiness but is feeling the budgetary pinch in its dwindling force structure. Now at its smallest since the start of the Korean War, the Army may have too many missions in too many places for too few troops.



The danger that the US will wind up with a can't-do Army, intimidated by such challenges, is candidly acknowledged in the posture statement. The Army leadership flatly states that "our force structure may not be adequate to accomplish our missions," that "our ability to provide the necessary range of capable, ready, and supported forces is at risk," and that "this does not bode well for our strategy of deterrence."

The posture statement makes allowance for opposing views, if only to rebut them. It notes, for example, that the Army's misgivings about being able to maintain and fortify the nation's nonnuclear deterrent forces are considered irrelevant in some political and strategic circles because the US is expected to retain an adequate nuclear deterrent, come what may. "However, in an age of relative nuclear parity, the burden of deterrence has shifted significantly toward conventional land forces," the Army says. The service warns that the US must take care not to bring about "a weakened Army that will not be able to respond swiftly with forces of sufficient quality, quantity, and staying power to provide a credible deterrent to coercion or outright aggression."

The Army puts a premium in its posture statement on "staying power," which it describes as "a unique contribution of land forces" in waging war. It contends that "we must have the capability to conduct sustained operations or our adversaries will be able to win by simply outlasting us."

According to the posture statement, the Army will be weakened in a number of ways if its buying power continues to erode. For example, "readiness will be threatened" and "the pace of modernization will be further slowed."

But further cuts of force structure are clearly in the forefront of the Army's fears.

### **Force Cuts**

Early this year, the Army was at pains to point out that the deceleration of US military spending had caused it to cut its total force by 8,600 active-duty soldiers and 12,000 civilians since 1986. It also was forced to abandon plans to strengthen Reserve Component and Army National Guard forces and get them in shape "to meet all of the wartime requirements" of the Commanders in Chief (CINCs) of US warfighting commands.

"In the face of [fiscal] pressures," the service said at the time, "the adequacy of the current and future Army force structure to execute national military strategy with a reasonable assurance of success is increasingly open to question."

Then matters rapidly got worse. The Bush Administration made additional cuts in its defense budgets for Fiscal Years 1990 and 1991, and the Army lost another \$4 billion that it had banked on spending over those two years.

As a result, it will have to lop 7,900 additional soldiers from its active force. More than forty percent of them—3,312, to be exact—will be drawn from the 4th Infantry Division at Fort Carson, Colo., in the form of an entire brigade—lock,

The burden of deterrence has shifted significantly toward land forces, which are counted on to bring "staying power" to combat. stock, and barrel-and all divisionlevel units supporting it.

The remainder of the personnel cuts will come naturally from deactivating Pershing missile units that were positioned in Europe until the Intermediate-range Nuclear Forces (INF) Treaty uprooted them. Those cuts may seem aseptic, but the Army doesn't see them that way. It would like to be able to keep the soldiers, if not their units.

By the end of September 1991, the active Army will be down to 764,100 soldiers. Given its heavy responsibilities in Europe and Korea and its potential need to fight in any number of places around the globe, the Army, at those numbers, is being forced to court disaster, its leaders contend.

The Army has tried to put the best face on the most recent defense budget cuts. Even though forces will be cut, their readiness and sustainability will be preserved, the service claimed. It also maintained that the damage to force structure had been "minimized," considering what might have been.

The service also claimed that it would be able to live with "slowing the pace of modernization, which includes the elimination of programs that contribute the least to warfighting."

### State-of-the-Art, but Tight

As to modernization, there was some reason to cheer. The Army was permitted to proceed in developing its highly prized, state-of-theart LHX light attack helicopter. It had been a close call, though. Secretary of Defense Richard Cheney had decided to scrap the program, but he acceded to the Army's eleventh-hour appeal in its behalf.

The service was forced to accept a hard bargain, however, and will have to take LHX out of its hide.

To come up with funding to continue the LHX program, the Army will eliminate one attack helicopter battalion from its active force and two such battalions from its reserve force by the end of Fiscal Year 1991.

That won't be the end of it. Over the following two years, the Army National Guard will be forced to relinquish two battalions of attack helicopters, and yet another battalion will be excised from Army Aviation's active force. When all is said and done, the Army will reduce its fleet of helicopters by some 2,000 over the next several years. While bringing along the LHX, it will revamp its aviation plans and programs in a big way.

As things stood at budget-revision time, the Army will be forced to scrap its helicopter improvement program (AHIP) for upgrading older but still useful combat choppers. It will also have to cut the annual production runs of AH-64 Apache attack helicopters and UH-60A Black Hawk troop helicopters and buy out Apaches by the end of 1991, several years sooner than planned.

Army officials made it clear, however, that they intended to press for restoration of enough AHIP funding to keep the program alive. The Army had been counting on AHIP to enhance the nightfighting gear and capability of all its helicopters.

With AHIP aborted and with Apache production destined to end prematurely, "we will have a cold attack-helicopter production base for as much as four years" in the mid-1990s, lamented Under Secretary of the Army Michael E. Stone.

There was good news for the Army in the Air Force portion of the revised defense budget. Ample funding was provided to advance the McDonnell Douglas C-17 airlifter safely out of development and solidly into production. The budget also enables USAF to begin upgrading A-10s and F-16s for close air support of front-line soldiers under fire.

The Army has a long-standing need for a great deal more Air Force airlift. Stateside troops can't fight unless they can get to combat zones. As all too many war games have shown, the outcome of a war in Europe would hinge on how fast and how copiously those troops can arrive.

This is why the Army, along with the warfighting CINCs of unified commands, joined with the Air Force in vigorously promoting the C-17 program throughout the Pentagon budgeting process.

"The worldwide mobility of Army forces remains inadequate," declares a recent Army document. It continues: "The Army supports the Air Force C-17 program, which provides for critical intertheater and intratheater [airlift] capabilities essential to projecting Army forces in time of crisis."

The Army has come a long way amid many changes in this decade. Despite major problems with some systems—such as the ill-fated DIVAD air defense weapon—the modernization program that the service launched in the mid- to late 1970s, once rid of the tremendous expense of the Vietnam War, has paid off in a wealth of new weapons and computer and communications gear.

### **Flexible Components**

All such improvements have enabled the Army to spruce up its line outfits, refashion many of them, and mix and match them in different ways in its attempts to stay abreast of national requirements.

The Army now has twenty-eight combat divisions and twenty-two combat brigades that belong to no particular division. Ten of the divisions are in the Army National Guard. Of the eighteen divisions in the active force, six include "roundout" brigades of Army reservists. Nearly two-thirds of all combatsupport units that would be available in the event of wartime mobilization are made up of National Guard or Reserve Component troops.

The active-component force is the one that is spread thin and that may have too tall an order. It embodies "all units needed on a day-today basis around the world to deter aggression in concert with US allies" and to quell conflict and "defend US interests wherever they may be challenged," the Army says.

In all, the Army is made up of heavy forces, light forces, and special operations forces (SOF).

At the heart of heavy forces are six armored divisions of about 16,800 soldiers each and eight mechanized infantry divisions of about 17,100 each. These divisions, together with stand-alone armored and mechanized brigades, each about one-fourth the size of a whole division, are the Army's big hitters.

They are in business to wage what the Army calls "mid-intensity to high-intensity combat" against enemy forces that likewise are heavily armored and mechanized—namely, Warsaw Pact land forces, formidable of firepower and all too numerous, in the European theater. Korea has also claimed the Army's close attention for nearly forty years. The 2d Infantry Division, long a fixture there, is technically neither an armored division nor a mechanized division. It nevertheless qualifies as more heavy than light in makeup because it contains two tank battalions, two mechanized battalions, three helicopter battalions, and five artillery battalions.

With its forward units dug in at the demilitarized zone (DMZ) between South and North Korea, the 2d Infantry has undergone quite a change in recent years.

In 1977, when President Carter suggested pulling the 2d out of Korea, it had far fewer tanks and armored-infantry vehicles than it has today. Even so, it was widely regarded as a crack, combat-ready outfit with an inarguably valid mission, and Mr. Carter was persuaded to leave it alone.

Also individualistic in composition are the 82d Airborne Division, the 101st Air Assault Division, and the 9th Motorized Division. The 9th is a cross between a heavy division and a light one. The other two are considered light divisions, even though the 101st is heavy in helicopters.

In the main, the Army's light force is built around five light infantry divisions, each consisting of some 10,800 soldiers. The lightdivision concept having been successfully tested at Fort Lewis, Wash., these divisions were formed throughout the 1980s to afford the Army greater flexibility.

### **Rapid Deployment**

Sacrificing heavy firepower for the sake of greater air and land mobility, the light divisions are designed for rapid deployment to reinforce forward-deployed heavy units or to go it alone in arenas more conducive to their armor-lacking tactics.

Light infantry divisions would be "especially effective in urban areas and restrictive terrain," the Army claims.

Special Operations Forces are made up of about 5,000 active-duty soldiers and three times that many in reserve outfits. Reliant in most cases on Army helicopters and Air Force fixed-wing aircraft for supDespite the onsurge of specialoperations and light forces, armored and mechanized units are still the Army's power hitters.

porting firepower and mobility, the SOFs are subdivided into four Special Forces Groups, the 75th Ranger Regiment, Army Special Operations Aviation units, and Civil Affairs forces.

The SOFs are sitting pretty these days. As the posture statement explains it, "The Army's budget for SOF has continued to expand despite overall budget constraints for FYs '90 and '91. This funding increase reflects the challenges to our nation's security, and allows SOF structure expansion even in the face of active-force strength reductions."

On the other hand, the latter-day special emphasis on SOF is regarded as misplaced and is resented in some quarters across the services. Many Army traditionalists contend that the buildup of special forces—and of light infantry outfits too, for that matter—has been overdone at the expense of heavy forces that will always be, with their much more fearsome firepower, the real guts of the total fighting force. A strong case can be made, however, that heavy forces, even if too few in number to suit the traditionalists in the "tank army," have never had it better. They fared exceptionally well in the process of modernizing the Army throughout this decade.

From the beginning of Fiscal Year 1980 to the end of Fiscal Year 1988, Army "heavy" units were the chief beneficiaries of new and better weapons all around. These included 6.473 General Dynamics (originally Chrysler) M1 Abrams main battle tanks, 4,883 FMC Corp. M2 and M3 Bradley infantry fighting vehicles, 416 LTV Multiple Launch Rocket Systems (MLRS), 603 McDonnell Douglas (originally Hughes) AH-64 Apache attack helicopters, 931 UTC-Sikorsky UH-60 Black Hawk troop-carrying helicopters, and a richly variegated assortment of nearly 75,000 wheeled vehicles.

In addition, 3,000 previous-generation General Motors M60 tanks and 342 Bell AH-1 Cobra attack helicopters were modernized.

### **Upgrading Artillery**

Artillery, too, is being transformed. Central to its modernization through 1988 were twenty-one new MLRS batteries in the active force and five more in POMCUS (Prepositioning of Materiel Configured to Unit Sets) storage in Europe.

MLRS deployment, which is continuing, is crucial to the Army's ability to put its AirLand Battle doctrine into play. That doctrine is predicated on an Army-Air Force partnership in countering enemy attacks at the Forward Edge of the Battle Area and in striking, beyond the FEBA, enemy second-echelon and third-echelon units bent on reinforcing the front.

There is much more than MLRS to the remaking of the artillery. For example, three new battalions of 155-mm self-propelled howitzers and a target-acquisition battery have been brought into play, and the Army will soon begin deploying British-developed M119 105-mm light howitzers. They will be much lighter, shoot much farther, and be far easier to ferry via helicopters or land vehicles than the relatively unwieldy M102 howitzers they will supplant. Many changes in the Army have been made in the name of staying power—making heavy forces, in particular, better able to sustain combat. A major change was the revamping of logistical support commands to expedite the repair and resupply of equipment during or directly after combat.

Each forward brigade was given a logistical support battalion. Such a battalion was also positioned in the rear area of each division.

Champions of the light-forces concept claimed vindication in the clearly satisfactory results of the US deployment of airborne and light-infantry troops to Honduras in March 1988. Nicaraguan infantry units, having crossed the border into Honduras, withdrew following the arrival of a US infantry brigade task force—two battalions of the 7th Infantry (Light) Division from California and two battalions of the 82d Airborne Division from North Carolina—3,200 soldiers in all.

At the time, Lt. Gen. John W. Foss, Commanding General of the US XVIII Airborne Corps, declared, "We have demonstrated our resolve to help our allies. Twelve days ago, there were Nicaraguan troops in Honduras with little likelihood of peace. [Now] there are no troops in Honduras, and [the Nicaraguans] have sat down at the peace table...."

Last May, the Administration dispatched 2,000 US soldiers and Marines to Panama to defend fellow Americans and Panamanian allies in the bloody aftermath of that nation's election.

The situation in Central America will almost certainly continue to smolder. So far as the Army is concerned, given its decreasing size, there are altogether too many comparable places on the planet where it might have to fight to protect US interests.

As the Army posture statement ominously puts it: "Socioeconomic conditions in the Third World are worsening despite tentative advances toward democracy. At the same time, military capabilities are steadily rising, especially in the area of ground conventional forces. This grim combination of trends seems to portend increased violence and instability around the world."

## Viewpoint

## Old Men, Young Men, and Flying

By Gen. T. R. Milton, USAF (Ret.), CONTRIBUTING EDITOR

The desire of pilots to fly is not new, but other things have changed. The great danger of the pilot exodus is that it sets up a shortage of leaders for the future.



One of the constants of life on this planet is the difference in the perceptions of the young and the old. What passes for respect and deference on the part of young

people, may, in fact, be thinly veiled contempt. Equally, the older generations have always had a tendency to patronize. After all, they have been young, have faced the problems of early careers, and have emerged they are confident—the wiser for it all.

Many of the responses to a column I wrote for this magazine's March issue—"The Commitment Gap"—put into serious question my grasp of reality. This is at least a reassuring sign that young people haven't altered their view of old men since the days when I was young.

In recent discussions with junior commissioned pilots, the same themes that consistently appeared in the letters were present. These young pilots came into the Air Force to fly, but after the first few cockpit assignments, the flying opportunities appeared to be limited and of questionable value; they seek neither high rank nor responsibility, only to fly; their senior officers are out of touch, too concerned with the big picture.

There is nothing new about this particular youthful attitude. On the eve of World War II, Army Air Corps squadrons were multiplying like amoebas: New squadrons were formed from the old ones, and then divided again. Airplanes, on the other hand, did not have this happy ability to multiply. There were pitifully few of them to be parceled out to the infant squadrons, and sometimes we had to revert to primary trainer biplanes just to get in a few flying hours.

If any airline, or even a barnstorming circus, had come along with an offer that involved flying, there would have been plenty of takers. In those days, we were off-limits to the airlines, but Claire Chennault was allowed to recruit active-duty pilots for his American Volunteer Group in China, and he didn't have any trouble inducing people to resign in order to take part in that adventure.

They seek neither high rank nor responsibility, only to fly; their senior officers are out of touch, too concerned with the big picture.

Soon enough, however, the aircraft industry caught up with pilot production. During the latter years of World War II, airplanes and flying time were the least of our worries. Even the superannuated colonels had been replaced by commanders of the same generation as the troops. Leadership of the Army Air Forces in World War II was the domain of youth. "No drinks to Air Force colonels under twentyone," read the sign over ground forces' bars.

When the war ended, the huge military establishment came apart in an almost hysterical demobilization. The airlines hired a good many military pilots, but the attraction in those days was easy to resist. All things considered, the Air Force was a better deal.

The Berlin Airlift was another inducement to give up the quiet life. We recalled hundreds of pilots for airlift duty, and many of those stayed on. Then, of course, there was Korea, once more an occasion for recalls and the disruption of civilian careers. All in all, what with a crisis every few years, the world appeared so unsettled that it made sense to stick around.

It seems hard to believe that our last big disruption came to an end some fourteen years ago. Since that time, we have seen military business settle, for the most part, into predictable routine. Training, such as the splendid Red Flag exercises, has never been so realistic and exacting, but there has been a shortage of excitement. Rightly or not, no one seems to think war in Europe is imminent, or even likely. Yesterday's tensions have relaxed as Gorbachev does his skillful best to dismantle NATO. In the Pacific, the specter of a huge and menacing Red China used to add zest to our readiness training. Today, it's hard to know exactly who is the prospective enemy.

Young people tell us they are leaving the service because they want to fly and are tired of Mickey-Mouse additional duties. Their seniors, they say, are too busy looking up to look down. Those may be valid reasons; maybe they are not. It is at least fair to suspect that money and spouses' careers are factors. In any case, too many—an unaffordable too many are resigning from the Air Force.

In years to come, squadrons, wings, and air forces will still need commanders. The great danger of the pilot exodus is not a loss of pilot experience in the near term, although that is a worry, but its effect on our future leadership. It is all very well and quite understandable that young pilots claim they want nothing from life except to fly an airplane, but leadership remains basic to effective airpower. They've always been the third of the force with the lowest profile. That may change, though, as it becomes more difficult to recruit and retain them.

# The Quiet Crisis in Civilian Personnel

### A STAFF REPORT

WASHINGTON'S public preoccupation with the threat of pilot shortages masks mounting concern about the state of another class of highly skilled but little-noticed Air Force professionals.

The health of USAF's 260,000strong force of civilian employees fully one-third of total force structure—is no longer viewed as secure. All signs indicate that the beleaguered group of managers and technicians, who work side by side with blue-suit counterparts at every installation, in every career field, and at every level of command, is faltering badly.

In fact, say experts, the quality, quantity, and effectiveness of the force are in doubt. One recent analysis goes so far as to warn that the service, and the government generally, now faces a "quiet crisis." The problem stems from two factors.

One is an unprecedented exodus of high-caliber workers from federal service. The US is experiencing difficulties retaining civilians in the face of fierce competition for talent. A study issued in March by the National Commission on the Public Service notes that increasing numbers of top workers are fleeing government service for lucrative private-sector jobs.

The second factor is government recruiting failure. In a stark reversal of historic norms, US agencies now find themselves unable to attract, or even interest, the most talented workers in the country. Of all honor graduates from top universities, a mere three percent seek federal employment, a commission survey reveals.

Taken together, experts assert, the government's twin difficulties in holding or even attracting bright civilian workers have left it with little option but to embrace lower standards in hiring new personnel and to accept the inevitable attendant erosion in worker competence.

### **Alarming Trend for USAF**

For the Air Force, such trends are alarming. "Palace Agenda," a civilian personnel management plan prepared by the Air Force Civilian Personnel Directorate, is blunt: "With the Air Force becoming increasingly dependent on technology as a force multiplier . . . our human resources will have to be competitive if we expect to maintain our edge. . . . Technical skills will underlie almost all Air Force civil-

At right, Air Force civilian employees ready an F-4 for storage at **USAF's Aerospace** Maintenance and **Regeneration Center at** Davis-Monthan AFB, Ariz., which is staffed almost entirely by civilian personnel. The depth of experience that each person brings to the job is vital to AMARC's mission. The Air Force is finding qualified civilians increasingly hard to attract and retain.



ian jobs, as the civilian force will be called upon to support Air Force missions that depend on sophisticated technology."

Air Force vacancy statistics indicate that some fifteen percent of civilian authorizations go unfilled at any time. By itself, this is not alarming, particularly in light of the fact that budget reductions in FY '88 have forced a number of Air Force commands to limit civilian hiring to ninety percent of authorized strength. "The problem," says Tony Kausal, chairman of the Air Force Association's newly formed Civilian Personnel Council, "resides in our [lack of] ability to retain experienced, quality people and to recruit new, highly qualified people in some parts of the country and in some career areas."

Geographically, retention difficulties are most severe on the country's east and west coasts—especially in such high-priced locations as Boston, Los Angeles, Washington, D. C., and New York. While the problem is less serious in other regions, it is still significant, particularly in engineering, acquisition, and other technical areas.

In Los Angeles, the Air Force is experiencing a very high turnover for engineers. At the GS-12 level, about one-half of all the engineering positions are vacated each year. In some acquisition jobs, turnover approaches forty percent annually. Recruiting difficulties leave positions vacant for an average of seven months. Even longer vacancies are not uncommon, with some positions reportedly going unfilled for more than eighteen months.

Experience on the east coast is much the same. The exodus of engineers and other professionals on the eastern seaboard has led some to quip that Hanscom AFB, Mass., home of USAF's Electronic Systems Division, has become a training ground for the high-tech industries of Boston.

No matter what the geographic area, retaining technical, engineering, and managerial workers has become a problem of massive proportions.

Senior managers are leaving the government in droves. A 1987 General Accounting Office survey of Senior Executive Service employees found that almost one-quarter of those surveyed planned to find private-sector employment within a year. Another survey found that more than half would leave government for a suitable private-sector job.

Although the retention problem is most noticeable among technical specialists, engineers, those in acquisition-related fields, and senior executives, it reaches deeper into the ranks. In high-cost cities, retaining administrative and clerical employees has become a significant problem.

Employees in the lower pay grades—GS-6 and below, grades commonly held by secretaries and other clerical workers—are far more likely to quit government jobs than are others in the federal work force. Typically, they move within a few years into higher-paying jobs in other government agencies and then into far more remunerative positions in the commercial sector.

In Los Angeles, this problem has grown to critical proportions. GS-5 secretary positions, for example, are experiencing an annual turnover of almost 100 percent because of promotions and lucrative private industry jobs. In some cases, new hires leave in less than one month.

### **Growing Gap in Experience**

Compounding the Air Force's retention woes is a lack of success in recruiting qualified younger workers who can be trained to replace those who leave.

Each year, Air Force personnel officers make more than 1,000 job offers in both the spring and fall to college graduates. Recent years have found that half of those receiving job offers refuse, which is about twice the turndown rate experienced in private industry. Even more worrisome is the fact that the percentage of those declining job offers appears to be rising.

The result is a growing gap in experience. The federal government's annual hiring is concentrated on entry-level and other low GS ratings. The Office of Personnel Management reports that only 3,000 people were hired at or above the GS-13 level in 1987. Senior personnel cannot be replaced by "first-termers." The concern is put this way by Kausal: "It is essential to have experienced people to negoti-

ate with a contractor. We don't want a brand-new negotiator sitting across from an industry negotiator with thirty years' experience."

Those who do sign up for government work seem to be of lower quality than in years past. The Commission on the Public Service found indications that the quality of new workers is eroding steadily. On a standard test for newly hired government employees, the average score during the 1980s falls ten percentage points below that of the previous decade.

The recruiting problem stems, in part, from a tight labor market that has resulted from adverse demographic trends. As growth in the labor market slowed from about 2.9 percent per year in the 1970s to about one percent in the 1980s, the government has increasingly been forced to compete with private industry for the most talented new workers. Evidence is that the government has been losing this race. Some conclude that the government, in the future, may be forced to hire "the best of the desperate."

For senior federal civilian workers and potential recruits alike, the main problem with government service can be summarized in one short phrase: inadequate compensation.

One official survey reports that utter frustration with their low compensation levels was a significant factor for almost forty percent of the federal senior executives who left government service in 1985, and the situation has not improved since then.

Air Force employees can be divided into three principal categories: blue-collar workers, who are paid the prevailing local hourly wage and constitute the Wage Grade force; white-collar workers, who receive salaries based on a nationwide standard for similar jobs; and Senior Executive Service (SES) members, who also receive salaries based on a national standard.

For Wage Grade employees, the federal system works well, paying skilled craftsmen and others a competitive local wage. However, for GS and SES employees, variations among local labor markets are great, and a single, uniform pay nationwide is not workable. Surveys show that, from one geographic area to another, adequate salaries for the same work can vary by as much as thirty percent.

The problem is self-evident. "We can't pay thirty or forty percent less than what industry is going to pay and expect to keep people who can't afford to buy houses near where they work," warns Kausal. "As a GS-14 [in Los Angeles], I couldn't afford a house within forty-five minutes of work."

### **The Federal Salaries Problem**

Apart from regional variations, white-collar workers are suffering from an absolute decline in compensation relative to the rest of the economy. The Commission on Public Service, for example, reports that average starting salaries in private sector consulting and research firms rose fifteen percent in the past decade, while banking and finance salaries rose eighteen percent. "At the same time," it points out, "average starting pay for careers in federal government has fallen twenty percent . . . [and] now trails the private sector on average by almost \$6,000."

The lack of comparability extends to annual pay increases. The Congressional Budget Office (CBO) points out that, during the past ten years, the rise in private-sector salaries and wages exceeded that of federal salaries by about twenty percent. Thus, says CBO, federal pay adjustments have been insufficient to achieve comparability since October 1977.

Also great is a loss of purchasing power to inflation, a problem most pronounced at the level of senior managers. Between 1969 and the end of 1988, the Commission on the Public Service estimates, senior government executives lost thirtyfive percent of the value of their salaries in this way.

Potential federal workers, no less than those already in place, are turned off by the pay situation. Low starting salaries combined with limited flexibility in benefits packages are seen as a major constraint on federal recruiting efforts. Industry recruiters offer the most qualified candidates such incentives as bonuses, advance pay, liberal moving allowances, and flexible benefits packages—as well as higher starting salaries. Federal recruiters can't begin to match these packages.

Compensation is not the only factor causing problems, however. The public image of the federal "bureaucrat," sullied in recent years by partisan political attacks and criticism. is also a factor. A number of credible surveys conducted in recent years all have made the point that today's college students and others entering the job market for the first time hold public service in exceedingly low esteem. In their view, government work cannot offer a rewarding career, a significant challenge, or an opportunity to affect major public policy decisions.

It is against this backdrop of competitive labor markets, inequitable compensation structures, and declining public image that the Air Force must plan for the future. How does the service propose to overcome these obstacles to acquire the type of high-quality civilian force that it needs?

### Looking Toward the Future

Palace Agenda, USAF's civilian personnel roadmap, summarizes several Air Force initiatives to build and maintain the civilian personnel force in the future. One major change in the plan calls for more flexible management of civilians. Congress has relaxed the requirement for arbitrary end-strength ceilings, allowing service managers to deploy civilian forces according to their budgets. Now, Air Force managers can be flexible in determining how many employees to hire and how to mix part-time with full-time and permanent with temporary employees to meet mission needs in the most economical manner.

The result of this change, according to Palace Agenda: "During FYs '85 and '86, overall civilian employment costs were more than \$50 million under budget, yet we were able to exceed programmed employment levels by almost 10,000 employees."

To accommodate regional pay differences and compete with private industry, the Air Force has received permission from the Office of Personnel Management (OPM) to designate "shortage career fields." This narrows the advantage of industry recruiters by allowing Air Force recruiters to make "on-thespot" job offers, hire some employees at higher grades, and provide some moving/relocation incentives. Under a three-year test program called Palace Compete at Edwards AFB, Calif., managers will be permitted to adjust position and grade structures within broad legal limits, so long as their overall civilian payroll costs remain within budget. Managers can reward performers, offer more competitive salaries, and increase retention.

Other initiatives to enhance retention include accelerated career promotions based on individual achievement, using authority delegated by OPM to waive such requirements as time in grade for those who excel.

Efforts are under way to expand the Civilian Career Management Program, launched in 1976, which currently covers only seventeen career areas comprising a total of about 42,000 employees. Civilian workers now are permitted to compete for time in Professional Military Education schools. The Air Force has reserved forty-eight slots at Squadron Officers School for those at or above the GS-9 level, sixteen slots at Air Command and Staff College for those at or above the GS-11 level, and six at the Air War College for those at or above the GS-14 level.

Another initiative called Palace Acquire focuses on recruiting. Under Palace Acquire, the Air Force offers two- and three-year internships leading to full-time employment in specific career fields. Managers recruit interns directly from college campuses and other locations. Interns enter as GS-5s or GS-7s and progress to GS-9, GS-11, or GS-12, depending on the length of their program. They are then placed into a vacancy within their career field.

Also being investigated is an array of other possible initiatives, from market-sensitive pay systems and financing of new education programs to payment of regional differentials for civilian workers.

The success of these efforts has yet to be determined. What is already clear, however, is that the Air Force stake in the outcome is high. "Spurred by [USAF] force structure changes," concludes the Palace Agenda report, "these [civilian] managers and professionals will be called upon to assume an increased role in the Air Force worldwide." We never forget whose promises we're keeping.

To "... provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity..."

No obligation is more binding than a nation's promise to its people.



**GE Aircraft Engines** Keeping the Promise

## The Chart Page

## **The Defense Budget—Revised**

### Edited by Colleen A. Nash, STAFF EDITOR

In January, President Reagan presented a DoD budget request to Congress for Fiscal Years 1990 and 1991, providing for two percent real growth per year. In February, President Bush proposed a one-year freeze in real growth to meet deficit targets and real increases of one percent in FY '91 and FY '92 and two percent in FY '93.

The Reagan budget request has been revised, and budget authority has now been reduced by a two-year total of \$19.9 billion. The two-year Air Force request for FYs 1990 and 1991 is now \$6.3 billion below the January request.

Funding levels can be expressed in different ways. Totals are most frequently cited as *budget authority* (value of new obligations, including some in later years, that the government is authorized to incur) or *outlays* (actual expenditures, some of which are funded by budget authority in previous years).

When funding is described as *constant* or *real dollars*, the effect of inflation has been factored out to make direct comparisons between budget years possible. A specific year, often the present one, is chosen as a baseline for constant dollars. When funding is described as *current* or *then-year dollars*, no adjustment has taken place. This is the actual amount spent, budgeted, or forecast.

The entire defense program includes not only DoD activities but also some in the Department of Energy and other federal agencies. The following charts address only the *direct program*, which comprises DoD activities only.

In some instances, numbers on the following charts may not sum to totals shown because of rounding.

	DoD BUDGET REQUEST FOR FYs 1990-91 (Current \$ Billion)								
Pudaat Authority	1989	1990	1991	1992	1993	1994	Cumulative 1990–94		
January Budget	200.2	305.6	9009	335.7	360.7	365.6	1 678 5		
Cuts	-	- 10.0	-9.9	-13.7	-14.8	- 15.8	- 64.2		
Amended Budget	290.2	295.6	311.0	322.0	335.9	349.8	1,614.3		
Outlays									
January Budget	289.8	293.8	304.7	316.2	329.3	343.4	1,587.4		
Cuts		- 4.0	-6.9	-9.4	- 11.9	- 13.9	-46.1		
Amended Budget	289.8	289.8	297.9	306.8	317.4	329.5	1,541.3		

The cuts represent a more than \$64 billion cut in budget authority from the five-year budget plan for FY '90 through FY '94. This is in addition to the \$300 billion cut already made to the FY '88–94 program presented in early 1987.

			J	(End Fisca	RY ST	RENG n Thcusan	TH ds)						
	Actual								Pr	ogramme	be		
	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
	1976	1980	1981	1982	1983	1964	1985	1986	1987	1988	1989	1990	1991
Active Component Military													
Army	779	777	781	780	780	780	781	781	781	772	772	764	764
Navy	524	517	529	542	558	565	571	581	587	593	593	592	592
Marine Corps	192	188	191	192	194	196	198	199	200	197	197	197	197
Air Force	585	558	570	583	592	597	602	608	607	576	571	568	567
Total	2,081	2,040	2,071	2,097	2,123	2,138	2,151	2,169	2,174	2,138	2,133	2,122	2,120
Reserve Component Military (Selected Reserve)													
Army National Guard	362	367	389	408	417	434	440	446	452	455	457	458	459
Army Reserve	195	213	232	257	266	275	292	310	314	313	319	322	323
Naval Reserve <sup>a</sup>	97	97	98	105	109	121	130	142	148	149	153	153	155
Marine Corps Reserve	30	36	37	40	43	41	42	42	42	44	44	44	44
Air National Guard	91	96	98	101	102	105	109	113	115	115	115	116	116
Air Force Reserve	48	60	62	64	67	70	75	79	80	82	84	85	85
Total	823	869	917	975	1,005	1,046	1,088	1,130	1,151	1,158	1,171	1,178	1,182

Navy Training and Administration of Reserves (TARs) personnel are counted in the Selected Reserve from FY 1980 on. Prior to FY 1980, TAR personnel are included in the Active Military.

		(E	nd Strengths)	IMANI				
		FY 1990		FY 1991				
	January 9 Budget	Adjustment	Revised Budget	January 9 Budget	Adjustment	Revised Budget		
Active Military					and the second second second	1999 <b>-</b> 1999		
Army	772,300	-7.900	764,400	772,400	-8.300	764,100		
Navy	597,600	-5,600	592.000	598,200	-6.200	592,000		
Marine Corps	197,200	- 11 - <b>-</b> 11 - 11	197,200	197,200		197,200		
Air Force	571,100	- 3,200	567,900	566,800	-	566,800		
Total	2,138,200	- 16,700	2,121,500	2,134,600	- 14,500	2,120,100		
Reserve Personnel								
Army	322,000	- 300	321,700	323,700	- 600	323,100		
Navy	153,200	+200	153,400	153,800	+ 1,200	155,000		
Marine Corps	44,000	1	44,000	44,100	-	44,100		
Air Force	84,800	+ 100	84,900	85,200	-	85,200		
Army National Guard	458,000	-	458,000	458,800	- 300	458,500		
Air National Guard	116,300	-100	116,200	116,100	+ 200	116,300		
Total	1,178,300	-100	1,178,200	1,181,700	+ 500	1,182,200		

	BUDGET AUTHORITY BY MILITARY COMPONENT (\$ Million)							
	FY 1984	FY 1985	FY 1986*	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
Current Dollars								
Department of the Army	62,181	74,270 <sup>b</sup>	73,128 <sup>b</sup>	73,9945	75,813 <sup>b</sup>	78,164 <sup>b</sup>	78,771 <sup>b</sup>	81,836 <sup>b</sup>
Department of the Navy	82,088	99,015 <sup>b</sup>	96,113 <sup>b</sup>	93,500 <sup>b</sup>	100,281 <sup>b</sup>	97,407 <sup>b</sup>	97,812 <sup>b</sup>	103,144 <sup>b</sup>
Department of the Air Force	86,108	99,420 <sup>b</sup>	94,870 <sup>b</sup>	91,624 <sup>b</sup>	88,324 <sup>b</sup>	94,580 <sup>b</sup>	97,740 <sup>b</sup>	102,984 <sup>b</sup>
Other	27,773	14,096	17,279	20,353	19,336	20,035	21,277	23,037
Total—Direct Program (B/A)	258,150	286,801	281,390	279,469	283,755	290,186	295,600	311,000
Constant FY 1990 Dollars								
Department of the Army	75,944	87.269b	83.537b	82.071b	80.920 <sup>b</sup>	80.541 <sup>b</sup>		
Department of the Navy	99.040	116.127 <sup>b</sup>	109.813b	103.234b	106.824b	100.223b		
Department of the Air Force	102,742	115,444 <sup>b</sup>	107.506b	100.8945	94,416 <sup>b</sup>	97 622b		
Other	34,134	16,857	20,096	23,013 <sup>b</sup>	20,894 <sup>b</sup>	20,874 <sup>b</sup>		
Total—Direct Program (B/A)	311,861	335,697	320,952	309,213	303,054	299,261		

a Lower Budget Authority in the Military Personnel Accounts in FY 1986 reflects the congressional direction to finance \$4.5 billion for the military pay raise and retirement accrual costs by transfers from prior year unobligated balances.

bincludes	Retired	Pay	accrual.	
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	BUDGET		BY MILITAR rent \$ Billion)	IY COMPON	IENT	
		FY 1990			FY 1991	
	January Budget	Adjustment	Revised Request	January Budget	Adjustment	Revised Request
Army	80.5	-1.7	78.8	84.1	-2.2	81.8
Navy	101.7	-3.9	97.8	105.1	-1.9	103.1
Air Force	100.5	-2.7	97.7	106.6	-3.6	103.0
Defense Agencies	20.3	-1.3	19.0	22.3	- 1.4	20.9
Defense Wide	2.6	-0.5	2.1	2.9	-0.8	2.1
Total	305.6	-10.0	295.6	320.9	-9.9	311.0

The Chart Page

	B	UDGET A	UTHORIT	Y BY TITL	E			
		1000	(\$ Million)					
	FY 1984	FY 1985	FY 1986*	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
Current Dollars								
Military Personnel	48,363	67,773	67,794	74.01C	76,584	78,566	79,185	81,283
Retired Pay	16,503	b	đ	E	b	b	Þ	b
Operation & Maintenance	70,950	77,803	74,888	79,607	81,629	85,939	90,199	94,042
Procurement	86,161	96,842	92,506	80,234	80,053	79,232	78,754	87,147
Research, Development, Test								
and Evaluation	26,867	31,327	33,609	35,644	36,521	37,542	39,545	39,495
Special Foreign Currency								
Program	3	9	2	4		÷	-	
Military Construction	4,510	5,517	5,281	5,093	5,349	5,703	4,823	5,648
Family Housing & Homeowners								
Assistance Program	2,669	2,890	2,803	3,075	3,199	3,266	3,235	3,620
Revolving & Management								
Funds	2,774	5,088	5,235	2,612	1,246	722	774	850
Trust Funds, Receipts &								
Deductions	-650	-447	-729	-809	-827	- 784	-758	-720
Proposed Legislation	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100						-157c	-365°
Total—Direct Program (B/A)	258,150	286,802	281,390	279,469	283,755	290,186	295,600	311,000
Constant FY 1990 Dollars								
Military Personnel	58,538	78,132	75,434	80.365	80.210	80.011		
Retired Pay	20,205	b	b	b	b	b		
Operation & Maintenance	84,615	91,140	86,686	89,194	88,572	89,311		
Procurement	104,102	113,599	105,223	88,324	85,089	81,549		
Research, Development, Test								
and Evaluation	32,560	36,853	38,501	39,576	39,133	38,788		
Special Foreign Currency								
Program	4	10	2	4	-	-		
Military Construction	5,481	6,505	6,051	5,637	5,704	5,878		
Family Housing & Homeowners								
Assistance Program	3,182	3,352	3,175	3,392	3,423	3,371		
Revolving & Management								
Funds	3,659	6,355	6,397	3,196	1,465	793		
Trust Funds, Receipts &	(and		1998		A statement			
Deductions	-485	-248	- 518	- 475	- 542	-441		
Proposed Legislation			1		-	-		
Total-Direct Program (B/A)	311,861	335,697	320,952	309,213	303,054	299,261		

\*Lower Budget Authority in the Military Personnel Accounts in FY 1986 reflects the congressional direction to finance \$4.5 billion for the military pay raise and retirement accrual costs by transfers from prior year unobligated balances. \*Retired Pay accrual included in Military Personnel appropriation. \*Figure is for total defense-wide contingencies, which includes other legislation and management improvements.

		(Curre	nt \$ Billion)				
		FY 1990		FY 1991			
	January Budget	Adjustment	Revised Request	January Budget	Adjustment	Revised Request	
Military Personnel	79.8	-0.7	79.2	82.1	-0.8	81.3	
O&M	91.7	-1,5	90.2	95.5	-1.5	94.0	
Procurement	84.1	-5.4	78.8	91.9	-4.7	87.1	
RDT&E	41.0	- 1.5	39.5	41.3	- 1.8	39.5	
Military Construction	5.3	- 0.5	4.8	5.9	-0.3	5.6	
Family Housing	3.3	a	3.2	3.7	- 0.1	3.6	
Other	0.4	- 0,6	- 0.2	0.6		-0.2	
Total	305.6	- 10.0	295.6	320.9	-9.9	311.0	

	PROGRAM TERMINATIONS (Current \$ Million)							
	FY 1	990	FY 1	991	FY 1992-1994			
	Quantity	Dollars	Quantity	Dollars	Quantity	Dollars		
Army								
AH-64 Helicopter								
(after 1991)	-6	- 38	-6	+17	- 144	-1,603		
AHIP	- 36	- 276	- 36	- 304	- 96	- 996		
M88 Recovery Vehicle	-	-	-78	-86	- 137	-206		
Navy								
V-22 Aircraft	-12	-1,267	-24	-1,540	-157	- 5,758		
F-14D Aircraft	- 12	- 365	-12	-469	-36	-1,532		
Phoenix Missile		2. S	-420	-327	-406	-281		
SSN-688 Submarine	-1	-714	10 A	-		-		
Air Force								
F-15 Aircraft								
(after 1991)		-11	1000 C (#100 C )	+ 552	- 78	- 3,620		
LANTIRN								
Navigation Pod	-67	-50			1	-		
Targeting Pod	-37	-32	-30	-31	10 10 10 10 10 10 10 10 10 10 10 10 10 1	-		

	FY 1990 (	Changes	FY 1991 Changes			
	Quantity	Dollars	Quantity	Dollars		
Army						
ADATS Missile	-234	- 149	-406	- 114		
ATACMS Missile	- 124	-46				
UH-60 Helicopter	-11	-32	-11	- 34		
Navy						
SH-60F Helicopter	- 18	-205				
T-45TS Aircraft	-24	-264	-24	-17		
F/A-18 Aircraft	-6	-156	-6	-74		
Coastal Minehunter	-2	-110				
Air Force						
B-2 Bomber	6	-855		-3.226		
Tacit Rainbow Missile	-		b	- 30		
National Aerospace Plane <sup>a</sup>	an the second	-200	11 - E 1. S 1	- 390		
Defense Agencies						
SDIQ	이 이 가는 <u>요구</u> 이 이 가지?	- 991		-1 271		

FORCE STRUCTURE CHANGES (\$ Million)				
	FY 1990 Changes		FY 1991 Changes	
	Dollars	Manpower	Dollars	Manpower
Army				
Deactivate One Active Mechanized				
Brigade/Cancel Activation of Selected Units	-91.3	-7,929	- 197.7	-7,929
Restructure Army Attack Helicopter Units	-2.1	-	- 15.9	- 375
Navy				
Betire the USS Coral Sea	-53.3	-1.257	- 106.6	-1 418
Accelerate Retirement of Destroyers	-74.3	- 3.357	-108.6	-2,709
Deactivate 73 P-3A/B Aircraft	-67.7	-876	-77.5	-876
Transfer 10 Frigates			10.00	1001030
From the Active Forces	-29.7	-676	-70.6	-1.690
To the Reserves	+28.9	+ 696	+55.9	+1,740
Air Force				
Deactivate WC-130 Hurricane				
Reconnaissance Aircraft	-14.0	-439	-6.2	이번 방법을 받아.
Restructure TR-1 Program	-4.8	-71	-3.5	-70

In a fourteen-nation test of science achievement, US high school seniors finished dead last. And that's just the beginning of the problem.

# It's Time to Worry About Technical Manpower

**BY F. CLIFTON BERRY, JR.** 

THE United States is slipping. By many criteria that count, it is no longer the world leader. The trade and budget deficits, for example, have weakened the US's position relative to its overseas partners and competitors. We are losing ground to other nations in the fielding of new technologies. Foreigners are buying and controlling US real estate, farm land, and companies. The defense industrial base is weak and getting weaker.

Last year, the Aerospace Education Foundation sounded the alert about the defense industrial base in a major report, "Lifeline in Danger." A companion study, to be published by the Foundation later this year, will examine a related problem that is just as alarming, if not more so.

The US technical manpower base is in deep trouble. The problem is already apparent in the schools, in the workplace, and elsewhere. "A Nation at Risk," produced six years ago by the National Commission on Excellence in Education, described the situation in stark language: "The educational foundations of our society are . . . being eroded by a rising tide of mediocrity that threatens our very future as a nation and a people. What was unimaginable a generation ago has begun to occur—others are matching and surpassing our educational attainments."

The report went on: "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves.

"History is not kind to idlers," the report continued. Pointing out that we now live among "determined, well-educated, and strongly motivated competitors," it made three quick and pertinent competition comparisons: Japanese automobiles, South Korean steel mills, and German machine tools. "These developments signify a redistribution


of trained capability throughout the globe. Knowledge, learning, information, and skilled intelligence are the new raw materials of international commerce." The report summarized, "Learning is the indispensable investment required for success in the 'information age' we are entering."

Three years later, a 1986 study by the US Census Bureau looked at the functional illiteracy rate, which at that time stood at about thirty percent of the population. The study predicted that, if 1986 trends continued, functional illiteracy in the general population of the US would reach seventy percent by the year 2001. That means in less than twelve years, no matter what their academic records, seventy percent of the population will fall short of functioning as productive members of society.

#### Still at Risk

Five years after "A Nation at Risk" appeared, Secretary of Education William J. Bennett assessed America's educational progress. In 1988, he said, "We are doing better than we were in 1983... but we are certainly not doing well enough, and we are not doing well enough fast enough. We are still at risk."

Current examples of educational deficiencies abound. In early 1988, the New York Telephone Co. tested 22,880 applicants for 2,000 entrylevel jobs. The jobs did not require a high school diploma. Eighty-four percent of the applicants failed the examination. In July of that year, Secretary of Commerce C. William Verity wrote in "Building a Quality Workforce," a joint initiative of the Departments of Commerce, Education, and Labor: "At a time when more and more jobs require at least basic proficiency in English comprehension and mathematics, our young entrants into the labor force are proving to be disturbingly deficient in these skills, not to mention knowledge in such areas as science, geography, and foreign languages."

In March 1989, the Wall Street Journal looked at education in big cities. It reported that in some of Philadelphia's inner-city schools the dropout rate is as high as sixty percent. Nationwide, the Journal found that 3,800 teenagers drop out of school each day. Those dropouts are generally lost to the labor market. They are not competitive candidates for jobs that count; in most respects, they are incapable of entering the work force.

Louis V. Gerstner, a former president of American Express Co., commented recently on the lamentable quality of the entry-level work force. Writing in the Washington *Post* (March 20, 1989), he noted "good news and bad news." The good news, Mr. Gerstner said, is that American Express will be hiring a minimum of 75,000 people over the next five years. The bad news is that the company may not be able to find them. These are entry-level jobs; yet many applicants can barely write, are ignorant of geography, and cannot cope with simple mathematics.

Mathematics is the key to opportunity everywhere. Phillip A. Griffiths, Chairman of the Board on Mathematical Sciences and professor of mathematics at Duke University, says, "Those who do not learn basic mathematics problem-solving skills will be left behind in the world of the future. And this is just as true for nations as it is for individuals." Mr. Griffiths made that statement at the conference releasing the report "Everybody Counts" in January 1989. The report was sponsored by the National Research Council as part of its response to the urgent national need to revitalize mathematics and science education. Frank Press, Chairman of the Research Council, stressed how crucial it is "for science, technology, and the economy of the nation that all students receive high-quality education in mathematics."

In its early paragraphs, the report says, "More than ever before, Americans need to think for a living; more than ever before, they need to think mathematically. Yet, for lack of mathematical power, many of today's students are not prepared for tomorrow's jobs. In fact, many are not even prepared for today's jobs." Then it says, "Wake up, America! Your children are at risk."

Perhaps the US experience is not unique; maybe educational achievement levels are slipping worldwide. The evidence suggests otherwise. Comparing US education levels with those in other countries adds cause for concern. Consider the "International Science Report Card," issued in 1988 by the National Science Teachers Association



**US Ranks Low in Science Achievement** 

**Mean Percent Correct** 

US ninth-grade students ranked fifteenth among the sixteen countries participating in a 1986 international science achievement test. Still more alarming is the fact that US ninth-graders' average score on this test in 1986 was lower than that achieved by US ninth-graders in 1970.

Source: International Science Report Card, International Association for the Evaluation of Educational Achievement.

(see chart below). The report was based on standardized tests administered to students in the United States and twenty-three other countries. Students at the fifth-, ninth-, and twelfth-grade levels were tested. By 1988, data on the US and most other countries had been analyzed and included in the report.

At the fifth-grade level, US students ranked eighth among fifteen countries. The ninth-grade students ranked lower-fifteenth place. Even worse news came from testing the twelfth-grade advanced-science students. For example, US twelfthgraders completing a second year of biology ranked fourteenth among the fourteen countries whose data were analyzed-dead last. In other sciences the US results were slightly better, but not encouraging. US twelfth-grade students with two years of chemistry ranked eleventh among thirteen countries; in physics, the comparable result was ninth of thirteen.

#### **Jobs and Skills Mismatched**

Educational shortcomings would be lamentable enough in a static situation, but the circumstances are not static. The economy and workplace are changing rapidly, and the pace of change is accelerating. As Secretary Verity commented in "Building a Quality Workforce," "The 'basic skills gap' between what business needs and the qualifications of the entry-level workers available to business is widening."

Secretary Verity and his colleagues cited examples of the pace of change. The Commerce Department noted that about ninety percent of all scientific knowledge has been generated in the last thirty years. It estimated that the pool of knowledge will double in the next ten to fifteen years. Product life cycles also shrink, requiring change and adaptability. The Commerce Department says that life cycles for electronics products "already have collapsed to three to five years" and that product life cycles rarely will exceed five to ten years in other industries.

The rapid change will demand a flexible and adaptable work force. "Building a Quality Workforce" quotes David Kearns, CEO of Xerox: "Future jobs will be restructured about every seven years, and work and learning will be inseparable." The Bureau of Labor Statistics underscores the need for education in the future. It forecasts that more than half of all new jobs created between 1984 and 2000 will require some education beyond high school, and almost a third will be filled by college graduates. Today, only twenty-two percent of all occupations require a college degree.

Yet while the number of new jobs is growing (16,000,000 created between 1982 and 1988, says the Labor Department), the number of new entrants is shrinking. The group of people between sixteen and twenty-four years of age has been the traditional source of new workers. But that group is dwindling as the effects of the post-babyboom era begin to take hold; fewer mothers and fewer babies per mother translate into a smaller future labor pool. The Hudson Institute, in its "Workforce 2000" report, projected the trend in these terms:

• Decline in population growth means an older work force, with average age of workers increasing from thirty-six to thirty-nine by the year 2000.

• Workers aged sixteen to thirtyfour accounted for half the work force in 1985, but will be declining to less than forty percent by 2000.

• Eighty percent of new entrants into the work force will be women, minorities, and immigrants.

Besides requiring a steady influx of entry-level workers, companies in the aerospace and defense sectors also require midlevel and senior men and women who are already qualified and productive. The ebb and flow of defense contracts and new projects often require companies to add qualified technical people to compete for new business or complete business on the books. The companies must range far afield to find and hire them.

For example, listening to the car radio while stuck in freeway traffic in Los Angeles, I heard a recruitment commercial for Westinghouse Defense: "Come to beautiful Chesapeake Bay and work on exciting projects in the land of pleasant living. Interviews being conducted at the Century Marriott on Saturday." Back home a day later in the Baltimore-Washington area, I heard a radio commercial broadcast for Rockwell Autonetics: "Join Rockwell at Newport Beach, Calif., where it's warm and pleasant, and the prospects are challenging. Interviews Saturday at Crystal City."

#### "The Depth of Commitment"

In March 1989, Boeing borrowed up to 670 skilled production workers from its competitor Lockheed to fill orders for its 747-400 airliners. Dean Thornton, president of Boeing Commercial Airplanes, said that borrowing workers from Lockheed and other Boeing divisions showed "the depth of the Boeing commitment to produce the 747-400s that meet all the quality and technical expectations that our airline customers have." It also demonstrated the acute shortage of skilled aircraft production workers in Seattle and a surplus in Marietta, Ga., where Lockheed's C-5B work had wound down

Other short-term remedies taken by aerospace companies include bounties and hefty recruitment advertising. Aerospace companies in Southern California offer bounties of up to \$2,000 to employees who recruit qualified people with the right skills. The mix of money spent on product and recruitment advertising is changing to be more heavily weighted for recruiting skilled people. But if a California firm hires engineers from Baltimore, there is a hefty financial cost for moving the people and their families. In addition, in more than half of working families, both spouses are employed. That makes them reluctant to move without assurance that both will be employed in the new situation.

Clearly, such actions are shortterm fixes. Coordinated national reforms are required for the long term.

In 1983, the authors of "A Nation at Risk" recommended simple, straightforward, and lasting national reforms. Among them: strengthen content to stress basics; adopt more rigorous standards and expectations; devote more time to basics with better use of the school day, longer school days, and lengthened school year; improve teaching and teachers; and provide leadership and funding.

In his 1988 assessment of progress, Secretary Bennett said that reforms face serious obstacles; among them, sheer bureaucratic inertia from 100,000 school systems and determined opposition in different forms. One group of opponents denies that things are as bad as they seem. A second group admits that things are bad, but says that "society" or the "system" needs to be altered.

"Today," Secretary Bennett said, "we hear opposition by extortion: the false claim that to fix our. schools will first require a fortune in new funding." Finally, he said, current opposition to school reform "is manifested in the narrow, self-interested exercise of political power in statehouse corridors and local school board meetings." Sweeping national remedies may seem obvious, but as Secretary Bennett pointed out, they are difficult to implement. Even successful national programs require local participation as an element of success. What is being done locally by industry and communities?

#### Local Initiatives

In many localities nationwide, industry, government, and schools are working together to create improvement. They are not waiting for national solutions. Take Cincinnati, for instance.

"Unless something is done, hundreds of children born this year [1987] in Cincinnati will grow up functionally illiterate and unemployable. Almost half will never finish high school. We must work together to stop this enormous waste of human potential in our community." In saying that, John Pepper, the President of Cincinnati-based Procter & Gamble, was emphasizing the need for business to do something about the forty percent dropout rate in Cincinnati's public schools.

A partnership between business and education was developed in January 1987. Called the "Cincinnati Youth Collaborative," it is aimed specifically at dropout prevention. The CYC links hundreds of business volunteers with scores of public and private sector organizations concerned with youth. By working together, the CYC helps the system keep young people in school and helps the schools prepare them better for the job market.

In Chicago, fifty companies have

#### **How Many Engineers?**

If your laboratory or your project has enough engineers for the work at hand, there is no engineer shortage. However, if you don't have the engineers you need, the shortage is acute. For the best national use of technology and engineering talent, it is useful to know how many engineers of which disciplines are available.

Unfortunately, the numbers vary. That is the conclusion of John Alden of the American Association of Engineering Societies (AAES). Reporting in Engineering Manpower Bulletin 92 (January 1989), Mr. Alden found that the National Science Foundation (NSF) counted 2,634,900 engineers in the US in 1986 (most recently compiled figures). However, the Bureau of Labor Statistics counted 1,331,747—only about half as many.

Mr. Alden adjusted the NSF figures downward by deducting the numbers of engineers unemployed or out of the labor force, employed but not in engineering, primarily in management jobs, and in other categories. With those adjustments, he squeezed the NSF total to 1,217,600. By Mr. Alden's calculations, the actual number of practicing engineers is somewhere between 1,200,000 and 1,300,000.

pooled resources to found their own school, the *Wall Street Journal* reported in March 1989. The companies hope their school will demonstrate that children in poverty can learn as well as suburban children can. The tuition-free Corporate-Community School holds classes year-round and tailors progress to the children's needs.

"Magnet schools" are another way for communities to address two social needs at the same time, desegregation and educational innovation. These schools have educational innovations that attract students and parents. Their spaces are filled by racial quotas to ensure desegregation. Prince George's County, Md., adjacent to Washington, D. C., has thirteen programs in forty-seven schools, offering 1,500 openings. Parents form lines a week before the openings are allotted, camping out on the spot to ensure their children have a shot at a magnet slot.

Mr. Kearns of Xerox advocates reorganizing every public school district with more than 2,500 children into a year-round universal magnet system. In his restructuring, advocated in *Winning the Brain Race* (coauthored with Denis P. Doyle), Mr. Kearns says the magnet schools "would be free to implement new teaching strategies and learning methods... Principals and teachers would run their schools with complete academic and administrative autonomy."

School magnets, like all magnets, are attracting forces. Magnet schools attract controversy and criticism along with their appeal to parents and students. Mary H. Metz, professor of education at the University of Wisconsin, is an expert on magnet schools. She says they draw controversy because they are different, and "they challenge a pervasive myth—that the only way to achieve educational equality is through standardization." She says that magnet schools draw political fire because they bring this tacit contradiction (between standardization and diversity) to public consciousness.

#### **Building Better Employees**

Increasingly, industry is forced to make, rather than buy, productive employees. In its report, "Workplace Basics, the Skills Employers Want," the American Society for Training and Development stated the basic lesson: "Employer interest in improving basic skills is driven by economic concerns. When deficiencies affect the bottom line, employers respond with training or replacement." But the replacement course is less feasible, because the entry-worker pool is shallow and less trainable. Consequently, employers' interest in providing training in basic workplace skills is growing.

In Southern California, aerospace companies banded together with community colleges nearly four years ago to develop curriculum guides for seven occupations critical to their manufacturing operations: manufacturing planner, tool designer, machine operator, machine maintenance worker, quality control inspector, composites fabrication technician, and numerical controlled programmer. Curriculum writers from more than twenty community colleges worked in teams to convert industry requirements and input into workable instruction units.

Within eight months, the guides were ready for use in classrooms across the region. In the process, industry and the colleges both learned more about each others' needs. The project has proved successful in practice. Students qualified for jobs the aerospace companies needed to fill, and the colleges built a core of practical instructional experience usable for other aerospace manufacturing jobs, as well as in other industries. Companies involved (all members of the Southern California Aerospace Industry Education Council) were McDonnell Douglas, Hughes Helicopters (now part of McDonnell Douglas), Northrop, and Rockwell International.

Looking ahead, what can be done to arrest the decline in America's intellectual capital? What can be done to preserve and improve its technical manpower resources? Clearly, individual companies, school systems, unions, and workers should not await magical national solutions. Those will be a long time coming, if ever. Local initiatives show the most promise for addressing local problems. The Cincinnati and Southern California cases are examples of hundreds and perhaps thousands of local groups combining to address the problems.

Whichever solutions are sought, unless effective action is taken, the US will have a third strike to add to the trade and budget deficit woes: the technical-manpower deficit. The time is late; the problem, already critical, worsens daily.

F. Clifton Berry, Jr., is a former Editor in Chief of AIR FORCE Magazine. He saw USAF service in the Berlin Airlift, 1948–49. Later, he was a paratrooper and an officer in the 82d Airborne Division. He commanded airborne and infantry units in the US and Korea and saw Vietnam combat as operations officer of a light infantry brigade. His most recent article for AIR FORCE Magazine was "Destroying Enemy Armor" in the April '89 issue. Here's an opinion from a former flying leader who sees merit on both sides of the pilot retention controversy.

## This Is a Family Argument

#### BY COL. ROBERT E. VENKUS, USAF (RET.)

FOR the past five months, a hot topic in AIR FORCE Magazine articles and letters to the editor has been the pilot-retention problem. The force is losing more flyers a year than the number of replacements it can train. Air Force leaders point to the lure of the airlines, now hiring aggressively and paying well for pilots. For their part, pilots say the big issue is not pay and that the leadership is not listening to them.

The exchange has taken on an emotional tone that reflects frustration at all levels. Pilots have shown little understanding of the complex issues faced by Air Force leadership, opting instead for a simplistic "Let me fly!" attitude. Flag officers seem to have fallen back on the lamest of excuses for failing to find an adequate fix, suggesting that pilots leaving the service are flawed either personally or professionally. All this is distressing to one who was part of the Air Force family for almost three decades and who still feels a close kinship to the service.

#### A Quarter Century of Change

The past twenty-five years brought many changes. The All-Volunteer Force, for example, led to cultural change when it called for military compensation to be competitive with civilian wages. The focus on economic issues, in my view, caused an irrevocable change in the level of commitment of our officers and airmen. That does not mean, of course, that they became bad people—but they often perceived things differently from those of us of an earlier generation. The Air Force leadership obviously understands this to an extent. What else could explain leather jackets (an attempt, perhaps wrong, to recapture the élan of 1945) and pilot bonuses ("We have to compete in the marketplace")?

Another big change has been the transformation of the Guard and Reserve. Twenty-five years ago, they were usually seen as poor alternatives to an active-duty career. If you wanted to fly top-of-the-line aircraft, you stayed on active duty. If you didn't mind flying jets with one gear in the boneyard, you could opt for the militia. Flying the best aircraft was at least as important to many of us as the \$322 per month we got for our pilot skills. Today's pilots have a different choice. Guard and Reserve units are equipped with modern, capable jets. They are also highly trained and experienced, which leads to predictable victories over active flyers in many competitions. A career with these units has become a very attractive option for skilled Air Force aviators.

One thing that has not changed is the emphasis on youthful, vigorous armed forces. The up-or-out policy

has been interpreted by many pilots (including this one) as "Every man a potential Chief of Staff." Indeed, personnel policies have often been weighted in favor of that perception, fostering square-filling and ticket-punching at the expense of line combat capability. However, such mistaken policies, many of which have been eliminated or modified by the current Air Force leadership, had another goal as well: keeping cockpits filled with young, energetic aircrews capable of dealing with the rigors of combat. That is an area where active units have a definite edge over the Guard and Reserve Forces.

#### **Coping With the Stresses of Combat**

Those of us who flew fighters well into our forties became acutely aware of the physical changes that gradually reduced our ability to perform in combat. Sure, wiliness and wariness born of experience made us safe, capable pilots—but we would probably not have coped as well with the grueling stresses that combat often brings. I recall a string of nineteen night Wild Weasel missions in a twenty-day period, as well as a nine-hour fighter mission supporting a deep search and rescue. Will all the Guardsmen and Reservists who *really* believe they are more capable of *sustained* combat performance in their forties than they were in their twenties please stand up?

At the same time, it appears that the goal of a young fighting force has become an official excuse for not providing alternative pilot career paths. Would a "limited-duty" flying corps really be an impossible misfit alongside the generation of officers raised in the 1980s? Would the service as an institution be irreversibly damaged? I think the Air Force will eventually be forced to adopt some version of a limited aviation-career path. Why not start now, before an uneven, misapplied bonus structure alienates other career groups?

Despite major differences in perspective, generals and pilots still have a great deal in common. Air Force leaders, however, must resist the temptation to try reshaping the next generation in the image of the last. Pilots must realize that most generals were pilots first. They share the love of flying, the love of country, and the desire to field the best fighting Air Force the nation can afford. Solutions may not be easy, but they will develop just as quickly if both sides adopt a more conciliatory tone. After all, this is a family argument.

The author flew 169 combat missions in the F-105 during the Vietnam War. In 1986, he was Vice Commander of the 48th Tactical Fighter Wing at RAF Lakenheath. From the days before Kitty Hawk to the era of space, their names are among the greatest in flight.

# The Aviation Hall of Fame

BY JEFFREY P. RHODES, AERONAUTICS EDITOR



The National Aviation Hall of Fame, in Dayton, Ohio, was formally established by Pres dent Lyndon Johnson on July 14, 1964. The first inductees were, naturally enough, Wilbur and Orville Wright, followed by 124 other aviation notables. The Hall of Famers (with their **year of induction**) are as follows:

William McP. Allen (1900–1985). Led development of commercial and military jet travel. Helped to advance supersonic flight and space travel in various roles at Boeing Airplane Co. 1971.

Frank M. Andrews (1884–1943). Reorganized Army Air Corps. Helped establish independent General Headquarters Air Force. 1986.

Neil A. Armstrong (born 1930). Served as a military pilot, test pilot of X-15 and other supersonic aircraft. Astronaut on the Gemini 8 and Apollo 11 space missions. First man to walk on the moon. 1979.

H. H. "Hap" Arnold (1886–1950). Made many pioneering flights. Won first Mackay Trophy. Led Army Air Forces in World War II. Only aviator to attain five-star rank. Founding father of Air Force Association. 1967.

J. Leland Atwood (born 1904). Designed BT-9, O-47, AT-6, P-51, B-25, P-82, FJ-1, and AJ-1 aircraft for North American Aviation. Led company as it developed F-86, F-100, XB-70, X-15, B-1, and various spacecraft and boosters. 1984.

Bernt Balchen (1899–1973). First pilot to fly over the South Pole. Later, the first to fly over both poles. Founder of Norwegian Airlines. Served USAF as Arctic aviation expert. Received Harmon Trophy. 1973.

Thomas S. Baldwin (1854–1923). Pioneered balloon flights. Improved parachutes. Developed successful dirigibles (including the first one for the Signal Corps). 1964.



Lincoln Beachey (1887–1915). Demonstrated flight capabilities of aircraft. Performed such maneuvers as spin recovery and inside loop. 1966.

Olive Ann Beech (born 1903). Led Beech Aircraft Co., including tenure as chief executive officer. Honored as "The First Lady of Aviation." 1981.

Walter H. Beech (1891–1950). Created such innovative aircraft as the Staggerwing, Model 18, Bonanza, UC-45, F-2, AT-7, AT-10, AT-11, and T-34. 1977.

Alexander Graham Bell (1847–1922). Performed research into principles of lift, propulsion, and control. Advanced scientific test facilities. Promoted independent US air force. 1965.

Lawrence D. Bell (1894–1956). Developed such innovative and unique aircraft as P-59 (America's first jet aircraft), X-1 (used to break sound barrier), X-5, and X-14. Developed first commercially licensed helicopter. 1977.

William E. Boeing (1881–1956). Organized network of airline routes in the 1920s. Founded namesake company that would produce many military and commercial aircraft types from World War I to the present. **1966**.

Richard I. Bong (1920–1945). Demonstrated immense skill as fighter pilot. Became America's all-time leading ace with forty confirmed victories. Died preparing to test gunnery skills in new jet fighter, the P-80. 1986.

Frank Borman (born 1928). Military pilot and astronaut. Commanded Gemini 7 and Apollo 8 (first manned spacecraft to orbit the moon). Became Eastern Air Lines executive. 1982.

Albert Boyd (1906–1976). Set new world speed record in the P-80R. Served as engineer and logistician during World War II. Promoted scientific flight test. 1984.

George S. Brown (1918–1978). Served as bomber pilot in World War II. Provided leadership during Korean and Vietnamese conflicts. Was Air Force Chief of Staff and later Chairman of Joint Chiefs of Staff. 1985.

Richard E. Byrd (1888–1957). Pioneered use of airplanes in polar regions, making flights over both poles. Acquired scientific knowledge of these regions for more than thirty years. Received peacetime Medal of Honor and Medal of Freedom. **1968**.

Clyde V. Cessna (1879–1954). Developed early monoplanes. Formed and managed several aircraft manufacturing companies, including namesake company. Produced high-efficiency general aviation aircraft. 1978.

Clarence D. Chamberlin (1893–1976). Set record endurance and altitude flights. Made 1927 nonstop flight from Long Island, N. Y., to Germany. Promoted public flying. 1976.

Octave Chanute (1832–1910). Wrote Progress in Flying Machines. Demonstrated successful man-carrying gliders. Served as counselor to Wright brothers and others engaged in flight research. **1963**.

Claire L. Chennault (1890–1958). Developed science of fighter tactics and doctrine. Showed distinguished leadership in China as commander of American Volunteer Group (the Flying Tigers) and Fourteenth Air Force. 1972.

Jacqueline Cochran (birthdate unknown; died 1980). Was first woman to fly in Bendix Trophy Race. Organized Women's Airforce Service Pilots (WASP) program during World War II. Won Harmon Trophy. Was first woman to exceed speed of sound. Served as president of National Aeronautic Association and Fédération Aéronautique Internationale. **1971.** 

Michael Collins (born 1930). Served as Air Force test pilot. Was astronaut on Gemini 7 and Apollo 11 missions. Was planner, developer, and overseer of National Air and Space Museum. 1985.

Charles Conrad, Jr. (born 1930). Served as Navy test pilot. Was astronaut on Gemini 5, Gemini 11, Apollo 12, and Skylab space missions. Was third man to walk on the moon. **1980.** 

A. Scott Crossfield (born 1921). Piloted such research aircraft as D-558-II, X-4, X-5, and X-15. Was first pilot to exceed Mach 2 and first to surpass Mach 3 and survive. Helped form Society of Experimental Test Pilots (SETP). Won Collier Trophy and SETP's Iven Kincheloe award. Developed advanced flight controls. 1983.

Alfred A. Cunningham (1882–1939). Was first Marine aviator. Made first catapult launch from an underway ship. Led Marine aviation in early decades of flight. 1965.

Glenn H. Curtiss (1878–1930). Developed lightweight engines. Improved airplanes and control systems. Created basic new craft such as seaplanes and amphibians. Constructed first airplane to take off and land on a ship and first airplane to fly across the Atlantic. **1964**.

Alexander P. deSeversky (1894–1974). Was industrialist, author, strategist, and pilot with thirteen aerial victories in World War I. Invented in-flight refueling and first gyroscopically stabilized bombsight. **1970.** 



James H. Doolittle (born 1896). Made first accurate measurement of effects of acceleration in flight. Made first takeoff, flight, and landing completely on instruments. Made first outside loop. Organized and led first raid on Japan in April 1942 (for which he received the Medal of Honor). Commanded Twelfth, Fifteenth, and Eighth Air Forces during World War II. Was first National President of Air Force Association. 1967.

Donald W. Douglas (1892–1981). Designed and manufactured many types of military and commercial aircraft, including Douglas World Cruiser, SBD, A-26, C-74, D-558-II, C-124, A-4, and DC-3. 1969.

Charles Stark Draper (1901–1987). Developed new aircraft instruments (to monitor engines), gyroscopic sights, automatic inertial guidance systems for aircraft, missiles, and spacecraft, and fly-by-wire control systems for aircraft. 1981.



Ira C. Eaker (1896–1987). Served as chief pilot of *Question Mark* during 1929 record endurance flight. Made first "blind" transcontinental flight. Organized VIII Bomber Command. Commanded Eighth Air Force and served as deputy commander of Army Air Forces. **1970**.

Amelia Earhart (1897–1937?). Promoted interests of women in flying. Set numerous records and milestones. Was first woman to fly (as a passenger) across the Atlantic, first to make a nonstop transcontinental flight, and first to pilot an autogiro. **1968**.

Carl B. Eielson (1897–1929). Was first person to fly over polar regions. Devoted his life to bringing aviation to sparsely populated world regions. 1985.

Theodore G. Ellyson (1885–1928). Pioneered with seaplanes and catapults. Was first Naval aviator. 1964.

Eugene B. Ely (1886–1911). Made first unassisted takeoff from a naval vessel. Made first successful landing and takeoff from same ship, thus proving practical ty of aircraft carriers. 1965.

Frank K. "Pete' Everest (born 1920). Served as pilot during World War II. As test pilot, established unofficial altitude record of 73,000 feet in X-1, set world speed record of 755.149 mph in F-100, flew X-1B to Mach 2.3 and X-2 to record Mach 2.9 in 1956. Tested X-3, X-4, X-5, XF-92, YB-52, and most "Century Series" Air Force fighters. **1989.** 

Sherman M. Fairchild (1896–1971). Developed precision aerial cameras, such advanced types of commercial and military aircraft as the PT-19, C-119, F-27 and their engines, and space-related satellites and components, including semiconductors. 1979.

Reuben H. Fleet (1887–1975). Provided leadership role in military flight training. Organized airmail service. Developed successful training aircraft and flying boats for commercial and military use and such multiengine bombers as B-24, B-32, and B-36. 1975.

Anthony Fokker (1890–1939). Designed Dr.I, D.VII, D.VIII, and T-2, which was first aircraft to fly across US nonstop. Designed synchronized machine gun. Developed airliners vital to establishment of worldwide air routes. 1980.

Henry Ford (1863–1947). Produced aircraft engines in World War I, aircraft and engines in World War II. Built first modern airport and trimotor airliner. 1984.

Joe Foss (bcrn 1915). Was second leading Marine Corps ace in World War II. Received Medal of Honor. Established South Dakota Air National Guard. Was National President of Air Force Association. **1984.** 

Benjamin D. Foulois (1879–1967). Participated in trials of first military airplane and cesigned first airplane radio receiver. Pressed for improved long-range mil tary aircraft. Served as Chief of the Army Air Corps from 1931 to 1935. 1963.

Francis S. "Gabby" Gabreski (born 1919). Demonstrated unusual valor and combat tactics in becoming third leading Army Air Forces ace in World War II and one of top aces in Korea. Number-one living American ace. 1978.

John H. Glenn, Jr. (born 1921). Was fighter pilot in World War II and Korea. Was first to make supersonic transcontinental flight. Was first American astronaut to o bit the earth, in 1962. Now a US Senator. 1976.

George W. Goddard (1889–1987). Developed aerial photography for wartime reconnaissance and peacetime aerial mapping. 1976.

Robert H. Goddard (1882–1945). Invented bazooka. Launched first successful liquid-fueled rocket. Solved problems of rocket control. Developed parachute recovery system for rockets. 1966.

Arthur Godfrey (1903–1983). Promoted aviation on radio and television programs. As a pilot, carried out record-setting, around-the-world flight in a JetCommander business aircraft. 1987.

Barry M. Goldwater (born 1909). Served military aviation as a pilot and administrator and as a US Senator supporting national defense, space developments, and commercial and private aviation. 1982.

Virgil I. "Gus" Grissom (1926–1967). Served as Air Force fighter pilot in Korea. Was astronaut on second Mercury mission and first Gemini mission. Died in 1967 in Apollo capsule fire. **1987.** 

Robert E. Gross (1897–1961). Led Lockheed Aircraft Co. in various capacities in manufacture of commercial and military aircraft from 1932 to the space age. 1970.

Leroy R. Grumman (1895–1982). Developed such engineering innovations as folding wings. Designed aircraft from FF-1 through lunar module. 1972.

Harry F. Guggenheim (1890–1971). Operated Daniel Guggenheim Fund (which proved feasibility of passenger service). Provided first aviation weather-reporting service. Provided full-flight laboratory where Jimmy Doolittle made the first "blind" flight. **1971**.

Daniel J. Haughton (1911–1987). Led development of Lockheed C-130 transport. Brought the L-1011 TriStar to market. Served as Lockheed's board chairman. 1987.

Albert F. Hegenberger (1895–1983). Pioneered instruments and systems, such as first fully automatic flight control. Made first flight to Hawaii (which won the Mackay Trophy) and first solo "blind" flight (which won the Collier Trophy). Served in the Army Air Forces. 1976.

Edward H. Heinemann (born 1908). Designed and developed such military aircraft as the Douglas A-20, A-26, A-1, D-558-II, A-3, and A-4. Worked as aerospace consultant. 1981.

Robert A. Hoover (born 1922). As longtime test pilot for North American Aviation, performed aerobatics for millions of spectators. Led Society of Experimental Test Pilots. 1988.

Howard R. Hughes (1905–1976). Developed such advanced design aircraft as H-1 and H-4. Set aerial records demonstrating the capabilities of a variety of aircraft. Developed domestic and international commercial aviation. 1973.

David S. Ingalls (1899–1985). Was only US Navy ace in World War I. Established aviation legal codes. Developed Naval Air Transport service during World War II. Promoted commercial and private flying. 1983.

Clarence L. "Kelly" Johnson (born 1910). Created innovative technical concepts that significantly advanced aircraft design, performance, and reliability. Helped design Lockheed P-38, T-33, U-2, and SR-71 aircraft. Helped achieve supersonic flight and spaceflight. 1974.

George C. Kenney (1889–1977). Developed wing-mounted machine guns and other warplane armament. Was General MacArthur's top air officer in the Pacific in World War II. Organized postwar Strategic Air Command. Was National Pres dent of Air Force Association. 1971. Charles F. Kettering (1876–1958). Developed reliable engine ignition systems. Laid out principles for and built one of the first cruise missiles. Developed tetraethyl-lead engine "knock" suppressant and high-compression engines and fuels. 1979.

James H. "Dutch" Kindelberger (1895–1962). Developed aeronautical designs and precision manufacturing techniques that helped North American Aviation build the AT-6, B-25, P-51, F-86, F-100, X-15, and XB-70. Contributed to development of Apollo spacecraft. 1972.

A. Roy Knabenshue (1876–1960). Performed public demonstrations of balloons and steerable balloons. Designed and built early dirigibles. Managed airplane exhibition teams for Wright brothers. 1965.

William J. "Pete" Knight (born 1929). Was Air Force test pilot in F-100, F-104, F-5, and especially X-15, in which he set unofficial speed record of Mach 6.7 and earned astronaut wings. 1988.

Frank P. Lahm (1877–1963). Was the Army's first airplane and dirigible pilot and an early proponent of aircraft for military purposes. Organized training facilities for Army Air Corps. Held unofficial title "Father of the West Point of the Air." 1963.

Samuel P. Langley (1834–1906). Studied air and space. Demonstrated the practicality of mechanical flight and provided inspirational guidance to others. 1963.

William P. Lear, Sr. (1902–1978). Developed advanced radio-operated navigation and control systems and the LearJet family of business aircraft. 1978.



CURTIS EMERSON LEMAY

Curtis E. LeMay (born 1905). Was lead navigator on two historic B-17 flights to South America. Commanded XXI Bomber Command and Twentieth Air Force during World War II. Commanded US Air Forces in Europe (organized Berlin Airlift) and was architect of Strategic Air Command. Served as Air Force Chief of Staff from 1961 to 1965. 1972.

Anthony W. LeVier (born 1913). Raced high-speed planes. Flight-tested Lockheed P-38, XP-80, F-104, and U-2 and contributed knowledge about flight safety. 1978.

Anne Morrow Lindbergh (born 1906). Made pioneering flights to survey air routes to the Orient and Europe. Wrote extensively to encourage aviation and air travel, 1979.

Charles A. Lindbergh (1902–1974). Made first solo flight across the Atlantic in 1927. Pioneered the Great Circle Route. Provided valuable technical service to Army Air Forces before and during World War II. 1967.

Edwin A. Link (1904–1981). Pioneered in improving flight training and safety through development of unique ground-based trainers and simulators. 1976.

Allan H. Lockheed (1889–1969). Made first dual-pilot controlled flight. Founded three airplane manufacturing firms and was consultant to namesake company. 1986.

Grover Loening (1888–1976). Developed new amphibian airplanes with retractable landing gear. Received Collier Trophy for development of "Air Yacht." Furthered the utility of aircraft and helicopters. 1969.

Frank Luke, Jr. (1897–1918). Showed courage and skill as a pursuit pilot and skill in development of new tactical combat maneuvers. Was one of America's leading aces of World War I. 1975.

John A. Macready (1887–1979). As early test pilot, participated in first nonstop transcontinental flight in Fokker T-2. Won three consecutive Mackay Trophies. Pioneered high-altitude flight. 1968.

Glenn L. Martin (1886–1955). Brought about important advances in aircraft design. Manufactured such aircraft as MB-1, B-10, B-26, and Matador and Mace missiles. 1966.

James S. McDonnell (1899–1980). Advanced military aircraft design in F3H, F-101, F-4, F-15, AV-8B, and F/A-18. Did pioneering work in space technology with the Mercury and Gemini spacecraft. Developed such commercial aircraft as DC-9 and DC-10. 1977.

John C. Meyer (1919–1975). Demonstrated extraordinary courage and skill as fighter pilot in World War II and Korea. Was seventh leading Air Force ace of all time. Commanded Twelfth Air Force. Was Air Force Vice Chief of Staff, Commander in Chief of Strategic Air Command. 1988.

William "Billy" Mitchell (1879–1936). Developed early theories of airpower. Demonstrated concept of strategic bombing by sinking obsolete German battleship Ostfriesland. Defined roles and missions for an independent air force. 1966.

Marc A. Mitscher (1887–1947). Attempted to be first pilot to cross the Atlantic. Commanded USS *Hornet* (the carrier that launched Doolittle's 1942 raid on Japan). Participated in Battle of Midway. Commanded Task Force 58 during World War II in the Pacific. **1989.** 

John J. Montgomery (1858–1911). Researched the nature of laws of flight. Constructed and tested a series of early gliders without flight-control systems. Made public demonstrations of gliders. 1964.

Thomas H. Moorer (born 1912). Was naval aviator during World War II. Commanded both Pacific and Atlantic Fleets. Served as Chief of Naval Operations, Chairman of Joint Chiefs of Staff from 1970 to 1974. 1987.

Sanford A. Moss (1872–1946). Studied and demonstrated gas turbine engines and developed aircraft turbosuperchargers while working for General Electric. 1976.

Gerhard Neumann (born 1917). Served as mechanic with American Volunteer Group in China. Was technical expert in development of variable stator compressor system for jet engines. Led development of J79 engine while working for General Electric. **1986.** 

John K. Northrop (1895–1981). Demonstrated originality and ingenuity in aircraft construction and design, especially in "flying wing" designs in use today. Produced such aircraft as the P-61, F-89, X-4, and America's first rocket plane, the MX-324, and developed such missiles as Snark. 1974.

William A. Patterson (1899–1980). Demonstrated professionalism in airline development, innovations in passenger service, concern for employees in numerous official capacities at United Airlines. **1976.** 

William T. Piper, Sr. (1881–1970). Developed, produced, and marketed such lightplanes as Cub, Tripacer, and Cherokee for general aviation use. Promoted their application to a wide variety of commercial and military uses. 1980.

Wiley H. Post (1898–1935). Performed flights around the world in Lockheed Vega *Winnie Mae*, demonstrating the practicality of new flight-related equipment. Conceived and proved feasibility of fully pressurized flying suit, which led to discovery of the jetstream. Was killed with Will Rogers, in crash near Point Barrow, Alaska, in 1935. **1969**.

Albert C. Read (1887–1967). Was Naval aviator, commander of NC-4 on first successful transatlantic flight in 1919. Honored as pioneer of Naval aviation, 1965.

Robert C. Reeve (1902–1980). As a barnstormer, airmail pilot, and bush pilot, played a vital role in demonstrating uses of the airplane in the economic, social, and cultural environment of Alaska. 1975.

Frederick B. Rentschler (1887–1956). Helped establish Pratt & Whitney, United Airlines, Sikorsky Helicopters, and Hamilton Standard, which developed controllable propellers. 1982. Holden C. Richardson (1878–1960). Was Naval aviator who conceived, developed, and demonstrated water- and ship-based aircraft and such devices as the turntable catapult for capital ships. 1978.

Edward V. Rickenbacker (1890–1975). Was combat pilot and leading American ace of World War I. Managed several airlines, including Eastern. Assisted in the growth of modern commercial aviation. 1965.

Calbraith P. Rodgers (1879–1912). Made first flight across the United States in Wright EX Vin Fiz in 1911, surviving many hardships and crashes. 1964.

Will Rogers (1879–1935). Demonstrated public support of aviation for defense and transportation. He and Wiley Post were killed in an airplane crash near Point Barrow, Alaska, in 1935. 1977.

T. Claude Ryan (1898–1982). Developed significantly advanced aircraft such as the M-1, PT-22, X-13, and Firebee drone. Trained critically needed pilots during World War II. Developed electronic space navigation systems that helped make it possible for man to land on the moon. **1974.** 

Walter M. "Wally" Schirra, Jr. (born 1923). Was fighter and test pilot and the only astronaut to fly on successful Mercury (Mercury 8), Gemini (Gemini 6A), and Apollo (Apollo 7) missions. 1986.

B. A. Schriever (born 1910). Was Air Force test pilot and leader of the Air Force's research and development and ballistic missile and military space programs. Adapted those technologies to the nation's efforts to explore space. 1980.

Thomas E. Selfridge (1882–1908). Designed and developed airplanes and made pioneering flights. First Army officer to fly; first fatality of powered flight, killed in 1908 while a passenger in aircraft flown by Orville Wright. 1965.

Alan B. Shepard, Jr. (born 1923). Was Navy test pilot and first US astronaut launched into space. Commanded Apollo 14. Was fifth man to walk on the moon. 1977.

Igor I. Sikorsky (1889–1972). Developed large multiengine aircraft, including flying boats used in commercial transoceanic flights. Developed single-rotor helicopter, of which VS-300 was the first successful example. 1968.

Robert F. Six (1907–1986). Developed regional airline that became Continental. Expanded it to serve both national and international routes. 1980.



C. R. Smith (born 1899). Developed domestic air transportation as president of American Airlines. Organized Army Air Forces Air Transport Command. Expanded international aviation. Was National President of Air Force Association. 1974.

Carl A. "Tooey" Spaatz (1891–1974). Was pilot attached to Gen. John J. Pershing's 1916 expedition to Mexico. Won three aerial victories in World

War I. Commanded Question Mark endurance flight. Commanded Eighth Air Force, Twelfth Air Force, and US Strategic Forces in Europe during World War II. Was USAF's first Chief of Staff. Was first Board Chairman of Air Force Association. **1967.** 

Elmer A. Sperry, Sr. (1860–1930). Developed gyroscopic instruments such as the turn-and-bank indicator and artificial horizon, gyroscopic bombsight and antiaircraft searchlight. Was 1930 inventor of automatic pilot system that kept an airplane on a prescribed flight path. 1973.

Lawrence B. Sperry, Sr. (1892–1923). Pioneered development of automatic flight stabilizers, flight instruments such as side-slip indicator and optical drift indicator, guided missiles, and such innovative aircraft as R-3 and Messenger. 1981.

John Paul Stapp (born 1910). Specialized in aerospace medicine. Proved that human bodies can withstand forces associated with ejecting from aircraft at high speeds and high altitudes. Promoted automobile seat belts. 1985.

Lloyd C. Stearman (1898–1970). Founded company that produced C-1, C-2, C-2M, C-2C, and PT-9. As president of Lockheed, oversaw design of Electra, development of Constellation. Stearman Division of Boeing produced the World War II PT-17 trainer. **1989**.

Charles E. Taylor (1868–1956). Built first successful airplane engine for the Wright brothers. Maintained early airplanes such as Wright Military Flyer and Wright EX for their historic flights. 1965.

John H. Towers (1885–1955). Made first attempt to cross Atlantic in NC-3. Established first Naval Air Station at Pensacola, Fla. Commanded USS *Langley* and USS *Saratoga*. Fought for recognition of airpower as a vital part of Naval doctrine. **1966.** 

Juan T. Trippe (1899–1981). Developed basic principles of airline operation and pioneered international commercial aviation as head of Pan American Airways. 1970.

Roscoe Turner (1895–1970). Participated in early commercial aviation and air races leading to important technical advancement in design and performance of high-speed aircraft and engines. 1975.

Nathan F. Twining (1897–1982). Commanded Thirteenth and Fifteenth Air Force during World War II. Directed final Twentieth Air Force operations against Japan. Commanded Air Materiel Command and Alaskan Air Command. Served as Air Force Chief of Staff and became first Air Force general to be Joint Chiefs of Staff Chairman (1957–60). **1976**.

Wernher von Braun (1912–1977). Developed rocket-powered ballistic missiles, satellites, space probes, and earth-orbiting and lunar spacecraft that made up US manned space program. 1982.

Theodore von Kármán (1881–1963). Developed theoretical studies and practical applications of aerodynamics to improve aircraft performance. Developed rocketry in creating intercontinental ballistic missiles. 1983.

Chance M. Vought (1890–1930). Designed VE-7, first airplane to land on USS Langley (the Navy's first aircraft carrier), the OU-1, Navy's first aircraft to be catapult-launched, and F4U Corsair of World War II. Started what is now LTV (second-oldest aircraft company in existence), which built the F-8 and the A-7 jet aircraft. **1989.** 

Leigh Wade (born 1896). Flight-tested and achieved record-setting performances with new and improved aircraft and equipment. Participated in 1924 round-the-world flight. 1974.

Henry W. Walden (1883–1964). Conceived, built, and demonstrated manned flight in the first successful monoplane in the United States. 1964.

T. A. Wilson (born 1921). Developed many Boeing aircraft and missiles. Led the planning, development, and production of such jetliners as the 707, 727, 737, and 747. 1983.

Orville Wright (1871–1948). Co-invented first successful man-carrying airplane. Became the first person to fly an airplane that achieved controlled, powered flight. Unlocked the secret of powered flight. 1962.

Wilbur Wright (1867–1912). Co-invented first successful man-carrying airplane. Showed unfailing devotion to the task of unlocking the secret of powered flight. 1962.

Charles E. Yeager (born 1923). Recorded thirteen aerial victories in World War II. Conducted test flights resulting in attainment of supersonic flight in the X-1. Contributed to aerospace research and safety. 1973.

John M. Young (born 1930). Was only astronaut to go into space six times (Gemini 3, Gemini 10, Apollo 10, Apollo 16, STS-1, and STS-9). Honored as leader of US space program. 1988.

## Valor

## Airlift to Khe Sanh

It definitely was not a day like any other for Howard Dallman and his crew.

#### **BY JOHN L. FRISBEE**

**K** HE Sanh will go down in history as a great victory for the isolated, surrounded, and outnumbered Marines who, from late January to early April 1968, defended an outpost some ten miles from the DMZ in western South Vietnam. It was a victory made possible by air resupply. Of the more than 1,100 missions to Khe Sanh flown by tactical airlift, one of the most remarkable was that of Lt. Col. Howard Dallman and his C-130E crew.

In his monumental 1983 study of tactical airlift in Southeast Asia, Col. Ray Bowers wrote: "Lt. Col. Howard M. Dallman was an experienced pilot who was admired for his personal qualities by the younger officers serving under him." In World War II, Dallman had flown fortyfive missions as a bomber pilot in Italy before he was shot down on October 23, 1944.

The morning of February 5, 1968, Dallman's C-130, assigned to the 345th Tactical Airlift Squadron, left its temporary base at Tuy Hoa for Da Nang, where a load of ammunition and a medical evacuation team awaited. The weather at Khe Sanh, Dallman's destination about thirty minutes' flight time to the northwest, was forecast to be at minimums, which made landing at the mountain-girded strip a challenge. The first of several unpleasant surprises came as copilot Capt. Roland Behnke checked in with Khe Sanh control. The GCA was out for an indefinite period.

Navigator Maj. Gerald Johnson was confident he could find the runway with an airborne radar approach, though none of the crew had landed there before. Dallman and

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Behnke started their letdown. At a sweaty 300 feet they broke out of the overcast, the strip directly ahead. Then as the C-130 ground and bucked to a stop, the big bird was hit by a shell that ignited ammunition boxes in the cargo compartment. Johnson and loadmaster SSgt.

> Dallman told the crew to leave the plane, but every man remained with the aircraft.

Wade Green immediately began fighting the fire, assisted by Behnke, who had called the tower for a fire truck, and flight engineer SSgt. Charles Brault.

Seventeen tons of ammunition could explode at any moment, closing the runway and flattening the built-up area of Khe Sanh, with many casualties. Dallman began backing the Hercules to a safer area at the far end of the runway, where the five-man crew, with help from the fire truck, finally extinguished the fire and helped offload stillsmoking ammo boxes.

All was not yet over. As the last pallet of ammunition was unloaded, one of the tires was blown by a sniper's bullet, and a mortar attack bracketed the C-130. Dallman told the crew to leave the plane, which was drawing most of the fire, but every man remained with the aircraft as it was towed for a short distance, then taxied to a maintenance area. There Brault repaired an aircraft jack and managed to change the damaged wheel, all the time under fire from mortars, rockets, artillery, and heavy machine guns.

While the wheel was being changed, Howard Dallman agreed to fly a Marine corporal and his outof-commission bulldozer back to Da Nang. The 'dozer was loaded and the aircraft positioned for takeoff when one engine, which had ingested debris from an exploding mortar round, quit. The 20,000pound bulldozer and a disappointed corporal were unloaded and Dallman left the bird to get permission for a three-engine takeoff. In the ten minutes it took to get clearance from Airlift Control Center, Behnke and Brault got the fourth engine started. Dallman sprinted back to the C-130 as Behnke, a qualified aircraft commander, opened the throttles for takeoff. The Herk was hit again as it took off, but without serious damage. Howard Dallman and his crew had saved a valuable transport plane, delivered a load of ammunition to the surrounded Marines, and prevented major damage to a battered outpost.

For dealing heroically with a series of crises that day, Lt. Col. Howard Dallman was awarded the Air Force Cross, the first tactical airlift crewman to be so honored. "I was well aware," he said, ". . . that an equal part of the award belonged" to the other four crew members, all of whom received the Silver Star.

The tactical airlifters lost 122 aircraft and 230 crewmen while supporting US and allied forces in Southeast Asia. Without them, there would have been few successful campaigns in that long, bitter war. Howard Dallman and his crew set an example of teamwork and valor by their determination to complete a mission under circumstances that would have justified abandoning their aircraft and its perilous but desperately needed cargo.

As the Marines at Khe Sanh would have put it, "Semper fi!"

Four-engine fighters, phantom friendlies, duels with flak guns, and other tales from the forgotten world of the flareships.

# **BLIND BAT**

#### BY SAM McGOWAN

THE scene was Southeast Asia, 1966. After nightfall, we took off from Ubon, Thailand, flying east over Laos toward North Vietnam. It was my first ride Up North in a C-130 flareship, one of the most vital, yet least celebrated, aircraft in the war.

Our "target" that night was nighttime itself. Hanoi, recycling a tactic employed against France, was using darkness as a weapon, one that shielded southbound convoys from attack. We in the flareships sought to strip the enemy of this cover by turning night into day.

We pierced enemy airspace, skirted flak traps at Mu Gia Pass, and kicked four flares into the void. When they popped into brilliance, bathing the landscape in eerie brightness, we got an instant response. Cherry-red tracers sped toward us, shot past our wing, then burst in thunderous explosions just overhead—the nearest of near misses.

Close calls, I learned, were nothing if not routine for those engaged in "Blind Bat," a colorful, important, yet now almost forgotten Vietnam mission. What, exactly, was it? Originally, the phrase Blind Bat was just the call sign for C-130s on forward air controller/flareship duty over southern Laos. Soon, it came to have a wider meaning, denoting an entire mission. By early 1966, all C-130 flareship operations in-theater went by the shorthand name Blind Bat.

In the early days, each C-130 operated as part of a four-ship formation, filled out by a pair of B-57 bombers and a Marine EF-10 for electronic-countermeasure support. Whether the group operated over North Vietnam or over Laos, the C-130 crew would "flare" while the B-57s bombed and the EF-10 jammed enemy radars. Later years found the C-130s working with F-4s and other fighters.

The Blind Bat mission lasted six years, from mid-1964 to mid-1970. Initially, flights originated at Da Nang, South Vietnam, and routinely overflew the North. In the spring of 1966, the flareship mission moved to Ubon. By that time, stronger air defenses had forced USAF to restrict flareship flights to the southern part of North Vietnam and the Ho Chi Minh Trail in Laos. In their day, Blind Bat crews managed to detect a great volume of traffic moving from North Vietnam into Laos and on into South Vietnam. When things went right, crews found targets and directed fighters to them with effectiveness. Experience gained by Bat crews was passed to AC-130 gunship operators, who often used hardware first tested in flareships. Today, however, these contributions go largely unrecognized.

#### **Tricks and Surprises**

From the very start, the Blind Bat mission lent itself to tricks and surprises. Retired Lt. Col. William Cooke, who served as navigator on the original Blind Bat aircraft, recalls that the crew and C-130 arrived in Da Nang one morning and spent the balance of the day drawing up flight plans for the first mission that night. When they emcrged at nightfall, they were astonished at what they found: Their C-130, sparkling silver only a few hours before, had been painted jet black.

There were other, more serious surprises. Much mission-aircraft equipment, especially locally manufactured flare-chutes used to dispense the illumination devices, was



found to be woefully defective. There were no clearly established operating procedures. What's more, the first missions were flown depending entirely on eyeballs. It was some weeks before crews were given binoculars to assist them in searching for targets. Only much later did they receive night-vision Starlight scopes.

#### The Impact Is Felt

As unsophisticated as the first Blind Bat operations may have been, they seem to have had an impact. That conclusion can fairly be drawn from the actions of the Communist forces themselves.

When Viet Cong sappers and mortar crews mounted their July 1965 attack on Da Nang airfield, the C-130 flareships were the first to be struck. Also destroyed was a C-130 airlifter parked nearby.

As the mission grew in scope and sophistication, so did Communist efforts to thwart the Blind Bat planes. Ground fire was an everpresent threat. The problem first reached dangerous proportions over North Vietnam, but soon became serious over Laos as well. Two Blind Bat C-130s were lost to enemy fire during the war, one in May 1968 and the other in November 1969, both over Laos.

On one Blind Bat mission, my crew became caught in a flak trap while I was serving as loadmaster near an open door. We had just come in for a flare drop when one of the orbiting fighters in our formation called over the radio for our pilot to "break."

Our pilot jerked the C-130 into a sharp vertical bank to the right and hauled back on the yoke. Those of us in the back held on to anything we could grab. When next we looked, enemy tracers were rocketing through the airspace where we would have been.

Blind Bat crews came to know certain flak emplacements as one does a mortal enemy. One such position was located near the Laotian village of Tchepone, where the enemy had mounted an antiaircraft gun on a railroad car that could be hidden in a mountain tunnel or pulled out to fire. Innumerable airstrikes, even B-52 raids, were mounted to destroy that gun, but still it survived. One Blind Bat crew that inadvertently overflew this emplacement came uncomfortably close to destruction. When a flak round hit their plane's left wing, setting fire to the hydraulic fluid in the primary system, the crew jettisoned all flares and began preparations for bailout—an event dreaded by every flareship crew member. Just as the pilot, Maj. Jack Frank, was reaching for the bailout bell switch, however, the flight mechanic saw that the fire had gone out. The airplane was still flyable.

The problem, however, was that the hydraulic pressure needed to help operate the flight controls no longer existed. As the pilot made haste toward the nearest friendly airfield, the loadmasters, flight mechanic, and navigator came up with a solution. They attached two tiedown straps to the aileron bellcrank in the overhead cargo compartment. With the crew pulling on the tie-down straps to help bank the aircraft, Major Frank and the copilot, Lt. Charley Rief, managed to land the plane. Once on the ground, however, the crew saw what a close call they'd had: The fire had come within inches of a fuel tank.

#### **Attacked by MiGs**

After 1965, most "Blind Bat" missions were flown some distance from the SAM and MiG dens around Hanoi. On at least one occasion, though, a C-130 flareship was attacked by MiGs.

John Blewitt, a navigator on a C-130 providing flare support approximately 120 miles from Hanoi, was alerted by a "College Eye" AEW ship over Thailand that two MiGs had taken off from Hanoi and were heading fast in his direction. That caused the Blind Bat to drop down to treetop altitude, where it was able to evade the MiGs as they made two passes. When it was over, the crew realized that they had been flying between mountains, below the ridges, at night, in unfamiliar airspace.

Although ground fire was a preoccupation of Blind Bat crews, what I remember most vividly is the fatigue. We got shot at often enough, especially when over North Vietnam, but we were always tired, especially the enlisted crew members. Ubon had been built to house a fighter wing, with no plans for nightflying enlisted men. Air-conditioning didn't exist. As a result of Thailand's oppressive heat and humidity, sleep became a near impossibility during the day.

Weight of flares and survival equipment contributed to fatigue. Crew members wore survival vests and parachutes. Whenever our aircraft banked or was thrown into a violent turn to evade ground fire, the increased G forces multiplied the weight of this equipment many times. We loadmasters handled twenty-seven-pound flares, each of which would instantly become an eighty-one-pound flare in a three-G turn. One night, when the flare business was slow and we had time to relax, the whole enlisted crew fell fast asleep-over North Vietnam.

Frequently, crews found themselves engaged in operations that were strange even by Blind Bat standards. For example, at times we would be called on to flare for unknown friendly forces on the ground in areas where no friendly forces were supposed to exist. These phantom friendlies could be found on the coast of the South China Sea, sometimes in the mountains of Laos.

One night, my crew was told to flare Thai territory between Ubon and the Mekong River, some twenty miles to the east. At the time, all we knew was that local radar had picked up unidentified low-flying craft. The Air Force has since revealed that Communist flights out of Laos and North Vietnam flew supplies to insurgents in northern Thailand. We happened to be involved in one of the few incidents when one of the flights was detected.

#### **Frustrated Fighter Pilots?**

Perhaps because the C-130 mission was owned by Tactical Air Command, our pilots thought of themselves as "four-engine fighter pilots." Many seemed to be frustrated fighter pilots anyway. Even enlisted crew members got caught up in the spirit, at times attacking enemy trucks or guns with anything at hand.

Several times on our way out of North Vietnam, for example, we would mount an "attack" on flak trap emplacements at Mu Gia Pass. We would load six flares in the chute, set the fuzes to go off only after the flares reached the ground, and thus "bomb" the gun emplacements below. Enlisted crew members often fired their M16s at targets on the ground, until the fighter crews—fearful of being "holed" by a friendly round—put a stop to the practice.

Then there was the crew that managed to scrounge a recoilless rifle from the Marines. The Bat crew members had already chained the gun down in the cargo ramp and were about to unofficially introduce the AC-130 gunship concept to Vietnam, but it was not to be. Local US authorities, alerted by fighter crews, ordered the gun removed and returned.

#### **Rewarding and Frustrating**

The flare mission was rewarding and frustrating at the same time. By detecting and destroying enemy trucks, sampans, and troop formations, we knew, we were reducing the threat to our comrades slogging it out in rice paddies and jungles. That was the reward. The frustrations were equally strong.

Take, for example, the "restrictions." Strictly off limits were any vehicles or other suspected enemy targets found within the confines of anything even remotely resembling a village. A flareship crew might find Communist trucks on the trail, but it would take time for fighters to arrive. In addition, we would have to wait for our C-130 ABCCC (Airborne Battlefield Command and Control Center) ships, orbiting high overhead, to obtain permission to attack. By the time the attack was finally cleared to proceed, the trucks would have turned off into a "village." Many, if not most, of these villages were specially constructed fakes. Aware of our restrictions, the Communist forces made provision to exploit them.

Another restriction prohibited attack against targets more than a hundred yards from an infiltration route. The Communists also knew about this constraint and frequently made camp just beyond the hundred-yard limit. I must report, however, that the hunter-killer teams were not always able to observe this fastidious restriction. More than a few camps, seemingly safe beyond the hundred-yard limit, were demolished. By accident, of course.

Truth to tell, we in the flareships found another great frustration in the propensity of fighter pilots to miss targets. Flarelight did not provide the best of conditions for precision bombing. More to the point, many of the fighter pilots lacked experience. While the slower, propdriven aircraft such as A-1s and A-26s were flown by men on their second and sometimes even third war who were quite accurate in their bombing, many of the "fast-mover" pilots were fresh from training. This was especially true with respect to F-4 pilots.

The crew members were about to unofficially introduce the AC-130 gunship concept to Vietnam.

One case in point was a near-fiasco that turned into an absolute triumph.

We had been briefed to be on the lookout for a particular ammunition dump in North Vietnam that was thought to be located in our designated patrol area. A few miles west of Dong Hoi, our flareship pilot thought he had spotted it. The aircraft commander, Capt. Bob Bartunek, called for the fighters. Soon a flight of F-4s came under our control. Yet, from our point of view, Air Force F-4s loaded with iron bombs amounted to just about the worst bombing combination possible. Our experience taught us to expect little.

The problems began. Six flares had been readied, and the "flarekicker" was holding them in place with his legs. Now, you can only hold those heavy flares with your legs for a short time and then you have to release. But our pilots had lost sight of the target. After fifteen minutes of circling and looking, the flare-kicker couldn't stand the strain any longer. He simply lifted his legs, and the six flares were gone.

Amid much confusion and shouting, the navigator again spotted the target. It was right below the string of accidentally launched flares! The first F-4 came in, pickled his load, and zoomed upward. He missed the target. The pilot of the second F-4, no doubt the least experienced, came in and made his drop. He missed too, dropping a mile wide and on the wrong side of the river.

Some fighter pilots, however, get lucky, and this fellow turned out to be one of them. When his bombs went off, they set off tremendous secondary explosions. He had hit the real dump—which nobody had even seen—entirely by accident.

#### **Credit the F-4 Pilots**

Flak suppression, however, is one area in which the F-4 pilots deserve high credit. When they used CBUs—that is, cluster bombs they were murder. It always was a thrill to watch an F-4 "duel with the guns," with the enemy tracers spewing toward the attacking fighter and the winking lights of the bomblets bursting all around the spot the tracers had come from.

As the 1960s came to a close, the flareships faced a new threat to their existence. This one could not be avoided like flak traps or MiGs. Seventh Air Force had decided to begin large deployment of new AC-130 gunships and had to find a way to pay for them. The money and manpower were found by laying up the flareships. Thus, in mid-1970, the Blind Bat mission was shut down for good.

Just how effective the mission really was, no one can say with any certainty. The best testimonials, perhaps, come from Communist soldiers who came down the Ho Chi Minh Trail to fight in the south. In postwar news interviews, they nearly always mentioned the presence of the flareships in the nighttime skies and how avoiding them had required constant effort.

Sam McGowan served twelve years in the Air Force as a loadmaster with TAC, PACAF, and MAC, accruing more than 6,000 hours on C-130s, C-141s, and C-5s. Currently a corporate pilot, he is the author of The C-130 HERCULES: Tactical Airlift Missions, 1956–1975. This is his first article for AIR FORCE Magazine. There are still 2,371 of them unaccounted for in Southeast Asia.

# The Missing Americans

#### BY COLLEEN A. NASH, STAFF EDITOR

T HAS been twenty years since AIR FORCE Magazine published "The Forgotten Americans of the Vietnam War" by Louis R. Stockstill. That article, later condensed in *Reader's Digest*, brought the plight of American prisoners of war and missing in action (POW/MIA) to the attention of the world. It also began a long commitment on AFA's part to the POW/MIA issue.

At the 1988 AFA National Convention, delegates unanimously adopted a resolution renewing AFA's pledge to support the "continuation of direct Presidential interest in fullest possible accounting for all POW/MIA from Vietnam or any other past or future hostile actions in which US military or civilian personnel are detained against their will."

On March 10, 1989, the National League of Families of American Prisoners and Missing in Southeast Asia held a seminar at AFA National Headquarters.

The program provided an update on what is known about POWs and MIAs. There are currently 2,371 Americans unaccounted for in Southeast Asia, including 878 Air Force, 701 Army, 462 Navy, 287 Marine Corps, forty-two civilians (including two females), and one Coast Guardsman.

Approximately sixty percent of the 1,737 missing in Vietnam were lost in the south. In other parts of the region, 545 Americans were lost in Laos, eighty-three in Cambodia, and six over Chinese territorial waters.

#### **Recovering American Remains**

Almost ninety percent of the missing in Laos and almost 100 percent of the missing in Cambodia were lost in areas controlled by the Vietnamese. This means that if there is any information regarding the fate of these men, it is most likely in the hands of the Vietnamese. So far, the Vietnamese have refused to talk about these cases, insisting that the US discuss these matters with the Lao or the Cambodians.

Furthermore, it is believed that the Indochinese governments, particularly the Vietnamese, have extensive files that document what they know about many of the missing. However, they have not released this information, in spite of continued US requests over the years.

According to Army Col. Joseph A. Schlatter of the Defense Intelligence Agency (DIA), "At the end of the war, almost half the missing men were considered 'Killed in Action— Body Not Recovered.' This means that, at the time these men were lost, there was considerable evidence—usually from US eyewitnesses—that they died in the loss incident, but we were not able to recover their remains."

Colonel Schlatter added that "we know that the Vietnamese have the remains of missing Americans stored in the Hanoi area. The only questions are where and how many."

Since 1973, 212 sets of remains have been repatriated and identified as Americans. In August 1987, Gen. John W. Vessey, Jr., Special Presidential Emissary to Hanoi on the POW/MIA issue and former Chairman of the Joint Chiefs of Staff, led a delegation to Hanoi. During his meetings with Foreign Minister Thach, General Vessey obtained an agreement to resume cooperation on POW/MIA issues. Since General Vessey's visit, cooperation has improved. Technical experts from the Joint Casualty Resolution Center and the US Army Central Identification Laboratory have conducted several investigations, surveys, excavations, and technical discussions with their Vietnamese and Lao counterparts. In April, the League reported that the US and Vietnamese had just completed the fifth and longest joint search for missing Americans in Vietnam.

#### **The Living Prisoner Question**

Colonel Schlatter said that although DIA does "not have the positive, specific evidence demonstrating that Americans remained in captivity after the prisoner release [during] Operation Homecoming in 1973," the possibility of living Americans in Southeast Asia cannot be ruled out—for several reasons. According to DIA, "There are Americans who were known to have been captured but who did not return. While there are no indications that these men were alive at [the time of] Homecoming, until we can prove with some degree of certainty what happened to them, we cannot rule out the possibility that one or more of them survived."

To date, DIA has received 1,159 firsthand, live sighting reports. "Almost ninety percent of these reports are what we call 'resolved' that is, we know who or what the report is about, and it is not about a missing American," said Colonel Schlatter. As for the remaining ten percent, these are "not a small number of 'hardcore, reliable' reports. They are reports that were received recently, and we have not completed our investigations."

So while it is true that there have been many reports of missing Americans still alive in Southeast Asia, it



One of the most visited sites in the Washington, D. C., area is the Vietnam Veterans Memorial—the long, black wall inscribed with the names of the 58,156 Americans killed or MIA in Southeast Asia. Relatives or friends regularly leave flags, flowers, or other expressions of their feelings near their loved one's name.

is also true that none has proved out so far. Even so, DIA cannot afford to ignore a single report, as it does not know what the next one will bring.

Finally, Colonel Schlatter said that so long as the Indochinese governments "refuse to answer questions that we know they should be able to answer, we must recognize the possibility that some of the men who figure in these questions could have survived."

Air Force Col. George Dixson, Principal Advisor to the Secretary of Defense on POW/MIA Affairs, also said that the existing evidence indicates that there are no Americans held against their will in Southeast Asia, but that until we know otherwise, American policy will remain the same.

#### **Communication Is the Key**

As to the question of what the US can do to expedite the return of American remains from Southeast Asia, communication appears to be the key. While the US was considering establishing diplomatic relations with the Vietnamese during the period between 1975 and 1978, remains were being returned fairly regularly. When Vietnam invaded and took over Cambodia in December 1978, the US broke off talks, and the return of remains ceased. Then, in 1981, the Reagan Administration separated POW/MIA and other humanitarian matters from political issues, such as aid, trade, and the normalization of diplomatic relations. This policy of nonlinkage has produced results, with remains now being returned at a fairly steady rate.

Karl Jackson, Special Assistant to the President and Director of Southeast Asian Affairs for the National Security Council, told the crowd at the seminar that the Bush Administration "will not let you down. We will continue to give priority to the POW/MIA issue."

The day before the seminar, the official League POW/MIA flag was placed in the Capitol Rotunda. It is the only flag on display there. On March 8, Rep. Bob Lagomarsino (R-Calif.), recently reappointed House POW/MIA Task Force Chairman, introduced a resolution to mark September 15, 1989, as National POW/MIA Recognition Day.

## Airman's Bookshelf

#### By Jeffrey P. Rhodes, AERONAUTICS EDITOR

Bulldog: The Bristol Bulldog Fighter, by David Luff. Foreword by Air Vice Marshal Charles George Lott. The Bristol Bulldog was one of the most beautiful biplanes ever and was a classic 1930s fighter. This book, a labor of love for the author, gives a complete history of the Bulldog's development (including a technical description) and the aircraft's operational history with the Royal Air Force and the forces of other countries. Profusely illustrated with many rare pictures, the book also has color endpapers showing famous Bulldogs. Smithsonian Institution Press, Washington, D. C., 1988. 188 pages with photos, diagrams, appendices, bibliography, and index. \$24.95.

Cierva Autogiros: The Development of Rotary-Wing Flight, by Peter W. Brooks. Much as the Wright brothers built and expanded on the work of Otto Lilienthal to arrive at the practical airplane, loor Sikorsky used the work of Juan de la Cierva as a preliminary for the helicopter. Not much has been written about this Spaniard, who started building gliders in 1910 and powered airplanes a year later. He flew his first successful autogiro in the early 1920s, then moved to England, where he founded a company to control development of his designs. (For more about de la Cierva, see p. 167, May '89 AIR FORCE.) In this book, after an introductory section on autogiro development, Brooks details the history of each of the Cierva designs (including specifications). He also covers autogiro development in the United States, the Soviet Union, and Japan, as well as helicopter development after World War II. Smithsonian Institution Press, Washington, D. C., 1988. 384 pages with photos, diagrams, maps, illustrations, appendices, notes, glossary, bibliography, and index. \$22.50.

Eject! Eject!, by Bryan Philpott. Despite the absolutely vital role ejection seats play in modern aircraft and the fascination both pilots and nonpilots have with them, little has been written about them. This book is the first step toward remedying that situation. Going back to 1930, when an idea for a spring-loaded assisted escape system was rejected by the Royal Air Force, the author describes the first-generation "catapult seats" used by the Germans in World War II and continues on to F-111 escape pods and the many types of seats used today. The author effectively alternates descriptions (and diagrams) of various seats and how they work with pi-lots' tales of "punching out." This work is neither a definitive history nor a technical guide to the ejection seat (a fact the author recognizes), but is interesting nonetheless. Ian Allen Ltd./Motorbooks International, Osceola, Wis., 1989. 160 pages with photos, diagrams, and index. \$21.95.

Hoyt S. Vandenberg: The Life of a General, by Philip S. Meilinger. Many of the Air Force's pioneers first gained fame as pilots. Hoyt Vandenberg, quite a pilot himself, was one of the first to recognize the need for management, organization, and planning. During World War II, General Vandenberg served as the air planner for the North Africa and Normandy invasions and later was Ninth Air Force commander. In 1948, he became the second Air Force Chief of Staff, a position he held until 1953. He instituted many concepts still in use, such as the deputy chief of staff system. Completely committed to the concept of airpower, General Vandenberg presided over the Air Force during the Berlin Airlift, the Korean War, and the B-36/supercarrier controversy. Meilinger is deputy head of the history department at the Air Force Academy. Indiana University Press, Bloomington, Ind., 1989. 279 pages with photos, notes, bibliography, and index. \$27.50

Khe Sanh: Siege in the Clouds-An Oral History, by Eric Hammel. The January-to-April 1968 siege of Khe Sanh was one of the bloodiest battles ever involving the US Marine Corps. Although the Marines on the Khe Sanh plain were surrounded by two North Vietnamese divisions, US forces eventually won the set-piece battle, in part through the use of close air support and resupply from the air. The author sets the stage for this epic battle, but then turns the narrative over to the vivid accounts of nearly 100 individuals (almost all Marines) who survived. The accounts cover all the bases-from privates in foxholes to cooks, chaplains, and the commanding generals who directed overall strategy. Where gaps exist in the story and for background and clarification, the author quotes afteraction reports or unit histories. A masterful telling of history. Crown Publishers, Inc., New York, N. Y., 1989. 528 pages with maps, photos, glossary, notes, and bibliography. \$24.95.

Lockheed U-2R/TR-1, by Jay Miller and Chris Pocock. This latest volume in the Aerofax Minigraph series looks at the second-generation variants of the stillshrouded-in-mystery U-2 reconnaissance/ intelligence-gathering aircraft. Relying on unclassified sources, the authors trace the design, development, flight test, and—in amazing detail—the operational history of the U-2R and TR-1 aircraft. As is usual with these Aerofax publications, a technical section on construction, systems, and powerplant is included, as well as a lengthy section on the various sensors carried aboard. Also included are cockpit diagrams and such interesting tidbits as how to pack a U-2 in a C-141 or pick up a TR-1 with a crane. The more than 200 photographs (including a number in color) are the real stars of this book; many of them are very unusual. Aerofax, Inc., Arlington, Tex., 1988. 56 pages with photographs, diagrams, foldouts, and acronym list. \$9.95.

Scraps of Paper: The Disarmament Treaties Between the World Wars, by Harlow A. Hyde. Foreword by retired Adm. Elmo R. Zumwalt, Jr. The Intermediate-range Nuclear Forces (INF) Treaty is the first of its kind in the nuclear age, but it is not the first US attempt at disarmament. Almost forgotten are three treaties (especially the Washington Treaty of 1922) that severely curtailed US naval expansion in the period between the world wars. The author takes an in-depth look at these treaties-the mood of the times, the larger political context, and the numerous violations that took place while people and nations rushed headlong toward World War II. The author's research backs his contention that for the US to be able to take a rational approach to future arms limitation, the country must not repeat the mistakes made between the wars. Media Publishing, Lincoln, Neb., 1988. 456 pages with photos, bibliographical essay, appendices, and index. \$18.95.

The War of the Cottontails: Memoirs of a Bomber Pilot, by William R. Cubbins, and A Reason to Live, by John Harold Robinson. Much has been written about the specifics of World War II air battles, but now veterans who were not the "headline" players are beginning to tell their stories. Both of these authors flew on B-24s-Cubbins as a pilot serving in Italy and Robinson as a waist gunner in England. In addition to bringing entirely different perspectives, the narratives tell entirely different stories. Cubbins was shot down and spent time as a POW, and he talks about the larger events of the war. Robinson sees the war as it affected him, and his is really a love story about his wife and himself. Interesting reads. War of the Cottontails, Algonquin Books, Chapel Hill, N. C., 1989; 267 pages with photos and illustrations; \$19.95. A Reason to Live, Castle Books, Memphis, Tenn., 1988; 445 pages with photos and illustrations; \$22.95.

In twenty-five years, this event has raised more than \$1.6 million for scholarships, airpower, and airmen.

## **Iron Gate Salutes the Chief**

BY JAMES A. McDONNELL, JR. AFA CHIEF, PROGRAMS AND MILITARY RELATIONS

A FA's New York City Iron Gate Chapter held its twenty-sixth annual National Air Force Salute in early April. The evening's honoree, Air Force Chief of Staff Gen. Larry D. Welch, received the Chapter's Maxwell A. Kriendler Memorial Award. The award, originally known as the Bronze Eagle, was renamed in 1974 in honor of Mr. Kriendler, one of the Chapter's founders.

The crowd of more than 1,000 listened as General Welch was cited for his distinguished service, his energetic and dynamic leadership, and his demonstrated concern for the people of the total Air Force.

During the evening, Iron Gate Chapter President Richard A. Freytag presented a Jimmy Doolittle Fellowship to Dan F. Huebner, Chairman of the National Air Force Salute Foundation and a former president of the Iron Gate Chapter. Ira C. Eaker Fellowships were presented to AFLC Commander Gen. Alfred G. Hansen, AFSC Commander Gen. Bernard P. Randolph, and TAC Commander Gen. Robert D. Russ. The Salute is the leading supporter of AFA's Aerospace Education Foundation Fellowship program.

The Salute is also a major fundraiser for Air Force-related charities. The money raised is distributed among the Air Force Assistance Fund, the Aerospace Education Foundation, the US Air Force Academy, the Air Force Historical Foundation, the Air Force Museum, the National Aviation Hall of



The National Air Force Salute Foundation's Board of Directors celebrate Iron Gate's twenty-sixth annual Salute. From left: Irwin Gorman, Arthur J. Scrivani, Richard A. Freytag, Dan F. Huebner, Dorothy L. Welker, Chief of Staff Gen. Larry D. Welch, Thomas J. McKee, and William I. Lees.



Iron Gate Chapter's President, some of the Salute's honorees, and their wives take a break during the festivities. From left: Richard and Pamela Freytag, Gen. Alfred and Donna Hansen, Gen. Larry and Eunice Welch, Gen. Robert and Jean Russ, and Lucille and Gen. Bernard Randolph.

Fame, and others. Proceeds are also contributed to scholarships for Manhattan Group Civil Air Patrol cadets and the Falcon Foundation.

AFA National Secretary and Salute Chairman Thomas J. McKee noted that the Salute has raised \$1,648,300 in its first twenty-five years. The entertainment program featured the musical group "The Manhattan Rhythm Kings." In addition, the cadets of the Manhattan Group Civil Air Patrol presented the colors.

Next year's Air Force Salute will take place in New York City on Saturday, April 7.

## **AFA NOMINEES** [1] 1989-90

BY LINDA J. JAHODA ADMINISTRATIVE ASSISTANT TO THE CHIEF, FIELD ORGANIZATION DIVISION

A meeting on May 27 in Colorado Springs, Colo., the Air Force Association Nominating Committee selected a slate of candidates for the four national officer positions and the eighteen elective positions on the Board of Directors that will be presented to the delegates at the National Convention in Washington, D. C., on September 19. The Nominating Committee consists of the five most recent past National Presidents, the twelve National Vice Presidents, and one representative from each of the twelve regions.

Nominated for his second term as National President was Jack C. Price of Clearfield, Utah. Prior to his recent retirement, he was the Deputy Director of Distribution for the Ogden Air Logistics Center, Hill AFB, Utah. In this capacity, he directed a large Air Force depot-level complex involved in wholesale and retail receipt, storage, issue, and shipment of materiel worldwide. He was also responsible for quality control, packaging, inventory, and transportation. The Directorate, comprising approximately 2,300 civilian and military personnel, has the responsibility for management of nearly 400,000 items in storage valued at \$4.2 billion. Mr. Price controlled and managed an annual payroll budget of approximately \$58.5 million and a physical plant valued in excess of \$100 million.

Mr. Price has held a number of management and supervisory positions with the Ogden Air Logistics Center. His previous position was Chief of the Missile and Aircraft Systems Division in the Directorate of Maintenance. His past positions include Deputy Chief of the Aircraft Division; Chief of the Navigational Instruments, Photographic, and Training Devices Division; and Chief of the Missile Division.

The recipient of numerous performance awards, Mr. Price has been active in a number of professional, technical, and managerial associations during his career.

He was born in Iowa and moved to Utah in 1953. He attended Weber State College, where he majored in management logistics. Mr. Price served a six-year tour in USAF prior to and during the Korean conflict. He began his Civil Service career at Hill AFB in 1953.

Mr. Price served previously on the Executive, Finance, Resolutions, Constitution, and Organizational Advisory Committees of AFA. He has also served as National Secretary, National Vice President (Rocky Mountain Region), Utah State President, Utah State Vice President, Ute Chapter President, Ute Chapter Vice President, Aerospace Education Foundation Trustee, and Aerospace Education Foundation Trustee Emeritus. Currently, he serves as National President, permanent National Director, and member of AFA's Executive and Resolutions Committees. He has received AFA's Presidential Citation, Special Citation, Exceptional Service, and Medal of Merit awards. He is a Life Member of AFA and a Charter Sustaining Life Member of the Aerospace Education Foundation.

Sam E. Keith, Jr., of Fort Worth, Tex., was nominated for his second term as Chairman of the Board. He is a retired General Dynamics executive and former executive vice president of Geoscience and Services, Inc., an energy firm specializing in remotesensing satellite technology. He currently serves as senior consultant to Arrowhead Associates, an aviationrelated firm, and he is also an independent oil and gas developer and investor. A combat veteran of World War II, he later served in Korea. Mr. Keith attended Texas Christian University and Texas A&M and has taken part in many national defense forums.

Mr. Keith, an active leader in charitable and civic endeavors, has served as president of Goodwill Industries, cochairman of the Fort Worth Military Ball, and vice president of the Greater Fort Worth Civic Leaders Association.

Mr. Keith served previously on the Executive, Finance, Audit, and Organizational Advisory Committees of AFA. He has also served as National Vice President (Southwest Region), elected AFA National Director (eight times), Texas State President, Fort Worth Chapter President, Aerospace Education Foundation Trustee, Aerospace Education Foundation Trustee Emeritus, and Chairman of the Fort Worth Air Power Council, an official AFA organization. Currently, he serves as Chairman of the Board, Vice Chairman of the Executive Committee, and Trustee of the Aerospace Education Foundation, and he is invested as a Doolittle Fellow. He has received AFA's Presidential Citation, Exceptional Service Award (twice), and Medal of Merit. He received AFA's Man of the Year Award in 1968 and is a Life Member of AFA and a Charter



Jack C. Price

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Sustaining Life Member of the Aerospace Education Foundation.

Nominated for his third term as National Secretary, Thomas J. McKee of Fairfax Station, Va., is the Vice President, Business Development, Washington Operations, Grumman Corp. He has been with Grumman since 1977 and is responsible for coordinating efforts to identify potential new business opportunities and continue existing programs through the development and implementation of an overall marketing strategy and associated plans. He is also responsible for ensuring the maintenance of effective customer liaison and contacts with appropriate corporate departments.

Mr. McKee was born in Montgomery, Ala. He traveled extensively as a dependent in an Air Force family. He earned a bachelor of arts degree in political science from Southeast Missouri State University in 1970 and completed the Emerging Executives Program at Pennsylvania State University in 1983.

Mr. McKee entered USAF in July 1970 and received his commission on completion of Officer Training School at Lackland AFB, Tex. He completed undergraduate pilot training at Reese AFB, Tex., in October 1971. During his seven years of active service, he performed duties as a T-38 instructor pilot and check pilot in Air Training Command (ATC). He attended USAF Squadron Officer School, Maxwell AFB, Ala., in 1975 and subsequently transitioned to Tactical Air Command (TAC) as an assistant flight commander in A-7D aircraft at Myrtle Beach AFB, S. C. In March 1977, he separated from the Air Force and joined the Grumman Corp.

Mr. McKee previously served as an Under-40 National Director and on the **Communications Committee. Since** 1983, he has been Chairman of the National Air Force Salute Committee for AFA's Iron Gate Chapter in New York City. He is Vice President of the Iron Gate Chapter and has been appointed New York State Vice President for Government Affairs. Currently, he is Chairman of the Resolutions Committee, a member of the Executive Committee, and a member of the Aerospace Education Foundation's Board of Trustees. He is a Life Member of AFA and a Charter Sustaining Life Member of the Aerospace Education Foundation.

Nominated for his third term as National Treasurer was **William N. Webb** of Midwest City, Okla. He is an advisor in Air Force Association matters for the Commander of the Oklahoma City Air Logistics Center.

Born in western Oklahoma, Mr. Webb completed schooling at Burns Flat, Okla. He attended Southwestern State Teachers College, Weatherford, Okla., in 1945. He moved to Midwest City, Okla., in August 1950 and obtained employment at the Oklahoma City Air Materiel Command (now known as the Oklahoma City Air Logistics Center) at Tinker AFB. He started work at Tinker as a warehouseman and completed his career in April 1981 as the Chief of the Management Organization for Distribution. His responsibilities throughout his career included accounting, manpower, funding, data systems, and engineering.

Mr. Webb became an AFA member in 1960. He has held the office of National Vice President (Southwest Region) and has served on the Finance Committee for eleven years. Currently, he is Chairman of the National Finance Committee, a member of the Aerospace Education Foundation's Board of Trustees, State Treasurer, and a member of the Central Oklahoma (Gerrity) Chapter and the Oklahoma Air Force Association Executive Committee. He has twice received AFA's Exceptional Service Award, and he was honored with the first Storz Award for membership.

The following individuals are permanent members of the AFA Board of Directors under the provisions of Article IX of AFA's National Constitution: John R. Alison, Joseph E. Assaf, David L. Blankenship, John G. Brosky, Daniel F. Callahan, Robert L. Carr, George H. Chabbott, Earl D. Clark, Jr., M. Lee Cordell, R. L. Devoucoux, James H. Doolittle, Russell E. Dougherty, George M. Douglas, E. F. Faust, Joe Foss, Barry M. Goldwater, John O. Gray, Jack B. Gross, George D. Hardy, Alexander E. Harris, Martin H. Harris, Gerald V. Hasler, John P. Henebry, Robert S. Johnson, Arthur F. Kelly, Victor R. Kregel, Curtis E. LeMay, Carl J. Long, Nathan H. Mazer, William V. McBride, J. B. Montgomery, Edward T. Nedder, J. Gilbert Nettleton, Jr., Jack C. Price, William C. Rapp, Julian B. Rosenthal, Peter J. Schenk, Joe L. Shosid, C. R. Smith, William W. Spruance, Thos. F. Stack, Edward A. Stearn, James H. Straubel, Harold C. Stuart, James M. Trail, A. A. West, Herbert M. West, Jr., and Sherman W. Wilkins.

The eighteen people whose photographs appear on the following page are nominees for the eighteen elected Directorships for the coming year. Asterisks indicate incumbent National Directors.



Sam E. Keith, Jr.

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Thomas J. McKee



William N. Webb

## NOMINEES FORAFA's

## **BOARD OF DIRECTORS**



Donald D. Adams, Omaha, Neb. Corporate business consultant. Former National Vice President, national committee chairman, State President, and Chapter President. Current National Vice President (Midwest Region) and national committee member. Life Member of AFA and Charter Life Member of the Aerospace Education Foundation.

\*Richard H. Becker, Oak Brook, III. Retired senior account executive. Former National Director, State and Chapter President, Advisory Council Member for the Aerospace Education Foundation, Aerospace Education Foundation Trustee, national committee member, and national committee chairman. AFA Man of the Year for 1983. Current National Director and national committee member. Life Member of AFA and Charter Sustaining Annual Member of the Aerospace Education Foundation.

Daniel F. Callahan III, McMinnville, Tenn. Standardization/evaluation navigator and instructor/navigator, Tennessee ANG. Former Under-40 National Director. Current Chapter President and national committee member. Life Member of AFA and Life Member of the Aerospace Education Foundation.

\*Charles H. Church, Jr., Kansas City, Mo. Bank executive. Former National Vice President (Midwest Region), national committee chairman, and Chapter President. Current National Director and national committee vice chairman. Life Member of AFA and Charter Sustaining Life Member of the Aerospace Education Foundation.

Charles G. Durazo, McLean, Va. Consultant in electronics manufacturing. Former National Vice President, State President, Chapter President, and national committee member. AFA Man of the Year for 1988. Current National Vice President (Central East Region) and national committee member. Life Member of AFA and Life Member of the Aerospace Education Foundation.

\*William J. Gibson, Ogden, Utah. Retired Air Force officer and retired airport executive. Former national committee member, National Vice President (Rocky Mountain Region), State President, and Chapter President. Current National Director and national committee member. Life Member of AFA and Charter Sustaining Life Member of the Aerospace Education Foundation.

\*H. B. Henderson, San Diego, Calif. Aerospace industry executive. Former National Director, National Vice President (Central East Region), national committee member, and State and Chapter President. Current National Director and national comm ttee member. Life Member of AFA and Life Member of the Aerospace Education Foundation.

\*Thomas W. Henderson, Tucson, Ariz. Retired real estate broker. Former National Vice President (Far West Region), State President, State Vice President, chapter officer, and national committee member. Current National Director and national committee member. Life Member of AFA and Life Member of the Aerospace Education Foundation.

Jan M. Laitos, Rapid City, S. D. Corporate business consultant. Former National Vice President (North Central Region), national committee member, and chapter officer. Current State President, national committee member, chapter officer, and member of the Aerospace Education Foundation's Advisory Council. Charter Life Member of AFA.

\*Frank M. Lugo, Mobile, Ala. Educator. Former National Director, National Vice President (South Central Region), national committee member, State and Chapter President, Aerospace Education Foundation Trustee, and Advisory Council Member of the Aerospace Education Foundation. Current National Director, national committee member, and member of the Aerospace Education Foundation's Advisory Council. Life Member of AFA and Charter Sustaining Life Member of the Aerospace Education Foundation.

\*James M. McCoy, Bellevue, Neb. Insurance executive. Former Chief Master Sergeant of the Air Force, National Director, national committee chairman, and national committee member. Current National Director, national committee chairman, national committee member, and Aerospace Education Foundation Trustee. Life Member of AFA and Charter Sustaining Life Member of the Aerospace Education Foundation.

Edward J. Monaghan, Anchorage, Alaska. Flight school instructor/president. Former National Director, National Vice President, State President, and Chapter President. Current National Vice President (Northwest Region) and national committee chairmar.

\*Bryan L. Murphy, Jr., Fort Worth, Tex. Marager of management systems and procedures. Former National Vice President (Southwest Region), State and Chapter President, chapter officer, and national committee member. Current National Director and rational committee member. Life Member of AFA.

\*Ellis T. Nottingham, Atlanta, Ga. Marketing executive. Former National Director, state officer, Chapter President, Under-40 National Director, and national committee member. Current National Director and national committee member. Life Member of AFA and Life Member of the Aerospace Education Foundation.

\*Walter E. Scott, Dixon, Calif. Travel agency owner. Former National Secretary of the Aerospace Education Foundation, state officer, national committee member, Aerospace Education Foundation Trustee, Aerospace Education Foundation Trustee Emeritus, and Advisory Council Member for the Aerospace Education Foundation. Current National Director, national committee chairman, and National Secretary of the Aerospace Education Foundation. Founder of the Aerospace Education Foundation Scott Associates Program. Life Member of AFA and Charter Sustaining Life Member of the Aerospace Education Foundation.

Mary Ann Seibel, St. Louis, Mo. Administrator. Former National Director, Under-40 National Director, national committee member, and Chapter President. Current national committee member. Life Member of AFA and Charter Sustaining Life Member of the Aerospace Education Foundation.

James E. "Red" Smith, Princeton, N. C. Real estate broker/accountant. Former National Vice President, State President, Chapter President, national committee member. Current National Vice President (Southeast Region), national committee member. Life Member of AFA and Life Member of the Aerospace Education Foundation.

Paul D. Straw, San Antonio, Tex. Retired bank executive. Former chapter officer. Current State Treasurer and Chapter President. Former Director, San Antonio Area Cancer Society, Heart Association, and Red Cross. Past Chairman, VIA Metropolitan Transit Board. Charter Sustaining Annual Member of the Aerospace Education Foundation.

#### Jack B. Flaig-1924-89

One other AFA leader, Jack B. Flaig of Lemont, Pa., was nominated for the Board, but died in an accident on June 13. An assistant professor at Penn State, he was a Life Member of AFA and a Charter Sustaining Life Member of AEF. A former National Vice President (Northeast Region), Mr. Flaig was a member of the Board of Directors at the time of his death. Intercom



By John R. "Doc" McCauslin, CHIEF, FIELD ORGANIZATION DIVISION

SMSgt. Apolino Garcia Honored

SMSgt. Apolino "Ed" Garcia, a member of the Enid (Okla.) Chapter and assigned to duty at Vance AFB, Okla., recently received the 1989 President's Volunteer Action Award. The presentation was made to him by President George Bush at a White House luncheon. Sergeant Garcia is the first member of the military to receive this prestigious award since its inception in 1982.

Sergeant Garcia, his wife Maria, and their daughter Norma then went on a tour of Washington, D. C., met with members of Congress, and visited AFA headquarters, where they were congratulated by Executive Director Chuck Donnelly (see photo) and staff members.

Sergeant Garcia's award was in recognition of his work as a volunteer in helping minorities in Oklahoma and feeding the poor and for his active role in his church's programs.

#### Lori Jordan Wins Essay Contest

Ms. Lori Jordan, Lewisville, Tex., is the 1989 Earle North Parker Essay Contest winner. Her entry, "My Role in America's Future," earned her a \$3,000 scholarship. Her parents proudly watched as Texas AFA State President Dan Heth and Mr. Parker, an AFA Life Member, made the presentation during activities by Texas AFA, meeting in Austin.

A panel of five judges reviewed essays from fifteen Texas chapters before selecting Ms. Jordan's. The annual contest for high school seniors, jointly sponsored by Texas AFA and Mr. Parker, started in 1963. Each year a different theme is featured. Submissions must be between 500 and 600 words long.

Ms. Jordan's essay was about an elementary school teacher and said, in part: "Even as it is today, dollar signs were then the measure of the legitimacy of all things. Dollar signs and prestige. Education majors ranked embarrassingly low in both areas. Thus, the unutterably dreaded label, 'just a teacher,' was hung around my neck. But I chose to wear



**AFA Executive Director** Chuck Donnelly, right, congratulates SMSgt. Apolino E. Garcia on receiving the 1989 President's Volunteer Action Award. Just before this meeting with General Donnelly (USAF, Ret.) at the AFA Headquarters building, Sergeant Garcia had been honored by President Bush at a White House luncheon. Sergeant Garcia, an AFA member assigned to Vance AFB, Okla., is the only military member to have received the Volunteer Action Award.



It was "Jack Price Appreciation Night" in Utah, and AFA National President Jack C. Price (center) was honored at a dinner sponsored by the Utah State and chapters for his twenty-five years of service to AFA and given an American eagle print. Others shown, left to right, are National Director William "Hoot" Gibson; National Vice President (Rocky Mountain Region) Jack Powell; Mr. Price; Utah State AFA President Glenn Lusk; and National Director Nate Mazer.

#### Intercom

it with pride... as I walked out of the doors of George Washington Elementary School and escaped with a secret salary which neither the school board nor the IRS knew [anything] about.

"I did not know how to document the expression on Johnny's face when the world of phonics finally opened to him. Or Suzy's shriek of delight at the perfect score she had received on her latest arithmetic assignment. Or the crayon drawing of a butterfly left anonymously on my desk. And the children's laughter at recess came with no price tag. These were just a few of the items supplementing the gross income of a person like me who chose to discard a comfortable future like a soiled napkin, content to live her life as nothing more than a teacher."

Every chapter president and Texas State AFA official attended the daylong gathering, which was highlighted by the State Executive Council Meeting with former Air Force Secretary Hans Mark (also an AFA Life Member) as keynote speaker.

#### Saluting Peacekeeper

The General Bernard A. Schriever/ Los Angeles (Calif.) Chapter recently saluted the full operational capability of SAC's first fifty Peacekeeper ICBMs. About 900 Air Force members, civilians, and contractor personnel gathered for the event at which Maj. Gen. Edward P. Barry, Jr., Commander of AFSC's Ballistic Systems Division, was invested as an



AFA Board Chairman Sam E. Keith (right) presents an AFA Special Citation to Anthony J. DeLuca, Air Force Competition Advocate General. The presentation was made during an annual banquet sponsored by AFA's Central East Region. Mr. DeLuca, an AFA member, was honored for his outstanding contributions to the Air Force's competition in contracting program and for his support of AFA.

Aerospace Education Foundation Jimmy Doolittle Fellow.

General Barry was cited for his "demonstrated leadership in all elements of AFSC's efforts in ICBM systems design, development, acquisition, test, and deployment." He was also given the Schriever Award for outstanding contributions to USAF in the area of ICBMs, specifically for his team's efforts in deploying the first fifty Peacekeepers "on time and under cost." The Schriever Award was established in 1975.

#### **New Senior Enlisted Advisors**

Congratulations to these newly selected Senior Enlisted Advisors: CMSgt. David J. Campanale, 93d Bomb Wing, Castle AFB, Calif.; CMSgt. Willie A. Currie, Hq. USAFE, Ramstein AB, Germany; CMSgt. James Ellingworth, 7th Bomb Wing, Carswell AFB, Tex.; CMSgt. Wayne Gray, 7206th Air Base Group,

> AFA's Del Rio (Tex.) Chapter is actively engaged in raising funds for a Ribas-Dominicci Plaza to honor the F-111 pilot downed during the 1986 raid on Libya. Shown, left to right, at Laughlin AFB, Tex., are John Stein, President of the Laughlin Heritage Foundation; Lt. Col. Chet Guerin, Laughlin Base Commander; and Larry Martwig, Chapter President, presenting the chapter's \$500 check.



### AFA'S 1989 NATIONAL CONVENTION

## AEROSPACE DEVELOPMENT BRIEFINGS AND DISPLAYS



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#### SHERATON WASHINGTON HOTEL September 17 - 21

### CONVENTION ACTIVITIES INCLUDE

- Opening Ceremonies
- Aerospace Education Foundation Luncheon Honoring Distinguished Americans with Doolittle and Eaker Fellowships
- Business Sessions
- Secretary's Luncheon
- Hon. Donald B. Rice Secretary of the Air Force
- Annual Reception
- AEF Roundtable
  - "The Technical Manpower Challenge"
- Chief's Luncheon Gen. Larry D. Welch Chief of Staff, US Air Force
- Air Force Anniversary Dinner-Dance Program: Featuring a Guest Artist and the USAF Band

Hotels available other than the Sheraton Washington in Washington, D.C., are: Normandy Inn, 2118 Wyoming Ave., N.W. Phone (800) 424-3729. The Highland Hotel, 1914 Connecticut Ave., N.W. Phone (800) 424-2464. Also available is a free housing service that matches requests with vacancies at several hotels: Washington, D.C. Accommodations, 1720 20th St., N.W. Phone (800) 554-2220.

SHERATON WASHINGTON HOTEL September 17-21 (202/320-2000) NOTE: THIS FORM NOT FOR USE BY DELEGATES. WATCH YOUR MAIL FOR INFORMATION.

#### ADVANCE REGISTRATION FORM

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accompanied by check made payable to AFA. Mail to AFA, 1501 Lee Highway, Arlington, VA 22209-1198.	Anniversary Reception & Dinner Dance
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The Air Force Association is an independent, nonprofit, aerospace organization serving no personal, political, or commercial interests; established January 26, 1946; incorporated February 4, 1946.

OBJECTIVES: The Association provides an organization through which we as a free people may unite to address the defense responsibilities of our nation imposed by the dramatic advance of aerospace technology; to educate the members and the public at large in what that technology can contribute to the security of free people and the betterment of mankind; and to advocate military preparedness of the United States and its allies adequate to maintain the security of the United States and the free world.



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#### Intercom

Hellenikon AB, Greece; CMSgt. Richard G. Griffis, 81st Tactical Fighter Wing, RAF Bentwaters, UK; CMSgt. William J. Griffith, Logistics Communications Div., Wright-Patterson AFB, Ohio; CMSgt. Kirby G. Harvey, 432d Tactical Fighter Wing, Misawa AB, Japan; CMSgt. Richard K. Humphrey, 39th Special Operations Wing, Rhein-Main AB, Germany; CMSgt. Andrew King, 379th Bomb Wing, Wurtsmith AFB, Mich.; CMSgt. Dennis E. Mills, 27th Tactical Fighter Wing, Cannon AFB, N. M.; CMSgt. Dale W. Niemi, Strategic Communications Div., Offutt AFB, Neb.; and CMSgt. James T. Sturm, 443d Military Airlift Wing, Altus AFB, Okla.

#### **Tasks Ahead for Fitzsimons**

At a recent meeting of the Mile High (Colo.) Chapter, the new commander of Fitzsimons Army Medical Center, Brig. Gen. Thomas Bowen, USA, sketched for chapter members the future of this historic medical complex and stressed that many difficult challenges lie ahead.

"Fitzsimons has been on the

#### **Coming Events**

July 7-8, Montana State Convention, Bozeman; July 14-15, Arkansas State Convention, Blytheville; July 14-15, Colorado State Convention, Colorado Springs; July 21-23, Pennsylvania State Convention, State College; July 21-23, Texas State Convention, South Padre Island; July 22-23, North Carolina State Convention, Seymour Johnson AFB; July 29 Michigan State Convention, Lansing; July 29-30, Florida State Convention, Daytona Beach; August 4-6, North Dakota State Convention, Grand Forks; August 11-12, Utah State Convention, Wendover; August 11-13, Arizona State Convention, Sedona; August 12, Indiana State Convention, West Lafayette; August 12-13, Delaware State Convention, Dover AFB; August 18-19, Wisconsin State Convention, Milwaukee; August 24-26, California State Convention, San Francisco; August 26, Illinois State Convention, Chanute AFB; September 18-21, AFA National Convention and Aerospace Development Briefings and Displays, Washington, D. C.; October 20-21, 25th Annual Orientation of AFA State Presidents and New Directors, Washington, D. C.; October 27-29, North Central Regional Workshop, Sioux Falls, S. D.; November 17-18, Southeast Regional Workshop, Savannah, Ga.

closure list at one time or another since it opened in 1917 and once again has been spared to serve the active and retired military community in the metro Denver area," he said. General Bowen noted that everything—including plumbing, electrical, and other facilities that date back to before World War II—will have to be upgraded to provide the care necessary for the 1990s, not to mention the next century.

#### South Carolina Convention

da

South Carolina's annual state convention was held at Shaw AFB, S. C., in April. Among those making presentations were Emilio Tavernise, Directo

#### Alabama and the Space Program

Zachary Thompson was luncheon speaker at the Alabama State AFA annual convention in Montgomery. An AFA member, Mr. Thompson spoke about the role of Huntsville, Ala., in support of the NASA space program and the impact of the loss of the space shuttle *Challenger*.

During the convention, State President H. R. "Bobby" Case and Lt. Gen. Ralph Havens, USAF, Air University Commander, presented a number of state and local awards.

#### Adopt a Library!

The General Nathan F. Twining (Fla.) Chapter has established an



#### Neymous

banquet was Maj. Gen. Louis G. C. tis, USAF, Commander of AFLC's San Antonio Air Logistics Center, Kelly AFB, Tex. His talk, "Focus, Foolishness, and Footnotes of Logistics," centered on the acquisition, procurement, and maintenance of Air Force aircraft and supporting systems.

engineering, and as ogy and operations.

#### **Belle Fourche's Dining Out**

AFA's newest Stateside chapter, at Belle Fourche, S. D., recently supported the first Dining Out of the 1st

#### Intercom



At a banquet sponsored by AFA's Central East Region in Arlington, Va., USAF Chief of Staff Gen. Larry D. Welch, right, expresses his appreciation to Charles Durazo, AFA National Vice President (Central East Region), in the form of a check given on the General's behalf to the Air Museum in Mr. Durazo's home town of Liberty, Kan.



Combat Evaluation Group. Its Commander, Lt. Col. Don McCrabb, and all assigned members of the site attended the event, which featured CMSgt. William J. Capstrack as guest speaker. Chief Capstrack is the senior enlisted advisor for 12th Air Division at Ellsworth AFB, S. D.

Also on hand were AFA National President Jack C. Price, National Vice President (North Central Region) John E. Kittelson, and Belle Fourche Chapter President Robert L. Helmer.

#### Flight Instructor of the Year

AFA in Illinois has proudly announced that the son of Illini Chapter President Donald C. Weckhorst has been named "Flight Instructor of the Year" by Tactical Air Command.

The honoree, Capt. Donald C. Weckhorst, an F-5 instructor with the 425th Tactical Fighter Squadron, Williams AFB, Ariz., is also an AFA member. Born at Bitburg AB, Germany, he has lived on many Air Force bases and has training time with the RAF in England.

His father, Chapter President Weckhorst, retired from the Air Force as a chief master sergeant after a thirtyyear career that included assignment as Senior Enlisted Advisor to the Commander of the Chanute Technical Training Center.

#### **Experiences in Vietnam**

A retired Army chief warrant officer who is also a recipient of the Medal of Honor for valor in Vietnam, Michael J. Novosel, was the recent guest speaker at a luncheon meeting of the General Bruce K. Holloway (Tenn.) Chapter. The 110 members present heard Mr. Novosel recount his experiences in Southeast Asia as a helicopter rescue pilot. During his forty-two-year career, Mr. Novosel earned sixty-one Air Medals among his many other decorations.

Another speaker recalling his Vietnam experiences for an AFA group recently was Col. Jim Bitz, USAF, who addressed members of the Southern Indiana Chapter at the Stonehenge Restaurant, Bedford, Ind. Chapter President Jim Fultz introduced the speaker. Colonel Bitz is currently Professor of Aerospace Studies at Indiana University, Bloomington, Ind.

#### **Communications Overview**

Col. Barron Keller, USAF, DCS/ Logistics, Hq. Air Force Communications Command, Scott AFB, III., was guest speaker at a recent meeting of the Greater Seattle (Wash.) Chapter. The colonel gave the ninety people in

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#### Intercom

attendance an excellent overview of the work of Communications Command. AFROTC Detachment 910 from the University of Washington provided a color guard. Washington State AFA President A. R. "Dick" Lewis and chapter members enjoyed the spirited presentation by "Mr. Transmit," as the speaker was referred to during his introduction.

#### Small-Chapter Winners

Congratulations to these AFA Small-Chapter winners ("small" is defined as between twenty and 150 members): 1977—Rocky Mountain (Utah) Chapter; 1978—James H. Straubel (Mich.) Chapter and Northeast Texas Chapter; 1979—Air Force Mothers (Pa.) Chapter and Blue Barons (Colo.) Chapter; 1980—South Bend (Ind.) Chapter; 1981—Charles A. Lindbergh (Conn.) Chapter; 1983—Flatirons (Colo.) Chapter; 1983—Flatirons (Colo.) Chapter; 1985—Florida Highlands (Fla.) Chapter; and 1988—William A. Jones III (Va.) Chapter.

#### Correction

Because of an editing error in one of the captions in "Intercom" in the May issue, an incorrect price was given for Jane Metcalf's book *Dowry* of Uncommon Women. The correct price for the book is \$12.50, including tax and postage. It may be ordered from Jane Metcalf, 4917 Ravenswood Drive., San Antonio, Tex. 78227. Book sales benefit the Air Force Village Foundation, Inc.

#### How to Have Your Say

Contributions to "Intercom" should be sent to J. R. "Doc" McCauslin, Chief, Field Organization Division, AFA Headquarters, 1501 Lee Highway, Arlington, Va. 22209-1198.

### **Bulletin Board**

I would like any technical information (manuals, wiring diagrams, etc.) concerning the **Norden bombsight**, autopilot, and stabilizer. **Contact**: Lt. Col. Harry E. Smith, Jr., USAF (Ret.), 1901 Tanglewood Blvd., Wichita Falls, Tex. 76309.

I am in search of any attachments for the Norden bombsight (bombing scales, computer, tachometer, glide bombing attachment, etc.) for display. Contact: Albert L. Pardini, 231 E. Grant St., Santa Maria, Calif. 93454.

I would like to trade Australian Air Force, Army, and Navy items for USAF flying clothing, helmets, wings, high-altitude equipment, etc. Contact: Sgt. G. W. Phillpotts, RAAF, 52 Stanley St., Frankston 3199, Victoria, Australia.

I would like a flight patch (or any patch or pin) relating to the **B-36. Contact:** Gary C. Kamerer, 6519 W. 87th Pl., Los Angeles, Calif. 90045.

I will buy and trade **uniform items** and personal field gear from all countries, military insignia of all kinds, special interest in beret crests, patches, and other police-related items. **Contact:** Cheryl L. Buckler, 4025 Pima Way, N. Highlands, Calif. 95660.

Will trade pocket knives for USAF squadron patches. Contact: Pat Crain, 3606 Larry Lane, Chattanooga, Tenn. 37412.

I need patches from 1st Fighter Day Squadron, George AFB, Calif., and 14th Fighter Interceptor Squadron, Sioux City MAP, S. D., from the period 1950–60. Contact: A1C Kathalene Davis, P. O. Box 2629, APO New York 09057.

I will trade others in the series for videotapes of episodes of "Great Planes" covering P-47, P-51, and P-38. Contact: Lt. Col. John H. Meierdierck, USAF (Ret.) 2900 Valley View, Space 287, Las Vegas, Nev. 89102.

I need male and female uniforms and uniform items from the period 1947–67. Contact: MSgt. Neill A. Smith, PSC #1, Box 26893, APO San Francisco 96230.

Please send patches and decals along with brief unit histories for a recruitment display. Contact: TSgt. Ray A. Blecker, USAF Recruiting Office, Point Shopping Center, Suite 236, Harrisburg, Pa. 17111.

Please send me any and all USAF **patches** or stickers. **Contact:** Thorsten Recker, Neisser Str. 12, 2942 Jever, W. Germany.

I need any and all **patches** to replace recently lost collection. **Contact:** MSgt. Brad E. Garner, USAF, 191 Main St., Apt. 3, Limestone, Me. 04750-1311.

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," An Fonce Magazine, 1501 Lee Highway, Arlington, Va. 22209-1198. Letters should be brief and typewritten. We cannot acknowledge receipt of letters to "Bulletin Board." We reserve the right to condense letters as necessary. Unsigned letters are not acceptable. Photographs cannot be used or returned.—THE EDITORS

Information on William J. Brodek of Jamaica, N. Y., who was imprisoned in the South Compound of Stalag Luft III during World War II. Contact: Maj. Karl W. Wendel II, USAF (Ret.), 825 Grove Ave., Southampton, Pa. 18966.

Information on **Dr. Phillip Howerton**, USAF Serial Number A03075312, SSN 245-44-0358. Last stationed at Myrtle Beach AFB, S. C., in 1963. **Contact:** Arthur P. Voisard, 1310 Cornwall Dr., Ocean Springs, Miss. 39564.

Information on **Donald C. Dahlin**, who served during World War II and escaped from occupied Belgium, and **Maj. J. C. Skinner**, USAF, who retired in 1957 and later served at the US Embassy in Laos. **Contact**: Jacques Gaudissart, rue du Séwoir 78, 7440 Lens, Belgium. Information on the following members of the 336th Bomb Squadron, 95th Bomb Group, who operated in 1944 out of Horham, England (last known whereabouts in parentheses): Sgt. Peter J. Saia (Bridgeport, Conn.), Sgt. G. B. Flynn (Winston-Salem, N. C.), Lt. Donald Doherty (Detroit, Mich.), Sgt. Grover Mackenroth (Port Arthur, Tex.), SSgt. Robert J. Flint (Columbus, Ohio), Lt. Gerson Burd (Philadelphia, Pa.), and Sgt. Arnwald W. Anderson (Sioux Rapids, Iowa). Contact: Arthur P. Voisard, 1310 Cornwall Dr., Ocean Springs, Miss. 39564.

Information on the following members of a B-17 crew of the **534th Bomb Squadron**, 381st Bomb Group: Jack Derlin, Claude Drewyour, Grant Recksiech, Carl Schwamb, Lloyd Roundtree, Jerry Baver, and McLamb. **Contact:** Ernest R. Murray, HCR-4000, Benson, Ariz, 85602.

Information on a **B-17 navigator** shot down and captured in late April or early May thirty-five kilometers north of Berlin near the city of Werneuchen, Germany. **Contact:** Gerhard Walter, Stefanstrasse 6, 8058 Erding, W. Germany.

Information on alumni from AFROTC Det. 770, Clemson University. Contact: AFROTC Detachment 770, Clemson University, Tillman Hall, Clemson, S. C. 29632.

Information on alumni from **AFROTC Det. 425**, **Mississippi State University. Contact:** AFROTC Detachment 425, P. O. Drawer AF, Mississippi State University, Miss. 39762.

Information on **Bill Westhafer** of Dillsburg, Pa., who was a member of Class 43-B and later flew B-24s in the Pacific theater during World War II, Last known to be an Eastern Air Lines captain living in southern New Hampshire. **Contact:** Duane U. Woodfield, 7476 Oak Moss Dr., Sarasota, Fla. 34241.

Information on **CMSgt. George Nowery,** formerly stationed at the US Embassy, Stockholm, Sweden. **Contact:** Christopher Hess, 269 W. Wilkes-Barre St., Easton, Pa. 18042.

Information on Maj. Jack Pope and Lt. Col. Herb Ross, who commanded the 80th Fighter Squadron in 1954 and 1955, respectively. Contact: Col. George R. Halliwell, USAF (Ret.), Rte. 1, Box 806, Hampton, Tenn. 37658.

Any information on a Major Grey (or Gray) of the 12th Air Force who adopted one of two young brothers in Kaufbeuren, Germany, in 1953. I am hoping to reunite the brothers. Contact: Lt. Colu Thomas A. Goff, USAF (Ret.), 339 Gatewater Ct. #303, Glen Burnie, Md. 21061.

Information on members of the **821st Bomb** Squadron (M), which was formed at Selfridge Field, Mich., in 1944. Contact: CMSgt. R. W. Dyer, USAF (Ret.), 718 Windrock Dr., Windcrest, San Antonio, Tex. 78239.

Information on the following members of the **454th Bomb Group** (World War II): John J. Faron from Massachusetts, Joseph G. Richardson, Jr., from Pennsylvania, and Eugene J. Trainor from Rhode Island. **Contact:** Joe Colson, 13030 New Brook Dr., Houston, Tex. 77072.

information on the following men who served with the 14th Communications Squadron from 1956 to 1958 at Clark AB, the Philippines: Gary D. Shellenbager of Michigan and Antonio Montes of California. Contact: Donald L. Dillman, Rte. 2, Box 27, Lynn, Ind. 47355.

Information on Lt. Craig S. Hefelman from Albuquerque, N. M., who trained me and another German Air Force officer in Class 61-G-2 at Laredo AFB, Tex. Contact: Col. Hans-Dietert Rulle, German Air Force, 5210 Troisdorf 13, Am Gerstenkamp 10, W. Germany.

Information on **Henry T. Schmitt**, serial number 17244033, of the 28th Bomb Squadron, 19th Bomb Group, who served on Guam and Okinawa during the Korean War. **Contact:** Paul Moon, 603 W. Sandusky St., Findlay, Ohio 45840.

Information about the **crew of a B-24** that crashed on December 24, 1944, near Alpbach in the Austrian Tyrol while en route to Italy after being hit by flak over Munich. **Contact:** Matthew R. Riesmeyer, 2134-A Renault, St. Louis, Mo. 63146-2445.

I would like to make contact with **Canadians** who served with USAF in Vietnam. **Contact:** Fred Gaffen, Canadian War Museum, 330 Sussex Dr., Ottawa, Canada, K1A 0M8.

I would like to contact any pilots or communications personnel who flew the **P-61 Black Widow** during World War II, especially those operating from Iwo Jima. **Contact:** Richard B. Downing, Jr., 426 Navarre Ave., Coral Gables, Fla. 33134.

The Air Forces Escape & Evasion Society would like to hear from anyone who crash-landed or bailed out in enemy territory and escaped or evaded capture to return to his unit. Contact: Clayton and Scotty David, 19 Oak Ridge Pond, Hannibal, Mo. 63401.

Photographs of and information on American aircraft downed in Germany and American aircraft with Luftwaffe markings. Contact: Hans-Heiri Stapfer, Bergstrasse 35, CH-8810 Horgen/ ZH, Switzerland.

The Air Weapons Controller (AWC) School would like information from former AWCs, particularly about training, especially during the period 1942–50. Contact: Capt. Scott M. Mc-Gonagle, USAF, 3625th TCHTS/TTOD, Tyndall AFB, Fla. 32403-5000.

### **Unit Reunions**

#### AAF/USAF Crash Rescue Boat

AAF and USAF Crash Rescue Boat personnel will hold a reunion in October 1989, in Tampa, Fla. **Contact:** John E. Hagan, 6749 Sandwater Trail, Pinellas Park, Fla. 34665. Phone: (813) 544-9192.

#### Canberra Ass'n

Former B-57 Canberra crew members will hold a reunion September 2–3, 1989, at the Marriott Hotel in Albuquerque, N. M. Contact: Robert F. Lewis, 10812 Academy Ridge Rd. N. E., Albuquerque, N. M. 87111. Phone: (505) 299-8122.

#### "Coconut Heads"

A reunion will be held September 14–17, 1989, in Atlanta, Ga. for members of the "Coconut Heads," anyone who spent time on Christmas Island. Members of the 12th Fighter Squadron are especially welcome. **Contact:** Ernest Garrels, 402 Linn St., Benson, III. 61516. Phone: (309) 394-2273.

#### DCANG

Members of the District of Columbia Air National Guard will hold a reunion September 27–30, 1989, at the Ocean Dunes Resort/Villas in Myrtle Beach, S. C. **Contact:** Irv Taylor, 2505 Kayhill Lane, Bowie, Md. 20715. Phone: (301) 262-1855.

#### **ICBM and Space Pioneers**

Members and contractors supporting the US Air Force intercontinental ballistic missile (ICBM) and space programs from 1954 through the present will hold a reunion July 29, 1989, at the Los Angeles Marriott Hotel in Los Angeles, Calif. **Contact:** Bob Krumpe, P. O. Box 444, Hawthorne, Calif. 90251. Phone: (213) 322-8160.

#### **Morocco Personnel**

Air Force personnel who served in Morocco from 1942 through the present will hold a reunion October 6–8, 1989, at the Green Oaks Inn in Fort Worth, Tex. **Contact:** Charles Nichol, 3709 Wildwood Rd., Fort Worth, Tex. 76107.

#### **NEAC/Pepperrell AFB Officers**

Air Force officers stationed at Northeast Air Command/Pepperrell AFB, Newfoundland, between 1947 and 1983, have scheduled their reunion for October 1989 in San Antonio, Tex.

#### **Reunion Notices**

Readers wishing to submit reunion notices to "Unit Reunions" should mail their notices well in advance of the event to "Unit Reunions," Am Fonce Magazine, 1501 Lee Highway, Arlington, Va. 22209-1198. Please designate the unit holding the reunion, a time and location, and a contact for additional information.



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#### Unit Reunions

Contact: Fran Richstatter, 3726 Longridge, San Antonio, Tex. 78228. Phone: (512) 732-2345.

#### Northwest Field, Guam

Members of the 315th Bomb Wing, which comprised the 16th, 331st, 501st, and 502d Bomb Groups; plus the 24th, 73d, 75th, and 76th Air Service Groups; and the 339th Signal Company who were stationed on Northwest Field, Guam (World War II), will hold a reunion October 5–7, 1989, at the Hyatt Regency Hotel in Crystal City, Va. **Contact:** Col. George E. Harrington, USAF (Ret.), 4600 Ocean Beach Blvd., Apt. 505, Cocca Beach, Fla. 32931. Phone: (407) 784-0342.

#### Pampa Army Airfield

Pampa Army Airfield personnel will hold a reunion August 17–19, 1989, in Pampa, Tex. Contacts: PAAF Reunion Association, P. O. Box 2015, Pampa, Tex. 79065. Phone: (806) 665-2526. John P. Wunderle, 502 Dundee Trail, Southern Pines, N. C. 28387. Phone: (919) 692-5775.

#### Stalag Luft I and III

Former prisoners of war who were held in Stalag Luft I and III in Germany during World War II will hold a forty-fifth-anniversary reunion of their liberation in May 1990 at former campsites in Barth, Zagan, and Moosburg. **Contact:** Philip J. Gibbons, 549 N. E. Eighth Ave., Deerfield Beach, Fla. 33441. Phone: (305) 427-1023.

#### 4th Combat Cargo Squadron

Members of the 4th Combat Cargo Squadron will hold a reunion in conjunction with the Hump Pilots Association on August 23–27, 1989, at the Sheraton Hotel in Spokane, Wash. **Contact:** Ben Deatherage, 245 Grant Ave., Cottage Grove, Ore. 97424. Phone: (503) 942-8571.

#### **7th Photo Recon Group**

The 7th Photo Reconnaissance Group will hold a reunion October 4–9, 1989, at the Radisson Hotel in Denver, Colo. **Contact:** Col. George A. Lawson, USAF (Ret.), 4390 14th St. N. E., St. Petersburg, Fla. 33703. Phone: (813) 526-8480.

#### 8th Combat Cargo Squadron

Members of the 8th Combat Cargo Squadron (World War II) will hold a reunion October 12–15, 1989, in San Antonio, Tex. **Contact:** Paul Vaughan, 1801 S. Hill St., Los Angeles, Calif. 90015. Phone: (213) 747-0241.

#### 11th Army Air Force

Former 11th Army Air Force veterans and Alaskan Air Command will celebrate the fiftieth anniversary of the Air Force in Alaska in August 1990 at Elmendorf AFB, Alaska. **Contact:** Ralph M. Bartholomew, 615 Stedman St., Ketchikan, Alaska 99901.

#### 20th/81st Tactical Fighter Wings

Members of the 20th and 81st Tactical Fighter Wings and attached units who served at RAF Woodbridge, England, between 1962 and 1966 are planning to hold a reunion October 1989 in Oklahoma City, Okla. **Contact:** Mrs. Eleanor Moore, P. O. Box 291, Burns Flat, Okla. 73624.

#### 21st Air Depot Group

Members of the 21st Air Depot Group will hold a reunion September 2–3, 1989, at the American Legion Hall in Van Wert, Ohio. **Contact:** James Campbell, 20 Chelsea St., Staten Island, N. Y. 10307.

#### 24th Combat Mapping Squadron

The 24th Combat Mapping Squadron (Guskhara, India) will hold a reunion September



27–30, 1989, at Delta Court of Flags in Orlando, Fla. Contact: Pat Coady, 1003 E. 3d Ave., Lawton, Mich. 49065. Phone: (616) 624-3651.

#### 24th Special Operations Wing/USAFSO

Members of the 24th Special Operations Wing and the USAF Southern Command (1969–75) will hold a reunion August 18–20, 1989, at the Green Oaks Inn in Fort Worth, Tex. **Contact:** Bud Stocker, 8840 Random Rd., Fort Worth, Tex. 76179. Phone: (817) 236-7595.

#### 33d Fighter Group

Members of the 33d Fighter Group, 58th, 59th, and 60th Fighter Squadrons (World War II) will hold a reunion September 27–30, 1989, at the Embassy Suites in Colorado Springs, Colo. **Contacts:** Mrs. Marylyn Zywan, 44 Lodge Ave., Huntington Station, N. Y. 11746. Phone: (516) 423-4593. George Coates, 6 Myrtle Ave., Secaucus, N. J. 07094. Phone: (201) 348-8065.

#### 33d Photo Recon Squadron

The 33d Photo Reconnaissance Squadron will hold a reunion September 15–17, 1989, in Colorado Springs, Colo. **Contact:** Walter Olick, 613 Columbine St., Sterling, Colo. 80751. Phone: (303) 522-3924.

#### 36th Air Depot Group Supply Squadron

The 36th Air Depot Group Supply Squadron (World War II) will hold a reunion August 30-September 5, 1989, at the Clarion Hotel in New Orleans, La. **Contact:** CMSgt. Glenn A. Moss, USAF (Ret.), 8414 McKenzie Circle, Manassas, Va. 22110. Phone: (703) 369-1381.

#### **48th Tactical Fighter Wing**

The 48th Tactical Fighter Wing will hold a reunion March 30-April 1, 1990, at the Dunes Hotel in Las Vegas, Nev. **Contacts**: William Douglas, 2202 Bittersweet Rd., Marshalltown, Iowa 50158. Phone: (515) 752-8099 (home) or (515) 754-5857 (work). George "Pete" Peterson, 3828 Cavalry St., Las Vegas, Nev. 89121. Phone: (702) 796-8888.

#### **50th Air Service Squadron**

Members of the 50th Air Service Squadron who served in England, Africa, and Italy during World War II with the 8th, 12th, and 15th Air Forces will hold a reunion in September 1989 in Cape Girardeau, Mo. **Contact:** Edwin R. Clark, M & D Park, E. Dorsey Lane, Poughkeepsie, N. Y. 12601.

#### 52d Troop Carrier Squadron

The 52d Troop Carrier Squadron will hold a reunion October 13–15, 1989, in San Antonio, Tex. **Contact:** Alexander Gozur, 141 Arnistad Blvd., Universal City, Tex. 78158. Phone: (512) 658-1427.

#### 57th Bomb Wing

Members of the 57th Bomb Wing, which comprises the 12th, 310th, 319th, 321st, and 340th Bomb Groups, their service squadrons, plus the 308th Signal Wing will hold a reunion July 17–23, 1989, at the Red Lion Motor Inn in Salt Lake City, Utah. **Contact:** Robert E. Evans, 1950 Cunningham Dr., Speedway, Ind. 46224-5341. Phone: (317) 247-7507.

#### 59th Air Police Squadron

The 59th Air Police Squadron stationed at RAF Burtonwood, England, will hold a reunion August 10–12, 1989, in Omaha, Neb. **Contact:** George Raishy, 9415 Himebaugh, Omaha, Neb. 68134. Phone: (402) 572-6674.

#### 75th Troop Carrier Squadron

The 75th Troop Carrier Squadron will hold a reunion October 5–8, 1989, in Springfield, Mo. **Contact:** Robert C. Richards, 139 Kiser Dr., Tipp City, Ohio 45371. Phone: (513) 667-3827.

#### 89th Attack Squadron

Members of the 89th Attack Squadron, 3d Bomb Group (World War II), will hold a reunion May 9-13, 1990, at the Red Lion Inn in Colorado, Springs, Colo. Contact: Bill Beck, 7355 Buckeye Ct., Colorado Springs, Colo. 80919. Phone: (719) 599-5336 (evening).

#### 95th Bomb Group

Members of the 95th Bomb Group (H) (B-17s, 8th Air Force, World War II) will hold a reunion September 17-24, 1989, at the Doubletree Hotel in Tucson, Ariz. Contact: Dave Dorsey, 125 Clark St., Clarks Green, Pa. 18411. Phone: (717) 587-2290.

#### 96th Bomb Group

The 96th Bomb Group will hold its reunion in conjunction with the 8th Air Force Historical Society on October 4-9, 1989, in Denver, Colo. Contact: Thomas L. Thomas, 1607 E. Willow Ave., Wheaton, III. 60187. Phone: (312) 668-0215.

#### 111th FIS

Members of the 111th Fighter Interceptor Squadron "Ace in the Hole" will hold a reunion September 16–17, 1989. **Contact:** Maj. Jerry Bepko, 111th FIS Reunion Committee, 147th FIG TexANG, Ellington ANGB, Tex. 77034-5586. Phone: (713) 929-2185. AUTOVON: 954-2185 or 954-2681

#### 310th, 311th, and 312th Ferrying

Members of the 310th, 311th, and 312th Ferrying Squadrons, 27th Air Transport Group (World War II), will hold a reunion September 26-28, 1989, in Dayton, Ohio. Contact: Lyle Gildermaster, 135 Colver Dr., Ponchatoula, La. 70454. Phone: (504) 386-6351.

#### 322d Troop Carrier Squadron

Members of the 322d Troop Carrier Squadron, 14th Air Force (transportation section), will hold a reunion in conjunction with the 14th Air Force Association on September 13, 1989, in Portland Ore. Contact: Frank Stefanek, 27120 S. E. Hwy. 212, Boring, Ore. 97009-9238. Phone: (503) 663-4207.

#### 338th/3d Photo Recon Squadrons

Members of the 338th and 3d Photo Reconnaissance Squadrons who served in Guam, Momote Air Strip, and Clark Field between 1946 and 1950 will hold a reunion September 22-24, 1989, in Arlington, Va. Contact: Albert E. Dawson, 1108 Beverly Dr., Alexandria, Va. 22302. Phone: (703) 548-9681.

#### 341st Fighter Squadron

The 341st Fighter Squadron, 5th Air Force (World War II), will hold a reunion September 28-October 1, 1989, in Colorado Springs, Colo. Contact: John McAllister, 1437 Coble Ave., Hacienda Heights, Calif. 91745. Phone: (818) 968-2545.

#### 351st Strategic Missile Wing

The twenty-fifth-anniversary reunion of the 351st Strategic Missile Wing will be held on September 22-24, 1989, at Whiteman AFB, Mo. Contact: Capt. Paul J. Mica, USAF, P. O. Box 6075, Whiteman AFB, Mo. 65305. Phone: (816) 687-3160 or (816) 687-3676. AUTOVON: 975-3725.

#### 369th Bomb Squadron

The 369th Bomb Squadron of the 20th Air Force, stationed on Guam (1945 through 1946), will hold a reunion September 7-9, 1989, in Gettysburg, Pa. Contact: Landis P. Ickes. Box 252, Osterburg, Pa. 16667. Phone: (814) 276-3629.

#### 381st Bomb Group

The 381st Bomb Group will hold a reunion September 13–17, 1989, at the Little America Hotel in Salt Lake City, Utah. **Contact:** Ford Thueson, 746 S. 750th East, Bountiful, Utah 84010. Phone: (801) 298-0179.

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#### 388th Fighter-Bomber Wing

Members of the 388th Fighter-Bomber Wing stationed at Clovis, N. M., and Etain AB, France, will hold a reunion October 5-8, 1989, at the Radisson Hotel in Sacramento, Calif. Contact: Roger Green, P. O. Box 591, Diamond Springs, Calif. 95619. Phone: (916) 967-9327 (Edward J. Culleton).

#### 482d FIS

The 482d Fighter-Interceptor Squadron will hold a reunion July 14-16, 1989, in Goldsboro, N. C. Contact: James W. Dove, P. O. Box 10216, Goldsboro, N. C. 27530. Phone: (800) 334-1066 or, in N. C., (800) 672-3125.

#### 486th Bomb Group

The 486th Bomb Group will hold a reunion September 30–October 3, 1989, in Tucson, Ariz. Contact: Robert Bee, 2064 Tuckaway Ct., Columbus, Ohio 43228.

504th Bomb Group Members of the 504th Bomb Group, 20th Air Force, will hold a reunion September 5-9, 1990. Contact: Art Tomes, 2409 Oakwood Dr., Burnsville, Minn. 55337.

870th Chemical Company The 870th Chemical Company, 20th Air Force, stationed on Saipan during World War II, will hold a reunion September 21-23, 1989, at Lake Cumberland State Resort Park in Jamestown, Ky. Contact: Edward J. Kleindienst, 41 Judge Lane, Bethlehem, Conn. 06751. Phone: (203) 266-7437.

#### 3201st Air Police Squadron

Members of the 3201st Air Police Squadron who were stationed at Eglin AFB, Fla., from 1953 through 1959 are planning to hold a reunion September 14-16, 1989, in Fort Walton Beach, Fla. Contact: William E. Thompson, 409 Roosevelt Dr., A-2, Dothan, Ala. 36301. Phone: (205) 794-9159.

#### 6005th/7025th Air Postal Groups

USAF Postal Service personnel of the 6005th and 7025th Air Postal Groups and Air Force Squadrons 1st through 12th will hold a reunion September 8–9, 1989, at Maxwell AFB, Ala. **Contact:** Maj. James K. Foshee, USAF (Ret.), 3509 Deer Trail, Temple, Tex. 76504. Phone: (912) 774 7202 (817) 774-7303.

7330th Flying Training Wing The 7330th Flying Training Wing, stationed at Fürstenfeldbruck AB, Germany, between 1953 and 1958, will hold a reunion September 20-24, 1989, in Seattle, Wash. Contact: Father William L. Travers, US Embassy, Bonn, Box 270, APO New York 09080.

#### **Gibbs Field Alumni**

The Gibbs Field Alumni is planning a reunion in 1990 for all eighteen cadets classes (Classes 43-A through 44-G) who flew at Fort Stockton, Tex., between 1942 and 1944.

Please contact the address below for additional information.

Raymond C. Murray 11803 Nene Dr. Austin, Tex. 78750

Phone: (512) 258-6433

#### Suffolk County AFB Units

I would like to hear from members of all units stationed at Suffolk County AFB, N.Y., from 1953 through its closing. I want to compile a mailing list for a reunion that is scheduled for the autumn of 1990 in Colorado Springs, Colo. Please contact the address below.

D. A. Isgrig 400 Sunglow Alamogordo, N. M. 88310 Phone: (505) 437-6435



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