

SEPTEMBER 1986/\$5

# AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

## *The Human Element in Airpower*











**"I walked out to fly the F-20 119 times, and I flew it 118."**

*Tigershark Test Pilot*

## **F-20 Tigershark**

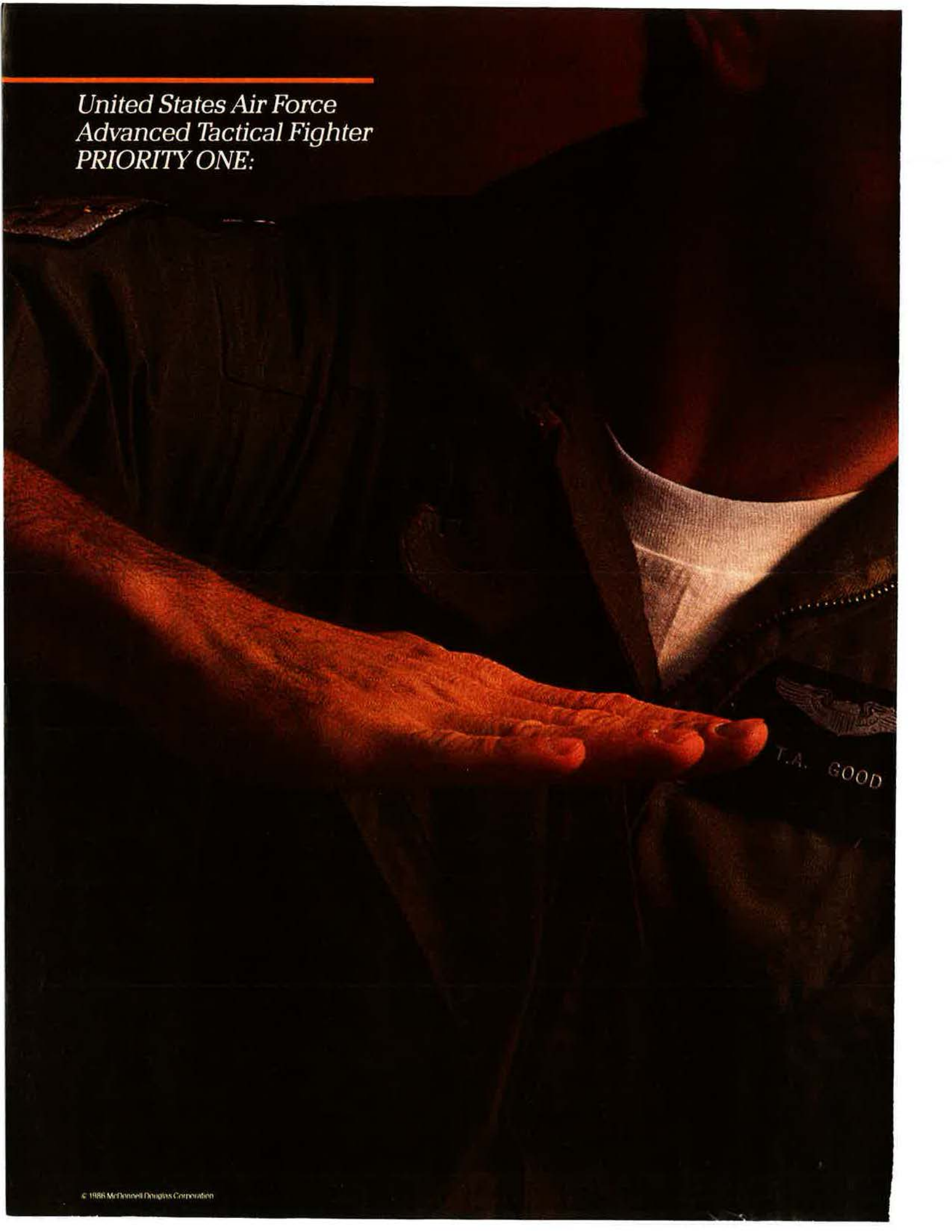
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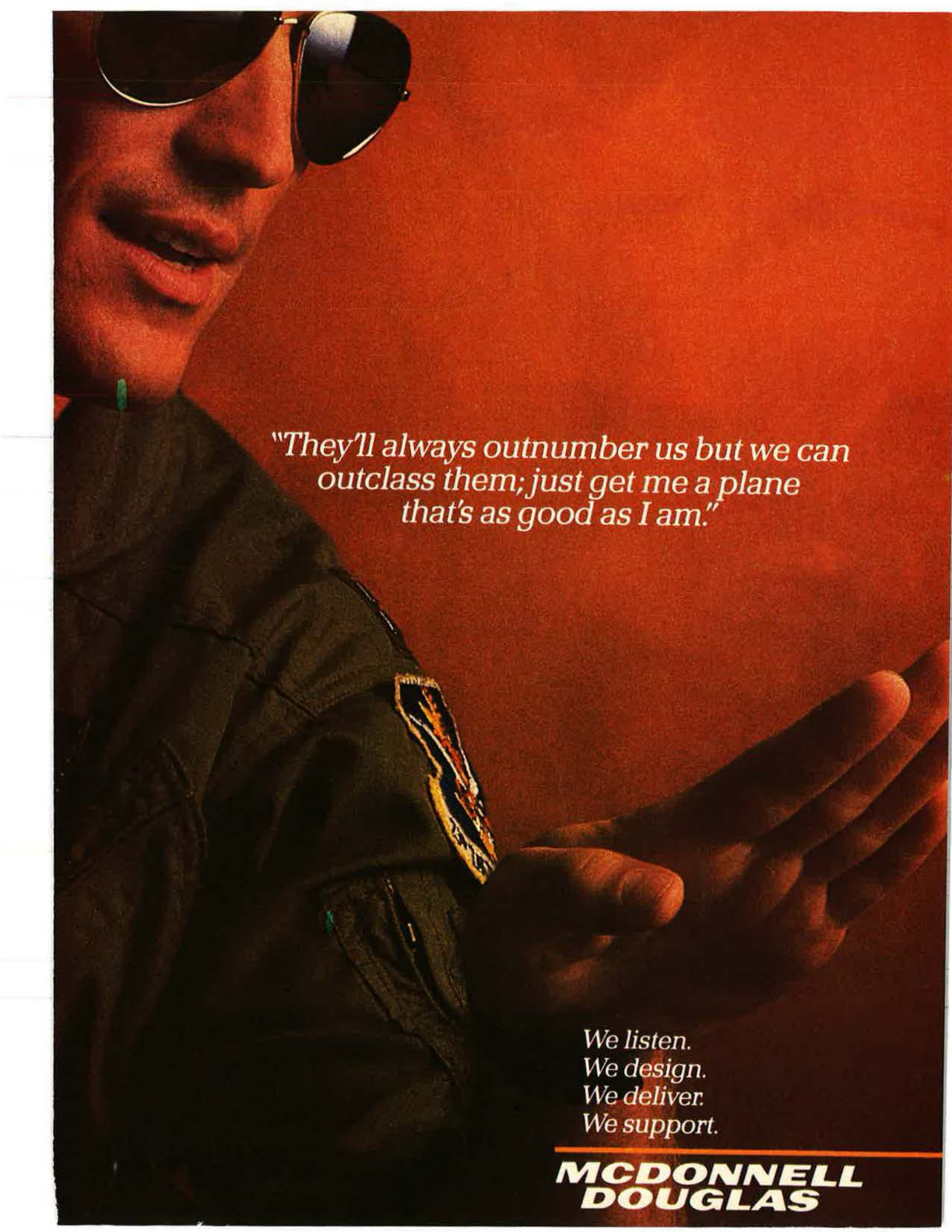


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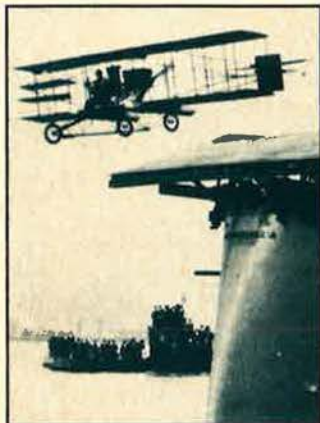
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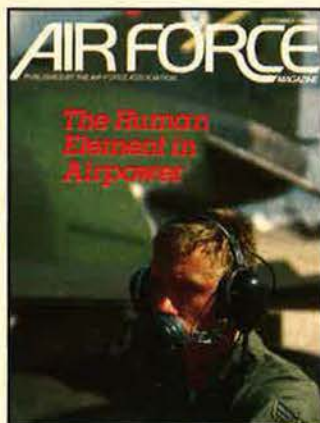




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**About the cover:** SrA. Robert W. Blackburn typifies the sort of dedicated airman who makes USAF the world's finest air service. A Special Section on "USAF People and Their Heritage" begins on page 59. (Photo by TSgt. Raymond Williams, USAF)

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	careful	easy	goss'mer	I'll	leapt	Mahu	part	remembers	sent



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trotting	warm	wine	your
trouble	warmth	wing	yours
trowest	warp'd	winged	yourself
true	warrant	wins	yourselves
truly	warring	winter	youth
trumpet	wars	winter's	zed
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trundle	wast	wise	zwagger'd
trunk	waste	wish	
trust	watch	wishes	
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trusty	watches	witch	
truth	water	with	
truth's	waters	withal	
try	wat'rish	withdraw	
tune	waved	wither	
t'unsettle	wawl	within	
Turk	wax	without	
Turlygod	way	witness	
turn	ways	wits	
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tutors	we	woes	
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'twas	weakens	wolves	
'tween	weal	wolvish	
twelve	wealth	woman	
twenty	weapon	woman's	
twice	weapons	womb	
'twill	wear	womb'd	
twinkled	wears	women	
'twixt	wearst	women's	
two	weary	wonder	
'twould	weather	wont	
tyrannous	weaves	wooden	
tyranny	web	wool	
tyrant's	wed	word	
ugly	weeds	word's	
unable	weep	words	
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unquietly	white	yea	
unremovable	whites	year	
unruly	whither	years	

# Anyone could have used these 4,178 words. In the hands of William Shakespeare, they became *King Lear*.

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Federal Systems Division



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## AN EDITORIAL

# Terrorism and Military Force

By John T. Correll, EDITOR IN CHIEF

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SIX months ago, Air Force and Navy fighter aircraft—in significant numbers and employing theater-quality weapon systems—struck at targets in Muammar Qaddafi's terrorist state of Libya. Time may prove this action to have been of extraordinary instructive value in the difficult struggle against international terrorism.

In the immediate aftermath of the raid, there was widespread speculation that the United States had set off, unwittingly, a chain of increased violence and reprisals. So far, that has not happened. Nor has the Third World rallied to Qaddafi, as some had feared.

This would seem to bear out the contention of Benjamin Netanyahu, Israel's Ambassador to the United Nations, that the "Cycle of Violence" theory is fraudulent. In a new book, *Terrorism: How the West Can Win*, Ambassador Netanyahu makes a strong case that when terror victims strike back, the terrorists are deterred, not incited to do more and worse.

The results of the Libya raid also figure to have a major impact on decisions, now being made, about the role of military forces, particularly air forces, in the fight against terrorism. The United States is obviously determined to overcome the frustration and indecision of the past two decades and establish a more substantial counterterror capability.

The means of doing so, however, are hotly disputed. The debate presently centers on budgets, equipment, and organization for low-intensity conflict and Special Operations Forces, although neither of these is totally synonymous with antiterrorism. (See *"Dealing With Ambiguous Warfare,"* p. 26.) And beyond this, both theorists and decision-makers are still struggling with some basic concepts.

The stickiest of these is the traditional view that the military is not well suited to conducting counterterror operations. So long as terrorism was a hit-and-hide enterprise, there was seldom a clear objective that could be resolved by military means. When the objective was clear, it typically required application of minimum force. Military units are good mainly at applying maximum force. But if the military did not perform this mission, who would? And if it were a military mission, should it not be carried out by unique forces, with emphasis on small numbers, low technology, and independence of operation?

From there, it was only a short step to the next conceptual break. When people thought about counterterrorism, they lumped it together with other forms of low-intensity combat and began to regard it as something apart from the spectrum of military conflict. This is

reflected in various ideas that seek to formalize the split, the most extreme of which is a proposal from Rep. Dan Daniel (D-Va.) to create a separate military service for special operations.

Opponents of that idea were quick to point out that the boundaries of low-intensity conflict are hazy and that once fighting begins, it is subject to rapid escalation. Special Operations Forces cannot be parceled out neatly from other military missions, because they have vital tasks in conventional and theater warfare. Disjoining them from regular military forces would degrade overall combat flexibility. Conversely, line units—especially fighter and attack squadrons—have now demonstrated their value at the low end of the spectrum of conflict.

While the players were arguing about the counterterror game plan, the game itself was changing. Most of the terror gangs have been networked for a long time, but it has been only in recent years that terrorist states revealed themselves, giving open support and outright sponsorship to international atrocities. These states have fixed geographic locations. They can be targeted and struck.

If air forces are used in this role, the capabilities they need are not that different from the requirements for regular theater combat: high-quality intelligence information; improved systems for target acquisition; weapons that are accurate and precise, perhaps delivered from standoff range; lethality on the first pass; tactical surprise; and survivability from ingress to egress.

Military force is not the only instrument—and not even the main instrument—for response to terrorism. Diplomatic and economic options should be exhausted before the nation resorts to military action. There may be instances when the only course is to do nothing, because there is nothing that can be done.

If, however, the nation decides to commit military forces, it should not do so casually or with fuzzy intention. The Libya raid demonstrated the long reach and telling impact of modern airpower, properly employed. Half measures are dangerous, as well as ineffective. Warfare at any level in the spectrum of conflict is inherently risky, unpredictable, and bloody. The consequences, including collateral damage, cannot be controlled with assurance. Nor can reprisals and escalations be ruled out. The "Cycle of Violence" theory may not be wrong 100 percent of the time.

All of this should be understood going in. If the objective is not important enough to justify the realities of armed conflict, or if the nation lacks the determination to see it through, then it had best keep its aircraft on the ground and leave its troops in the fort. ■

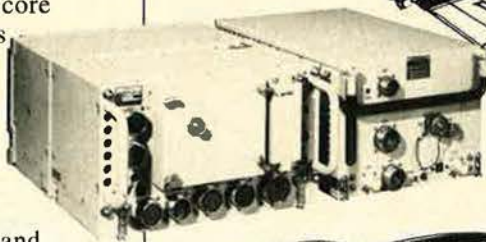


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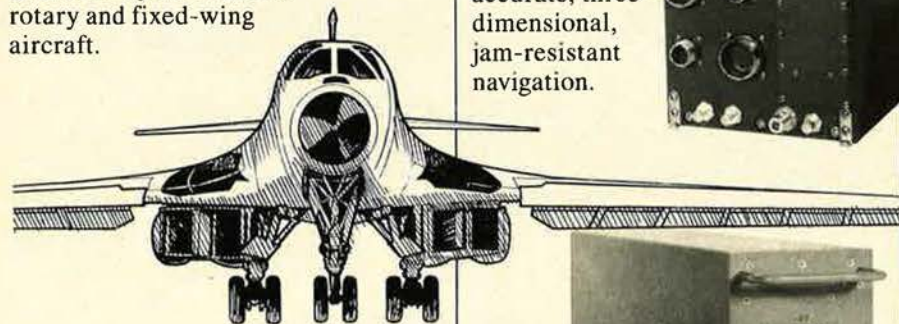


## ARC-186 VHF FM/AM.

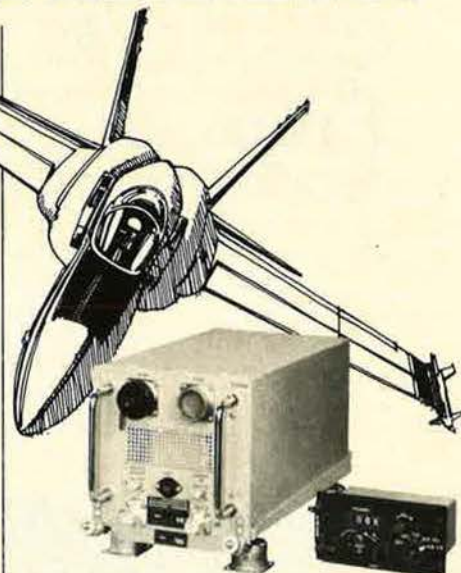
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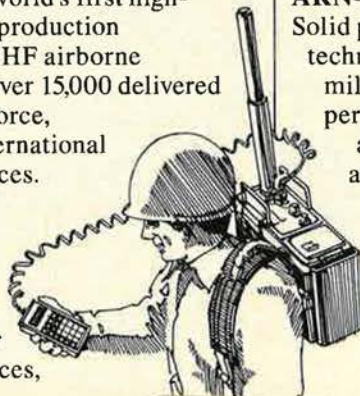


**ICS.** Collins intercom systems are aboard the F-14, F-4 and the Coast Guard's HH-65A helicopter. Our latest system, the AIC-33, is flying on the B-1B.



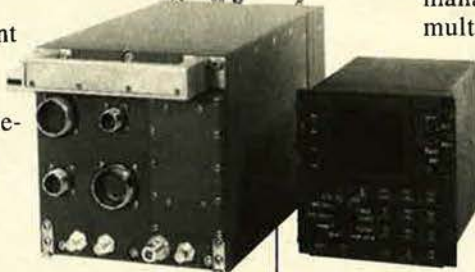
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# AIRMAIL

## On the Plateau?

I have been an AFA member and fan since my cadet days (USAFA, '61) and have watched proudly the growth of our Association these past years. However, the August 1986 issue made me wonder if we have not reached the plateau of our achievement. Two items prompt me to say that.

First, I noticed the absence of Jim Coyne from your masthead. His articles were accurate and "operational," as opposed to "philosophical." If he left the magazine, we really lost a refreshing writer.

Second, I read with interest David Gray's editorial (see "In the Name of Jointness," p. 8, August '86 issue). I think he missed the mark. After twenty-four years in the Air Force, I say that our armed forces' biggest failures are lack of "integrated" staff specialists, absence of "jointness," and not having "SuperCINCs." Most officers avoided joint staff duty like the plague, and it was not until it was required to "fill a square" that officers were assigned to such.

From that perspective, I salute my former cadet Air Officer Commanding, Gen. Charles Gabriel, who left us a true legacy of jointness with his USAF-Army joint initiatives.

Col. Hector Andres Negroni,  
USAF (Ret.)  
Chesterfield, Mo.

• Senior Editor James P. Coyne left the magazine staff last spring to become the Executive Editor of Signal Magazine. We agree with Colonel Negroni that it is a loss, but fortunately not a total one. Mr. Coyne's by-line appears in this issue on the article "Standing Up for Airpower" on page 159.—THE EDITORS

## Staffers' Edge?

Re: Your August 1986 editorial "In the Name of Jointness."

I would like to address the question of drawing "our top military leaders mostly from the ranks of those who gained early membership in an insulated and exclusive corps and whose demonstrated skills are in staff and coordination jobs."

It would be interesting to see how many of our recent Air Force leaders gained their station via the staff route. In the late 1960s and 1970s, professional execs and military assistants seemed to have a definite edge.

Brig. Gen. Kenneth H. Bell,  
USAF (Ret.)  
Fairborn, Ohio

## Brain Buckets

Your article about airmen's helmets, "Brain Buckets" (August '86 issue, p. 86), revived memories of forty-four years ago.

I was flying a P-47 from Westover in November 1942 when the engine quit running. In the ensuing belly landing, the gunsight tore up the cloth helmet and left a scar of forty-four years and a six-month hospital bill.

World War II saw 250,000 pilots fly in cloth and soft leather helmets. The fifty-mission crush cap had a danger of its own in the protruding screw that was the back part of the cap badge. Luckily, I finished my career in F-5 recon planes, which took pictures and did not have the gunsight.

The hard hat is a great thing. It must have saved the lives of a few thousand airmen.

Dr. Julian MarDock  
Dallas, Tex.

Your August 1986 article "Brain Buckets" was of great interest to myself and staff. Your historical references in particular caught our attention. They are correct and accurate, with one glaring exception. On page 88, in the description and explanation of the Personal Equipment Laboratory,

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 legible (preferably typed). We reserve the right to condense letters as necessary. Unsigned letters are not acceptable, and photographs cannot be used or returned.

ry, you quote a letter written by Donald Husley of the Clothing Branch. While the letter itself is correct, the author's name is not. The correct name is Donald Huxley.

Mr. Huxley was the Chief of Air Force Clothing until 1975. During his long, illustrious tenure in this position, Mr. Huxley was the "guiding force" behind innumerable clothing and personal equipment items. Everything from helmets to service dress uniforms was affected by his personal goals of excellence. Of particular historical significance, Mr. Huxley personally participated in the selection of the blue shade now recognized as "Air Force Blue."

We feel very strongly that this error should be noted and corrected. Mr. Huxley passed away in July, but his participation as one of the Air Force's founding fathers should be remembered. I am privileged to sit at the desk once occupied by this great man.

Maj. Mitchell N. Driggers, USAF  
Chief, Clothing Division  
Life Support SPO  
Wright-Patterson AFB, Ohio

• Donald B. Huxley passed away on July 2, 1986. He retired in 1975 as the Chief of the Clothing Division at Wright-Patterson AFB after a distinguished thirty-four-year career. For his professional achievements, he was awarded AFSC's Meritorious Service Medal in 1962. We apologize for the misspelling.—THE EDITORS

## Air Force One

Having just read your August 1986 "Aerospace World" item on the new Air Force One, I thought your readers might be interested in a brief story about the old Air Force One of 1959.

While serving as the ARDC Chief of the KC-135 SPO, a joint project office back then, the AMC Chief (Col. George Leslie) was directed to proceed with the procurement of a replacement for the Independence, a DC-6. Three Boeing 707-120 series aircraft were nearing completion for Cubana Air, which defaulted come Castro. Like those intermixed with the Continental Air Lines order, they



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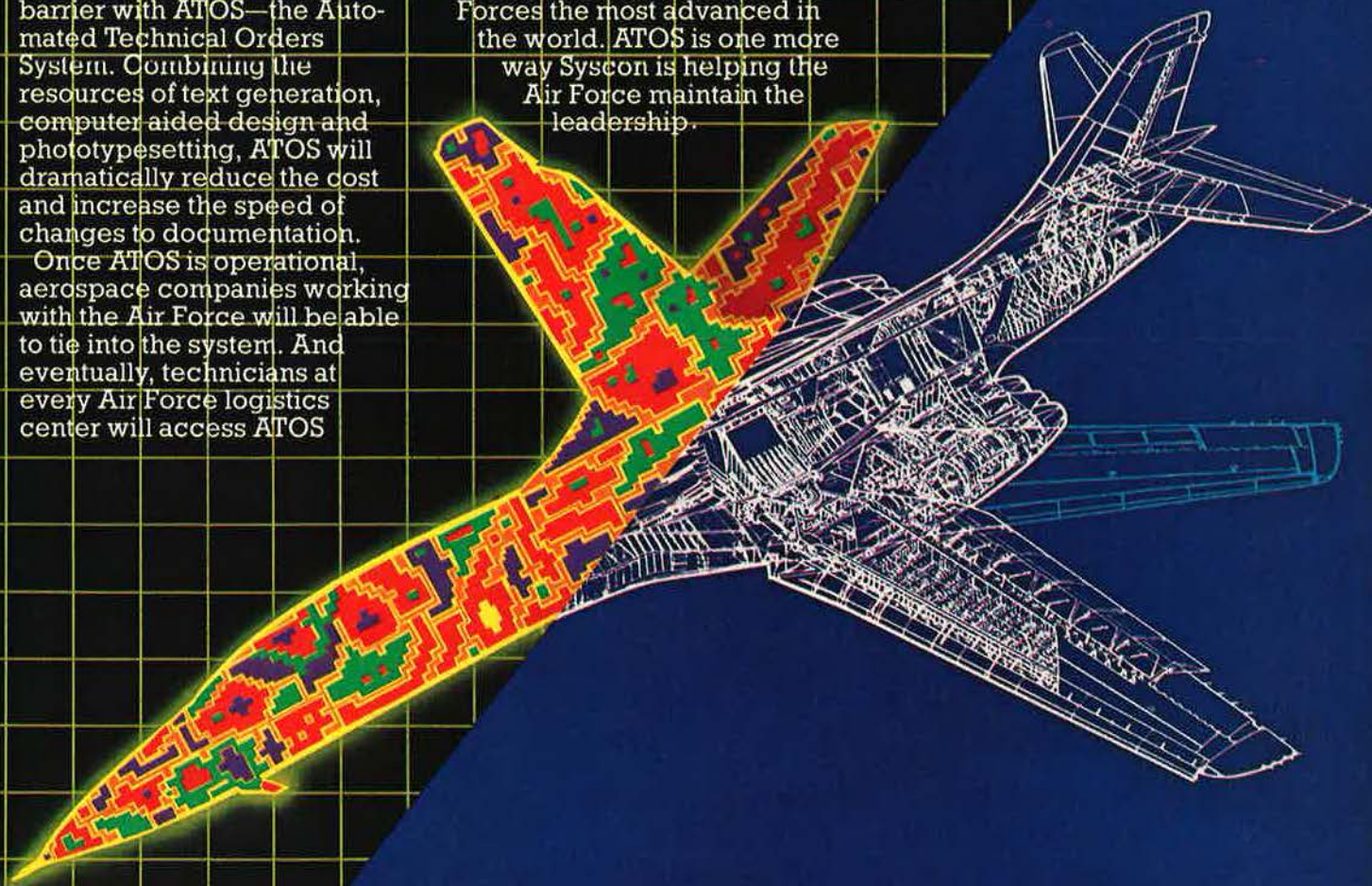
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Charles E. Cruze  
1501 Lee Highway  
Arlington, Va. 22209-1198  
Tel: 703/247-5800

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91-101 Oxford Street  
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## AIRMAIL

had the required two engine starters rather than one, but Continental had all they could use at the time, so Boeing approached the Air Force.

The purchase contract was negotiated by Nathan Silverman of the KC-135 office for the procurement of all three of the Cubana aircraft for \$12 million, sans engines. All three were configured identically and designated VC-137A. The first was delivered on April 30, 1959, and all three are still in the fleet, though with new engines, as C-137Bs.

As now equipped, one would guess that they are worth \$12 million on today's market—and that after twenty-seven years of TLC!

Col. C. R. Webb, Jr.,  
USAF (Ret.)  
Treasure Island, Fla.

### The P-12 Fun Machine

I just wanted to write and tell you how much I enjoyed the article "The P-12 Comes Home" by Steve McElroy, which appeared in the July 1986 issue. The reproduction of General McElroy's painting was especially enjoyable to a lover of old biplanes like myself.

I had the pleasure of serving as legal advisor to the Air Force Museum while I was stationed at Wright-Patterson AFB, Ohio, from 1975 to 1982 and was able to follow the restoration of 31-559 from its earliest days almost to completion of the project. Unless you had actually seen it, you would not believe the miracles that the restoration folks at the Museum worked on this aircraft. This is truly one of their finest efforts, and General McElroy has captured it all in his painting.

Also, my thanks for the yearly information contained in the annual May Air Force Almanac issue and especially for the inclusion of tail codes and markings this year. I hope you will continue this fine coverage in the future.

Lt. Col. John Langley,  
USAF (Ret.)  
Colorado Springs, Colo.

Steve McElroy's artwork and story "The P-12 Comes Home" in the July 1986 issue were first rate. However, there was one little error in his list of surviving P-12s that should be corrected.

The P-12E that he described as re-

portedly being an unflyable part of the Ontario Air Museum collection is fully operational and has taken part in many airshows over the past quarter of a century. For that matter, the museum is also listed incorrectly. It has been located at the Chino Airport in southern California since the early 1970s.

The museum's actual title is The Air Museum "Planes of Fame," and it first opened to the public in Claremont, Calif., in the late 1950s. The museum later relocated to the Ontario International Airport and, in the 1960s, moved to Buena Park, Calif. Now firmly entrenched at Chino Airport, the museum has a long-term lease and is in the midst of an expansion program that is making it a major attraction in the southern California area.

The Air Museum has more than seventy aircraft in its "Planes of Fame" collection. Eighteen of those aircraft are flyable, with new restoration projects being the order of the day.

By the way, the museum's P-12E has flown in both Army Air Corps and Navy markings over the years. When taking part in airshows with a Navy theme, the museum staff simply replaces the P-12E engine cowl ring with an F4B-3 cowl ring and repaints the airplane to represent the Navy version.

Although the museum is the oldest aviation museum on the West Coast and has an extremely varied collection of US and foreign aircraft, some of which are the last remaining examples of their particular types, it doesn't seem to receive as much attention as the Confederate Air Force. . . .

Frank B. Mormillo  
Covina, Calif.

### The Philippines Situation

In the July 1986 issue, Gen. T. R. Milton assessed the present conditions in the Philippines in relation to US interests (see "The Reality of the Philippines," p. 111, July '86 issue). I commend his conclusion that there is an urgent need to assist in rehabilitating the military, political, and economic structures. I only wish that the article had been written ten years ago, when it was evident to many in the Filipino-American community that Mr. Marcos was detrimental to bilateral interests. Well, better late than never.

The situation has improved dramatically with the overthrow of the Marcos dictatorship and the return of democracy. The economic disaster left behind by Mr. Marcos could be alleviated by Washington by either con-



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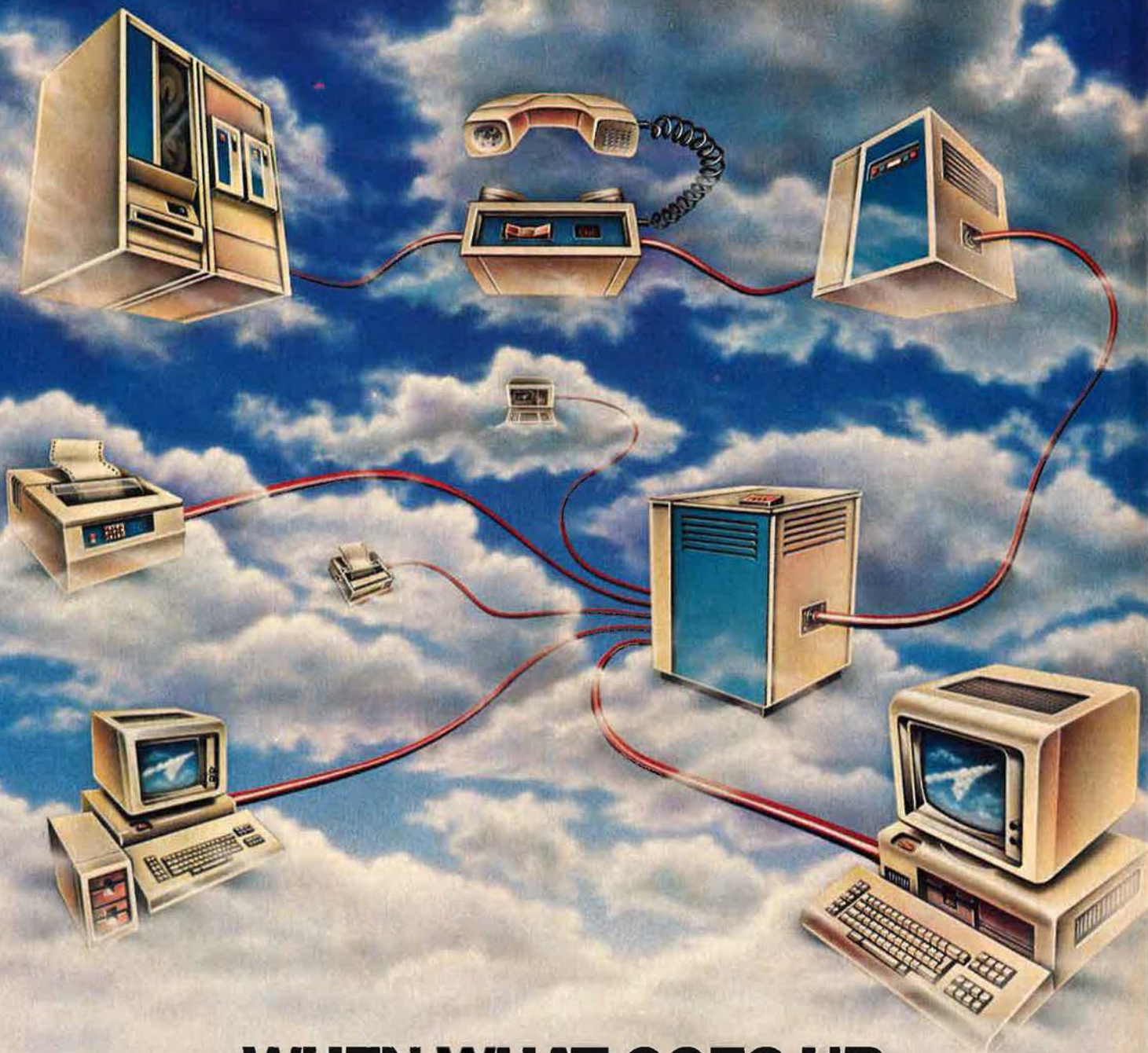
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vincing Mr. Marcos to return the \$5 billion to \$10 billion of stolen wealth or providing to the Philippine Good Government Commission intelligence data that could be used to recover the loot rapidly.

A drastic increase in foreign aid is unlikely because of Gramm-Rudman; therefore, the recovery of the stolen wealth is critical, considering that the Philippine external debt is about \$26 billion. Let us not allow misplaced loyalties to get in the way of common sense when dealing with Mr. Marcos and the stolen wealth.

Another step that the US could take to assist the Philippines is to make sure that Mr. Marcos behaves as a "guest" in Hawaii instead of allowing him to destabilize the Aquino government, as was shown by Mr. Tolentino's recent attempt to declare himself acting president.

With respect to the Aquino policy toward the NPA, General Milton must be corrected in his impression that it is a "kiss-and-make-up" policy. The policy is a serious effort at reconciliation. The solution to the Communist insurgency is not military, but economic. In the war against the NPA, the food truck is a more valuable weapon than a helicopter gunship when trying to win hearts and minds.

Enrico L. Montesa, Jr.  
Woodside, N. Y.

### Misplaced Medal?

I read with great interest the story by John L. Frisbee about Medal of Honor winner Capt. John Walmsley during the Korean War (see "Experiment at Yangdok," p. 112, July '86 issue). However, this story left a lot of unanswered questions.

The most important question that concerns me regards whatever became of the other crew members aboard "Skillful 13." When I flew the B-26, we had a crew of three with the hard-nose B-26 or a crew of four with the soft-nose B-26. My thoughts are with those other crew members. Mr. Frisbee devotes the entire article to the pilot, as if he flew the entire mission solo. There were at least three other valued human beings on that plane who were a necessary part of that mission.

As part of a B-26 crew on numerous bombing runs, I know that we were always briefed to expel our ordnance and come home so that we could fly again. In this case, Captain Walmsley chose to risk the lives of three or four men and an aircraft for the possibilities of getting a hit on a train. For "his" determined effort, he was awarded the Medal of Honor. What about the other crew members?

## AIRMAIL

In the heat of battle, I could see where a fighter pilot "might" risk himself and his aircraft on such an operation. But a bomber pilot should never have risked the additional lives. It certainly never happened on the missions I flew. The safety of the crew was always most important—to bring the bird and crew home to fly again. According to Mr. Frisbee, Captain Walmsley was "well aware of the risk." So why did he take it? Mr. Frisbee does not indicate whether "Skillful 16" even got the train.

The pilots who put this pilot in for the Medal of Honor and those pilots who endorsed this honor, in my estimation, used poor judgment. I keep thinking of those other crew members. What a waste.

Lt. Col. Alfred A. Zealy,  
USAF (Ret.)  
Brookfield, Wis.

### Forward Airlift

The letter "The C-17 Controversy

Continues" from 1st Lt. Glenn D. Butler requires a response (see "Airmail," p. 15, July '86 issue).

A lot of emotion surrounds the question of landing intercontinental transports behind the front. Let's address the cost side first. Traditionally, successful military commanders use the best available equipment and tactics to achieve an objective. When B-52s were needed to bring pressure on North Vietnam, we used (and lost) them. We won't send a C-130 when a truck could do the job, and we won't send a C-17 when a C-130 sortie can handle a task.

On the other hand, when multiple C-130 sorties to the same destination can be replaced by a much smaller number of C-17 missions, that's probably a logical choice. The C-17's performance and survivability features give it an edge in a hostile environment.

Telling the Army what we are going to airlift has some obvious limits. The C-17 was sized around the requirement to carry a double row of standard Army trucks. That also gives us the capability to carry outside equipment that the C-130 or C-141 can't accommodate. The C-5 just doesn't work well in the forward-field environment. I'll let the Lieutenant handle the

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lask of telling the Army division commander why he can't have any of his heavy equipment deployed forward by air.

Finally, the charge that MAC wants a "new high-tech" plane to keep up with SAC and TAC is well off the mark. The C-17 has been specifically designed around proven technology that has flown commercially or been tested in the YC-14 and YC-15 programs. Supportability is essential in an airlifter, and the C-17 will have it.

The C-17 will not replace the C-130, but it will offer a flexible airlifter to bridge the gap between the strategic and tactical airlifters in the current fleet. I've flown the C-130 in SEA and the C-141 and worked on the C-17 program. It's going to be an airlifter we can all be proud of. With the airlift shortage, there will be plenty of work for all of us.

Lt. Col. Michael R. Gallagher,  
USAF  
Travis AFB, Calif.

Aside from possible enemy aircraft, it's always seemed to me that the problem with expensive airlift aircraft in the combat zone is airfield security.

An example is Danang in Vietnam, which I first saw in early 1966. A few minutes after landing, the aircrew was in the traditional knees-and-elbows mode to the nearest bunker because of a mortar attack. Five years later, the only difference was that the siren was louder and the incoming was rockets. The ground forces had had six years to build up an extensive security and pacification program around Danang, but it still wasn't secure.

The big heavy is obviously needed to get the stuff across the ocean. Thus comes the need for a smaller, simpler aircraft in which cargo and people can be transhipped quickly.

The notion is somewhat akin to what commercial carriers do regularly, although our "packages" will be bigger. It would also allow for full use of the CRAF, whose airplanes need the upscale airfield.

Perhaps it's time also to consider putting a single pilot on the short-haul airlifter, assisted by a crew chief/loadmaster. My own experience reveals that a single pilot can fly short airlift flights totaling more than 100 hours a month without jeopardizing the mission.

Col. Robert B. Downs,  
USAF (Ret.)  
Loomis, Calif.

• For more on airlift, see the article by Gen. Duane Cassidy, "MAC's Moment of Truth," on page 114 of this issue.—  
THE EDITORS

## AIRMAIL

### The Mighty Titan

My compliments on the July 1986 "Intercom" item about the world's only intercontinental ballistic missile site open to the public: the Titan II missile museum operated by the Pima Air Museum in southern Arizona.

As the last Titan IIs are deactivated, so ends an era of nearly a quarter century of service by these guardians in defense of our freedom.

I applaud the dedicated SAC Air Force crews and personnel who manned and serviced the missile sites over the years and all who were instrumental in making the Arizona Titan II museum a reality. Through your efforts, the Mighty Titan II will still live on.

Larry Nielsen  
Oxford, Wis.

### Milton Doubleheader

What a nice surprise! A Milton doubleheader in the June 1986 issue (see *Contributing Editor Gen. T. R. Milton's "Airpower in Iberia" and "Remembering 'Hap' Arnold" in the June '86 issue*).

I have enjoyed the magazine since its inception, and in recent years, the very excellent articles by General Milton have been the first thing I turn to. Two in one issue made my day.

General Milton has a way of taking a subject of mediocre interest—to me, anyway, perhaps not to Iberia—and making it very clear and interesting.

All your articles and features are good, but General Milton's work is outstanding.

Jerry S. Stover  
Dallas, Tex.

### The Fine Print

I would like to bring to your attention an error on page 192 of the May 1986 Almanac issue. The 419th Tactical Fighter Wing is listed in the box on "USAF Aircraft Tail Markings" as an ANG unit. We are an AFRES unit.

We have received hundreds of calls informing us of the error, which proves that Reservists do read the fine print.

Barbara Ann Vessels  
Chief, Public Affairs  
Hill AFB, Utah

• Ms. Vessels is correct. We apologize for the error.—THE EDITORS

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*Flight Test to Div Mgr:  
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Last of 12 Mirage completed flight test at 10:00. In process C-130 D-check proceeding O.T. 707 special mission conversion to be in hangar at 24:00. 3 J-79's and 4 J-52's in process. 5 T-56's in inspection. 3 J-52's, 2 F-100's, 1 Atar, 2 PT6's and 5 Allison 250's in test cells. F-110 crew chief training accomplished.

*Engine Plant to Div Mgr:*

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## AIRMAIL

### The Proud Guard

I, along with many other members of Air National Guard units, would very much like to see AIR FORCE Magazine publish more articles about the Air Guard.

After having served four years of active duty with USAF, including a tour in SEA, I remained uninvolved for ten years prior to enlisting in the Guard. Since enlisting in the Guard, I have discovered a totally different Guard from the one we on active duty had so casually laughed about and referred to as "weekend warriors."

I see a very qualified, very professional, and totally dedicated group of individuals with years of military experience that is closely united to serve our nation. I see those years of active-duty training and experience, which could have been wasted, being used to maintain and fly aircraft and, above all, to train new enlistees in various skills that make their active-duty schooling more meaningful. I see a "group" pride and dedication that are seen among that select group of dedicated active-duty career personnel.

Gen. Duane Cassidy, MAC Commander in Chief, presented our unit with the first of eight C-141Bs on July 12, 1986. We are the first unit not on active duty to receive these aircraft. This is only one of my unit's firsts. . . .

The Guard is a definite credit and positive plus to the US Air Force and our nation, and I am proud to be a member.

The next time that any of our active-duty counterparts sees a C-141 taxi on their ramp with "Mississippi Air Guard" stenciled over the wheel well, they can be assured of finding a proud, professional crew flying a first-class aircraft that has been put in the air by a first-rate ANG unit.

SSgt. William C. Smith,  
MissANG  
Jackson, Miss.

- For more on the delivery of C-141B aircraft to the Guard and Reserve, see the item in "Aerospace World" on page 40 of this issue. Also in this issue, the articles "No Secret to Success," "Citizen-Airmen Do It Right," and "Manpower, Missions, and Muscle" highlight Guard and Reserve capabilities and achievements.—THE EDITORS

### Burtonwood

I am currently researching the history of the now disused Burtonwood airfield, used by the USAAF during World War II. I would be particularly interested in copies of old maps, runway layouts, base newsletters, photographs, or in contacting any ex-GIs stationed at the base during World War II.

This information is intended for my own use and is not for publication. Please contact me at the address below.

R. J. Monaghan  
36A Ashton Ave.  
Rainhill  
Merseyside L35 0QG  
England

### Remember Pearl Harbor?

For a book in progress evoking December 7 and 8, 1941, I would appreciate first-person accounts (or references to them) from persons whose experience of those days, from anywhere in the world, was war-related and memorable.

Please contact me at the address below.

Stanley Weintraub  
Institute for the Arts &  
Humanistic Studies  
Pennsylvania State University  
University Park, Pa. 16802

### Service in England

The BBC is making a series of documentaries about relations between Britain and America in this century. The producers would very much like to hear from members of USAF who have memories of any time they spent in England between 1958 and 1973.

Please contact the address below.

Anne Hartmayer  
BBC-TV  
630 5th Ave.  
New York, N. Y. 10111

### Fifteenth Air Force

I am interested in corresponding with former members of the Fifteenth Air Force stationed in Italy. I am interested in learning about unauthorized night flights to Palestine carrying ammunition for the underground there.

Please contact me at the address below.

Howard F. Jackson  
117 Second St.  
Garden City, N. Y. 11530

### Auditors in Vietnam

I am researching the topic of Air Force military auditors and their activities in Vietnam and Southeast Asia. I would like to hear from former auditors, commanders, or anyone else having information that I might



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## AIRMAIL

be able to use in developing one or more articles on the subject.

Any stories, reminiscences, audit reports, or other documentation would be very much appreciated. If you request, I will copy all information sent and return the originals to the sender. Please contact me at the address below.

Capt. Jim H. Crumpacker, USAF  
PSC Box 2561  
APO New York 09021

### Moby Dick

I am a writer researching the Moby Dick and WS-119L balloon programs.

I am interested in hearing from anybody involved in planning, operations, launch, recovery, or analyses of the Moby Dick weather balloon flights (1952-53), the WS-119L reconnaissance balloon training flights (1955), the first operational flights (January and February 1956), test flights of the improved version (1957), and the second flight series (1958).

Please contact me at the address below.

Curtis Peebles  
1164 E. Madison Ave.  
El Cajon, Calif. 92011

### Collectors' Corner

I am a pack rat and aviation history buff who must dispose of a hoard of aviation magazines. Perhaps there's another aviation historian among readers who would like to have these magazines for the cost of postage.

These magazines include *Flying* (1969-78), *Air Classics* (1972-78), *Plane & Pilot* (1974-79), and *Air Progress*. None of the years is complete.

Please contact me at the address below.

Lt. Col. Lawrence H. Boteler,  
USAF (Ret.)  
1709 James Payne Circle  
McLean, Va. 22101  
Phone: (703) 241-0575

I am a serious collector and historian of USAF air and security police memorabilia. I am interested in obtaining anything from unit patches to decorated helmet liners, fatigues, beret crests, and old photographs.

Please contact me at the address below.

Paul Block  
5718 Cambridge Lane, #1  
Racine, Wis. 53406

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I am a collector of military items and give talks on and display my things, but I have few Air Force items.

I would deeply appreciate any donations of patches, uniforms, and especially flight helmets and gear. Donations will be acknowledged, and I will reimburse shipping costs. Please contact the address below.

Mike Walsh  
RR 1, Box 66  
Easton, Minn. 56025  
Phone: (507) 787-2210

I am starting a collection of Air Force patches and insignia. I am es-

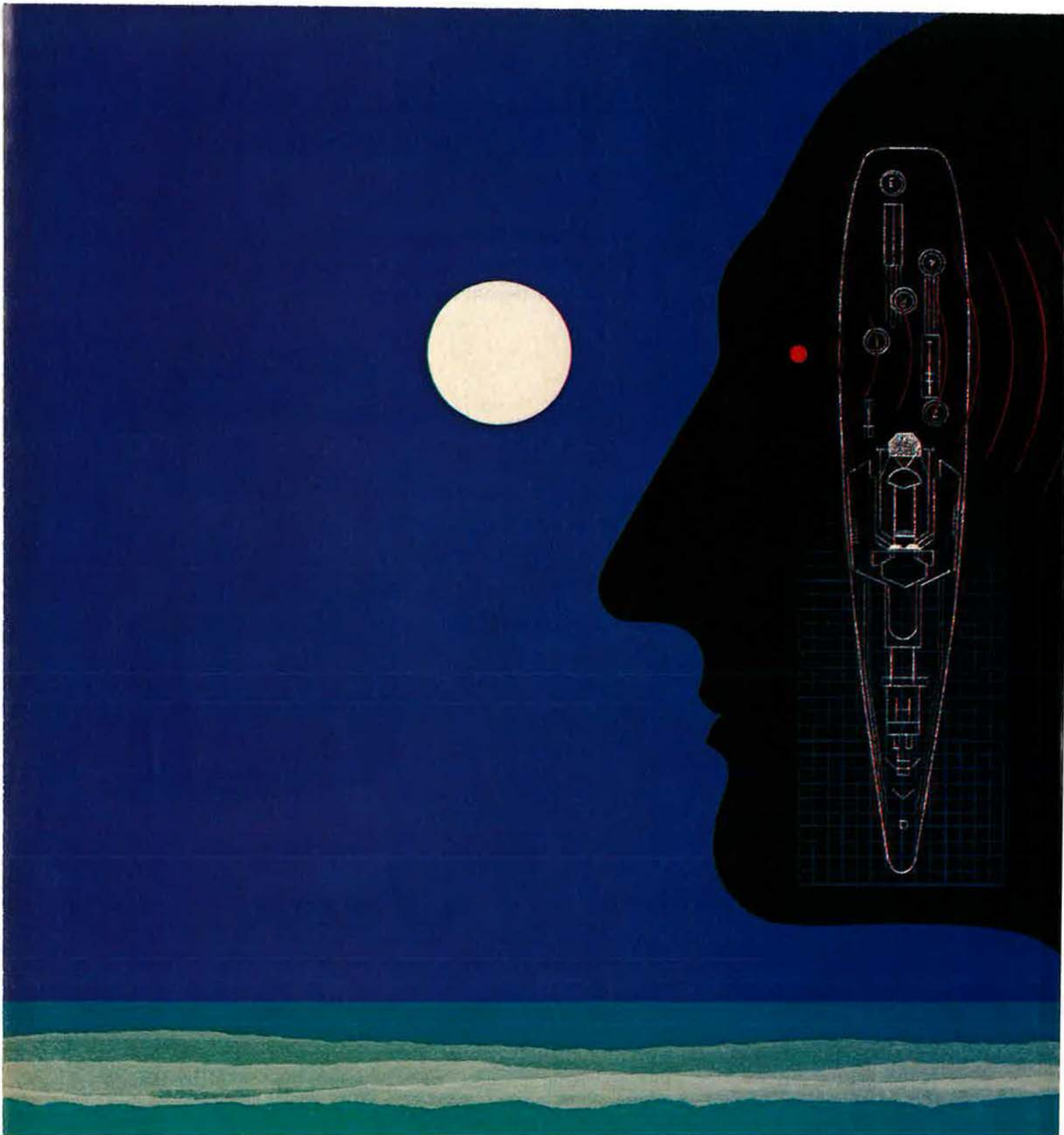
pecially interested in patches of fighter squadrons and wings.

Mike Thompson  
905 Evergreen St.  
Hillsville, Va. 24343

I would like very much to obtain a pair of metal insignia worn on uniform epaulets by members of the Central Flying Training Command during World War II. They are blue and gold and bear the inscription *Ut Viri Volent*.

Maj. T. F. Bryant, Jr.,  
USAF (Ret.)  
608 Everett Dr.  
Danville, Calif. 94526





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## IN FOCUS...

# Dealing With Ambiguous Warfare

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

*The revitalization program for Special Operations Forces is on track and will include much-needed airlift improvements. Organizational change—and some centralization—seems likely as well.*

Washington, D. C., Aug. 4



Earlier this year, the US Secretary of State, George Shultz, urged an intergovernmental task force convened by the Pentagon to help draft an active US strategy for "dealing with ambiguous warfare." This coinage, he went on to explain, encompasses a range of politico-military operations that Americans traditionally have been uncomfortable with because of the very ambiguity that unavoidably ensues from "conflicts involving limited uses of force for limited ends." At the same time, he predicted that "at least through the remainder of this century, [the] future of peace and freedom may well depend on how effectively we meet" low-intensity conflict and various forms of special operations that are being lumped together under the omnibus term of "ambiguous warfare." And the Secretary of State concluded with this appeal: "Just as we turned to our men and women in uniform when new conventional and nuclear threats emerged, we are turning to you now for the new weapons, new doctrines, and new tactics that this new method of warfare requires."

Secretary of Defense Caspar W. Weinberger, at the same occasion, suggested that there is a "mask on the face" of ambiguous warfare. In "virtually every case, behind the mask is the Soviet Union and those who do its bidding."

Although Special Operations Forces (SOFs) are not synonymous

with ambiguous, limited warfare, they are, and presumably will continue to be, a principal tool for coping with this challenge. Clearly, the SOFs are among the most concrete aspects of limited conflict and form the fulcrum of congressional and executive branch efforts to improve this nation's capability for dealing with the range of conflicts that the public thinks of as "dirty little wars."

At this time, the special operations business is not lacking for rhetorical or budgetary support. As the Pentagon's Assistant Secretary for International Security Affairs, Richard L. Armitage, told a House Armed Services Committee panel recently, "We have already come a long way" in regard to SOF. In 1981, the SOF budget stood at \$441 million. The request for 1987 is four times that figure, or \$1.6 billion.

Secretary Armitage, who serves as the Defense Department's proponent of all SOF policy matters, told the congressional panel that the Administration is determined to shore up SOF-related airlift, the central remaining weak spot in terms of special operations capabilities, by "seeking reprogramming that could exceed \$5 billion over the [current] five-year defense program." In general, he went on to explain, the Administration has sought over the past five years to bolster comprehensively the nation's special operations capabilities, and "we are now at the midpoint of the process." The deadline for completing the SOF revitalization program is 1990.

Congress, not to be outdone, jumped on the bandwagon with H.R. 5109, which at this writing is wending its way to the floors of both chambers. Its objective is to establish a "National Special Operations Agency" within the Department of Defense. This proposed agency—to be headed by a director picked by the President and approved by the Senate—is to have "unified responsibility for all special operations forces and activities" within the Pentagon. The bill calls for the National Special Operations Agency to "exercise command and operational control of all special op-

erations forces, including reserve forces, except for SOFs specifically assigned to unified combatant commands."

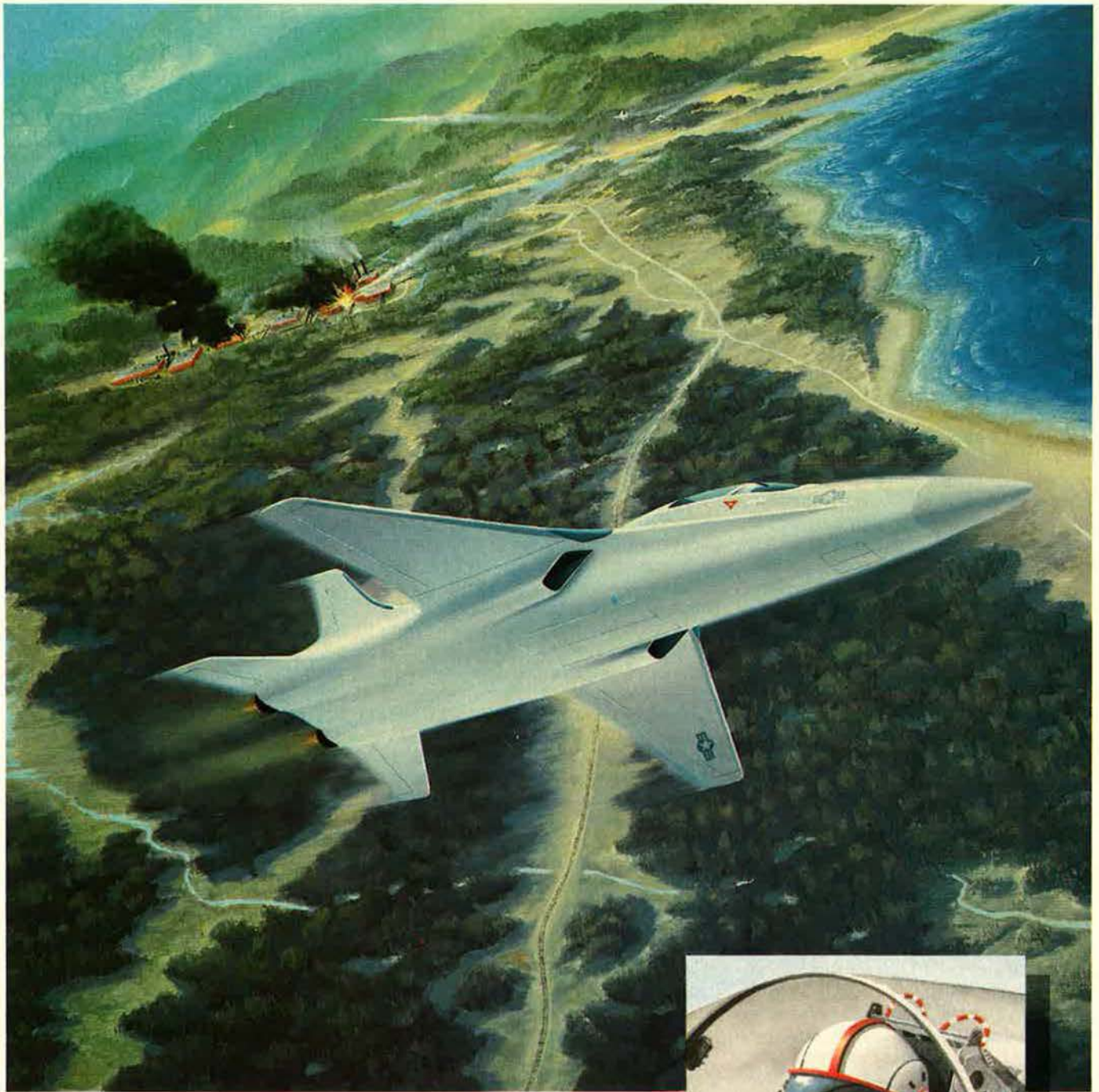
The as yet tentative legislation does not ease current restrictions on special operations—such as prohibitions against engaging in clandestine foreign intelligence collection and against covert actions, except in time of war. Sanctioned activities that the new agency would control and to which it could commit SOFs consist of direct action; strategic reconnaissance; unconventional warfare; foreign internal defense; civil affairs; psychological operations; counterterrorism; drug interdiction, including coordination with other government agencies; humanitarian assistance; theater search and rescue; and other activities specified by the President or the Secretary of Defense.

The bill stipulates that all SOFs shall be assigned to the new agency, with the proviso that the Secretary of Defense can allocate such forces from the Agency to combatant commands as needed. Further, forces assigned to the National Special Operations Agency will be organized as the Joint Special Operations Command. The Deputy Director for Operations of the Agency—who is to be a military officer above two-star rank—is to be the head of the new command.

The Joint Chiefs of Staff, meanwhile, have spelled out their own preference for streamlining the SOF command structure. Their concept revolves around what the Chairman of the Joint Chiefs of Staff, Adm. William J. Crowe, Jr., designated as a new Special Operations Force Command (SOFC). Stressing that the projected growth of the SOFs to a force of 30,000 or more active and reserve personnel entails the requirement for more joint or unified training and exercises, he acknowledged that there is "considerable confusion among different groups" as to what the capabilities and missions of the SOFs ought to be.

As a result, the Joint Chiefs of Staff started a review of the SOF issue, especially with regard to standard doc-





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trine, special equipment needs, associated intelligence requirements, and professional educational patterns of the individual services so far as their SOF components are concerned. The findings of this analysis, Admiral Crowe told Congress, prompted the Joint Chiefs of Staff to ascribe the following characteristics to the new Special Operations Force Command:

- Headquarters for the Command would be located in Washington, D. C.

- The commander, a three-star general or flag-rank officer, would report to the Secretary of Defense through the Joint Chiefs of Staff in the same manner as a unified or specified commander.

- The Chairman of the JCS would serve as the spokesman for the commander or, depending on the outcome of pending moves to change the structure of the Joint Chiefs of Staff, as overall supervisor on behalf of the Secretary of Defense.

- Special Operations Forces would be assigned to the command after achieving certain skills at the level of individual or team training, which would continue to be a service responsibility.

- The new Special Operations Force Command would take over from this point forward to mold the SOFs into a joint, cohesive operational force.

- SOFC's tasks would include warfighting concept development, doctrine, SOF-related military education, training, equipment development, interoperability, and readiness.

- The SOFC commander would act also as the SOF advisor to the Chairman of the Joint Chiefs of Staff.

- In case of SOF operations directed by the National Command Authorities (the President and his designated representatives) rather than through a unified commander, the SOFC commander, suitably reinforced, "could assume direct control of the operation, if directed to do so."

- Civilian oversight of the new command and its forces, the Joint Chiefs recommend, "given its focus on overseas rather than domestic employment and necessary coordination with the State Department," should remain with the Assistant Secretary of Defense for International Security Affairs.

With respect to in-theater arrangements, the Joint Chiefs of Staff recommend that the *status quo* be maintained: "The [individual] CINC's Special Operations Command (SOC) is an appropriate and satisfactory arrangement whereby the CINC normally exercises command and con-

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## IN FOCUS...

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trol over Special Operations Forces." Admiral Crowe added that "we would not want it any other way for global conventional war planning or for major contingencies, short of general war within the Unified Commander's theater." Among potential in-theater SOF tasks, he cited deterrence of state-supported terrorism or subversion, the injection of various forces to evacuate Americans safely from a country in turmoil, and the rapid reinforcement of friendly countries or governments under attack.

The JCS plan for revitalizing the Special Operations Forces, Admiral Crowe testified, "may not go as far as some would like," but "affords the Special Operations Community an unparalleled opportunity to apply their professional knowledge, skills, and imagination to new warfighting concepts, doctrines, and plans in support of national security objectives." In addition, the approach recommended by the Joint Chiefs imbues the SOFs with multiservice cohesion, gives the Special Operations Forces a voice in resource planning that they lacked before, and, "above all, it enjoys strong support from civilian as well as military leadership of all the services within the Department of Defense."

Under the JCS plan, the SOFs would be encouraged to strengthen their *esprit de corps* and to become "more integrated, achieve greater stature as a multiservice community, and receive proper recognition and promotion." At the same time, the Joint Chiefs of Staff are "wary of philosophies holding that one community is more elite than another," Admiral Crowe pointed out.

The JCS's blueprint for revitalization of the SOFs envisions that the individual services continue to program, procure, and maintain equipment assigned to or earmarked for Special Operations Forces. Similarly, the services would be responsible for maintaining the personnel pipeline to units assigned to the SOFC. Such an arrangement makes eminently good sense, since there is no way to divorce the SOFs from "service resource and support without becoming prohibitively expensive and creating a completely different service with all the administrative machinery that involves," according to Admiral Crowe.

## Revamping DoD's Acquisition Hierarchy

The final report of the President's Blue Ribbon Commission on Defense Management, known popularly as the Packard Commission, culminated in a host of provisions that can be expected to acquire the force of law before the end of this year. By then, Congress, in concert with the Administration, will probably have provided the statutory underpinning for the broad revamping of the Pentagon's military and management functions envisioned by the Packard Commission, according to David Packard, the panel's highly influential chairman.

While the panel's final report contains few departures from the comprehensive interim report issued earlier this year (covered previously in detail in this space), it elaborates on and refines several key recommendations.

In the acquisition sector, the Commission recommends that the President "direct the Secretary of Defense and OMB [the Office of Management and Budget] to institute biennial budgeting for Defense for the Fiscal Year 1988-89 Defense Budget and budgets thereafter." Further, the Defense Department should present its budget requests to Congress "within an operationally oriented structure." At the same time, "baselining [essentially a method for ensuring disciplined program management] and multiyear procurement should be used as much as possible to reinforce" stable progression of major programs from R&D to full procurement, with "milestones" acceptable to Congress as well as the Defense Department.

On the organizational side of the acquisition process, the Commission places central policy and oversight responsibility in the hands of a new "Level II" Under Secretary for Acquisition, who would be on a par with the Deputy Secretary of Defense and the Secretaries of the services. The White House, meanwhile, nominated Richard P. Godwin, a senior executive in the Bechtel Group, for this new job.

The Under Secretary of Defense for Acquisition (USDA) will supervise the performance of the entire acquisition system and set overall policy for R&D, procurement, logistics, and testing. The USDA, under the provisions of the Packard Commission, is to be ultimately responsible for determining that new programs are "thoroughly researched, that military requirements are verified, and that realistic cost estimates are made before the start of full-scale development."

Reporting to the USDA will be the Director of Research and Engineer-



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ing (now called the Under Secretary for Research and Engineering); an Assistant Secretary of Defense for Production and Logistics; the Assistant Secretary for Command Control Communications and Intelligence; the Director of Operational Test and Evaluation; and such other offices and agencies as the Secretary of Defense may designate.

Under the Commission's reorganization plan, the services are to create a mirror image of the USDA structure, with the respective service Secretary selecting a "Service Acquisition Executive in consultation" with the USDA. This official "should be a top-level Presidential appointee, of rank equivalent to a service Under Secretary." The Service Acquisition Executive will be responsible for administering service acquisition programs "under guidance from the Defense Acquisition Executive [USDA]."

The Packard Commission recommends, therefore, that only experienced acquisition managers be chosen for these assignments and that they devote "full time" to the acquisition responsibility. Also, "for major programs, the Defense Acquisition Executive and his service counterpart should function respectively like chief executive officers of a cor-

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## IN FOCUS...

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poration and a principal corporate subsidiary."

In turn, each service acquisition executive is to appoint a number of Program Executive Officers (PEOs) who, "like group general managers in industry, should be responsible for a reasonable and defined number of acquisition programs. Program managers for these programs should be responsible directly to their respective PEO and, on program matters, report *only* to him [or her]," according to the Commission's provisions. In this context, Commission Chairman Packard told this writer that, in the panel's view, the services had skewed program management one-sidedly toward military personnel. The Commission felt that a greater percentage of career civil servants should be assigned as program managers, he emphasized.

As in its interim report, the Packard Commission's final report emphasizes the importance and necessity of

prototyping, "either at the system or critical subsystem level." Operational tests should be combined with developmental tests of prototypes to uncover operational as well as technical deficiencies before a decision is made to start full-scale development.

Overall, the Commission felt that "the prototype program should allow us to fly—and know how much it will cost—before we buy."

### Washington Observations

★ The US Navy's new five-year budget plan calls for the development of two "blue laser satellites," probably of the excimer (rare gases laser) type, to provide reliable communications with submerged submarines.

Previously envisioned as operating in the blue-green segment of the spectrum, laser communications systems of this type are capable of penetrating clouds as well as seawater. Thus, they are potentially capable of solving the perennial communications problem of the ballistic missile submarines (SSBNs) that is caused by the requirement to come close to the surface to deploy a trailing wire antenna—and thereby betray their position—to communicate. The Navy also expects significant payoff from the blue laser communications pro-



## THE F-16 SET A NEW SURGE RECORD IN THE

While deployed at a remote air base, 18 U.S. Air Force F-16 Fighting Falcons engaged in a training exercise that set a new standard in combat fighter readiness.

Over the course of 16 flying days, the planes

and their pilots flew an average of 48 sorties. Then on the last day, in one 12-hour period, they flew 144 sorties. Sortie effectiveness was 100 percent. Turnaround reliability was 97 percent.

In fact, if it weren't for regulations that limit a



totype program in the antisubmarine warfare (ASW) field, in which the extensive "quieting" of Soviet submarines requires a "networking" approach.

★ The Senate Armed Services Committee is enforcing Air Force and Navy commonality with regard to both the USAF-developed ATF (Advanced Tactical Fighter) and the Navy-developed ATA (Advanced Tactical Aircraft) through a strict statutory provision. The bill prohibits the expenditure of funds for the full-scale development of either aircraft "until the Secretary of Defense has certified that the designs of the aircraft fully accommodate the essential requirements necessary to ensure cross-service utilization."

Congressional experts predict that acquisition of the subsonic, highly "stealthy" ATA would force the Air Force to curtail the buy of the F-15E. In the case of ATF, the Navy's carrier-landing requirement could impose major weight penalties on a common airframe.

★ The initially total and subsequently partial standdown of the US space launcher fleet between now and 1992, Air Force Secretary Edward C. Al-

dridge, Jr., told this writer, is not likely to cause any critical impairments of this country's intelligence, warning, or arms-control verification capabilities. This forecast presupposes normal life spans of the space-based sensor systems involved.

In case of shorter-than-expected on-orbit endurance, he added, the Air Force could seek to reconstitute critical space capabilities by using Titan 34D launchers before they are formally cleared for use. For the time being, this space launcher has been grounded because of two unrelated failures in 1985 and 1986.

At a recent Pentagon press conference, Secretary Aldridge also disclosed that the Air Force has informally examined the possibility of paying France for using that country's Ariane launchers to orbit some of USAF's Navstar GPS satellites.

In unveiling the Air Force's space-launch recovery program, Secretary Aldridge disclosed that the Vandenberg AFB spacelaunch complex, on which the Air Force has spent almost \$3 billion, will be completed and "maintained in an operational caretaker state until 1992." Savings from this measure—which, he said, did not constitute mothballing—might total about \$1 billion.

In order to boost the Air Force's expendable launch vehicle fleet size, which atrophied because of unilateral dependence on the Space Shuttle, several initiatives are being undertaken, according to Secretary Aldridge. The Air Force will be "procuring an additional thirteen Titan 34D-7 CELVs, which we now call the Titan IVs, to bring the total current program to twenty-three." In addition, USAF is "procuring at least twelve new boosters, called medium launch vehicles (MLVs), which will be used beginning in 1989 to launch twelve GPS satellites; increasing the East Coast Titan IV launch capability from about two per year beginning in late 1988 to four per year; and converting a Titan pad at Vandenberg AFB, Calif., for launching Titan IVs at the rate of two per year, beginning in 1989."

★ Congress is pressuring the Air Force to choose between an upgraded replacement of the aging Short-Range Attack Missile, the SRAM II, and the stealthy Advanced Cruise Missile (ACM). Current indications are that the solution will be to acquire the ACM as planned and to replace the aging, possibly "debonding" rocket motors of the remaining inventory of the original SRAMs. ■



## ONLY PLACE IT COUNTS. THE REAL WORLD.

pilot to four sorties per day, they could have flown even more. As it was, they set a new USAFE surge record of eight sorties per aircraft per day.

More important than a new record, however, is the demonstrated ability of the USAF to operate

the F-16 under real world conditions.

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**GENERAL DYNAMICS**



# CAPITOL HILL

By Brian Green, AFA DIRECTOR OF LEGISLATIVE RESEARCH

## Washington, D. C., July 29 Authorization Bills Approved

Both the Senate and House Armed Services Committees (SASC and HASC) have marked—and then remarked—their versions of the defense authorization bill. Both marks are far below the \$320 billion requested by the Reagan Administration. The bills must now be approved by their respective chambers and differences reconciled in conference.

The SASC finally approved defense budget authority of \$294.8 billion for all defense programs. The committee had earlier approved \$301 billion. The reduction brings the SASC authorization closer to the \$292 billion budget authority approved by Congress in late June in the joint budget resolution. Defense outlays were reduced from \$288 billion to \$286 billion, still higher than the \$279 billion budget resolution outlay target.

The SASC reductions were calculated on the basis of lower inflation estimates and lower fuel costs. The reductions were distributed by broad account only; earlier program funding levels were left unchanged. These included:

- \$675 million for the Small ICBM R&D program—a \$700 million reduction from the Administration request. Some of the funds would be fenced pending the outcome of the program review this December, which will determine the appropriate configuration for the small missile.

- Funding for twenty-one MX missiles and \$200 million of the \$388 million requested for R&D on a follow-on MX basing mode. The SASC positions on the MX and SICBM contrast sharply with the HASC authorization bill (see "Capitol Hill," July '86 issue).

- \$3.6 billion for the Strategic Defense Initiative (SDI), a twenty-five percent cut. The committee also adopted language, by a 10-9 vote, questioning the Administration's emphasis on population defense and arguing that emphasis should be on protection of US retaliatory forces.

- Virtually full funding for the C-17 airlifter.

The HASC remarked its authoriza-

tion bill to \$292 billion, up from its earlier \$284.9 billion. HASC-approved outlays increased from \$282 billion to \$285 billion. Committee Chairman Les Aspin (D-Wis.) continued to emphasize the disparity between the outlay targets in the budget resolution on the one hand and the committee markup on the other. Outlays are the basis of deficit calculations used in the Gramm-Rudman-Hollings balanced budget law to determine the need for further cuts. Floor amendments are expected to be introduced in the House to reduce the FY '87 defense outlays to \$279 billion and authorizations to \$282 billion.

Key program actions include:

- \$1.4 billion for the Small ICBM, the full Administration request.

- Elimination of funds for MX follow-on basing R&D.

- Conditional approval of funding for twelve MX ICBMs.

- \$151 million for the T-46 trainer canceled by the Air Force.

- \$200 million for a B-1 bomber contingency fund that will keep open the B-1 production lines without building more B-1s—an action opposed by the Air Force.

- \$587 million for C-17 R&D and \$180.3 million for procurement (\$612 million and \$217 million respectively were requested).

- Approval of testing of USAF's antisatellite (ASAT) system against an object in space, unless the Soviets dismantle their own ASAT system.

## Defense Reform Push Continues

The HASC attached a provision to its authorization bill calling for the creation of a National Special Operations Agency, a plan opposed by Chairman of Joint Chiefs of Staff (JCS) Adm. William Crowe and Assistant Secretary of Defense Richard Armitage. The proposal would create a unique defense combat agency (as opposed to the current support agencies) to be run by a civilian director (see "In Focus," p. 26).

The HASC also attached a package of thirteen acquisition reforms to its authorization bill, which would:

- Further define the role of Under Secretary of Defense for Acquisition, a position approved earlier by both the House and Senate.

- Require price, performance, and schedule baselines for all major acquisition programs.

- Reduce the use of military specifications for everyday products.

- Repeal the work measurement law that requires most contractors to provide the government with data on costs for labor and materials.

- Create a series of program executive officers, each of whom would oversee several programs and serve as the only management layer between the program managers and the acquisition executive.

Finally, the HASC approved a defense reorganization bill more extensive than the Senate-approved bill (see "Capitol Hill," July '86 issue). The bill would:

- Consolidate the civilian and military staffs of each military department. Air Force spokesmen express concern that the military staffs could be reduced to the level of support personnel.

- Create a joint specialty career. Joint assignments would be a prerequisite for promotion to general officer. Future commanders in chief and JCS chairmen would be required to have certain joint training and experience. These new requirements could lengthen career tracks.

- Provide authority to create "special combatant commands," with the shortest practicable chain of command, to respond to special military circumstances.

## G-R-H Provision Struck Down

The Supreme Court declared that the automatic budget cutting (or "sequestration") provision of the Gramm-Rudman-Hollings balanced budget law is invalid because it violates the constitutional separation of powers. Previously automatic cuts must now be referred to a special committee, passed in both chambers of Congress, and signed by the President. Efforts are under way to correct the bill's constitutional deficiency. ■



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# ADVANCING THE STATE OF THE ART

## Collins Avionics: Systems That Work When You Need Them Most.

From the beginning, Collins equipment served the needs of radio operators on land and sea, pilots and others who helped pioneer an industry. Today, more than 50 years later, our enviable performance record makes Collins equipment the logical choice where airline schedules, military missions or business appointments depend on reliable avionics. Our Collins Air Transport, General Aviation and Government Avionics Divisions have earned a reputation for supporting our products from introduction to final phase-out, and for working in a manner that our customers welcome.

## One Good Thing Leads to Another.

Forward-thinking manufacturers like Boeing know that the best way to repeat success is to start with what works best, then make it better. That's why the new 747-400 will fly with a new-generation Collins integrated display system, digital flight control system and central maintenance computer. We've advanced EFIS technology through improved display formats, reduced system power, increased reliability and cost-saving commonality. That's technological innovation. And it's why Collins systems also fly on Boeing's 737-300, 767 and 757 airliners.



## Weather Forecast: Smoother Flying Ahead.

Collins Doppler Weather Radar helps pilots detect areas of dangerous turbulence in a storm, and lets them take the safest, smoothest route to save fuel, improve on-time arrivals and keep passengers happy. The same breakthrough technology is found in the growing number of ground-based Collins Doppler Radar installations for airports, civil defense operations and TV and radio stations nationwide.

## The Integrated Cockpit: A Fact of Flight.

One of the world's most advanced business turboprops, the Beech Starship, will fly with a Collins "glass cockpit" (below). Included in the integrated avionics system are electronic flight instruments, digital flight controls, comm/nav and engine systems and other critical flight management functions. Developed in parallel with the aircraft design, the Collins integrated cockpit is packaged for reduced weight and volume, and designed for increased reliability and reduced pilot workload. It's a fact: Collins Avionics is bringing the future to the flight deck.



# COLLINS



# TE-OF-AN-INDUSTRY.



## We Put Ourselves in Your Position.

When the industry needed reliable Navstar Global Positioning System user equipment, Collins Avionics delivered—on time and on budget. Accurate to within 16 meters worldwide, our GPS user equipment for tanks, ships, submarines, aircraft and foot soldiers is beginning its production phase at a new, computer-integrated manufacturing facility. This equipment will use state-of-the-art devices with architecture to facilitate advanced technology integration. We're also developing a pocket-sized GPS unit for the DoD, and supplying Collins Navcore™ I commercial GPS receivers for precision navigation/position/time applications.

## A Data Link to the Future.

We've expanded the frontier of data link technology by flight-testing an experimental system that can monitor aircraft positions and relay operational and meteorological data over the North Atlantic via satellite. Engineering design is underway on similar systems for worldwide data and voice links between aircraft and ground. We also have a major role in the U.S. Joint Tactical Information Distribution System (JTIDS), which lets the military instantly identify, monitor and communicate positions of hostile and friendly aircraft in a jamming environment.



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nearly 900 engineers on in-house research directed toward a variety of advanced programs.

Among them: a high-speed data bus that promises a 50-to-1 improvement in throughput processing time over today's standards; a full-color, sunlight-readable flat panel LCD display that will cut instrument volume; an



integrated digital avionics system—called Concept 4—which will simplify both the design and operation of tomorrow's business jets; a computerized, robotic-assisted manufacturing facility that can dramatically reduce the cost of avionics; and an integrated military comm/nav/ident system that can replace a half-dozen or more present-day systems.

These are but a few of the promising programs now underway at our Collins Air Transport, General Aviation and Government Avionics Divisions.

If you'd like to learn more about how Collins Avionics can help you turn ideas into reality through innovative technology, write: Jim Churchill, President, Avionics Group, Rockwell International, Cedar Rapids, Iowa 52498. Or call (319) 395-3930.

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# AVIONICS



# READY. WILL

*Mission ready* has a new meaning at McConnell AFB where an entire wing of KC-135 tankers has been modernized with CFM56 engines.

Today, when the klaxon sounds, reengined KC-135 tankers of the 384th Air Refueling Wing move out with vastly greater fuel offload capabilities. In fact, two KC-135Rs now have the same average offload capability as three aircraft with original engines.

Deliveries of reengined aircraft have started at other US Air Force bases—at the rate of better than three aircraft a month. The production capability is also in place for faster deliveries as funding becomes available.





# LING. ABLE.

All reengined aircraft will get the benefits of CFM56 engines that are living up to everything expected of them. And then some. Reduction in fuel consumption, for example, was originally set at 25%. Actual fuel savings has averaged 27%, and comes close to 30% on training missions. During more than 25,000 engine flight hours, reliability has been extraordinary too.

In sum, the KC-135R reengining program adds up to a revitalized tanker force—one that's not only doing its own job better, but enhancing the mission readiness of the entire Air Force. **PROMISES COUNT.**

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# AEROSPACE WORLD

... PEOPLE ... PLACES ... EVENTS ...

By Jeffrey P. Rhodes, DEFENSE EDITOR

Washington, D. C., July 24

★ The president of the Air Force accident board investigating the April 18 Titan 34D explosion announced in a press conference on July 2 that the most likely cause of that mishap was a debonding of the rubber insulation from the steel rocket motor case, which allowed the solid-fuel propellant to burn through the casing.

Brig. Gen. Nathan J. Lindsay said that when the rocket fuel burned through the casing on the right-hand motor, the case could no longer sustain the normal internal operating pressure of 700 pounds per square inch, resulting in a rupture five inches below the joint between the first and second segments.

General Lindsay said that the O-ring seals of the solid-rocket motor did not contribute to the accident, as they did in the Space Shuttle *Challenger* accident, nor was it a design failure. "We recovered about ninety-five percent of the solid-rocket motor, and we were able to examine the joints. The O-rings and mechanical joints held up very well," said General Lindsay.

"This failure was simply one of detection," the General continued. "We periodically found evidence of bond weakening three or four times over two years of construction that were caught and fixed. There must have been something there originally, or perhaps the bond was weak. I don't know how the segment escaped detection." (The motor segments had been made by the Chemical Systems Div. of United Technologies between 1981 and 1982.) General Lindsay indicated that 940 successful segments have flown and that seventy flights have been launched with two solid-rocket motors.

General Lindsay further stated that the Air Force will "improve non-destructive inspection techniques and will survey what is state of the art. We will review the hardware. We are going to reestablish the confidence we have in the system." He also outlined a four-part evaluation that the program will undergo before Titan launches resume in early 1987.

The Titan 34D exploded at Vandenberg AFB, Calif., nine seconds after liftoff and about 800 feet off the pad. In addition to the loss of a classified payload, approximately \$70 million worth of damage was done to the launch site and an adjacent pad. Although the pad will later be modified to accommodate the heavier-payload-carrying Titan 34D-7, some pad reconstruction must be done before the launches can take place.

★ The AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) program got back on track July 15 when the missile passed within lethal range of a maneuvering QF-100 drone over the White Sands Missile Range in New Mexico. This latest launch broke a string of three unsuccessful firings in June and early July.

The mid-July launch was the first from an F-16's wingtip rail launcher and was the tenth guided launch in the missile's full-scale development (FSD) program. The nearly thirteen-

foot-long missile was fired from a production F-16 flying at Mach 0.85 at an altitude of 8,000 feet and was a front-aspect, look-down/shoot-down shot at medium range. The drone was flying at Mach 0.8 at 500 feet above the ground when the missile intercepted it.

The program hit a snag the first week of June, when two shots went awry in the space of three days. On June 2, the missile's motor failed to ignite after ejection from a Navy F/A-18 Hornet, and the AIM-120 fell into the ocean off the Pacific Missile Test Range at Point Mugu, Calif. It was the first developmental launch from a Navy aircraft and also the first from an F/A-18. That failure was believed to have been caused either by the ejector not giving the missile the required fifteen-G "kick" or by a malfunction in the missile's G-sensor. At White Sands on June 4, an AMRAAM fired from an F-15 in a head-on shot missed a QF-100 by a wide margin. This failure was caused by a software error.



A volunteer at Donaldson Center near Greenville, S. C., unloads a most unusual cargo for a C-141B—hay—as part of the "Moo-Aid" relief operation that began July 19. C-141s from Charleston AFB, S. C., and McGuire AFB, N. J., brought in more than 1,600 bales of hay on the first run to South Carolina. As this went to press, MAC had delivered more than 11,000 bales to drought-stricken areas.



On July 3, a missile fired from an F/A-18 failed to pass within lethal range of a QF-86 target. After normal separation and target updates, the missile apparently suffered a power failure and lost the target.

Hughes is the primary contractor on the AMRAAM program, and Raytheon is the second-source producer. The Air Force plans eventually to acquire 17,000 of the missiles, while the Navy has an order in for 7,000 AMRAAMs.



On June 25, the US Postal Service unveiled the design for a new stamp that will honor the late Gen. Henry H. "Hap" Arnold. No denomination or release date has yet been set for the stamp.

★ The Dassault-Breguet Rafale, France's new fighter aircraft, took off for the first time on July 4 from the company's St. Cloud facility. Chief Test Pilot Guy Mitau-Maurouard was at the controls for the one-hour flight that saw the aircraft exceed Mach 1.3 and check maneuverability up to five Gs. The flight took place only twenty-seven months after work began.

The Rafale features a delta wing and all-moving canards that interact with the wings and increase lift. Thirty-five percent of the structural weight is made up of new types of materials. The wings, canards, and forward fuselage are carbon fiber, while some fuselage panels, the tail fairing, and the leading edge slats are made of aluminum-lithium, aramid fiber, and titanium, respectively. The semiventral intakes have no moving parts and are designed for the optimum subsonic/supersonic performance compromise.

The pilot sits in a reclining seat for prolonged G-loads, and the side-stick controller is configured for hands-on throttle and stick (HOTAS) capability. The plane has quadruple redundant digital electric flight controls and has

new handling modes for gust alleviation, thrust/drag control, and high angle of attack control.

The version that flew is the Rafale "A," with two General Electric F404 engines. Production versions (the "B" model) will be powered by a pair of SNECMA M88 engines and will weigh less than the "A" and be slightly smaller. Development go-ahead is expected next year.

As planned, the Rafale will enter service with the French Air Force and Navy in the early 1990s. The aircraft will be used (with a dozen underwing hardpoints) for air-to-ground operations or (with either four medium-range MICA missiles and two MAGIC missiles or six MICAs) for air defense.

★ It may seem hard to believe, but the US Air Force is only nine years older than the Boeing KC-135 Stratotanker. With the coming, in the 1950s, of such jet bombers as the B-47 and B-52, the

shorter than the 707 and does not have cabin windows.

The Stratotanker enjoyed a remarkable production run, with 820 airplanes being built between April 30, 1957, and January 12, 1965. The bill for the entire group came to \$1.66 billion, or about \$2 million for each airplane.

Seven basic models of the KC-135 (used by Strategic Air Command, Military Airlift Command, and France) were produced over the years. The aircraft have since been modified into forty-six versions. The KC-135 has been used as everything from being an Air Force command post to chasing comets and eclipses on scientific missions. The very first KC-135A (serial number 55-3118) is still flying, although modified to an EC-135K configuration for Tactical Air Command.

The fleet is currently in the midst of two reengining programs. The special-duty aircraft and the KC-135s as-



For the past thirty years, the Boeing KC-135 Stratotanker has been filling the tanks of military airplanes all over the world. This picture shows the very first KC-135A (serial number 55-3118, the City of Renton) with the Model 367-80, its progenitor, peeling off. 55-3118 is still flying with TAC as an EC-135K.

Air Force saw the need to replace its fleet of 814 propeller-driven KC-97 Stratofreighters. Model 367-80, the company designation for the KC-135 prototype, first flew on August 31, 1956.

Often erroneously referred to as the military version of the 707, the KC-135 is actually a completely separate aircraft that flew eighteen months before the famous passenger liner did. The 707 fuselage is 148 inches wide, a full four inches wider than the KC-135; thus, much of the tooling for the KC-135 could not be used on the 707. The KC-135 is also four feet

signed to the Air National Guard and the Air Force Reserve are getting Pratt & Whitney TF33 engines from retired 707s and are being designated KC-135E. The SAC KC-135s are being retrofitted with higher-thrust General Electric/SNECMA CFM56-2 engines and are now designated as KC-135Rs. The reengined aircraft are expected to last at least another twenty-five years.

★ In a recent Air Force Policy Letter for Commanders, Gen. Earl T. O'Loughlin, Commander of Air Force Logistics Command, described one



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of the new programs that AFLC is developing as part of its new command strategy for component repair and manufacturing that takes into account wartime mission, skills requirements, and technology changes.

General O'Loughlin said that "one maintenance initiative that is gaining momentum is a Retirement for Cause Nondestructive Inspection System that is based on the premise that parts should not be retired simply because the work specification or other standards state a definite time for retirement.

"Under this program, parts will be inspected and, if still operational within required safety regulations, will be refurbished and continue to be used, even if past the retirement time specified in the standards. Estimated benefits are a cost avoidance of more than \$400 million for spare parts."

★ Willy and Joe would be appalled. In almost every frame of Bill Mauldin's legendary cartoon about Army life during World War II, either one or both of the characters had the remnants of a cigarette dangling out of his mouth. Soldier and cigarette seemed inseparable. That notion, however, changed on July 7, when the Army instituted its new "Controlling Smoking" policy, banning smoking in all Army-occupied areas except those specifically designated for smokers. The Army expects this plan to enhance readiness and to improve the health of the troops.

The provisions of this policy apply to all Army vehicles, aircraft, offices, buildings, facilities, and those spaces assigned to the Army by the General Services Administration.

The new policy will not attempt to prohibit smoking completely. It does allow for local commanders or their designated authorities to set up smoking areas so long as non-smokers are protected from the effects of second-hand smoke. Smoking areas may not be designated in auditoriums, conference rooms, restrooms, gymnasiums, fitness centers, and elevators.

Violators—including soldiers, Army civilians, and contractor personnel—who break the rules are subject to administrative action. Other violators could be removed from or denied access to Army-occupied buildings.

The Air Force and Navy are expected to announce their own no-smoking policies in the near future.

In a related action, the commander of the Army and Air Force Exchange Service (AAFES) has directed local exchange managers to remove all to-

## AEROSPACE WORLD

bacco products from health-care facilities if requested by the base or post commander.

★ The first Lockheed C-141B aircraft directly assigned to the Air National Guard and the Air Force Reserve were delivered in separate ceremonies the weekend of July 12. The delivery of the StarLifters marks a further step into strategic airlift by the reserve forces.

The Commander in Chief of Military Airlift Command, Gen. Duane H. Cassidy, flew the first C-141B to the 172d Military Airlift Group of the Mississippi Air National Guard on July 12. Soon after arrival, the *State of Mississippi* was flown to Italy, as part of a Guard deployment. The 172d MAG's C-130H aircraft were transferred to the 130th Tactical Airlift Group in Charleston, W. Va.

The 459th Military Airlift Wing at Andrews AFB, Md., received its first StarLifter on July 13. Maryland Gov. Harry Hughes dedicated the aircraft, naming it the *State of Maryland*. The unit received its second aircraft a week later and should receive its full complement of eight airplanes by next year. The 459th MAW's C-130Es were transferred to the 934th TAG at the Minneapolis-St. Paul International Airport in Minnesota.

The C-141Bs were transferred from the 60th and 63d MAWs at Travis AFB and Norton AFB, Calif.

In related action, the 136th TAW at Hensley Field in Dallas, Tex., an Air Guard unit, and the 908th TAG, an AFRES unit at Maxwell AFB, Ala., are scheduled to start receiving brand-new Lockheed C-130H aircraft in early August. Each of these units should receive their eight airplanes by year's end. The 908th TAG's C-130Es will be sent to the 914th TAG at Niagara Falls IAP, N. Y., whose C-130As will be retired. The C-130Bs from the 136th TAW will be distributed to augment five other ANG C-130B units.

★ The Boeing Co., General Dynamics Corp., and Lockheed Corp. announced on June 1 that the three firms would join forces to develop the Air Force's Advanced Tactical Fighter (ATF). The agreement includes design, manufacture, test, and support of the ATF.

McDonnell Douglas and Northrop, partners on the Navy's F/A-18 Hornet program, are reportedly considering a partnership for ATF development.

The Air Force is expected to award two contracts this fall for the upcoming demonstration/validation phase of the ATF program. Seven companies in all (the other two being Grumman and Rockwell) will submit proposals in early August. The Air Force will then pick two companies or teams to continue the development process.

If one member of the tripartite agreement is selected as one of the winners in the competition, the other two companies will become major subcontractors. If two of the team members are picked, other arrangements will be worked out. The three companies said they will share equally in the program to the fullest extent possible.

The team concept allows companies to combine resources and strengths and should significantly reduce the risk and cost to the members.

The Air Force is planning a fleet of 750 ATFs. By selecting two companies or teams to build prototypes, the Air Force expects the ATF to make its first flight in 1990, two years earlier than previously anticipated. The two prototypes will be designated YF-22A and YF-23A, respectively.

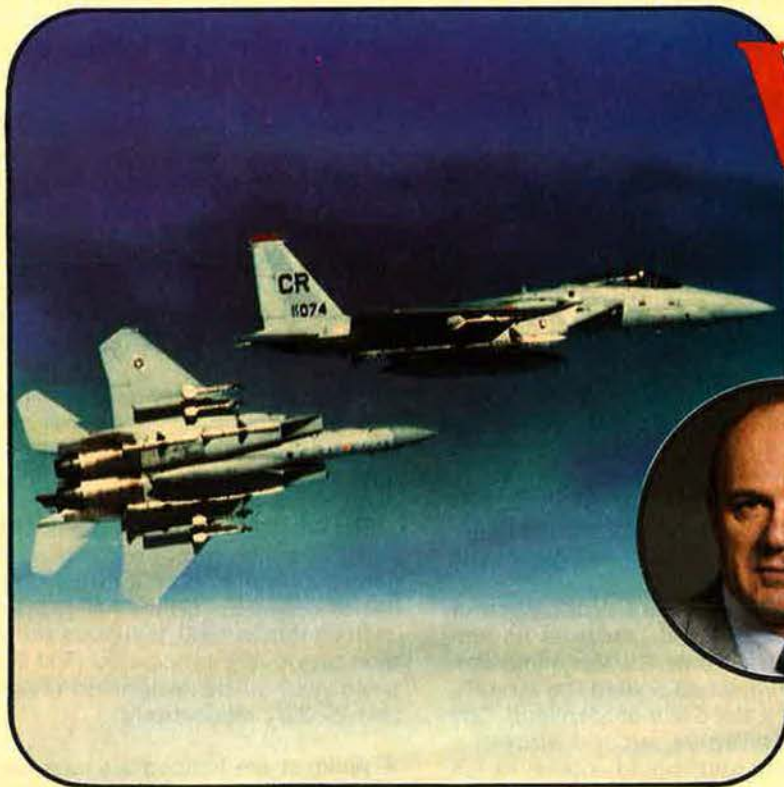
★ While attack helicopters have usually been effective against tanks and other ground targets, one overlooked factor was the vulnerability of the helicopters themselves to air threats. As a result, late-model Marine AH-1 Cobras, as well as the Army's AH-64 Apaches, are now capable of firing AIM-9 Sidewinder missiles. Unfortunately, the new Soviet Hokum and Havoc helicopters are also capable of air-to-air combat.

Having a capability to fire air-to-air missiles is one thing, but knowing how to fire them effectively is another. That is why the Marines at MCAS Yuma, Ariz., have started practicing tactics with the Tactical Aircrew Combat Training System (TACTS) made by Cubic Corp. of San Diego, Calif. The Air Force's Air Combat Maneuvering Instrumentation (ACMI) system is a version of TACTS. The Yuma range is one of thirteen ranges around the world used for air combat training.

The TACTS/ACMI system consists of a pod attached to the AIM-9 rail launcher. The pod communicates range, velocity, and flight dynamics data to ground tracking stations. Computers on the ground add weapons simulation and convert the data



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*J.A. "Bill" Saavedra  
Director, Air Force  
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to real-time, large-screen color displays of the activity on the range. The crews can watch the whole engagement from many perspectives when they return to base.

The standard P4-A TACTS pod had no trouble tracking helicopters at low altitudes and over rugged terrain. Such intrinsic helicopter characteristics as slow speeds, hovering, and very tight maneuvering also proved to be no problem for the equipment. The Marine Aviation Weapons & Tactics Squadron One (MAWTS-1) will conduct twice yearly Weapons and Tactics Instructor (WTI) courses at MCAS Yuma for its own pilots and those of the US Army, National Guard, and allied countries.

★ Under the provisions of a new joint Air Force/Army agreement signed on June 18, the Army will begin training Air Force security police in basic combat skills at Fort Dix, N. J., next fall.

The Army will train an estimated 7,000 Air Force security police annually in such basic combat skills as weapons training, individual and squad tactics, map reading, and communications. It was decided that the Army is better suited than the Air Force to teach such skills.

Approximately 210 Army and Air Force military and civilian personnel will be assigned to Fort Dix to support the training. Currently, 115 military and two civilians have been training nearly 3,500 security police per year at Camp Bullis, Tex., and will continue to do so through early next year.

★ The record (11,337 miles) for distance over a closed course that had been held by an Air Force B-52 crew since June 1962 was broken on July 15 when *Voyager*, an aircraft specially designed for record flights, set down at Mojave, Calif. The *Voyager's* crew of Dick Rutan and Jeana Yeager spent four and a half days flying twenty circuits between San Luis Obispo and Stewart's Point, Calif., covering 11,600 miles at roughly ninety-five mph.

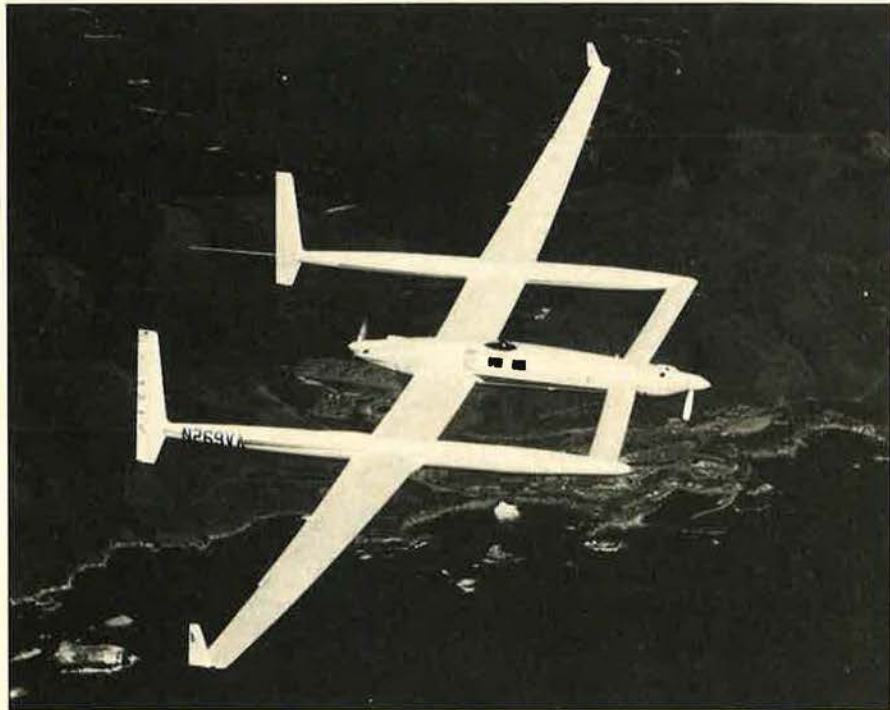
The 111-hour flight also broke an endurance record that had stood since the mid-1930s. Both new records are provisional, pending certification from the Fédération Aéronautique Internationale (FAI), the international aviation authority.

This flight was a prelude to the planned flight in September during which Yeager and Rutan will attempt to break the last barrier in manned flight—an unrefueled, nonstop flight around the world.

*Voyager* is a remarkable aircraft.

## AEROSPACE WORLD

Designed by Dick Rutan's brother Burt, the plane's composite structure and H-shaped design with a canard allows it to carry more than five times its weight in fuel. The plane carries 1,489 gallons of gas in fifteen integral



**Dick Rutan and Jeana Yeager flew Voyager for four and a half days to set a new record of 11,600 miles over a closed course. In September, the crew will fly this composite aircraft in an attempt to break the last remaining milestone in powered flight—a nonstop, unrefueled flight around the world.**

compartments in the wings, booms, canard, and fuselage.

The wings are designed to flex up to thirty-five feet, and the crew compartment is only large enough for one pilot to sit semiupright—the other pilot must lie down. Rutan, a former Air Force fighter pilot, and Yeager, a noted race pilot, will spell each other on the round-the-world trip, just as they did on this record flight. A four-cylinder, liquid-cooled 110-hp Teledyne Continental IOL-200 is the main powerplant, while an air-cooled, 130-hp nose-mounted engine will be used for additional power on takeoff and landing.

The 25,000-mile round-the-world flight is expected to take twelve to fourteen days.

★ In a variation on the way things usually work, an Oscar 17 satellite

that had hung in the National Air and Space Museum for fifteen years has been "recalled to active duty" and will be launched into space this October as the Polar BEAR (Polar Beacon Experiment and Auroral Research) satellite.

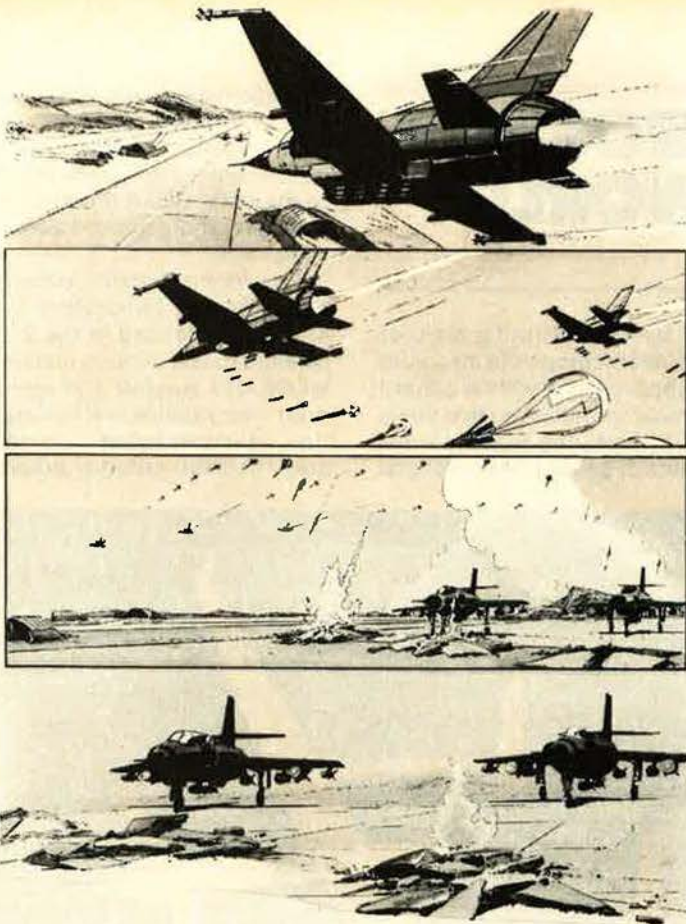
The Johns Hopkins University Applied Physics Laboratory in Laurel, Md., began testing of the 270-pound satellite in late June to ensure the Polar BEAR's survival and operation in orbit. The satellite will undergo vibration, electromagnetic compatibility, and thermal vacuum environment

tests while at the Hopkins Lab. The Air and Space Museum had preserved the satellite's electronics, and only one solar cell out of the thousands on board was rated as marginal and had to be replaced.

Checkout of the satellite's Scout launch vehicle is being managed through NASA under the direction of Air Force Systems Command's Space Division Expendable Launch Vehicle Program Office. The rocket and satellite will be launched from Vandenberg AFB, Calif.

The Polar BEAR will conduct two experiments. The Auroral Imaging Remote Sensor (AIRS), sponsored by the Air Force Geophysics Lab at Hanscom AFB, Mass., will photograph the aurora borealis, or Northern Lights. The Beacon Experiment, sponsored by the Defense Nuclear Agency, will measure the distortion of





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## AEROSPACE WORLD

the ionosphere. The aim of the two experiments is improved communications over the poles.

By using the "off-the-attic-shelf" satellite instead of building a new one, the Air Force saved more than \$2 million. Another \$6 million to \$8 million was saved by using flight-qualified spare parts in the buildup of the Scout.

★ Airliners today fly coast to coast in a matter of hours. Seventy-five years ago this September, the journey took an intrepid thirty-two-year-old aviator named Calbraith P. Rodgers forty-nine days, seventy-six stops, eighty-two actual flight hours, and twenty crashes to make the trip from Sheepshead Bay, Long Island, N. Y., to Long Beach, Calif.

In September, thirty-seven-year-old James R. Lloyd will attempt to recreate Rodgers's "adventure" (without the crashes) in a modern Pterodactyl Light Flyer (a homebuilt) that is similar in appearance and performance to Rodgers's Wright EX biplane. Mr. Lloyd's flight is expected to take thirty-seven days.

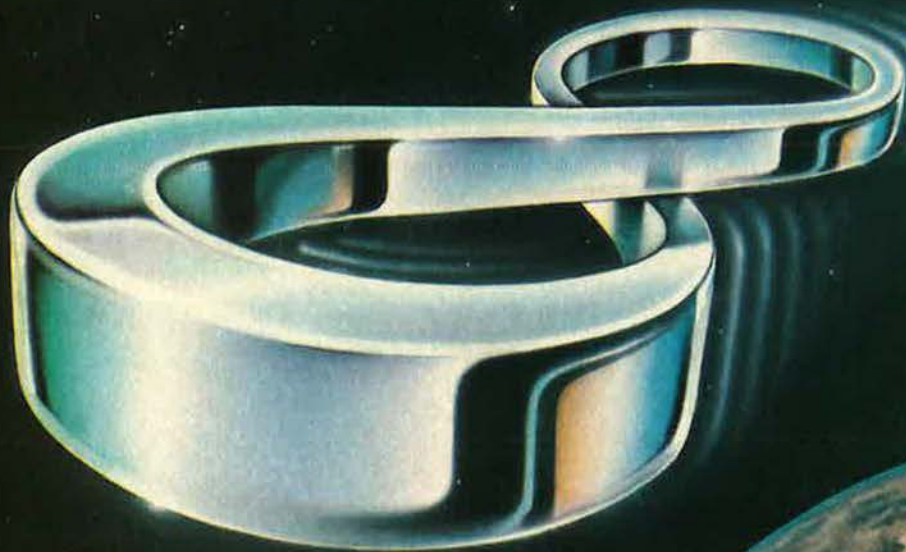
Wearing period clothes, Mr. Lloyd will land in many of the same places where Rodgers stopped in 1911. The flight, as planned, will leave September 17 from Long Island, cross Ohio and Indiana into Chicago, fly on to Kansas City, then down to Dallas, and across the southwest to Long Beach.

To prepare for the flight, Mr. Lloyd has been practicing takeoffs and landings on cow pastures and country roads. He will have only limited flight instruments, and he will navigate by railroad tracks and major highways. Top speed of the new aircraft is fifty-five mph, and his altitude will rarely top 1,000 feet.

Rodgers's intentions for the cross-country trip were not entirely motivated by the honor of being the first person to fly across the continent. William Randolph Hearst, the newspaper magnate, had made an offer of a \$50,000 prize to the first person who could fly coast to coast in thirty days. Rodgers persuaded J. Ogden Armour of Armour and Co. to sponsor him, and the Wright plane was named *Vin Fiz* to promote that company's new grape-flavored soft drink. The crashes and numerous days of bad weather prevented Rodgers from



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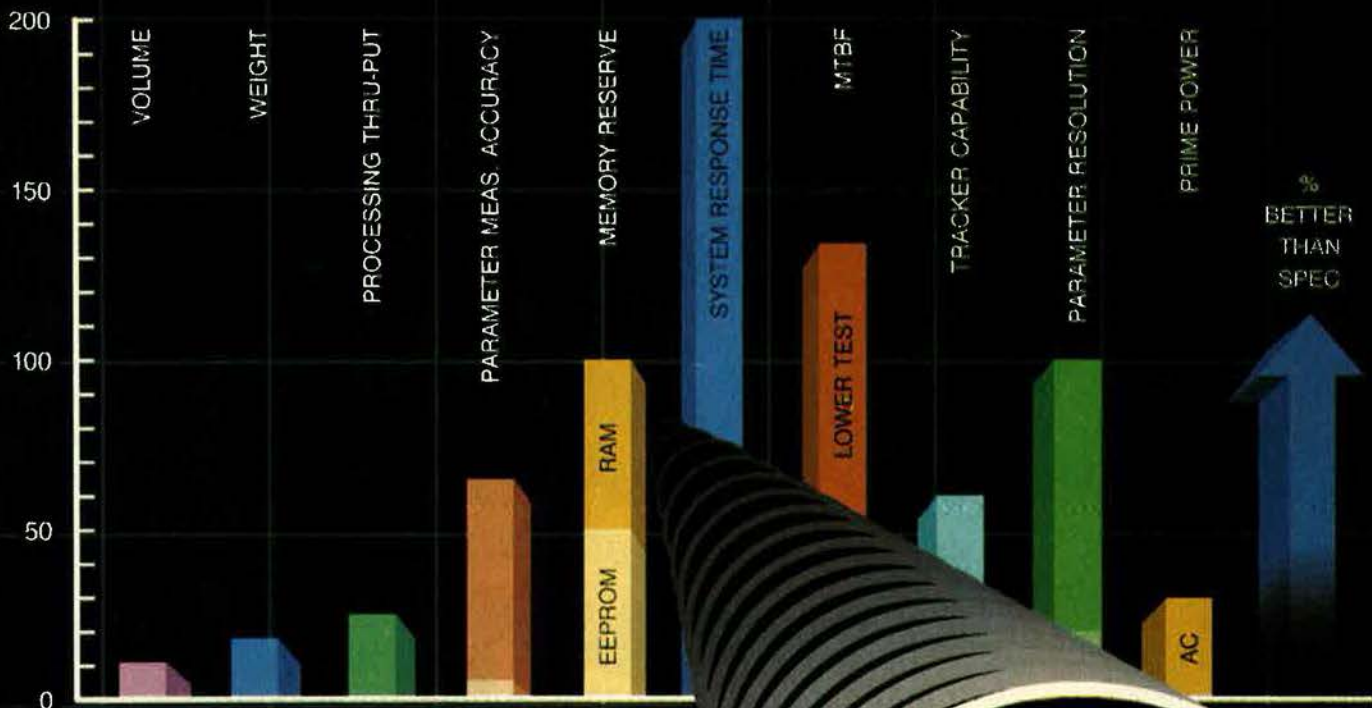
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# AEROSPACE WORLD

crossing in the required thirty days.

Even though Vin Fiz soda was no marketing success, Armour Food Co., as it is now called, was, and the company is the sponsor of this fall's anniversary flight.

★ The five-crew US team edged West Germany 2,275 to 2,224 to claim the team championship at the Fifth World Helicopter Championships held in late June at Castle Ashby outside Northampton, England. The US crew of CW2 Jon Iseminger and CW3 Jimmy Green from Fort Rucker, Ala., also claimed the individual title.

Other countries participating included the Soviet Union (third place), Great Britain (fourth), and Poland, which had only one team (fifth).

The twenty-one crews were judged in four different events—timed arrival, precision flying, navigation, and a slalom course. The overall team championship was decided by counting the total scores of the top three finishers from each country. The US crews finished first, fourth, fifth, sixth, and eleventh.

Chief Warrant Officers Iseminger and Green scored 769 points out of a possible 800 to win the individual championship. The team also achieved the only perfect score of the competition, recording 200 points in the precision flying event. The team of Warrant Officers James Maddox and Howard Fancher won the slalom event with 192 points.

The US team, which defended its title from 1981, was composed of five Army OH-58 Kiowa helicopter crews competing for the Helicopter Club of America (HCA). Two crews were from Fort Rucker, two were from Fort Campbell, Ky., and one was from the Texas Army National Guard. The five competition and two backup crews were picked by the HCA in a competitive flyoff in February. Twenty-five Army and two civilian teams competed at the flyoff.

★ "National safety would be endangered by an air force whose doctrines and techniques are tied solely to the equipment and processes of the moment. Present equipment is but a step in progress, and any air force that does not keep its doctrines ahead of its equipment, and its vision far into the future, can only delude the nation

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into a false sense of security." Did Secretary of the Air Force Edward C. Aldridge say this? Chief of Staff Gen. Larry D. Welch, perhaps? No, it was General of the Air Force H. H. "Hap" Arnold who said it forty-one years ago.

★ **AWARDS**—The **Mackay Trophy** for the most meritorious flight of the year in the Air Force was awarded to **Lt. Col. David E. Faught**, a KC-135 in-

structor pilot with the 97th Bombardment Wing, Blytheville AFB, Ark. During what became a thirteen-hour mission in 1985, Colonel Faught, along with his crew of seven, made fifty-seven attempts to free the stuck nose gear of their aircraft. They completed ten emergency reverse air refuelings and eventually made a successful nose-gear-up landing. Colonel Faught and pilot Capt. Robert M. Sauers were nominated for Distin-



guished Flying Crosses, while the rest of the crew—Capt. Stephen L. Wolborsky, Walter Price, and Russell S. Cochran, 1st Lt. Darrell J. Pratt, and MSgts. Larry B. Burrus and Jay Wilson—were awarded Air Medals. The four-man crew of a strip alert KC-135 that made an emergency takeoff to

# AEROSPACE WORLD

support the crippled KC-135 also received Air Medals.

In addition to sharing in the AFA President's Award and the Gen. William H. Tunner Award (see pp. 89 and 62), **Maj. Larry G. Brooks**, a Reservist with the 305th Aerospace Rescue and Recovery Squadron, Selfridge ANGB,

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# AEROSPACE WORLD

Mich., has been named winner of the **Koren Kolligian Trophy** for 1985. The Kolligian Trophy is awarded annually to the Air Force aircrew member who most successfully coped with an in-flight emergency during the preceding calendar year.

Retired **Maj. Gen. Donald W. Henderson**, former Commander of the Space and Missile Test Organization at Vandenberg AFB, Calif., was awarded the **Gen. Thomas D. White USAF Space Trophy** for 1985 by the award's sponsor, the National Geographic Society. The White Space Trophy is given for outstanding contributions to the nation's progress in aerospace during the previous year. General Henderson was cited for his role in molding a strong management relationship among the partners associated with the launching of DoD Shuttle payloads from the Kennedy Space Center and also for directing the activation and checkout of Space Launch Complex Six (SLC-6) at Vandenberg.

★ **MILESTONES**—An era ended on June 6 when the **last active-duty chief warrant officer in the Air Force, John Cronise**, retired after a forty-three-year career. The Army Air Forces implemented the warrant officer program during World War II as a way to recognize technicians who had special skills in assigned fields. With the introduction of E-8 and E-9 grades in the Air Force in 1958, warrant officers were phased out. Mr. Cronise enlisted in 1943, and after separating in 1946, he joined the Oregon National Guard. He was recalled to active duty during the Korean War and then again last April when the Oregon Guard was called up to assume the round-the-clock quick response alert mission with the 86th Tactical Fighter Wing at Ramstein AB, West Germany, which is in the process of converting to F-16s. The last whole-career active-duty CWO retired in 1982, but there's still a handful of warrant officers in the Guard.

With four aircraft now delivered to the 433d Military Airlift Wing at Altus AFB, Okla., the Air Force's **Lockheed C-5B fleet** passed the **1,000 hours of flight time** plateau in mid-June. The four aircraft are now being used for flight crew training and will be joined by five more of the giant transports by the end of the year.

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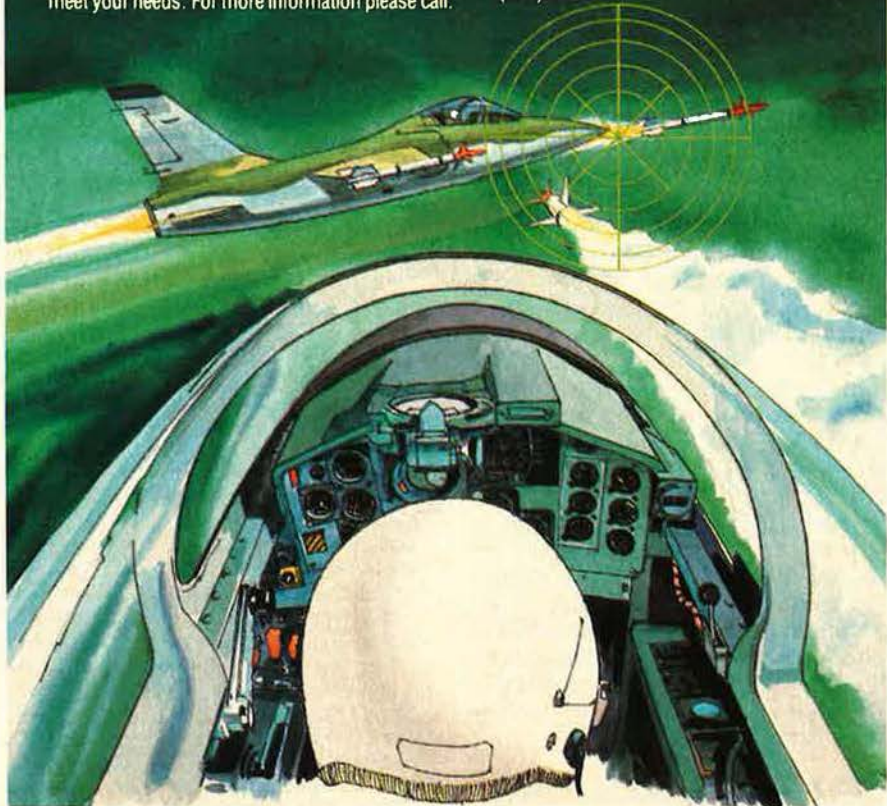
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After a flight from Rickenbacker ANGB, Ohio, the **last Fairchild UC-123K Provider** was retired to the Military Aerospace Maintenance and Regeneration Center at Davis-Monthan AFB, Ariz., on June 17. The Air Force Reserve's 907th Tactical Airlift Group—the only aerial spray unit in the Air Force—has flown the aircraft since 1973. The 907th TAG, which sprayed 735,000 acres in Idaho for insects during a thirty-day period

in 1985, will now use modified C-130A aircraft for its war on bugs.

After much political wrangling, the **first of five Boeing E-3A Sentry** Airborne Warning and Control System (AWACS) aircraft was delivered to the Kingdom of Saudi Arabia on June 30. Prince Bandar bin Sultan, the Saudi ambassador to the US, accepted the plane before it left the Boeing plant in Seattle for an eighteen-hour flight to the Middle East. The plane



# AEROSPACE WORLD

was flown by USAF personnel, accompanied by RSAF personnel, to the Saudi capital of Riyadh. The other four aircraft are scheduled to be delivered by the spring of 1987.

The **1,000th F-15 Eagle** left the McDonnell Douglas plant in St. Louis, Mo., recently for its new home at Eglin AFB, Fla. In the fourteen years since its first flight, McDonnell Douglas has built 931 of the air-superiority fighters, and a further sixty-nine have been manufactured under license by Mitsubishi Heavy Industries, Ltd., in Japan. In addition to USAF and the Japanese Air Self-Defense Force, the air arms of Israel and Saudi Arabia also fly the F-15. The F-15 can carry 12,000 pounds more weight than it could in 1972, and it also has better electronics. With a loss rate that is just one-third the projected rate, the F-15 is the safest fighter in Air Force history. A total of 1,286 F-15s is scheduled to be built.

Additionally, McDonnell Douglas Helicopter Co. recently delivered the **100th production AH-64 Apache attack helicopter** to the Army. The aircraft will be stationed at Fort Hood, Tex., where it will be part of the second Apache unit.

On June 30, the Navy launched a Tomahawk cruise missile with a dummy warhead from the guided missile cruiser *USS Long Beach (CGN-9)* while under way in the northern Pacific. This marked the **first time a cruise missile had been launched from a ship on a regular deployment** and not in an established missile range. The missile was launched from an Armored Box Launcher (ABL) and flew a simulated ground-attack mission. The missile flew to Kanaga Island in the Aleutians, approximately 500 miles from the ship.

★ **DIED—Adm. Hyman G. Rickover**, USN (Ret.), the father of the nuclear Navy, at his home in Arlington, Va., on July 8. He was eighty-six. A man both loved and hated by his superiors, peers, and subordinates, Admiral Rickover served in the Navy for sixty-three turbulent years. His foresight in persuading the Navy to power ships and submarines with nuclear reactors brought a revolution in naval tactics and changed the balance of power between the US and the Soviet Union. Some of the men who served under Admiral Rickover have assumed high positions in the military and in gov-

ernment—including Adms. James D. Watkins and Carlisle A. H. Trost, the past Chief of Naval Operations and the current one, and former President Jimmy Carter. Begun with the *USS Nautilus* in the mid-1950s, the nuclear

Navy now comprises four aircraft carriers, eight cruisers, ninety-seven attack submarines, and thirty-nine fleet ballistic subs that have a collective safety record of more than 3,000 years without a nuclear accident. ■

## SENIOR STAFF CHANGES

**RETIREMENT:** M/G Perry M. Smith.

**CHANGES:** M/G Donald O. Aldridge, from JCS Rep. for START, OJCS, Washington, D. C., to Cmdr., 1st STRAD, SAC, Vandenberg AFB, Calif., replacing retiring M/G Jack L. Watkins . . . B/G George L. Butler, from IG, Hq. SAC, Offutt AFB, Neb., to Dep. Dir., Ops., DCS/P&O, Hq. USAF, Washington, D. C., replacing retired B/G Robert B. Plowden . . . M/G James T. Callaghan, from Cmdt., AFIT, AU, and Cmdt., DISAM, Wright-Patterson AFB, Ohio, to Cmdr., 314th AD, PACAF, and Cmdr., US Air Forces, South Korea, Osan AB, South Korea, replacing M/G James P. Smothermon . . . M/G Michael P. C. Carns, from DCS/Ops. and Intel., Hq. PACAF, Hickam AFB, Hawaii, to Cmdr., 13th AF, PACAF, Clark AB, the Philippines, replacing B/G Charles F. Luigs . . . M/G James B. Davis, from Cmdr., Hq. AFMPC, Randolph AFB, Tex., to DCS/Ops. and Intel., Hq. PACAF, Hickam AFB, Hawaii, replacing M/G Michael P. C. Carns.

B/G Philip M. Drew, from Dep. Dir., Politico-Military Affairs, J-5, OJCS, Washington, D. C., to Cmdr., 65th AD, and Vice Cmdr., 17th AF, USAF, Sembach AB, Germany, replacing M/G John C. Scheidt, Jr. . . . B/G (M/G selectee) Richard F. Gillis, from DCS/Log., Hq. ATC, Randolph AFB, Tex., to Cmdr., AFALC, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing B/G Joseph K. Spiers . . . Col. (B/G selectee) William P. Hallin, from Dir., Materiel Mgmt., Warner Robins ALC, AFLC, Robins AFB, Ga., to Air Force Competition Advocate General, Hq. USAF, Washington, D. C., replacing retired B/G Gerald C. Schwankl . . . M/G Elbert E. Harbour, from Dep. Cmdr., Airlift and Trainer Systems, ASD, AFSC, Wright-Patterson AFB, Ohio, to Vice Cmdr., ASD, AFSC, Wright-Patterson AFB, Ohio, replacing retiring B/G Phillippe O. Bouchard . . . M/G Ralph E. Havens, from Cmdr., Hq. TUSLOG, Ankara AS, Turkey, to Cmdr., Hq. AFMPC, Randolph AFB, Tex., replacing M/G James B. Davis . . . B/G John R. Hullender, from DCS/Plans, Hq. ATC, Randolph AFB, Tex., to DCS/Ops., Hq. ATC, Randolph AFB, Tex., replacing M/G Chris O. Divich.

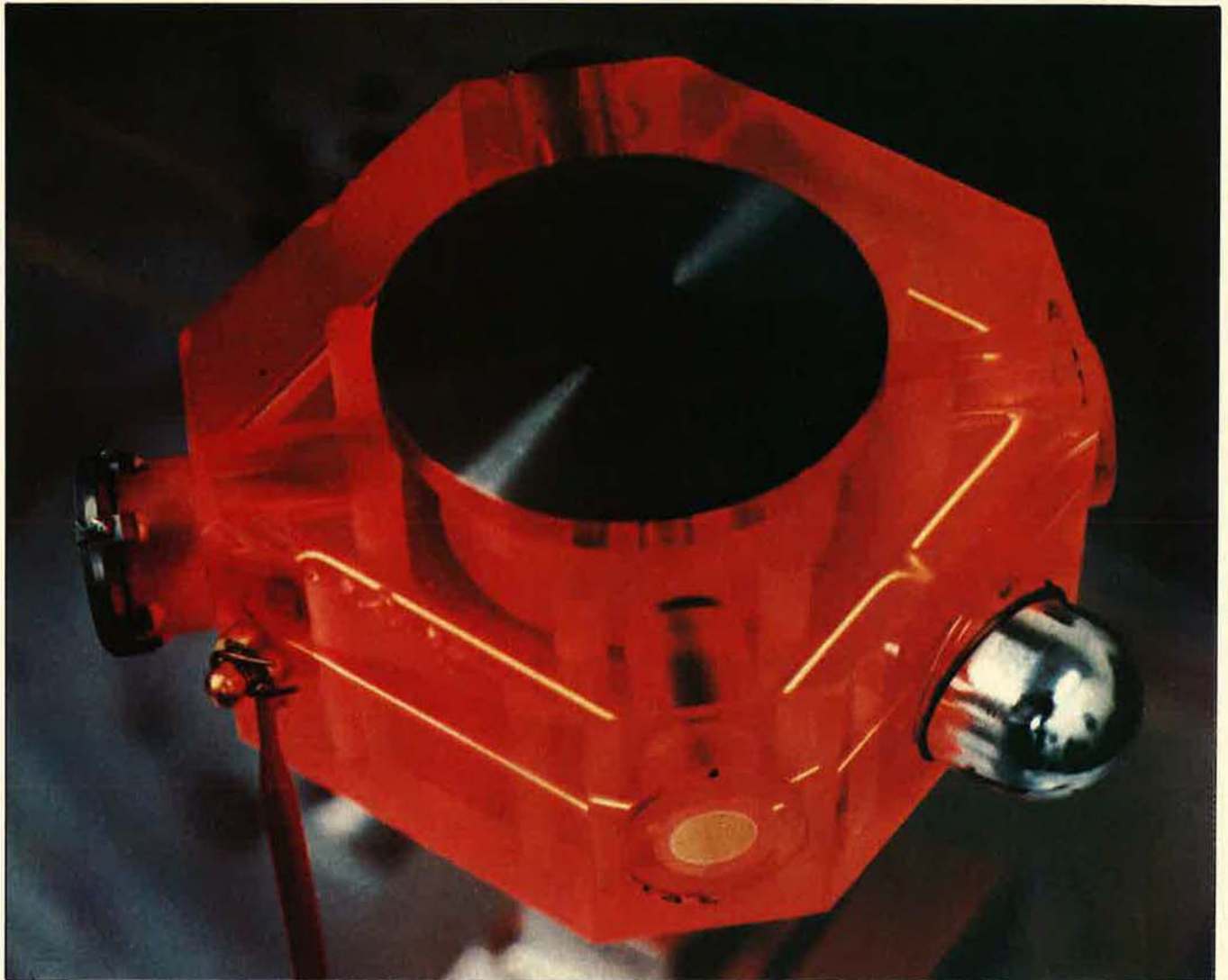
B/G John E. Jackson, Jr., from IG, Hq. ATC, Randolph AFB, Tex., to DCS/Plans, Hq. ATC, Randolph AFB, Tex., replacing B/G John R. Hullender . . . B/G Michael C. Kerby, from Dep. Dir., Legislative Liaison, Hq. USAF, Washington, D. C., to Dir., Legislative Liaison, Hq. USAF, Washington, D. C., replacing M/G Clifford H. Rees . . . B/G Charles F. Luigs, from Cmdr., 13th AF, PACAF, Clark AB, the Philippines, to Vice Cmdr., 5th AF, PACAF, Yokota AB, Japan, replacing B/G Richard J. Toner . . . Col. (B/G selectee) Philip L. Metzler, Jr., from Dir., Materiel Mgmt., Sacramento ALC, AFLC, McClellan AFB, Calif., to Dir., Maintenance and Supply, DCS/L&E, Hq. USAF, Washington, D. C., replacing B/G Richard L. Stoner . . . B/G Burton R. Moore, from Dep. Dir., Ops., DCS/P&O, Hq. USAF, Washington, D. C., to Dep. Dir., Legislative Liaison, Hq. USAF, Washington, D. C., replacing B/G Michael C. Kerby.

M/G Richard A. Pierson, from Cmdr., USAF ADWC, TAC, Tyndall AFB, Fla., to Chief, Hq. JUSMAG, Athens, Greece . . . M/G Clifford H. Rees, from Dir., Legislative Liaison, Hq. USAF, Washington, D. C., to Cmdr., USAF ADWC, TAC, Tyndall AFB, Fla., replacing M/G Richard A. Pierson . . . B/G Alan V. Rogers, from Spec. Ass't to Vice CINCSAC, Hq. SAC, Offutt AFB, Neb., to IG, Hq. SAC, Offutt AFB, Neb., replacing B/G George L. Butler . . . M/G John C. Scheidt, Jr., from Cmdr., 65th AD, and Vice Cmdr., 17th AF, USAF, Sembach AB, Germany, to Cmdr., Hq. TUSLOG, Ankara, Turkey, replacing M/G Ralph E. Havens . . . M/G James P. Smothermon, from Cmdr., 314th AD, PACAF, and Cmdr., United States Air Forces, South Korea, Osan AB, South Korea, to C/S, AAFSE, Naples, Italy, replacing M/G Louis C. Buckman . . . B/G Richard L. Stoner, from Dir., Maintenance and Supply, DCS/L&E, Hq. USAF, Washington, D. C., to Dep. Dir., Planning and Resources, J-4, OJCS, Washington, D. C.

B/G Daniel A. Taylor, Jr., from Vice Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, to DCS/Log., Hq. ATC, Randolph AFB, Tex., replacing B/G (M/G selectee) Richard F. Gillis . . . B/G Dale W. Thompson, Jr., from Cmdr., 20th TFW, Hq. USAF, Ramstein AB, Germany, to Vice Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, replacing B/G Daniel A. Taylor, Jr. . . . B/G Richard J. Toner, from Vice Cmdr., 5th AF, PACAF, Yokota AB, Japan, to Cmdt., AFIT, AU, and Cmdt., DISAM, Wright-Patterson AFB, Ohio, replacing M/G James T. Callaghan . . . M/G John H. Voorhees, from Dep. Dir., J-4/J-7, Hq. USEUCOM, Vaihingen, Germany, to Cmdr., Defense Personnel Support Ctr., DLA, Philadelphia, Pa.

**SENIOR ENLISTED ADVISOR CHANGES:** CMSgt. Richard P. E. Cook, to SEA, Hq. USAFA, Colorado Springs, Colo., replacing retired CMSgt. Larry Vance . . . CMSgt. Francis A. Rago, Jr., to SEA, Hq. AFDW, Bolling AFB, D. C., replacing CMSgt. Richard P. E. Cook. ■





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The United States Air Force has selected Litton's Guidance and Control Systems Division, long a world leader in inertial navigation, to produce the LN-93 Standard RLG Inertial Navigation Unit. Litton's LN-93 was the first RLG system to successfully complete all tests at the Central Inertial Guidance Test Facility, Holloman Air Force Base, New Mexico, and will be the Form-Fit Function alternative to the AN/ASN-141, currently manufactured by Litton for the F-16, A-10, FB-111, and other Air Force and Army aircraft. Initially, the Standard RLG INU will be employed in the C-130 Self-Contained Navigation System and the RF-4C, and later in the HH-60A and EF/F-111. A variant of the LN-93 will be

purchased for the F-15; the two configurations will share over 90% commonality.

The LN-93 Standard Ring Laser Gyro INU is Litton's most recent system to employ Ring Laser Gyros in strapdown configuration. As there are no moving parts, these gyros will have significantly better reliability than earlier-design spinning-wheel gyros. The LN-93 system employs the same 28cm pathlength Ring Laser Gyro and much of the same electronics as both the Litton commercial LTN-90 Inertial Reference System, and LN-92 RLG INS, currently under development for the U.S. Navy CAINS II. The high reliability guaranteed by Litton will allow the Air Force to employ a two-level maintenance approach, eliminating the need for test equipment at base shops.

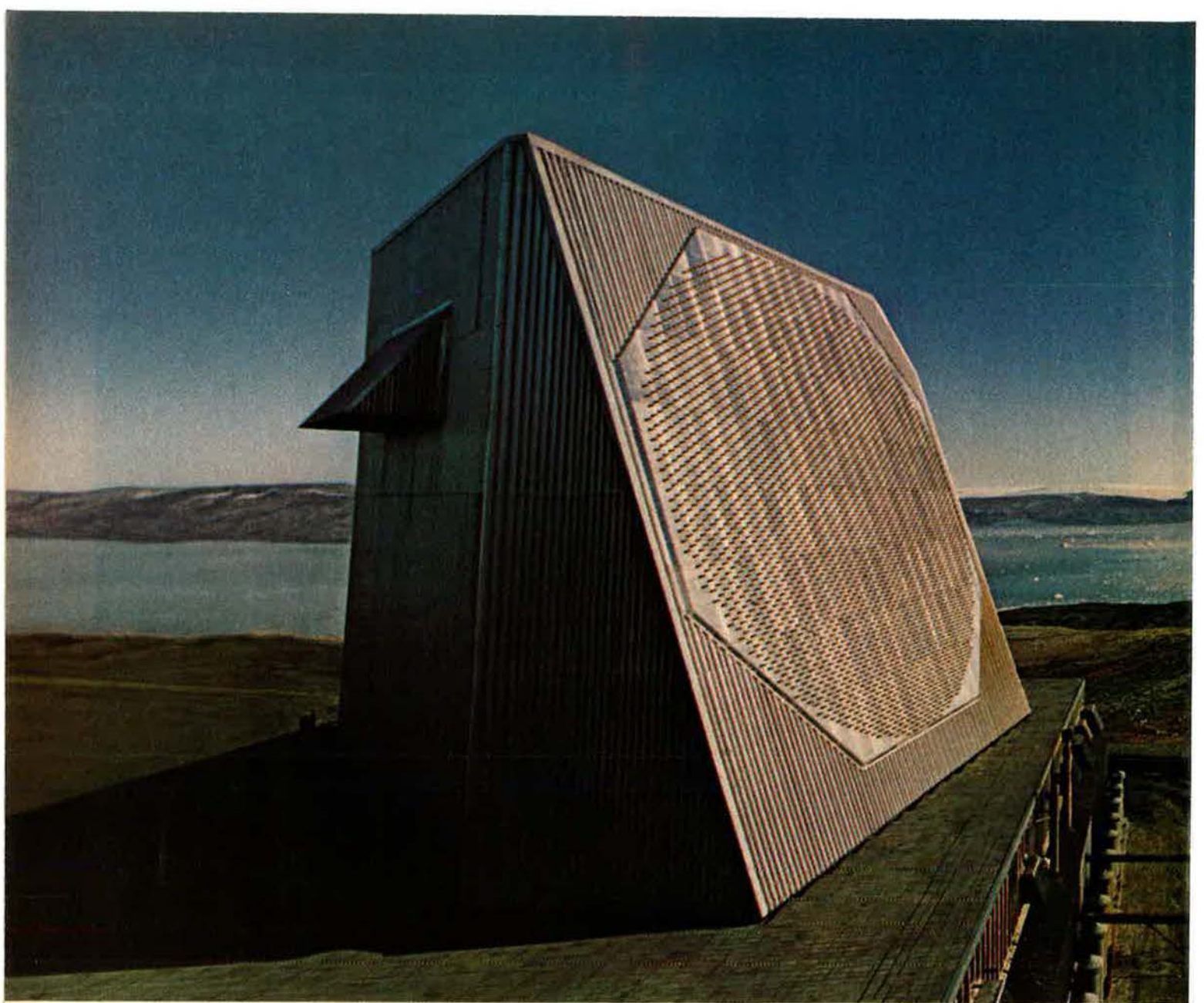


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Electronic beams generated by this 10-story-high radar in Thule, Greenland, will soon blanket the skies over a zone extending from the North Atlantic to the European coast. When operational, this sophisticated dual-faced radar will provide the early warning and detailed impact assessment needed in the event of a mass missile raid on the United States. And it will have a reliability factor approaching 100%.

To acquire and process this amount of detailed information, the U.S. Air Force Electronic Systems Division turned to the speed and accuracy of phased array radar in

updating the Ballistic Missile Early Warning System (BMEWS) at Thule. And, to meet the many challenges inherent in such a complex project, the Air Force chose Raytheon as prime contractor.

No company can match Raytheon's record of performance in building these giant radars. The Pavé Paws installations on the U.S. East and West Coasts, Cobra Dane in the Aleutians, and the seaborne Cobra Judy system are prime examples. Each has multiple ballistic missile target detection and tracking capabilities and an outstanding record of operational availability.





At Raytheon, we manage the complex by first mastering the basics. In the case of BMEWS, these basics include pioneering work in the field of antenna design, an understanding of *how to apply* phased array technology, and a thorough knowledge of every facet of systems management. It's this dedication to fundamentals that enables us to successfully produce systems essential to the national defense—and to do it time, after time, after time. Because at Raytheon, quality starts with fundamentals.

Raytheon Company, Government Marketing, 141 Spring Street, Lexington, MA 02173.

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*Where quality starts with fundamentals*





# SECURITY LOUD & CLEAR.

For secure voice/data communications...on land, sea and air. The ITT ANDVT Advanced Narrowband Digital Voice Terminal is in production.

The success and survivability of tactical forces depends upon the security of their communications. And when it comes to secure voice/data communications, ITT's ANDVT Advanced Narrowband Digital Voice Terminal speaks your language.

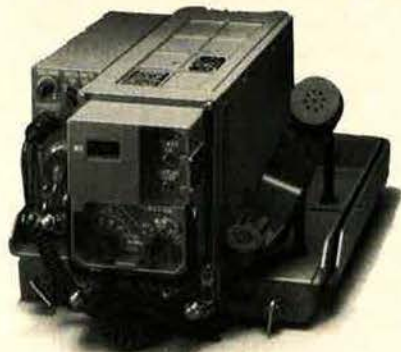
Whether the environment is ship-board, airborne, ground mobile or ground fixed, the ANDVT (CV-3591) provides secure half duplex voice and data communications. The terminal utilizes two similar processors for both voice and data processing.

Key voice processing functions are LPC-10 and ambient noise reduction. There are two independent modems, one for LOS and the other for HF radio transmissions. Both with

error protection coding and correction. The ANDVT terminal can be used as a Voice Processor only or a HF/LOS Modem-Only when operating with the optional plug-in module.

The ANDVT is easy to operate and requires no preventative maintenance or adjustment. And it has built-in on and off-line testing. It gives you clear, clean transmissions, reliability and above all—security.

The ANDVT Advanced Narrowband Digital Voice Terminal from ITT. For more information contact ITT Defense Communications Division, 492 River Road, Nutley, NJ 07110. 201-284-2205.



**ITT**  
DEFENSE COMMUNICATIONS





**We haven't found out yet what they can't do.**

We take a lot of pride in the fact that the Gulfstream jet aircraft we build are at work with hundreds of the world's most important businesses and industries, flying their key executives and staff all over the world.

But that's not all Gulfstreams are doing.

Governments have put them to work, too.

For example, eleven Gulfstream IIIs are replacing older jet transports in the U.S. Air Force fleet and saving millions of dollars by being more efficient to operate and less costly to maintain. And by proving they can do the work of bigger jet transports at a fraction of the cost, Gulfstream IIIs are routinely being used to fly leaders of our nation into every corner of the globe.

Other Gulfstream jets are doing the same, and more, for 30 other governments.

They are used to patrol shipping lanes, fishing grounds and coastlines. Transport administrative personnel. Perform search and rescue missions. Carry out medical evacuations. Fly priority cargo. Check airways navigation systems.

A Gulfstream jet can also do tasks such as electronic surveillance and reconnaissance, high altitude photography and other specialized missions that require the optimum combination of endurance, speed, size and reliability.

In fact, our newest Gulfstream, the Gulfstream IV, will be able to perform these missions with amazing productivity because of its superlative performance and advanced systems technology.

The truth is, the versatility and effectiveness of Gulfstream jet aircraft amaze even us at times, and we're the people who design and build them.

And, as we said at the start, we haven't found out yet what they can't do.



**Gulfstream  
Aerospace**

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**This is  
not the time  
to worry  
if you are in  
the weapon  
release envelope.**

## **Varo/Frazer-Nash Advanced Technology Launchers for All Attitude Launches**

Once pilots get the bogey in their sights, they shouldn't have to wonder if they are in the aircraft weapon release envelope. The new generation of Varo/Frazer-Nash advanced technology launchers eliminates this question.

With our new Advanced Technology Launchers (ATLs), aircraft limitations are a thing of the past. These variable attitude ATLs will be ideal for conformal weapon carriage and can be linked directly to the aircraft flight data system. When the missile is launched, it will depart the aircraft at the optimum launch angle no matter what the aircraft attitude. These launchers will conform to MIL-STD-1760 and MIL-STD-1553 (A or B) databuses.

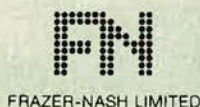
The Common Rail Launcher (CRL) is another innovative new design from Varo/Frazer-Nash. One modular CRL can fire any one of eight different missiles and can be adapted for the next mission's weapons while still on the aircraft. CRLs can be mounted on almost any aircraft in the U.S. or NATO inventory without special interface units.

For more information on Varo's innovative launchers, please write or call the launcher leader — Varo.



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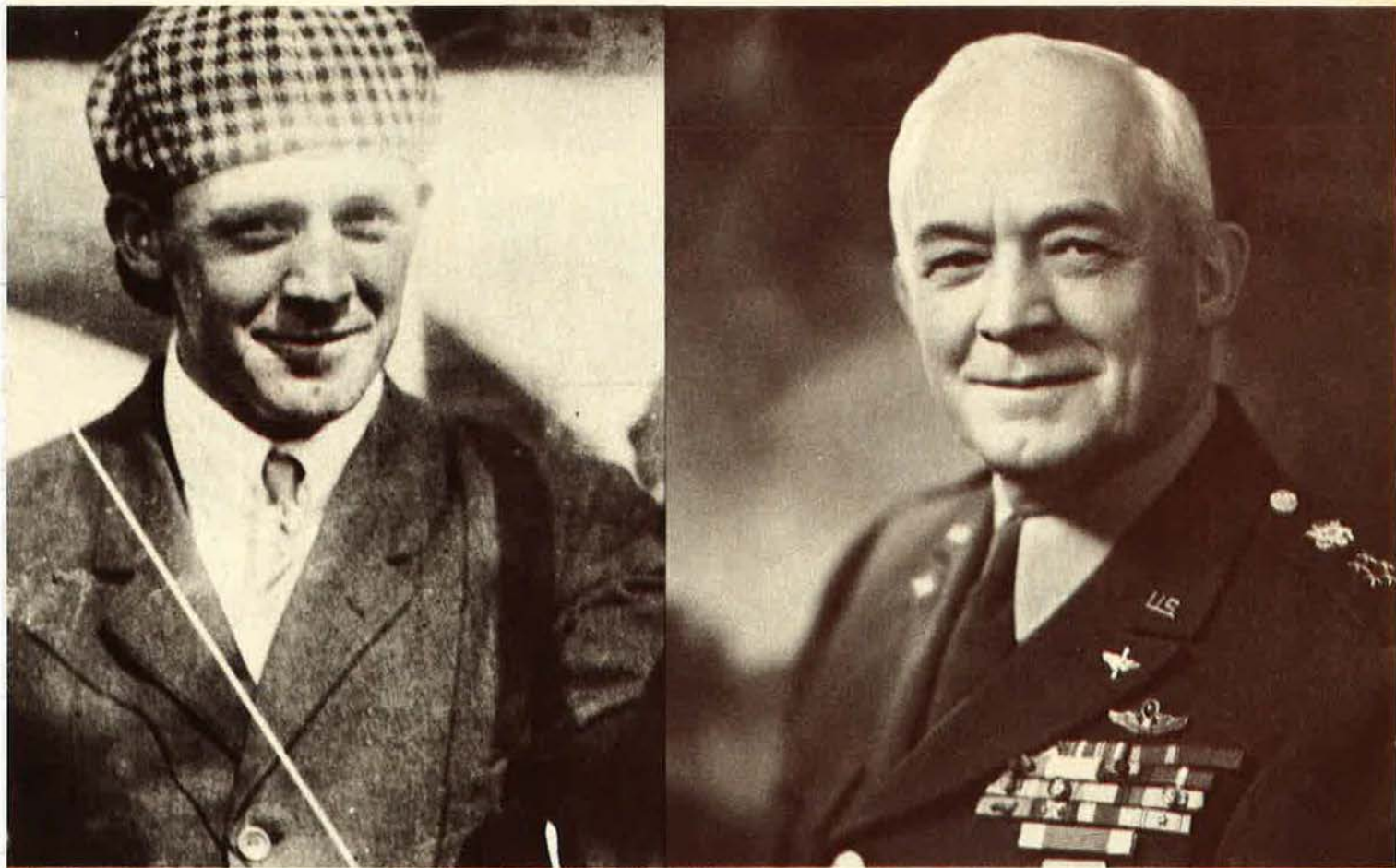




The 1986 AFA National Convention pays special honor to Hap Arnold on the centennial of his birth.

# ARNOLD

A SPECIAL REPORT



Henry H. "Hap" Arnold at the beginning and the end of his career. On the left is twenty-five-year-old Lieutenant Arnold in 1911, while on the right is General of the Air Force Arnold near the end of his all-too-brief sixty-four-year life.

**A**s Commander of the Army Air Forces during World War II, General Henry H. Arnold gave his nation outstanding service. To him fell the mission of building America's airpower for a global war in which victory or defeat depended on control of the skies. He fulfilled his mission in a manner that overwhelmed this nation's enemies and awed its allies. . . ."

By no means an exaggeration, this accolade is contained in the citation that "Hap" Arnold received

on being awarded a second Oak Leaf Cluster to his Distinguished Service Medal in October 1945. The citation captured the essence of General Arnold's incalculable contribution to the United States and to the US Air Force, which would come into being two years later, thanks to the foundation that he had laid for it by his leadership of the USAAF.

Paying tribute to General Arnold's "wide knowledge of the employment of airpower," the citation

also took note of his genius in having marshaled the resources and ingenuity of the US aircraft industry to build the bombers and fighters that would "sweep the skies of the enemy and deny him mobility on the surface" in the "great, decisive, three-dimensional battles of World War II."

We on AIR FORCE Magazine are proud to recall that General Arnold, who died in January 1950, not long after having been appointed the first (and only) General of the Air Force,



recognized the need for our publication early in World War II and found time to foster it.

James H. Straubel, wartime Editor of AIR FORCE Magazine and later the Executive Director of the newly formed Air Force Association and Editor and Publisher of AIR FORCE Magazine, tells that story as follows:

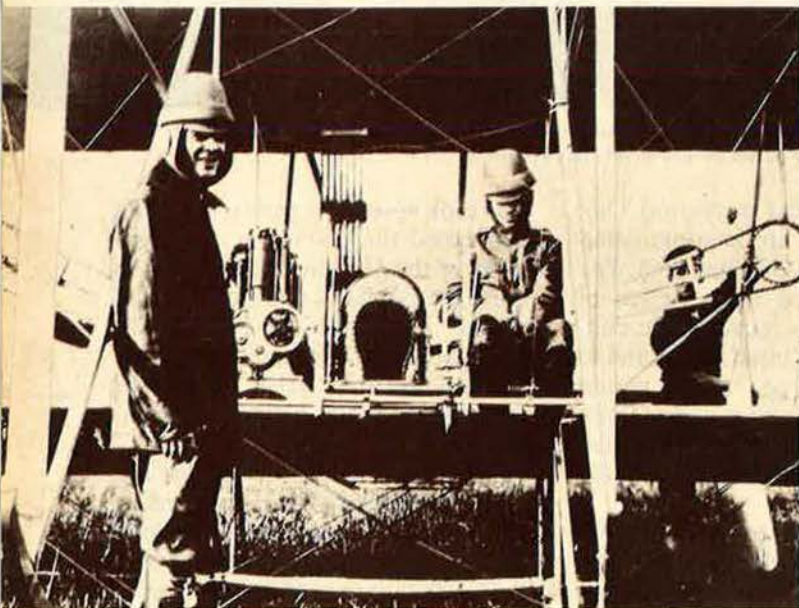
"General Hap Arnold was, in effect, the first Publisher of AIR FORCE Magazine when it was created during World War II as the Offi-

cial Service Journal of the US Army Air Forces. More than two decades earlier, while doing a routine Washington tour in the Information Office of the old Army Air Service, General Arnold had been, in fact, Editor of the mimeographed monthly newsletter that preceded the magazine. Some years later, while 'exiled' at Fort Riley, Kan., for his support of Billy Mitchell, General Arnold had written a couple of books for young readers.

"This pilot-General-writer-editor

wasn't, of course, listed on the masthead as publisher of the new AIR FORCE Magazine when it was introduced in December of 1942. Indeed, this official publication had no masthead. But the magazine was his 'baby,' established to help keep the troops, almost all of them raw recruits, abreast of that military force taking shape as airpower. 'I want a first-class, highly readable, slick paper magazine with worldwide circulation,' he told this Second Lieutenant after I had been tagged as

*In July 1934, then-Lt. Col. Henry Arnold led a flight of Martin B-10 bombers from Bolling Field, D. C., to Fairbanks, Alaska, to test the idea of reinforcing outlying possessions by air. Colonel Arnold (standing under the bombardier's window) was joined on the flight by then-Lt. Nathan F. Twining (front row, third from left), who later became USAF Chief of Staff and Chairman of the Joint Chiefs of Staff.*



*LEFT: In 1912, 2d Lts. H. H. Arnold and Thomas DeWitt Milling, two of the Signal Corps's first aviators, pose with one of the two airplanes the Army had at the time. Arnold was awarded the very first Mackay Trophy that year. RIGHT: Promoted to captain in 1916, Arnold became the supply officer of the newly formed Aviation School at San Diego, Calif. A year later he would be promoted to major.*





Editor, then added with a penetrating smile, 'and the best of its kind.'

"General Arnold, with all his responsibilities as Commanding General, kept a close watch on each issue of the magazine. On an informal but well-established basis, and to the displeasure of the military hierarchy, I reported directly to the General. We discussed specific articles, production problems, personnel requirements—the whole bit. But he never dictated terms.

"In emergencies, and there were

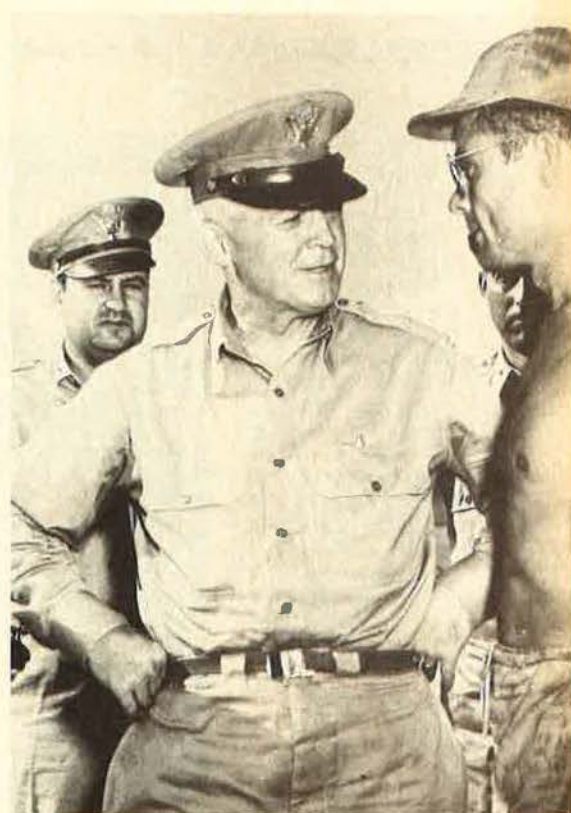
plenty of them, when I needed a fast response from the Publisher, Mrs. Arnold came to the rescue. She would stick my notes to the General on his bedroom mirror which, she laughingly assured me, got a lot of his attention. He was a handsome man, and he knew it. The mirror told him so. The mirror also told him what it took to keep AIR FORCE Magazine looking good. All my notes got answered—without a miss. If the magazine's initial flights were ego trips of sorts, so be it.

They got the job done, and that's what General Hap Arnold was all about."

It certainly was—all the way through Hap Arnold's illustrious military career that began with his graduation from the US Military Academy as a second lieutenant of infantry on June 14, 1907, eleven days shy of his twenty-first birthday, that spanned two world wars and airpower's coming of age, and that established him as a legendary US commander in his own time. ■



**LEFT:** Always one to get out with the troops, Arnold, now a lieutenant general, talks to a group of airmen in Egypt in 1943. **RIGHT:** The next year, General Arnold was in the Pacific theater, on Guam, talking with SSgt. Leo F. Fliess about B-29 maintenance. Maj. Gen. Curtis E. LeMay, in one of the few pictures without his characteristic cigar, can be seen over General Arnold's shoulder.



**LEFT:** In 1935, Arnold was awarded his second MacKay Trophy for the 1934 B-10 flight to Alaska. General Arnold, next to the trophy, is flanked by Reserve Maj. Jimmy Doolittle and Brig. Gen. Oscar Westover. **RIGHT:** In 1949, just a few months before his death, General Arnold traveled from his Sonoma Valley ranch to address the San Francisco Squadron's Air Force Day luncheon.





Here's what it takes to be ranked first among all the crews in USAF.

# The Top Crews

BY MAJ. MICHAEL B. PERINI, USAF

*For the second consecutive year, Crew S-247 of the 308th Strategic Missile Wing at Little Rock AFB, Ark., has won the Gen. Thomas S. Power Strategic Missile Crew Award. Standing around one of the consoles are, (from left) Capt. Robert J. Burns, deputy commander, MSgt. Donald W. Fent, missile systems analyst, MSgt. Carmen A. Malone, missile facilities technician, and Capt. Robert E. Servant, crew commander.*



**U**SAF'S AIRCREWS and missile crews represent aerospace power at the point of delivery. Everything else the Air Force does is designed to enable these crews to do what they do. Consequently, crews have always been held in special regard, and to be named by the Air Force as winner of the Air Force Association's annual crew award in your mission category is a professional distinction that's difficult to beat.

The 1986 recipients will be honored at the AFA National Convention this month with the Gen. Thomas S. Power Award for the best strategic combat missile crew, the Gen. Jerome F. O'Malley Award for the best reconnaissance crew, the Lt. Gen. Claire Lee Chennault Award for the outstanding aerial warfare tactician, the Gen. Curtis E. LeMay Award for the top strategic aircrew, and the Lt. Gen. William H. Tunner Award for the best aircrew in MAC.

The awards are based on achievements in 1985.



### Best Strategic Combat Missile Crew

Capt. Robert E. Servant, crew commander, and his Titan II crew—S-247 of the 308th Strategic Missile Wing—will receive their second consecutive Gen. Thomas S. Power Strategic Missile Crew Award, placing them first among more than 700 other missile crews in Strategic Air Command (see "Winners With Wings," September '85 issue, p. 50).

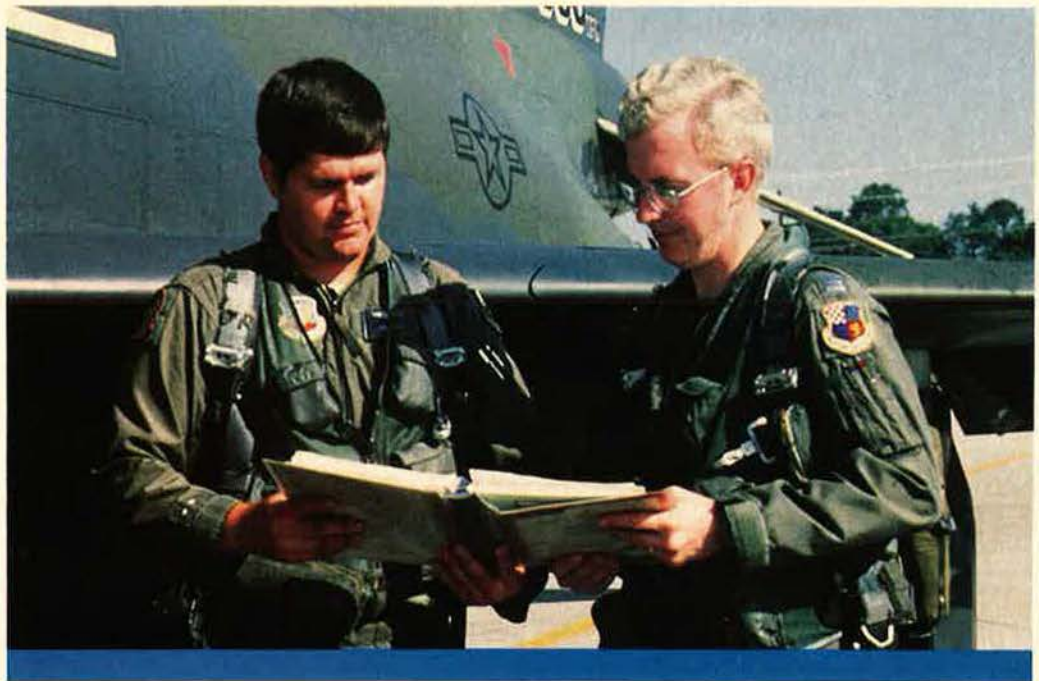
The Little Rock AFB, Ark., crew includes two new members this year: 1st Lt. Robert J. Burns, deputy commander, and TSgt. Robert Donald W. Fent, missile systems analyst. MSgt. Carmen A. Malone, missile facilities technician, remains on the crew from last year.

"In the areas of job knowledge, dedication, and performance results, S-247 is without peer," according to SAC officials. This crew's contributions to overall wing excellence were a big reason why the 308th SMW took

Captain Servant has earned seventeen "Highly Qualified" ratings (the highest possible) on evaluations, while Lieutenant Burns, Sergeant Malone, and Sergeant Fent earned a total of thirty-four highly qualified ratings. All four have been awarded the Eighth Air Force Crew Member Excellence Award for consistent performance during standardization evaluations.

If there is to be a repeat victory for the crew next year, Captain Servant will not be there to share in it. Now off crew, he is the sector commander in the 374th Strategic Missile Squadron, 308th SMW. Lieutenant Burns has been promoted to captain and assigned as missile crew commander and has since become a standardization evaluation crew commander. Sergeant Fent was promoted to master sergeant in March 1986. Sergeant Malone is a senior missile facilities technician overseeing the training branch.

*Flying an unmodified RF-4C, Capt. Leland D. Lewis (left) and Capt. Roger T. Corbin (right) were named "Top Day Reconnaissance Aircrew" and "Top Overall Reconnaissance Aircrew" at TAC's Photo Finish '85 worldwide reconnaissance competition and were also named as the 1986 recipients of the Gen. Jerome F. O'Malley Award for the best reconnaissance crew. Captains Lewis and Corbin are from the 16th Tactical Reconnaissance Squadron at Shaw AFB, S. C.*



the Williams Trophy as "Best Missile Wing in SAC" for an unprecedented third consecutive year in 1985.

The 308th finished first at the 1985 SAC Missile Combat Competition (SMCC) and thus won the Blanchard Trophy for the first time ever. The Wing's operations team, led by S-247, took top honors for "Best Missile Operations in SAC" and "Best Titan Operations" at the SMCC, winning by the second widest margin in the history of the competition. Crew S-247 was further recognized at the SMCC as "Best Missile Crew in SAC" and "Best Titan Crew." Their achievements add up to "an extremely impressive record of excellence," said Lt. Gen. Kenneth L. Peek, Jr., Eighth Air Force Commander. "Your team proved to be the best of the best."

Captain Servant attributes this record of success to the great support from the people in the 308th SMW and to the crew's attitude. "You see the missile each day," he says. "It reminds you never to get complacent."

Gen. Larry D. Welch, then Commander in Chief of SAC and now USAF Chief of Staff, called S-247's accomplishments "unparalleled" and commended their "sustained superior performance in their duties, in self-improvement, and community involvement."

### Best Reconnaissance Crew

An RF-4C aircrew, Capt. Leland D. Lewis, Jr., and Capt. Roger T. Corbin of the 16th Tactical Reconnaissance Squadron, 363d Tactical Fighter Wing, Shaw AFB, S. C., is the winner of the Gen. Jerome F. O'Malley Award.

"Putting this airframe up with the best and coming out on top is a matter of deep personal pride," says Captain Lewis, aircraft commander.

Lewis and Corbin were named "Top Day Reconnaissance Aircrew" and "Top Overall Reconnaissance Aircrew" at Photo Finish '85, a worldwide tactical recon-



naissance competition. "Their accomplishment is even more significant in view of the fact that they piloted a 'vanilla,' unmodified RF-4C, while the majority of their competitors was equipped with state-of-the-art, sophisticated avionics systems," say TAC officials. In the competition, Captains Lewis and Corbin acquired 100 percent of their assigned targets while flying day and night simulated combat missions over mountainous and desert terrain to locate and photograph targets. Gen. Charles A. Gabriel, then USAF Chief of Staff, sent his congratulations to the winners, stating, "The winning of this worldwide tactical reconnaissance competition attests to their expertise."

"We only flew together a dozen or so times before Photo Finish, so our secret was to go back to applying and practicing basic reconnaissance rules and procedures," Captain Lewis says.



**An innovator in four-ship tactics, Capt. Jack J. Catton, Jr., of the 18th Tactical Fighter Wing at Kadena AB, Okinawa, Japan, was named as the 1986 recipient of the Lt. Gen. Claire Lee Chennault Award, given to the Air Force's top tactician. Captain Catton authored the 18th TFW's Tactics Manual and he has been a leader in such fields as combat preparation, threat awareness, and weapons employment doctrine.**

Captain Lewis has more than 1,300 flying hours, and Captain Corbin has 1,100. "The confidence is there in the weapon systems," says Captain Lewis. "Our oldest aircraft are '64 models that are combat proven in Vietnam. You strive to keep a growth potential going—press beyond and refine your capabilities."

"With aging aircraft, complete team effort in the air and on the ground is vital," says Captain Corbin, who is the weapon systems officer. "We have great photo-interpreters and maintenance people."

A TAC inspection team rated Captain Lewis's standardization and evaluation trend-analysis program as among the best. His awards include winning two wing "turkey shoot" competitions that were flown against F-16s and other RF-4s. He has also been selected as the Ninth Air Force RF-4C Standardization and Evaluation officer.

Captain Corbin served as operations officer at Red

Flag 86-2, where his detachment acquired ninety-nine percent of its assigned targets, the unit's highest rate for any Red Flag exercise up to that time.

Both airmen see tactical reconnaissance as a mission with a future. "Battlefield commanders will always want to know what is over the other side of the hill," says Captain Lewis. "And we'll be there to tell them," Captain Corbin adds.

### **Aerial Warfare Tactician**

The 1986 Lt. Gen. Claire Lee Chennault Award recipient is Capt. Jack J. Catton, Jr., an F-15 pilot at Kadena AB, Okinawa, Japan.

"He's without a doubt our most outstanding tactician and practitioner in the art of aerial warfare," in the view of Gen. Charles A. Gabriel, then USAF Chief of Staff.

As Chief of Weapons and Tactics, 18th TFW, Captain

Catton has produced innovations in the fields of combat preparation, threat awareness, integration of command control communications and intelligence (C<sup>3</sup>I), force projection, protection of high-value airborne assets, weapons employment doctrine, and large force employment. "His undaunted approach to the multifaceted problems of offensive warfare . . . has thrust PACAF and the Air Force forward into a new era of force projection and tactical airpower," say TAC officials.

Captain Catton was selected as mission commander for a large-scale PACAF force employment that integrated more than 100 tactical and strategic assets, including thirty-six F-15s. Among his duties were setting up a command and control structure and developing a tactical deception plan. The result—"never before in PACAF has this size force been protected over such a great distance with such short notice and achieved such dramatic results," according to TAC officials.



Furthermore, Captain Catton developed and administered the 18th TFW Weapons program that encompasses all aspects of weapons and tactics training, threat knowledge, intelligence interface, tactics development, and weapon systems reliability. "One guy isn't going to protect our freedom or win the war," Captain Catton says. "It's a team effort. I'll take attitude over pure flying skills any day."

He authored the 18th TFW Tactics Manual with new chapters on radar targeting, three-ship degraded employment options, night employment, emission control, all-aspect missile defense, and "shot doctrine." Moreover, this updated version was published in the yearly rewrite of the F-15 volume of Multi-Command Manual 3-1. "I do everything to take advantage of pilot and airframe," says Captain Catton.

During a PACAF IG inspection in 1985, the inspectors

He acknowledges that being stationed in PACAF may have given him the edge in the Chennault competition. "Kadena is leading the way in four-ship tactics," he says. "It's our bread and butter."

### Strategic Aircrew Award

A year's worth of professionalism, performance, and teamwork won the 1986 Gen. Curtis E. LeMay Strategic Aircrew Award for crew E-33 of the 5th Bombardment Wing. This B-52 crew from Minot AFB, N. D., includes Capt. Robert B. Bush, instructor pilot; 1st Lt. Jeffrey K. Beene, copilot; Maj. Philip C. Krasnicki, instructor radar navigator; 1st Lt. Michael J. Oar, instructor navigator; Capt. Ronald C. Smith, instructor electronic warfare officer; and defensive aerial gunner, TSgt. Scott T. Smith.

"I guess we had that little bit of extra," says Captain



*Crew E-33 from the 5th Bombardment Wing at Minot AFB, N. D., was named as the Gen. Curtis E. LeMay Strategic Aircrew Award winner for 1986. This picture, taken at the 1985 SAC Bombing and Navigation Competition, shows (top row, left to right) Maj. Phil Krasnicki, radar navigator, Lt. Jeff Beene, copilot, and Lt. Mike Oar, navigator. In the middle row are Capt. Brian Bush, pilot, and TSgt. Scott Smith, gunner, and in front is Capt. Ron Smith, electronic warfare officer.*

termed his program "the model wing weapons and tactics program for the Tactical Air Forces" and named him as an "Outstanding Performer."

Captain Catton is the F-15 member of both the Korean Air Analysis Team and the Far East Tactics Analysis Team. He has prepared tactics bulletins for aircrews on the Far Eastern threat. "I tailor my tactics to the people I fly with," he says. "The greatest tactics come up zero if they can't be executed."

To improve use of the F-15 weapon systems he prepared an exhaustive classified study on beyond-visual-range missile employment techniques. PACOM war plans are being revised to implement these new techniques.

What forces shape a tactician? "Imagination," Captain Catton says. "One has to be innovative and consistently seek new and better ways to employ the aircraft in combat."

Bush. "Everyone got along well through the long hours of training. Also, pride and attitude, the desire to excel, to be the best we could possibly be, brought it all together."

The crew has achieved excellent results on scheduled and no-notice flight evaluations. During Global Shield '85, a SAC-wide exercise, they demonstrated the ability to complete missions under adverse conditions. Furthermore, forced to shut down two outboard engines because of a severe fuel leak while over extreme northern Canada, the crew was able to recover the aircraft safely. "The landing phase was particularly stressful due to the aircraft emergency and high, gusty wind conditions following the long flight," says Captain Bush.

Also during 1985, E-33 was recognized as the Best B-52 crew in SAC. At the Red Flag fighter-interceptor exercise, E-33 was named the top crew.

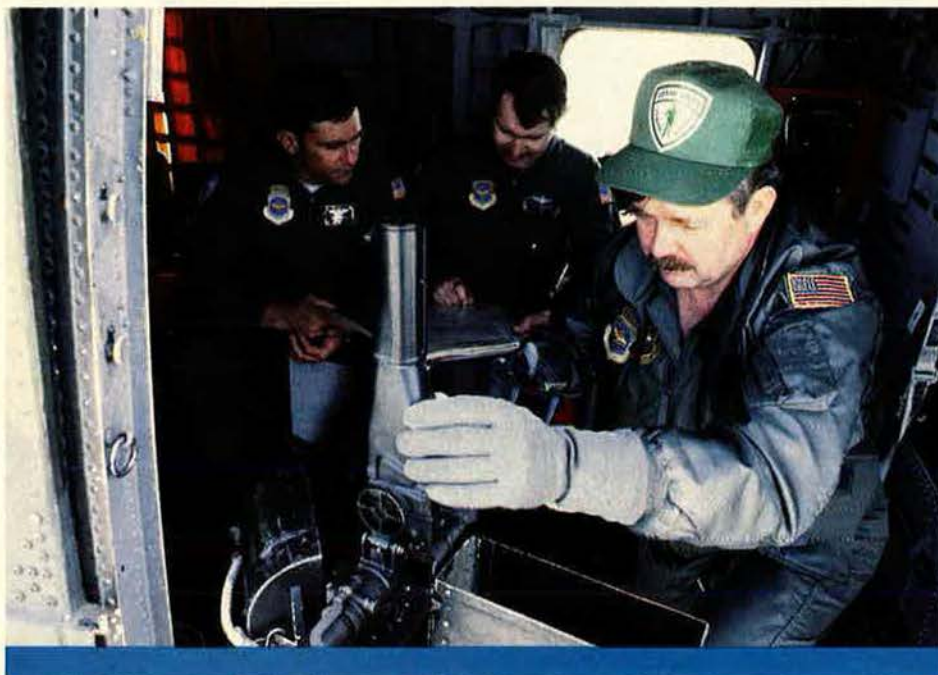
There were numerous personal achievements as well.



Captain Bush was one of only eight B-52 officers from SAC selected during the year for the Air Staff Training (ASTRA) program. His ASTRA assignment began in May 1986. Beene, now a captain, was selected for SAC's first operational B-1B combat squadron—one of only sixty-three crew members to be chosen. Major Krasnicki has attained an impressive bombing reliability record, achieving 100 percent reliability on all weapon releases, including a large number of direct hits. Lieutenant Oar's navigational skills were directly responsible for crew E-33's zero deviations in timing during SAC's bombing and navigation competition. Every weapon release was on time.

Captain Smith achieved the top electronic countermeasures scores in Fifteenth Air Force during Bomb/Nav Comp 1985. He is now at Columbus AFB, Miss., in Undergraduate Pilot Training. Sergeant Smith, with

**The Gen. William H. Tunner Award, given to the best aircrew in Military Airlift Command, went to Maj. Larry G. Brooks (left), Maj. John H. Schramm (center), and SMSgt. Paul N. LeClair (right) of the 305th Aerospace Rescue and Recovery Squadron, Selfridge ANGB, Mich. This crew displayed outstanding airmanship in bringing down their crippled HH-3E Jolly Green Giant helicopter after an engine explosion.**



only seven years of service, has made rapid promotion to technical sergeant and was selected as distinguished graduate at the Fifteenth Air Force NCO Leadership School.

SAC officials lauded this year's LeMay Award winners. "This distinguished crew displayed sustained superior performance in their duties, in professional development, and community involvement. The distinguished record of crew E-33 marks them as worthy of the prestigious recognition so thoughtfully initiated by the Air Force Association," says Gen. Larry D. Welch, then Commander in Chief of Strategic Air Command and now USAF Chief of Staff.

#### **The Best Airlift Aircrew**

Maj. John H. Schramm, Maj. Larry G. Brooks, and SMSgt. Paul N. LeClair of the 305th Aerospace Rescue and Recovery Squadron, Selfridge ANGB, Mich., are

the winners of the 1986 William H. Tunner Award.

This superb Air Force Reserve crew is a double AFA award winner for 1986, also receiving the President's Award, which goes to the outstanding Air Force Reserve aircrew each year.

"This crew displayed outstanding airmanship and gallantry during a catastrophic engine explosion and ensuing fire on their HH-3E helicopter," says Gen. Duane H. Cassidy, Commander in Chief of Military Airlift Command.

*(For details of their heroic story, see "Citizen-Airmen Do It Right," p. 89 of this issue.)* ■

*Maj. Michael B. Perini is Deputy Chief of the Operational Forces Branch in the Secretary of the Air Force's Office of Public Affairs. He was an Education With Industry (EWI) trainee with AIR FORCE Magazine during 1982-83 and is now a regular contributor to this magazine.*





# STRIKEFIGHTER

The A-7: Guaranteed to deliver superior CAS/BAI performance at half the cost of a new aircraft.

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*Specially re-engineered to carry the Close Air Support/Battlefield Air Interdiction load well into the 21st century, this tough combat veteran writes a new chapter in the A-7's book of performance and capabilities.*

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It's a whole new generation of A-7—faster, smarter, more agile and more capable. Building on the Corsair's rugged airframe, we have given the A-7 Strikefighter every capability that a CAS/BAI mission might call for.

The troops who'll need its support will need it *fast*, so the Strikefighter's support needs were kept simple. A small, unimproved forward airstrip and a supply of fuel and ordnance are all it takes.

You can hang a flexible ordnance payload of up to 17,380 pounds on it. Combat radius is almost 900 nautical miles. Even at night or under the weather, the Strikefighter can come in low and fast, to unload on the target with the accuracy of the most advanced navigation and targeting avionics.

Then it can "turn and burn," jinking to avoid the enemy threat with no loss of speed.

#### **Best Performance/Best Price**

From the bomb run to the balance sheet, this is an amazing airplane. Vought Aero Products, the A-7's original builder, will deliver the Strikefighter at a firm, fixed, flyaway price. What's more, operating and support costs will be guaranteed, and its economic life warranted through the year 2010.

What it all boils down to is combat effectiveness *plus* cost efficiency. The A-7 Strikefighter is the equal of any CAS/BAI aircraft—but at significant savings across the board.

 **Aerospace and Defense**  
Vought Aero Products Division

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The Air Force and AFA honor the twelve Outstanding Airmen.

# The Class of '86

BY JEFFREY P. RHODES, DEFENSE EDITOR

**A**s individuals, they all exhibit the character trait known as "class." As the Class of 1986, the twelve Outstanding Airmen of the Year represent the best of the Air Force's enlisted personnel. The members of this group are chosen from a list of eighty-nine nominees from the major commands, the separate operating agencies, and the direct reporting units.

This year's group is well representative of the entire Air Force. Each of seven of the major commands had an airman who made the elite group, as did the Air Force's newest direct reporting unit, the Air Force District of Washington. Tactical Air Command and Pacific Air Forces each had two of their own named as Outstanding Airmen.

The airmen were selected on the basis of job performance, leadership shown in their primary duties, significant self-improvement, leadership in social, cultural, or religious activities, recognition awards, and demonstrated ability in projecting a positive image of the Air Force.

The Class of '86 represents the thirty-first year the Outstanding Airmen have been selected by the Air Force. In that time, 471 enlisted personnel have been named as one of the 474 Outstanding Airmen. Three airmen have earned the honor

twice, and two of the selectees have gone on to be named Chief Master Sergeant of the Air Force.

The twelve, who are entitled to wear the Outstanding Airmen of the Year ribbon with the Bronze Service Star device, will be honored at the 1986 Air Force Association convention in September and will serve on AFA's Enlisted Council for the next year.

The "classmates" are:



**MSgt. Earl D. Anderson of Carswell AFB, Tex.**

• **MSgt. Earl D. Anderson** is the Noncommissioned Officer in Charge, Pass and Registration Section, 7th Security Police Squadron, 7th Bombardment Wing, Carswell AFB, Tex. Coming in with no experience in Pass and Registration procedures, he reorganized and revitalized the section, and he corrected all Inspector General discrepancies in just three months. He was promoted to master sergeant



last December through the Stripes for Exceptional Performers (STEP) program.

Sergeant Anderson holds an associate degree in management, and he is enrolled at Texas Christian University, pursuing his bachelor of arts degree. A distinguished graduate of the Strategic Air Command NCO Academy, he is currently enrolled in the Senior NCO Academy Correspondence Course.

Outside of work, he serves as a Cub Scout leader and as his church's treasurer. He also coaches a Little League baseball team and his squadron's volleyball and badminton teams. Sergeant Anderson, thirty, is a native of Springfield, Mo. He and wife Mary have two children.



**MSgt. Ronnie W. Baker of Luke AFB, Ariz.**

• **MSgt. Ronnie W. Baker** is a Weapons Flight Chief, 58th Aircraft Generation Squadron, Luke AFB, Ariz. He was solely responsible for setting up the weapons flight, establishing operating procedures, building charts, procuring test equipment and tools, and setting up a munitions account for the new F-16C and D aircraft as a cadre member of the 312th Aircraft Maintenance Unit. He also designed and got approval for a manual bomb release tool for hung bombs on the triple ejector rack.

Currently enrolled in the Senior NCO Academy Correspondence Course, Sergeant Baker is also working on an associate degree from the Community College of the Air Force. In February 1985, he was the honor graduate and winner of the Instructor Ability Award at the NCO Leadership School.

A Little League baseball and Pop Warner football coach outside of work, he also organized a softball team in his weapons flight to help raise more than \$500 for the Toys for Tots campaign. Sergeant Baker,

thirty-three, is a native of Cuero, Tex. He and his wife Valerie have three children.



**MSgt. Richard H. Foster of Elmendorf AFB, Alaska.**

• **MSgt. Richard H. Foster** is the NCOIC, Weapons Standardization Section, 21st Aircraft Generation Squadron, Elmendorf AFB, Alaska. His motto could easily be "have weapons, will load," as his crews safely loaded more than 2,000 AIM-7 and AIM-9 air-to-air missiles and half a million rounds of 20-mm ammunition in 1985. His crews participated in every 21st TFW deployment, exercise, and operational readiness evaluation that year. Earlier in his career, he was one of the first technicians to be trained on the Short-Range Attack Missile (SRAM) for the FB-111.

Sergeant Foster completed the Senior NCO Academy Correspondence Course, and he has completed fifteen semester hours of college credits in the past year.

Captain of his squadron's intramural golf team, Sergeant Foster also coaches a youth judo group. He developed a summer base tour program for senior citizens, school children, and AFJROTC cadets. He also started a program for visiting foreign air attachés and base civilians. Sergeant Foster, thirty-four, is a native of Port Chester, N. Y. He and his wife Debra have two children.

• **SMSgt. Timothy L. Gomez** is the Chief C-130 Flight Test Engineer and Flight Engineer Flight Examiner, Detachment 21, Air Force Contract Management Division, Air Force Plant Representative Office, Lockheed-Georgia Co., Marietta, Ga. As the Air Force's observer at the Lockheed plant, he assures quality on the C-130 program by participating in test and acceptance flights on all new and modified government aircraft. He was responsi-



**SMSgt. Timothy L. Gomez of Marietta, Ga.**

ble for identifying and for having deleted two unnecessary high-cost pieces of equipment that were being put on all basic C-130s. This action resulted in savings of \$15,000 per aircraft. Working with company engineers, Sergeant Gomez also developed a flight checklist for the ski-equipped LC-130H.

A graduate of both the Air Force Systems Command NCO Academy and the Senior NCO Academy, Sergeant Gomez holds two associate degrees, and he graduated this past spring from Saint Leo's College with a bachelor's degree in management.

He annually organizes, registers, and officiates a twenty-mile Easter Seals Walkathon. Sergeant Gomez, forty-one, is a native of San Francisco, Calif. He and his wife Doreen have two teen-age children.



**TSgt. Charles R. Grove, Jr., of Laughlin AFB, Tex.**

• **TSgt. Charles R. Grove, Jr.**, is NCOIC, Communications and Navigation Shop, 47th Field Maintenance Squadron, Laughlin AFB, Tex. Under his guidance, the Communications and Navigation Shop was instrumental in the base's maintenance complex's winning the 1985 Air Training Command Maintenance Effectiveness and Efficiency Award and for the Field Maintenance Squadron's being selected as the best in the Air Force for the same year. He also directed a massive remodeling of the shop's physical plant.



Sergeant Grove is a distinguished graduate of both the NCO Leadership School and the NCO Academy. He recently completed the requirements for his associate degree in technology through the Community College of the Air Force.

He is president of the NCO Academy Graduates Association, and he was responsible for getting that organization to contribute almost \$8,000 to Project Stork, Airman's Pantry, and the Senior NCO Academy. Sergeant Grove also helped raise more than \$12,000 for Operation Joy, which gives toys to children of needy families. He is a CPR instructor and the squadron CPR/Self-Aid Buddy Care monitor. Sergeant Grove, thirty-seven, is a native of Keyser, W. Va. He and his wife Nancy have two children.



**SSgt. Maryellen M. Hammock of Hickam AFB, Hawaii.**

● **SSgt. Maryellen M. Hammock** is the Executive Assistant to the Chief of Staff and CINCPACAF Senior Enlisted Advisor, Hq. Pacific Air Forces, Hickam AFB, Hawaii. Sergeant Hammock, an efficient office manager, set up separate information files and document control logs for each office's work requirements. Her behind-the-scenes work as event coordinator ensured a successful Fall 1985 Pacific-wide Senior Enlisted Advisors Conference. She was promoted to her current grade under the STEP program in December 1985.

Sergeant Hammock has completed a course in management analysis and concepts, and she has accumulated thirty-two semester hours toward her associate degree in business management from the Community College of the Air Force.

She gives of her time to the Oahu Central Region Special Olympics and the Hickam Youth Festival, a fund-raiser for youth programs. Sergeant Hammock also teaches aero-

bics and individual weight training routines at the base gymnasium. Twenty-three years old, Sergeant Hammock is a native of St. Louis, Mo.



**TSgt. Rosemary T. Johnston of Incirlik AB, Turkey.**

● **TSgt. Rosemary T. Johnston** is the NCOIC, Supply Procedures Unit, 39th Supply Squadron, Incirlik AB, Turkey. The unit achieved an outstanding on-time delivery rate of 99.8 percent through the personal efforts of Sergeant Johnston. She identified \$500,000 in excess assets that had been incorrectly charged to the supply account. She also initiated corrective actions that resulted in no missed launch times during an operational readiness inspection. Sergeant Johnston originated and edits a bimonthly newsletter that discusses supply issues and provides news to the squadron. A noted speaker, she has given NCO appointment ceremony addresses, and she provides monthly briefings to senior Air Force leaders.

Sergeant Johnston has maintained a 4.0 grade-point average in her studies, and she is nearing completion of an associate degree in business management.

A lay eucharistic minister, she is a member of the Catholic Women of the Chapel and a substitute teacher for Continuing Christian Development. She also works as a volunteer for the local elementary school and the Cub Scouts. Sergeant Johnston, twenty-eight, is a native of Covina, Calif. She and her husband, TSgt. David A. Johnston, have two daughters.

● **SMSgt. Michael I. Lampe** is a Combat Control Superintendent, Detachment 4, 23d Air Force Combat Operations Staff, Pope AFB, N. C. Sergeant Lampe played a major role in researching, designing, and conducting the selection course



**SMSgt. Michael I. Lampe of Pope AFB, N. C.**

required for assignment to a selectively manned unit that deployed on six sensitive Joint Chiefs of Staff exercises last year. As part of this unit, Sergeant Lampe spent 233 days TDY during 1985.

He supervises all combat control pararescue personnel assigned to the unit, and he improved the operational scheduling of personnel involved in the extensive TDY commitment. He was chosen to give a recent briefing to the Chairman of the JCS, Adm. William J. Crowe, CIA Director William Casey, and CINCMAC Gen. Duane Cassidy. For actions as one of the first combat personnel ashore during the Grenada operation in 1983, Sergeant Lampe was awarded the Bronze Star medal with Valor device.

Although he was off station for nearly two-thirds of 1985, Sergeant Lampe completed the final six hours he needed to receive an associate degree in air traffic control from the Community College of the Air Force.

In his spare time, he coaches soccer, basketball, and baseball for the local YMCA, and when he's in town he teaches Sunday School. Sergeant Lampe, thirty-seven, is originally from Bremerton, Wash. He and his wife Theresa have three sons.

● **TSgt. Ramona K. Longerbeam** is a Correspondence Control Technician, Executive Services Division, Directorate of Administration, Air Force District of Washington, Bolling AFB, D. C. As a vital but somewhat overlooked cog in the Air Force machine, Sergeant Longerbeam evaluates, processes, monitors, and controls incoming and outgoing suspense cases for the offices of the Secretary of the Air Force and the Air Force Chief, Vice Chief, and Assistant Vice Chief of Staff.



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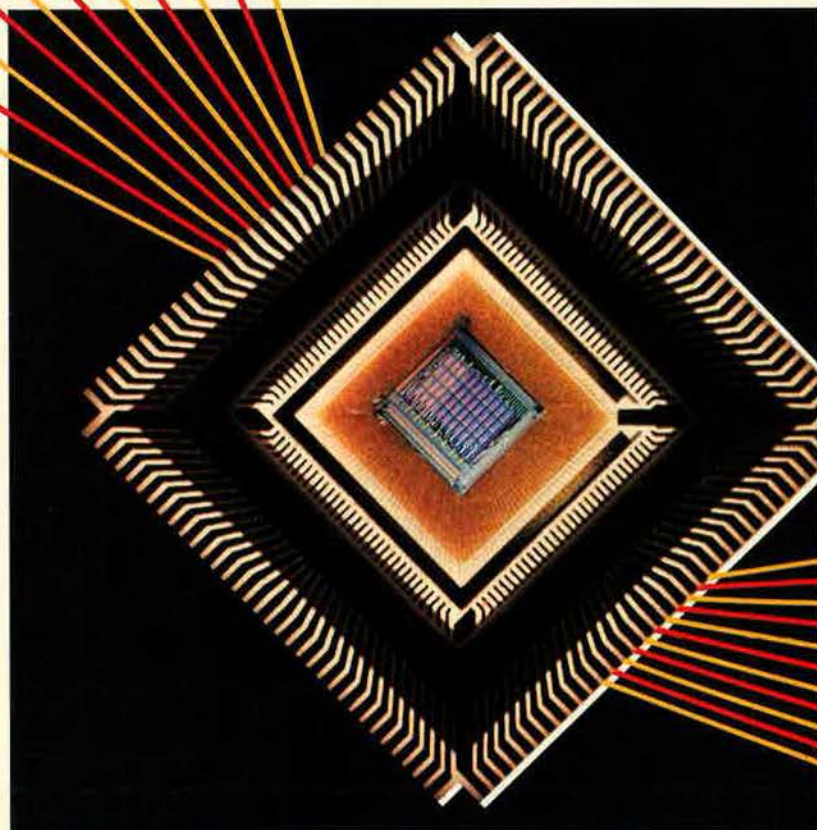
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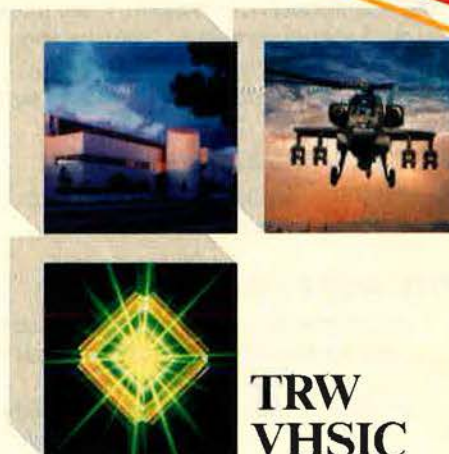


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**TSgt. Ramona K. Longerbeam** of Bolling AFB, D. C.

She also serves as the point of contact for controlling suspenses directed to Air Staff officers from the Secretary of Defense. She was promoted to her present rank through the STEP program in April 1985.

Sergeant Longerbeam is a distinguished graduate of the NCO Leadership School, where she also won the Commandant's Award. She is working on an associate degree from the Community College of the Air Force, and she will soon be attending the NCO Academy in residence. She is a member of AFA's Enlisted Council (see p. 204).

A volunteer with the Washington Special Olympics program, she also worked with retarded and handicapped children through the presidentially sponsored Inspire '85 program. She was recognized by the Air Staff Protocol Office for her voluntary assistance during the time of Gen. Jerome F. O'Malley's funeral. Sergeant Longerbeam, thirty-one, hails originally from Sturgis, Ky.



**SSgt. Roy E. Merritt** of Hill AFB, Utah.

● **SSgt. Roy E. Merritt** is an F-16 Development Technician Team member, 388th Component Repair Squadron, Hill AFB, Utah. Sergeant Merritt provided direct support to the Air Force's development, acquisition, modification, and testing of F-16 simulators. By eliminating duplication in the tech orders and in the maintenance training course and by eliminating re-

dundant diagnostics, he saved the Air Force \$3.5 million while serving as the control manager of the F-16 Digital Radar Landmass Simulator. He also developed and implemented a computerized system for tracking updates to the computer software.

Additionally, he publishes a quarterly newsletter that provides technical information about the simulator program to USAF and European F-16 simulator technicians.

Sergeant Merritt won five awards and is an honor graduate of the NCO Leadership School. He is working toward a degree in computer science.

Outside of work, he is a member of the NCO Open Mess Advisory Council and also serves on the local Area Advisory Council for Special Olympics. Sergeant Merritt, twenty-six, is a native of Rockford, Ill., and is married to the former Debora Dahlman.



**A1C Richard E. Toczek** of Clark AB, Republic of the Philippines.

● **A1C Richard E. Toczek** is an Electronic Communications and Cryptographic Maintenance Specialist, 1961st Information Systems Group, Clark AB, Republic of the Philippines. After Precision Measurement Equipment Laboratory technicians could not repair a connector that provided a vital communications link for the National Emergency Airborne Command Post (NEACP), Airman Toczek took it upon himself to try to make repairs. Without circuit diagrams or technical references, he traced all of the wiring and components and determined the correct signal parameters. He repaired the equipment, prevented an extended outage of a critical system, and saved a \$5,000 frequency connector from the scrap heap. He also designed and built a test apparatus for troubleshooting a complex cryptographic system.

Airman Toczek earned his associ-

ate degree in electronic systems technology from the Community College of the Air Force in 1985. He was the honor graduate of his class of the CRITICOM II system advanced technical course.

In his spare time, he is an active member of the Unit Advisory Council, and he was also his branch's Combined Federal Campaign key worker. Airman Toczek, twenty-four, is a native of Buffalo, N. Y. He and his wife Suzanne have three children.



**SMSgt. Leneir B. Webb** of Clark AB, Republic of the Philippines.

● **SMSgt. Leneir B. Webb** is the Chief of Contract Purchasing, Pacific Air Forces Contracting Center, Clark AB, Republic of the Philippines. With a massive construction project about to start at Clark, Sergeant Webb established new qualification procedures for contractors. With this new system in place, the list of responsible contractors was expanded from twenty-five to more than 200. This action resulted in a \$6.7 million savings in construction costs. He also developed a fixed-price/award fee contract format to give contractors performance incentives. This system will be adopted command-wide in the near future. Last fall, he was the keynote speaker at the US-ASEAN Center for Technology Exchange Conference.

A distinguished graduate of the Senior NCO Academy, Sergeant Webb is close to completing his associate degree from the Community College of the Air Force.

As a member of the Clarkview Church of Christ medical team, he helps dispense care to more than 1,000 Filipinos per month. He is a church deacon there, a rare honor for a non-Filipino. Sergeant Webb, thirty-eight, is a native of Birmingham, Ala. He and his wife Elizabeth have three children. ■



Crew chiefs put airpower on the line.

# Team of the Year

**BY BRENDA G. BEAUREGARD**  
AFA ASSISTANT FOR PROGRAMS AND AWARDS

---

**T**HE critical job of keeping USAF's aircraft fit to fly, fight, and win falls to Air Force ground crews, especially to the crew chiefs, whose exploits all too often go unsung.

USAF's Aircraft Maintenance Crew Chiefs are mechanics, technicians, teachers, and innovators all rolled into one. Their skills and inspirational qualities are reflected in the condition of their aircraft and in the pride and professionalism of their subordinates.

Great crew chiefs stand out. Five who clearly belong in that category were honored as the 1986 AFA/USAF Team of the Year and were selected from throughout the Air Force as the finest in the field.

*Members of the Team of the Year meet with Air Force Secretary Edward C. Aldridge at a reception on Capitol Hill given by AFA's Nation's Capital Chapter, which honored the team members for their outstanding work as aircraft maintenance crew chiefs. From left to right are SrA. Robert W. Blackburn, SSgt. Daniel J. Williams, TSgt. Edward C. Clarke, Secretary Aldridge, SSgt. Christian W. Pelletier, and TSgt. Jerry L. Densmore.*







**TSgt. Jerry L. Densmore** has been at the forefront of B-1B test and development since his assignment to Dyess AFB, Tex., as a member of the 96th Organizational Maintenance Squadron. (Photo by SMSgt. Jesse Grice, USAF)

• **TSgt. Edward C. Clarke** earned distinction as an F-4E Dedicated Crew Chief with the 347th Tactical Fighter Wing, Moody AFB, Ga. His painstaking probing and correction of problems made it possible for his aircraft to be flown at an average rate of twenty-two sorties per month in 1985 and to be classified as fully mission-capable ninety percent of the time. In the Bright Star '85 exercise in Egypt last year, Sergeant Clarke kept his aircraft continuously combat-ready in an unfamiliar, demanding environment by changing an engine on the spot.

• **TSgt. Jerry L. Densmore** of the 96th Organizational Maintenance Squadron, Dyess AFB, Tex., is renowned for his work on newly op-

erational B-1B bombers. His analysis of B-1B problems led to major design improvements for overwing fairing pressure regulators, windshield installation, and access to accessory drive gear boxes. When a B-1B engine failed on its maiden flight as a result of foreign-object damage, Sergeant Densmore dismantled it, meticulously examined it, and discovered bolts from the bomber's engine-bleed, air-pre-cooler flapper door deep inside the nacelle. The door assemblies were subsequently redesigned, saving millions of dollars in future problems and possibly aircrew lives.

• **SSgt. Christian W. Pelletier** of the 64th Organizational Maintenance Squadron, Reese AFB, Tex.,

took such good care of his T-38A that both were chosen to represent Reese at the first Air Training Command Turkey Shoot, which tests the proficiency of air and ground crews throughout ATC. Sergeant Pelletier received recognition for his outstanding performance on that occasion. He was also recognized as a Professional Performer by the ATC Inspector General.

• **SSgt. Daniel J. Williams** of the 520th Aircraft Generation Squadron, 20th Tactical Fighter Wing, RAF Upper Heyford, was chosen from among 340 crew chiefs to serve as aircraft turnaround supervisor of the wing's weapons load team in the 1985 LOADEO competition. His superior performance made it possible

**SSgt. Christian W. Pelletier** checks for the proper tool for the job before beginning repairs on this T-38 at Reese AFB, Tex., where he's a member of the 64th Organizational Maintenance Squadron. (Photo by A1C Greg Spraggins, USAF)





SrA. Robert W. Blackburn here helps a pilot into his F-4 Phantom II at Eglin AFB, Fla., where Airman Blackburn is assigned to the 3246th Organizational Maintenance Squadron. (Photo by TSgt. Ray Williams, USAF)



for the 20th TFW to win the Best Air-to-Ground Team LOADEO '85 Award and to place second in competition among all USAF wings. Sergeant Williams maintains his F-111E at an 89.6 percent mission-capable rate, compared to the USAF norm of sixty-five percent.

● SrA. Robert W. Blackburn of the 3246th Organizational Maintenance Squadron, Eglin AFB, Fla., showed his skills and leadership by salvaging a high-priority Pave Tack mission. The RF-4C assigned to the mission had erratic flight control problems during launch. Suspecting air in the hydraulic system, Airman Blackburn bled the system and instructed the aircrew to recycle the controls. This tactic succeeded. At the age of twenty-two, Airman Blackburn has earned many honors as a crew chief and is highly regarded as a trainer of new ones. ■

All it takes, according to the Chief Red award winner, is basic knowledge, hard work, and common sense.

# No Secret to Success

BY JEFFREY P. RHODES, DEFENSE EDITOR

**T**HERE is no big secret to the success I've had," said CMSgt. Richard W. Cooper, the 1986 winner of AFA's Chief Master Sergeant Dick Red Maintenance Award. "I had the basic knowledge, and I just worked hard and used good common sense. I learned a lot from other people, and I've been able to work my way up."

That is a somewhat understated assessment of a distinguished maintenance career that has spanned thirty-three of the thirty-eight years Chief Cooper has been involved with the Air National Guard. Starting as an air operations specialist in

1948, Chief Cooper became a mechanic in 1953, and since then he has been promoted to Aircraft Maintenance Supervisor and, finally, Chief of Quality Control for the 150th Consolidated Aircraft Maintenance Squadron at Kirtland AFB, N. M. Over the years, Chief Cooper has worked on aircraft ranging from P-51s and C-47s to F-80s, F-100s, F-4s, and A-7s.

Established in 1984, the Chief Red Award is presented annually to an enlisted Air National Guardsman for outstanding contributions to aerospace maintenance. The award honors the memory of CMSgt. Dick

Red, an Arkansas Guardsman whose career in aircraft maintenance spanned nearly forty years. CMSgt. Burl E. Summers of the Tennessee Air Guard won the award in 1985, and Ohio Guardsman CMSgt. Gene A. Killilea was the initial recipient.

After serving in the Ohio Guard for three and a half years, Chief Cooper attempted to transfer to the New Mexico Guard in 1952, but discovered there was no unit present—the state's 150th Tactical Fighter Group was actively involved in the Korean War. The unit returned Stateside in the fall of 1952, and





**CMSgt. Richard W. Cooper, this year's winner of AFA's Chief Master Sergeant Dick Red Maintenance Award, is shown here at Kirtland AFB, N. M., beside an A-7D. The Chief Red Award was established in 1984 and is presented annually to an enlisted Air National Guardsman for outstanding contributions to aerospace maintenance.**

then-Sergeant Cooper joined in January 1953.

In 1954, Chief Cooper attended the jet fighter aircraft mechanic course at Amarillo, Tex., and was the honor graduate. He then returned to the desert to work on the unit's F-80 Shooting Stars. Five years later, the 150th was selected as the first ANG unit to transition to the F-100 Super Sabre. Chief Cooper attended the F-100 Maintenance Familiarization Course and completed the airplane's maintenance technician course while in residence. He served as an F-100 mechanic until he was promoted to the position of Aircraft Maintenance Supervisor in 1960.

Eight years later, the 150th TFG was federally activated, and Chief Cooper, who by then had attained his present rank, was sent to the F-4D mechanic's course. He was assigned as Aircraft Maintenance Supervisor with the 355th TFS at Seymour Johnson AFB, N. C. Released from active duty in 1969, Chief Cooper returned to Kirtland and his former position with the Guard.

As with the F-100, the 150th TFG was chosen to be the first Guard unit to convert to the A-7D. As a matter of course, Chief Cooper was one of the first ANG noncommissioned officers to attend the Corsair II maintenance technician course. Chief

Cooper was promoted to his present position of Quality Control Supervisor for the 150th CAMS in 1975.

"One of the biggest changes I have seen in the Guard has been in maintenance," said Chief Cooper, who in his spare time has taken electronics courses in such areas as television repair and miniature circuitry soldering techniques. "When I started, things were pretty simple. Now, with the modern equipment, everything is much more specialized. You really have to stay on top of it. The in-commission rate is much harder to keep up now. I like the challenge, though."

One of Chief Cooper's most outstanding accomplishments was that he was solely responsible for getting repairs of A-7D outer wing panel flap hinge lugs changed from being a depot-level to a field-level operation. He proved that repair could be done in the field in two days with a different type of fastener as opposed to the fifteen days required at the depot. This action saved time and money on the actual repair and also in transportation costs between the base and the depot.

Never one to sit still for long, Chief Cooper started "fiddling" with computers a few years ago. He took to it well, and he designed a program for figuring the weight and balance of the A-7. He then received a request from Oklahoma City Air

Logistics Center personnel for a similar program for the B-52. Both programs are now in use at the depot level, saving time and money and improving the accuracy of weight and balance calculations.

In addition to his highly demonstrated maintenance skills, Chief Cooper has also improved his managerial talents by attending numerous seminars on position classification, production techniques, and equal employment opportunities. He has been very active in such civic affairs as the Boy Scouts and an annual Christmas toy drive for children in the Albuquerque area who suffer from leukemia.

Chief Cooper was militarily appointed to Maintenance Superintendent for the 150th CAMS in 1980. He recently retired from that position, although he still puts in one weekend a month and two weeks a year with the Guard unit.

"I manage the Guardsman Club, I ski, fish, bowl, and play tennis, along with being a locksmith on the side," Chief Cooper noted. "I don't have as much time off as I thought I would when I retired."

Looking back over his career, Chief Cooper said, "I was always taught to work as hard as you can, do a good job, and people would appreciate it." The Chief Red Award is proof that Chief Cooper's work is appreciated. ■



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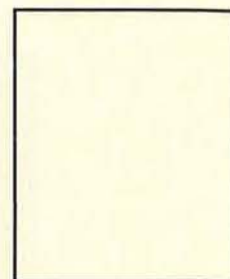
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**Comptroller of the Air Force**  
Lt. Gen. Truman Spangrud

**Deputy Comptroller**  
Joseph P. Poppo

**Ass't Comptroller for Accounting  
and Finance**  
Brig. Gen. Mark J. Worrick

**Director of Budget**  
Maj. Gen. Leo W. Smith II

**Director of Cost**  
Col. Milton L. Haines



**Deputy Chief of Staff  
Personnel**  
Lt. Gen. John A. Shaud

**Ass't DCS/Personnel**  
Maj. Gen. Robert C. Oaks

**Ass't DCS/Personnel for Military  
Personnel**  
Maj. Gen. Ralph E. Havens

**Director of Personnel Plans**  
Maj. Gen. William J. Mall, Jr.

**Director of Civilian Personnel**  
Pat L. Schittulli

**Director of Personnel Programs**  
Maj. Gen. Winfield S. Harpe

**Assistant for General Officer  
Matters**  
Col. Charles T. Robertson, Jr.



**Deputy Chief of Staff, Research,  
Development and Acquisition**  
Lt. Gen. Bernard P. Randolph

**Ass't DCS/RD&A**  
Maj. Gen. Donald L. Lamberson

**Director of Development and  
Production**  
Maj. Gen. Ronald W. Yates

**Director of Operational  
Requirements**  
Maj. Gen. John M. Loh

**Director of Space Systems and  
Command Control  
Communications**  
Brig. Gen. Robert R. Rankine, Jr.

**Director of Contracting and  
Manufacturing Policy**  
Brig. Gen. Kenneth V. Meyer

**Director of Program Integration**  
Col. Richard H. Danhol

**Special Assistant for ICBM  
Modernization**  
Brig. Gen. Charles A. May, Jr.

**Special Assistant for Low  
Observable Technology**  
Brig. Gen. James W. Evatt

**Special Assistant for Strategic  
Defense Initiative**  
Brig. Gen. Thomas W. Honeywill

**Special Assistant for WWMCCS  
Information Systems**  
Brig. Gen. Carl G. O'Berry

**Director of Electronic Combat**  
Brig. Gen. John A. Corder

**Director of Small and  
Disadvantaged Business  
Utilization**  
Donald E. Rellins

**Special Assistant for Special  
Operations Forces**  
Brig. Gen. Thomas E. Eggers

**Special Assistant for  
International Cooperative  
Research and Development**  
Col. Ronald W. Obermeyer

**The Competition Advocate  
General**  
Brig. Gen. William P. Hallin



**Deputy Chief of Staff  
Logistics and Engineering**  
Lt. Gen. Leo Marquez

**Ass't DCS/L&E**  
Maj. Gen. Stanton R. Musser

**Director of Logistics, Plans and  
Programs**  
Maj. Gen. Charles P. Skiplon

**Director of Transportation**  
Brig. Gen. Clarence H. Lindsey, Jr.

**Director of Engineering and  
Services**  
Maj. Gen. George E. Ellis

**Director of Maintenance and  
Supply**  
Col. (Brig. Gen. selectee) Philip L. Metzler, Jr.

**Special Assistant to DCS/L&E**  
Brig. Gen. William T. Williams IV

**Special Assistant to DCS/L&E  
and DCS/RD&A for Reliability  
and Maintainability**  
Brig. Gen. Frank S. Goodell



# The Major Commands

## Alaskan Air Command (AAC)

Hq. Elmendorf AFB, Alaska



Lt. Gen. David L. Nichols  
Commander



CMSgt. John F. Tobey  
Senior Enlisted Advisor

## Air Force Communications Command (AFCC)

Hq. Scott AFB, Ill.



Maj. Gen. John T. Slihl  
Commander



CMSgt. Jeremiah T. Hayes  
Senior Enlisted Advisor

## Air Force Logistics Command (AFLC)

Hq. Wright-Patterson AFB, Ohio



Gen. Earl T. O'Loughlin  
Commander



CMSgt. Jack E. Bowerman  
Senior Enlisted Advisor

## Air Force Systems Command (AFSC)

Hq. Andrews AFB, Md.



Gen. Lawrence A. Skantzle  
Commander



CMSgt. Billy D. Hall  
Senior Enlisted Advisor

## Air Training Command (ATC)

Hq. Randolph AFB, Tex.



Gen. Andrew P. Iosue  
Commander



CMSgt. J. C. Riley  
Senior Enlisted Advisor

## Air University (AU)

Hq. Maxwell AFB, Ala.



Lt. Gen. Thomas C. Richards  
Commander



CMSgt. Robert H. Waldrup  
Senior Enlisted Advisor

**Airlift Information Systems Div.**  
Col. Dennis C. Beasley  
Scott AFB, Ill.

**Engineering Installation Div.**  
Col. Robert A. Reinman  
Tinker AFB, Okla.

**European Information Systems Div.**  
Brig. Gen. Samuel J. Greene  
Kapaun AS, Germany

**Pacific Information Systems Div.**  
Col. Richard B. Ensign  
Hickam AFB, Hawaii

**Space Information Systems Div.**  
Col. Karl V. Price  
Peterson AFB, Colo.

**Standard Information Systems Ctr.**  
Col. Gerald W. Gill  
Gunter AFS, Ala.

**Strategic Information Systems Div.**  
(Temporarily Vacant)  
Offutt AFB, Neb.

**Tactical Information Systems Div.**  
Col. Albert J. Edmonds  
Langley AFB, Va.

**Air Training Information Systems Div.**  
Col. Kenneth R. Ruff  
Randolph AFB, Tex.

**Logistics Information Systems Div.**  
Col. Edward R. Canwise  
Wright-Patterson AFB, Ohio

**Research and Acquisition Information Systems Div.**  
Col. Richard W. Amann  
Andrews AFB, Md.

**Ogden Air Logistics Ctr.**  
Maj. Gen. Charles McCaustand  
Hill AFB, Utah

**Oklahoma City Air Logistics Ctr.**  
Maj. Gen. William P. Bowden  
Tinker AFB, Okla.

**Sacramento Air Logistics Ctr.**  
Maj. Gen. Lee V. Greer  
McClellan AFB, Calif.

**San Antonio Air Logistics Ctr.**  
Maj. Gen. Lewis G. Curllis  
Kelly AFB, Tex.

**Warner Robins Air Logistics Ctr.**  
Maj. Gen. Cornelius Nugleren  
Robins AFB, Ga.

**Logistics Operations Ctr.**  
Brig. Gen. Anthony J. Farrington, Jr.  
Wright-Patterson AFB, Ohio

**Logistics Management Systems Ctr.**  
Brig. Gen. Trevor A. Hammond  
Wright-Patterson AFB, Ohio

**International Logistics Ctr.**  
Brig. Gen. Stuart R. Boyd  
Wright-Patterson AFB, Ohio

**Air Force Acquisition Logistics Ctr.**  
Maj. Gen. Richard F. Gillis  
Wright-Patterson AFB, Ohio

**Air Force Packaging Evaluation Agency**  
Jack Thompson  
Wright-Patterson AFB, Ohio

**Aerospace Guidance and Metrology Ctr.**  
Col. Lloyd F. Powell  
Newark AFS, Ohio

**Aerospace Maintenance and Regeneration Ctr.**  
Col. Herbert W. Grounds  
Davis-Monthan AFB, Ariz.

**Air Force Contract Maintenance Ctr.**  
Col. John C. Novak  
Wright-Patterson AFB, Ohio

**Air Force Museum**  
Col. Richard L. Uppstrom  
Wright-Patterson AFB, Ohio

**Support Group, Europe**  
Col. Billy G. Edenfield  
RAF Kemble, UK

**Cataloging and Standardization Ctr.**  
Col. Marvin L. Davis  
Battle Creek, Mich.

**Air Force Contract Law Ctr.**  
Brig. Gen. Norman R. Thorpe  
Wright-Patterson AFB, Ohio

**Wright-Patterson Contracting Ctr.**  
Col. James F. Sears  
Wright-Patterson AFB, Ohio

**USAF Medical Center**  
Col. Frederick R. Bode  
Wright-Patterson AFB, Ohio

**Aeronautical Systems Div.**  
Lt. Gen. William E. Thurman  
Wright-Patterson AFB, Ohio

**Space Division**  
Lt. Gen. Forrest S. McCarney  
Los Angeles AFS, Calif.

**Electronic Systems Div.**  
Lt. Gen. Melvin F. Chubb, Jr.  
Hanscom AFB, Mass.

**Air Force Flight Test Ctr.**  
Lt. Gen. Melvin T. Twining  
Edwards AFB, Calif.

**Ballistic Missile Office**  
Maj. Gen. Aloysius G. Casey  
Norton AFB, Calif.

**Air Force Contract Management Div.**  
Maj. Gen. Bernard L. Weiss  
Kirtland AFB, N. M.

**Armament Div.**  
Maj. Gen. Gordon E. Fomell  
Eglin AFB, Fla.

**Space and Missile Test Organization**  
Maj. Gen. Donald L. Cromer  
Vandenberg AFB, Calif.

**Aerospace Medical Div.**  
Maj. Gen. Fredric E. Doppelt  
Brooks AFB, Tex.

**Arnold Engineering Development Ctr.**  
Col. Philip J. Conran  
Arnold AFS, Tenn.

**Foreign Technology Div.**  
Col. Gary Culp  
Wright-Patterson AFB, Ohio

**Air Force Space Technology Ctr.**  
Col. Lawrence L. Gooch  
Kirtland AFB, N. M.

**Air Force Military Training Ctr.**  
Maj. Gen. Chris D. Divich  
Lackland AFB, Tex.

**Chanute Technical Training Ctr.**  
Brig. Gen. William J. Gove, Jr.  
Chanute AFB, Ill.

**Keester Technical Training Ctr.**  
Maj. Gen. Thomas J. Hickey  
Keester AFB, Miss.

**Goodfellow Technical Training Ctr.**  
Col. (Brig. Gen. selectee) Paul L. Roberson  
Goodfellow AFB, Tex.

**Lowry Technical Training Ctr.**  
Maj. Gen. Joseph D. Moore  
Lowry AFB, Colo.

**Sheppard Technical Training Ctr.**  
Maj. Gen. Richard W. Phillips, Jr.  
Sheppard AFB, Tex.

**USAF Recruiting Service**  
Brig. Gen. William J. Porter  
Randolph AFB, Tex.

**Air Force Reserve Officer Training Corps**  
Brig. Gen. Richard E. Hearne  
Maxwell AFB, Ala.

**Air War College**  
Maj. Gen. Harold W. Todd  
Maxwell AFB, Ala.

**Air Force Institute of Technology**  
Brig. Gen. Richard J. Toner  
Wright-Patterson AFB, Ohio

**Air Command and Staff College**  
Brig. Gen. Richard E. Willis  
Maxwell AFB, Ala.

**Center for Aerospace Doctrine, Research, and Education**  
Col. John C. Fryer, Jr.  
Maxwell AFB, Ala.

**Hq. Civil Air Patrol—USAF**  
Col. John T. Massingale, Jr.  
Maxwell AFB, Ala.

**Squadron Officer School**  
Col. Ellwood D. Hinman III  
Maxwell AFB, Ala.

**USAF Senior NCO Academy**  
CMSgt. Bobby G. Renroe  
Gunter AFS, Ala.

**AU Center for Professional Development**  
Col. David L. Hosley  
Maxwell AFB, Ala.

**Extension Course Institute**  
Col. Cynthia H. Little  
Gunter AFS, Ala.

**Air University Library**  
Robert B. Lane  
Maxwell AFB, Ala.



**Electronic Security Command (ESC)**

Hq. Kelly AFB, Tex.



Maj. Gen. Paul H. Martin  
Commander



MSgt. Robert L. Sherwood  
Senior Enlisted Advisor

**Military Airlift Command (MAC)**

Hq. Scott AFB, Ill.



Gen. Duane H. Cassidy  
Commander in Chief



CMSgt. Charles K. Ray  
Senior Enlisted Advisor

**21st Air Force**  
Maj. Gen. Jack W. Sheppard  
McGuire AFB, N. J.

**22d Air Force**  
Maj. Gen. Donald D. Brown  
Troy AFB, Calif.

**23d Air Force**  
Maj. Gen. Robert B. Patterson  
Scott AFB, Ill.

**Air Weather Service**  
Brig. Gen. George E. Chapman  
Scott AFB, Ill.

**Aerospace Audiovisual Service**  
Col. James D. Elmer  
Norton AFB, Calif.

**Pacific Air Forces (PACAF)**

Hq. Hickam AFB, Hawaii



Gen. Robert W. Bazley  
Commander in Chief



CMSgt. David A. Guzman  
Senior Enlisted Advisor

**5th Air Force**  
Lt. Gen. Edward L. Tixier  
Yokota AB, Japan

**13th Air Force**  
Maj. Gen. Michael P. C. Carris  
Clark AB, Philippines

**313th Air Div.**  
Brig. Gen. Donald Snyder  
Kadena AB, Japan

**314th Air Div.**  
Maj. Gen. James T. Callaghan  
Osan AB, Korea

**326th Air Div.**  
Col. Robert R. Bartlett  
Wheeler AFB, Hawaii

**Air Force Space Command (AFSPACECOM)**

Hq. Peterson AFB, Colo.



Gen. Robert T. Herres  
Commander



CMSgt. Thomas J. Echols  
Senior Enlisted Advisor

**1st Space Wing**  
Col. Phillip E. Bracher  
Peterson AFB, Colo.

**2d Space Wing**  
Col. Lesler J. Weber  
Falcon AFS, Colo.

**Strategic Air Command (SAC)**

Hq. Offutt AFB, Neb.



Gen. John T. Chain, Jr.  
Commander in Chief



CMSgt. Jan C. Boyd  
Senior Enlisted Advisor

**8th Air Force**  
Lt. Gen. Kenneth L. Peek, Jr.  
Barksdale AFB, La.

**7th Air Div.**  
Brig. Gen. Loring R. Astorino  
Ramslein AB, Germany

**19th Air Div.**  
Brig. Gen. Robert M. Alexander  
Carswell AFB, Tex.

**40th Air Div.**  
Brig. Gen. Orlinus K. Lewis, Jr.  
Wurtsmith AFB, Mich.

**42d Air Div.**  
Brig. Gen. Larry D. Forner  
Blytheville AFB, Ark.

**45th Air Div.**  
Brig. Gen. John R. Allen, Jr.  
Pease AFB, N. H.

**15th Air Force**  
Lt. Gen. James E. Light, Jr.  
March AFB, Calif.

**3d Air Div.**  
Maj. Gen. Donald L. Marks  
Andersen AFB, Guam

**4th Air Div.**  
Brig. Gen. Denis L. Walsh  
F. E. Warren AFB, Wyo.

**12th Air Div.**  
Brig. Gen. Walter E. Webb III  
Dyess AFB, Tex.

**14th Air Div.**  
Brig. Gen. John R. Farrington  
Beale AFB, Calif.

**47th Air Div.**  
Brig. Gen. W. John Soper  
Fairchild AFB, Wash.

**57th Air Div.**  
Brig. Gen. Frederick A. Fiedler  
Minot AFB, N. D.

**1st Strategic Aerospace Div.**  
Maj. Gen. Donald O. Aldridge  
Vandenberg AFB, Calif.  
(effective Sept. 15, 1986)

**Tactical Air Command (TAC)**

Hq. Langley AFB, Va.



Gen. Robert D. Russ  
Commander



CMSgt. Kenneth R. Meeks  
Senior Enlisted Advisor

**1st Air Force**  
Maj. Gen. Buford D. Lary  
Langley AFB, Va.

**9th Air Force**  
Lt. Gen. William L. Kirk  
Shaw AFB, S. C.

**12th Air Force**  
Lt. Gen. Charles J. Cunningham, Jr.  
Bergstrom AFB, Tex.

**USAF Southern Air Div.**  
Maj. Gen. Henry D. Canlerbury  
Howard AFB, Panama

**USAF Tactical Air Warfare Ctr.**  
Maj. Gen. Thomas S. Swalm  
Eglin AFB, Fla.

**USAF Tactical Fighter Weapons Ctr.**  
Maj. Gen. Peter T. Kempf  
Nellis AFB, Nev.

**USAF Air Defense Weapons Ctr.**  
Maj. Gen. Clifford H. Ross, Jr.  
Lyndall AFB, Fla.

**28th Air Div.**  
Brig. Gen. (Maj. Gen. selectee) William K. James  
Tinker AFB, Okla.

**United States Air Forces in Europe (USAFE)**

Hq. Ramstein AB, Germany



Gen. Charles L. Donnelly, Jr.  
Commander in Chief



CMSgt. John R. McCauslin  
Senior Enlisted Advisor

**Deputy CINCUSAFE for Southern Area and COMAIRSOUTH**  
Lt. Gen. James R. Brown  
Naples, Italy

**3d Air Force**  
Maj. Gen. Thomas G. McInerney  
RAF Mildenhall, England

**16th Air Force**  
Maj. Gen. Thomas A. Baker  
Torrejón AB, Spain

**17th Air Force**  
Maj. Gen. William J. Breckner, Jr.  
Sembach AB, Germany

**TUSLOG**  
Maj. Gen. John C. Scheidt, Jr.  
Ankara AS, Turkey

**65th Air Div.**  
Brig. Gen. Philip M. Drew  
Sembach AB, Germany

**316th Air Div.**  
Brig. Gen. Lawrence E. Huggins  
Ramstein AB, Germany



# USAF's Separate Operating

## Air Force Accounting and Finance Center

Hq. Lowry AFB, Colo.



Brig. Gen. Mark J. Worrick  
Commander



CMSgt. Michael K. Thompson  
Senior Enlisted Advisor

## Air Force Commissary Service

Hq. Kelly AFB, Tex.



Maj. Gen. M. Gary Alkire  
Commander



CMSgt. Glenn H. Lewis  
Senior Enlisted Advisor

## Air Force Inspection and Safety Center

Hq. Norton AFB, Calif.



Maj. Gen. Fred A. Haelfner  
Commander



CMSgt. Ronald L. Schenk  
Senior Enlisted Advisor

## Air Force Legal Services Center

Hq. Washington, D. C.



Maj. Gen. Robert W. Norris  
Commander



CMSgt. Jerry L. Becker  
Senior Enlisted Advisor

## Air Force Audit Agency

Hq. Norton AFB, Calif.



Brig. Gen. Basil H. Plumm  
Commander  
Deputy Auditor General  
(Detailed to the Pentagon)



CMSgt. Fred H. Glover  
Senior Enlisted Advisor

## Air Force Engineering and Services Center

Hq. Tyndall AFB, Fla.



Col. Roy G. Kennington  
Commander



CMSgt. Norman F. Karaszewski  
Senior Enlisted Advisor

## Air Force Intelligence Service

Hq. Washington, D. C.



Brig. Gen. C. Norman Wood  
Commander



CMSgt. Roger Loughry  
Senior Enlisted Advisor

## Air Force Management Engineering Agency

Hq. Randolph AFB, Tex.



Col. James E. Roberts  
Commander



CMSgt. Michael C. Shirley  
Senior Enlisted Advisor



# Agencies

## Air Force Military Personnel Center

Hq. Randolph AFB, Tex.



Maj. Gen. Ralph E. Havens  
Commander



CMSgt. Arthur C. "Art" Shelton  
Senior Enlisted Advisor

## Air Force Office of Medical Support

Hq. Brooks AFB, Tex.



Col. Harold W. Grinstaff  
Commander



CMSgt. Daniel E. Chapman  
Senior Enlisted Advisor

## Air Force Office of Security Police

Hq. Kirtland AFB, N. M.



Brig. Gen. Paul N. Scheidel  
Commander



CMSgt. Robert C. Agee  
Senior Enlisted Advisor

## Air Force Office of Special Investigations

Hq. Bolling AFB, D. C.



Brig. Gen. Richard S. Beyea, Jr.  
Commander



CMSgt. Roy T. Day  
Senior Enlisted Advisor

## Air Force Operational Test and Evaluation Center

Hq. Kirtland AFB, N. M.



Maj. Gen. Michael D. Hall  
Commander



CMSgt. Robert L. Lucero  
Senior Enlisted Advisor

## Air Force Reserve

Hq. Robins AFB, Ga.



Maj. Gen. Sloan R. Gill  
Commander



CMSgt. Richard E. Russell  
Senior Enlisted Advisor

## Air Force Service Information and News Center

Hq. Kelly AFB, Tex.



Col. Paul F. Heye  
Commander



CMSgt. David A. Sheeder  
Senior Enlisted Advisor

## Air Reserve Personnel Center

Hq. Denver, Colo.



Brig. Gen. Wayne W. Lambert  
Commander



# Direct Reporting Units

## Air Force Academy

Colorado Springs, Colo.



Lt. Gen. Winfield W. Scott, Jr.  
Superintendent



CMSgt. Richard P. E. Cook  
Senior Enlisted Advisor

## Air Force Civilian Personnel Management Center

Randolph AFB, Tex.



Pat L. Schittulli  
Director

## Air Force District of Washington

Bolling AFB, D. C.



Brig. Gen. Edward N. Giddings  
Commander



CMSgt. Francis A. Rago, Jr.  
Senior Enlisted Advisor

## Air Force Technical Applications Center

Patrick AFB, Fla.



Col. (Brig. Gen. selectee)  
Richard J. O'Lear  
Commander



CMSgt. John T. Horsch  
Senior Enlisted Advisor

## Air National Guard

Hq. Washington, D. C.



Maj. Gen. John B. Conaway  
Director



CMSgt. Richard M. Green  
Senior Enlisted Advisor

## USAF Historical Research Center

Maxwell AFB, Ala.



Lloyd H. Cornett, Jr.  
Director



# Air Force Generals Serving in Joint and International Slots

## FOUR STARS



**Gen. Robert T. Herres**  
Commander in Chief,  
US Space Command  
Commander in Chief,  
North American  
Aerospace Defense  
Command  
Colorado Springs, Colo.

As USCINCSpace, integrates tactical warning and assessment, space operations, and ballistic missile defense planning. As CINCNORAD, provides surveillance and control of North American airspace, warning and assessment of aerospace attack, and appropriate response against air attack.



**Gen. Richard L. Lawson**  
Deputy Commander in  
Chief  
US European Command  
Stuttgart-Vaihingen,  
Germany

Responsible for ensuring maximum combat readiness of forces assigned to subordinate commands and advises USCINCEUR on the formulation of policy for the conduct of combat operations within the entire European theater.



**Gen. Robert H. Reed**  
Chief of Staff, SHAPE  
North Atlantic Treaty  
Organization  
Mons, Belgium

Responsible for reviewing and recommending policies to SACEUR that affect the operational capability of forces assigned from member nations of NATO to Allied Command Europe, in addition to directing, coordinating, and supervising all activities of the SHAPE staff.

## THREE STARS

**Lt. Gen. James A. Abrahamson**  
Director, Strategic Defense Initiative Organization  
Office of the Secretary of Defense  
Washington, D. C.

Program director for the nation's strategic defense effort, with a goal of developing and deploying an effective defense against ballistic missiles.

**Lt. Gen. James R. Brown**  
Commander, Allied Air Forces Southern Europe  
Deputy Commander in Chief, USAFE,  
for the Southern Area  
Naples, Italy

Conducts air operations and manages the total Southern Region land-based air resources in support of the region's NATO nations.

**Lt. Gen. Richard A. Burpee**  
Director, J-3 (Operations)  
Organization of the Joint Chiefs of Staff  
Washington, D. C.

Exercises staff supervision and cognizance over joint operational matters, including exercise and operational planning and direction, force readiness, and operational analysis; reconnaissance, electronic warfare, strategic, nuclear, and special operations; environmental services; and command and control countermeasures operations.

**Lt. Gen. Edgar A. Chavarrie**  
Deputy Assistant Secretary of Defense for  
Military Manpower and Personnel Policy  
Office of the Secretary of Defense  
Washington, D. C.

Principal advisor to the Assistant Secretary of Defense (Force Management and Personnel) on policy matters affecting active-duty and retired military personnel and their dependents. Primary mission is to pursue manpower and compensation policies that are in the best national interest and that meet service needs.

**Lt. Gen. Philip C. Gast**  
Director, Defense Security Assistance Agency  
Office of the Secretary of Defense  
Washington, D. C.

Manages activities relating to the transfer of US defense equipment, services, and military education and training by sale or grant to friendly countries.

**Lt. Gen. Harry A. Goodall**  
Deputy Commander in Chief,  
US Readiness Command  
Vice Director, Joint Deployment Agency  
MacDill AFB, Fla.

Assists USCINCRAD in providing a general reserve of combat-ready forces to reinforce other unified commands and in mobilization planning for a unified command comprised of all CONUS-based major combatant general-purpose Army and Air Force forces.

**Lt. Gen. Jack I. Gregory**  
Chief of Staff, Combined Forces Command  
Deputy Commander US Forces, Korea  
Deputy Commander in Chief UN Command, Korea  
Seoul, South Korea

As the second senior military representative in the Republic of Korea, he assists CINUNC in exercising combined command of UN Forces and is the senior US representative in Status of Forces Agreement negotiations.

**Lt. Gen. Alfred G. Hansen**  
Director, J-4 (Logistics)  
Chairman, Joint Materiel Priorities and Allocation Board  
Organization of the Joint Chiefs of Staff  
Washington, D. C.

Advises the JCS Chairman on joint and combined worldwide logistics and transportation matters and evaluates the capabilities of joint and specified commands to logistically support current operational activities, contingency operations, and plans.

**Lt. Gen. Leonard H. Perrotto**  
Director, Defense Intelligence Agency  
Washington, D. C.

Provides foreign intelligence and counterintelligence staff support to the Secretary of Defense and the JCS, coordinates DoD intelligence collection requirements, and manages the Defense Attaché System.

**Lt. Gen. John L. Pickitt**  
Director, Defense Nuclear Agency  
Alexandria, Va.

Provides support, staff advice, and consolidated management of all US nuclear weapons, stockpiles, testing, and research.

**Lt. Gen. Winston D. Powers**  
Director, Defense Communications Agency  
Arlington, Va.

Coordinates and manages all United States defense communications requirements.

## OFFICE OF THE SECRETARY OF DEFENSE

**Maj. Gen. Claudius E. Watts III**  
Senior Military Assistant to the  
Deputy Secretary of Defense  
Office of the Secretary of Defense  
Washington, D. C.

Serves as the Executive Assistant to the Deputy Secretary of Defense, advising and assisting him in all areas encompassing the entire range of defense responsibilities and national security affairs.

## ORGANIZATION OF THE JOINT CHIEFS OF STAFF

**Maj. Gen. Archer L. Durham**  
Director of Deployment  
Joint Deployment Agency  
MacDill AFB, Fla.

Directs worldwide joint service mobilization deployment planning and coordination for the Joint Chiefs of Staff.

**Maj. Gen. John P. Hyde**  
Deputy Director for Defense-wide C<sup>3</sup> Support  
Organization of the Joint Chiefs of Staff  
Washington, D. C.

Assures the integrity, compatibility, evolutionary capability, and technical efficiency of all defense-wide communications systems employed in support of command and control requirements designated by the Secretary of Defense.

**Maj. Gen. Martin J. Ryan, Jr.**  
Director, Strategic Plans and Resource  
Analysis Agency  
Organization of the Joint Chiefs of Staff  
Washington, D. C.

Reviews major materiel and personnel requirements of DoD in accordance with strategic and logistics plans, provides analyses concerning impact of DoD program and budget proposals on warfighting capability, and is focal point for resource implications in JCS joint planning issues.

## US ATLANTIC COMMAND

**Maj. Gen. Thomas G. Darling**  
Chief of Staff, US Atlantic Command  
Naval Base Norfolk, Va.

As executor and principal assistant to USCINCLANT, ensures that the organization, administration, training, readiness, and operations of the command are carried out in conformance with the policies, plans, and intentions of the CINC. Coordinates headquarters staff work and USLANTCOM activities.



## US CENTRAL COMMAND

**Maj. Gen. Davis C. Rohr**  
Deputy Commander in Chief  
US Central Command  
MacDill AFB, Fla.

Deputy Commander in Chief of a unified command responsible for essentially all US military activity in a nineteen-country area in the Persian Gulf, Horn of Africa, and Southwest Asia, including combined exercises with regional forces, administration of security assistance, and representational activities.

**Maj. Gen. Russell L. Violett**  
Chief, United States Military Training  
Mission to Saudi Arabia  
US Central Command  
Dhahran, Saudi Arabia

Responsible for coordination and integration of all military aspects of the US security assistance program to Saudi Arabia.

## US EUROPEAN COMMAND

**Maj. Gen. Thomas L. Craig**  
Director, J-5 (Plans and Policy)  
US European Command  
Stuttgart-Vaihingen, Germany

Develops plans, programs, and policies for all matters pertaining to war plans, force structure, and other elements of JCS support by USCINCEUR in coordination with other unified and specified commands.

**Maj. Gen. Edward J. Heinz**  
Director, J-2 (Intelligence)  
US European Command  
Stuttgart-Vaihingen, Germany

As the senior US military intelligence officer in the European theater, he is responsible for providing intelligence support to USCINCEUR, formulating intelligence plans, policies, and programs, and managing joint/combined theater intelligence activities.

**Maj. Gen. Monte B. Miller**  
Command Surgeon  
US European Command  
Stuttgart-Vaihingen, Germany

Ensures medical readiness within USEUCOM region by exercising joint command and control over medical planning and resources, providing adequate medical planning staffs, overseeing aeromedical evacuation system in wartime, and developing joint medical plans for responding to terrorist attacks and other medical crises.

**Maj. Gen. Richard A. Pierson**  
Chief, Joint US Military Advisory Group, Greece  
US European Command  
Athens, Greece

As senior US military officer in Greece, administers US military assistance to Greece, including the international logistics and sales program; promotes modernization of the Hellenic Forces; furthers US military plans, policies, and interests; and negotiates bilateral defense agreements.

## US READINESS COMMAND

**Maj. Gen. Leon W. Babcock, Jr.**  
Director, J-5 (Plans and Policy), and  
Inspector General, US Readiness Command  
MacDill AFB, Fla.

Principal advisor to USCINCREC on plans, policies, tactics, and procedures for rapid and effective deployment of combat-ready forces.

## US SOUTHERN COMMAND

**Maj. Gen. Henry D. Canterbury**  
Deputy Commander in Chief, USSOUTHCOM  
Commander, US Southern Air Division, TAC  
Howard AFB, Panama

As Deputy USCINCSO, responsible for all joint military matters in Latin America. As Commander of USAF Southern Air Division, responsible for USAF support to US Southern Command.

## US SPACE COMMAND

**Maj. Gen. James S. Cassidy, Jr.**  
Deputy Chief of Staff, Systems Integration,  
Logistics and Support (J-4/J-6)  
US Space Command  
Colorado Springs, Colo.

Responsible for planning, contracting, acquisition, implementation, integration, logistics, and day-to-day management of the operations and maintenance of command and control and automated systems in support of the command's mission of space operations, surveillance and warning, and missile defense.

## NORTH ATLANTIC TREATY ORGANIZATION

**Maj. Gen. William M. Charles, Jr.**  
Chief of Staff, 4th Allied Tactical Air Force  
Allied Air Forces Central Europe  
Allied Forces Central Europe  
Heidelberg, Germany

Assists the Commander, 4th ATAF, in the conduct of vital allied tactical and air defense operations in the central NATO region, utilizing the combined air assets, personnel, and resources committed to 4th ATAF by the US and its allies.

**Maj. Gen. Larry D. Dillingham**  
Deputy Commander, 6th Allied Tactical Air Force  
Allied Air Forces Southern Europe  
Allied Forces Southern Europe  
Izmir, Turkey

Assists the Commander, 6th ATAF, as the head of a multinational air force that conducts air operations in support of ground forces and provides air defense of the southeastern NATO region.

**Maj. Gen. Wayne O. Jefferson, Jr.**  
Assistant Director, C<sup>3</sup> Division  
International Military Staff, NATO Military Committee  
Brussels, Belgium

Coordinates and provides policy guidance and advice on the operational, technical, standardization, and resource requirements of NATO command, control, communications-electronics, and information systems.

**Maj. Gen. Gerald D. Larson**  
DCS Air, AFNORTH  
Allied Forces Northern Europe  
Kolsaas, Norway

Principal advisor to AFNORTH on all allied air operations in the command.

**Maj. Gen. Randall D. Peat**  
Assistant Chief of Staff, Operations, SHAPE  
Allied Command Europe  
Mons, Belgium

Responsible for assisting in the development and implementation of operational and contingency plans and formulation of force requirements for Allied Command Europe.

**Maj. Gen. James P. Smotherman**  
Chief of Staff, Allied Air Forces Southern Europe  
Allied Forces Southern Europe  
Naples, Italy

Assists COMAIRSOUTH in conducting air operations and managing the total southern region land-based air resources in support of the defense and preservation of the integrity of NATO nations in the southern region.

## DEPARTMENT OF DEFENSE AGENCIES

**Maj. Gen. Robert F. Durkin**  
Deputy Director of Foreign Intelligence  
Defense Intelligence Agency  
Bolling AFB, D. C.

Produces on a worldwide basis all-source finished basic military, scientific, and technical intelligence and estimates. Establishes policy for and manages DoD worldwide general intelligence production and ensures development and maintenance of military intelligence data bases.

**Maj. Gen. Lawrence D. Garrison**  
Commander, Defense Construction Supply Center  
Defense Logistics Agency  
Columbus, Ohio

Responsible for managing a worldwide distribution of repair parts for all military weapon systems, including aircraft, ships, submarines, automotive vehicles, missiles, and construction materials.

**Maj. Gen. John E. Griffith**  
Commander, Defense Fuel Supply Center  
Defense Logistics Agency  
Cameron Station, Va.

Integrates management of bulk petroleum on a worldwide basis, to include ownership and accountability of reserve and operating stocks to base level. Directs procurement activity in support of Strategic Petroleum Reserve program. Procures and distributes coal for Federal Government. Contracts for fuel storage and handling, stores prepositioned war reserve stocks, and tests fuels and lubricants.

**Maj. Gen. Paul H. Hodges**  
Director, Inter-American Defense College  
Fort McNair, Washington, D. C.

Responsible for the conduct of senior executive-level courses of study and associated research in the management of resources in the interest of national security to enhance the preparation of senior military officers and career civilian officials for positions of high trust in the Federal Government.

**Maj. Gen. Joe P. Morgan**  
Executive Director, Quality Assurance  
Defense Logistics Agency  
Cameron Station, Va.

Principal staff advisor for the development and application of major policies, plans, programs, and procedures relating to quality and reliability analysis of major systems, equipment, supplies, and services procured on government contracts.

**Maj. Gen. Stanton R. Musser**  
Deputy Director  
Defense Logistics Agency  
Cameron Station, Va.

Deputy commander of operational military logistics organization responsible for effective and economical worldwide logistics support, including procurement of common supplies and services, wholesale distribution of assigned items, and nationwide contracting administration services.

**Maj. Gen. Robert A. Rosenberg**  
Director, Defense Mapping Agency  
US Naval Observatory, Washington, D. C.

Responsible for providing support to the Secretary of Defense, the military departments, the JCS, and other DoD components on matters concerning mapping, charting, and geodesy. Coordinates all plans, programs, and policies affecting DoD MC&G resources and activities.

**Maj. Gen. John H. Voorhees**  
Commander, Defense Personnel Support Center  
Defense Logistics Agency  
Philadelphia, Pa.

Directs and manages center for the efficient and economical worldwide procurement and distribution of wholesale stocks of food, clothing, textiles, and medical supplies and blood in support of DoD activities. Operates the only DoD clothing manufacturing facility. Ensures product quality, performance, and compatibility.



It's obvious why Air Reservists and Air Guardsmen get plenty of respect these days.

# Citizen-Airmen Do It Right

BY MAJ. MICHAEL B. PERINI, USAF

*Despite a smoke-filled cockpit and burns to their faces, Maj. John H. Schramm (left) and Maj. Larry G. Brooks (right) brought their crippled HH-3E helicopter in for a soft landing. SMSgt. Paul N. LeClair, the flight engineer on the mission, is in the middle. For their actions, AFA awarded this AFRES crew the President's Award. (See also p. 62.)*



**C**ITIZEN-airmen no longer have an image problem. Today, the units and people of the Air Force Reserve and the Air National Guard stand second to none in the respect they command in the community of aerospace professionals. Such old labels as "weekend warrior" are manifestly nonsense considering the quality of these forces and the contributions they make to the Air Force mission.

The finest achievements of these citizen-soldiers—based on performance in 1985—will be recognized with the presentation of four special awards this month at the National Convention in Washington, D. C. They are the President's Award, which goes to the top AFRES flight crew; the Air Force Reserve Outstanding Unit Award; the Earl T. Ricks Award, for outstanding airmanship in the Air Guard; and the ANG Outstanding Unit Award.

## The President's Award

"The heat was so intense that the radios quit working in seconds," recalled Maj. Larry G. Brooks of the 305th

Air Rescue and Recovery Squadron. What began on October 8, 1985, as a routine instrument approach quickly turned into a near tragedy.

The crew, from Selfridge ANG Base, Mich., consisted of Brooks, Maj. John H. Schramm, and SMSgt. Paul N. LeClair. They barely had time to save their HH-3E from crashing into the heavily populated area of Chesterfield township, surrounding the base just 800 feet below.

A few miles from landing and at a critical point in their approach, a high-frequency vibration shook the helicopter.

Major Schramm, aircraft commander, relinquished the controls to the more-experienced Major Brooks, a flight examiner, who was flying as copilot during the training mission. Brooks began to guide the helicopter away from the highly populated area to the only nearby landing site—a horse training ground.

As the aircrew started emergency procedures, the number one engine exploded. "The forward cabin and





*The Air Force Reserve's 419th Tactical Fighter Wing at Hill AFB, Utah, posted the top team and bombing scores at the TAC-sponsored Gunsmoke '85 competition. The first AFRES unit to receive the F-16, the 419th TFW is the 1986 AFRES Outstanding Unit Award winner. (USAF photo by Maj. Len Burry)*

cockpit were quickly engulfed with flames and thick smoke," said Sergeant LeClair, flight engineer. Cockpit visibility completely vanished. "We could not see the instruments, or even see each other," Major Brooks said.

"I tried to get out of the way," said Sergeant LeClair. "But I now had a fireball burning at my back as I sat in the jump seat, and I was not able to go aft and open the crew door to get rid of the smoke."

The pilots, realizing they would probably be rendered unconscious if they inhaled the acrid smoke, did the only thing possible at this point. They opened their cockpit windows. The flames immediately rushed into the cockpit and across their faces.

"All the feelings about living and dying were there. It was painful, but no one panicked," said Major Brooks. "We all gritted our teeth and stayed where we were," he added.

Badly burned and relying solely on his flying instincts, Major Brooks made a slight turn to the left toward the now-unseen clearing. Sergeant LeClair, struggling to get relief from the intense heat and smoke, collapsed over the pilot's collective stick, forcing it all the way down. Major Schramm pushed him up and off the collective, giving Major Brooks control again. Catching glimpses of the ground through the chin bubble, Major Brooks completed the single-engine approach to a soft landing.

Majors Schramm and Brooks dived through their windows. Brooks broke his left wrist and severely bruised his hip. A few seconds later, the two pilots, gasping for breath, spotted each other. They quickly realized that Sergeant LeClair was still inside the helicopter. Ignoring their own injuries and risking worse, they plunged back into the wreckage and pulled Sergeant LeClair to safety. "When I went back in, I was thinking it was going to explode. But I didn't hesitate," Major Brooks said.

The crew does not believe themselves heroes. "No," Major Brooks said, "we're survivors. When I was in the

hospital I thought about other crewmen who tried to make their aircraft fly and couldn't."

What about going back into the burning H-3? "I can't explain why—there is a comrade in there . . . you just go do it," Major Brooks said. "It's the American way. You take care of your buddy."

At this writing, Majors Schramm and Brooks are flying again. Sergeant LeClair wants to fly again, but is still undergoing treatment and medical evaluation. The helicopter, being repaired, is expected to be in service again in April 1987.

Major Brooks's actions earned him the USAF's Kolligian Trophy in July. The crew will receive AFA's 1986 Lt. Gen. William H. Tunner Award as well.

Major Schramm works for a computer software company in Dearborn, Mich. Major Brooks and Sergeant LeClair are full-time Reserve technicians for the 305th.

#### **AFRES Outstanding Unit**

In only its second year of operation with the F-16 Fighting Falcon, the Air Force Reserve's 419th Tactical Fighter Wing, Hill AFB, Utah, is this year's Air Force Reserve Outstanding Unit Award winner.

The 419th has more than 1,000 Ready Reservists, including 250 air reserve technicians, assigned at Hill AFB and at Tinker AFB, Okla., where its 507th Tactical Fighter Group operates F-4s. Last year, its pilots logged more than 10,000 flying hours—5,379 in F-16s and 5,068 in F-4s. They did this conducting an aggressive unit training program, deploying overseas to Denmark and participating in numerous exercises.

The wing's citizen-airmen take their Reserve obligations seriously, as demonstrated by their participation in unit training assemblies, by active-duty training of almost 100 percent during the year, and by numerous individual achievement awards presented to unit members.

Every year since 1981, the wing has received TAC's flying safety award.



The unit attained excellent results during a TAC operational readiness inspection (ORI) in May 1985. The unit deployed 426 people, 145 tons of cargo, and eighteen F-16s to a bare-base location and operated successfully in an environment of simulated hostile air and ground attacks. TAC officials said that the unit's pilots, "demonstrated an exceptional ability to deliver ordnance on target."

In its first appearance at the TAC-sponsored Gunsmoke '85 competition, the 419th posted the top team bombing and gunnery scores. After five days of intense bombing, strafing, and navigation/attack missions, its forty-five-member F-16 team scored 9,431.5 out of a possible 10,000 points to lead the field of active-duty, Guard, and Reserve flyers participating. Gen. Charles A. Gabriel, then USAF Chief of Staff said, "The extremely high event scores and outstanding bombing results of your team demonstrate what can be done with the right combination of leadership, people, and equipment. Winning this highly competitive gunnery competition singles out the men and women of your wing as the best of the best."

### The Ricks Award

"My approach was a little similar to landing the Space Shuttle," recalled Capt. John F. Painter, a fighter pilot assigned to D Flight, with the 140th Tactical Fighter Group, Buckley ANG Base, Aurora, Colo.

It was February 9, 1985, and Captain Painter, a "Top Gun" graduate of F-100 Combat Crew Training School, was flying for his life.

The problem occurred during a four-ship A-7 training mission. Suddenly, the single engine on Captain Painter's A-7 attack aircraft would only run at idle power.

Captain Painter had never encountered serious problems in an A-7 Corsair before, but, he said, "I had already bailed out of two other fighter aircraft because of engine failures. It's never fun."

An experienced A-7D driver with twelve years of fighter time and 2,000 hours, Captain Painter tried various emergency procedures to get some response from his aircraft. "No fuel was getting to the engine because of a malfunctioning fuel control unit," he said. "I felt sure that if I could gain enough altitude and adjust my descent rate, then I could get the aircraft back on the ground."

Safe ground, however, was Pueblo Municipal Airport, forty-five miles to the northeast and with a partially closed runway.

Captain Painter's airspeed was 450 knots and his altitude only 2,000 feet. "I zoomed the aircraft up to 10,000 feet and aimed the nose toward Pueblo," he said.

As airspeed and altitude began to drop, he dumped fuel to extend range and prepared for either an ejection or a landing.

As Captain Painter neared Pueblo, it became apparent the best traffic pattern would be to approach the field from the southeast to avoid the heavy population center in case he had to abandon the aircraft and jump. "There was that initial fear and uncertainty, but as I got closer to the city I concentrated on getting the aircraft home," he said. "I didn't put the gear down until the last moment. It was a little bit of a Space Shuttle-type approach."

Almost out of altitude, he was well over the approach

lights when the wheels came down. "I had to use variable trailing edge flaps to adjust airspeed because the engine wouldn't respond to throttle movement," he said.

He touched down within the first 150 feet of runway, but the emergency wasn't over. The electrical generator had failed, too, leaving no antiskid braking or nosewheel steering. Captain Painter used differential braking to bring his A-7 to a safe stop.

In civilian life, Captain Painter is a DC-10 captain with Continental Airlines. He has more than 10,000 hours in jet transports and credits his survival to his training and his extensive flying experience, military and civilian. "No doubt about it," he said. "I don't think, however, I did anything differently than my squadron mates would have done."

ANG officials cited his superior flying skills under immense stress: "Captain Painter's calm, quick, and proper reaction coupled with his exemplary flying ability saved a valuable aircraft." Captain Painter said, "It's nice to be recognized among your peers, but I still consider myself just one of the guys—a citizen-airman doing his job."



*The Earl T. Ricks Award, given for outstanding airmanship by an Air National Guard pilot, goes to Capt. John F. Painter of the 140th Tactical Fighter Group, Buckley ANGB, Aurora, Colo.*



The men and F-106s of the 120th Fighter Interceptor Group at Great Falls International Airport, Mont., participated in nine deployments and fifteen exercises in 1985, and for their superior overall performance, the group was named as the recipient of the Outstanding ANG Unit Award.



### ANG Outstanding Unit

The Air National Guard Outstanding Unit Award for 1986 was presented to Montana's 120th Fighter Interceptor Group, stationed at Great Falls International Airport, Mont.

According to ANG officials, "Many records and achievements reflect the group's sustained and outstanding performance during the more than twenty-nine years that air defense has been the unit's mission. However, performance in 1985 was absolutely superior."

The unit provided NORAD with F-106 Delta Dart interceptors on twenty-four-hour, five-minute alert at Great Falls, Mont., and Davis-Monthan AFB, Ariz., during the year. Furthermore, 120th's aircrews flew 100 percent of the group's flying hours without any aircraft mishaps, earning TAC's Safety Award. Also, the 120th served as the USAF F-106 Central Academics Facility to train future F-106 pilots.

In May 1985, the 120th was the first unit to test First Air Force's extra-demanding ORI scenario. The team tasked the 120th to deploy 300 people, twelve aircraft, and 125,000 pounds of equipment while retaining combat capability at home. The 120th exceeded the team's expectations by obtaining excellent results in approximately ninety percent of the areas rated.

"When we were not having inspections, we were participating in nine deployments and fifteen flying exercises," said Lt. Col. Gary C. Blair, 120th Commander. Deployments included such isolated locations as Yellowstone, Northwest Territories, Canada, and cross-country to Tyndall AFB, Fla.

The unit also became the first First Air Force unit to participate in Red Flag—TAC's training program to season aircrews for combat. With ramp temperatures at Nellis AFB, Nev., exceeding 130 degrees, the unit ac-

complished a ninety-seven percent sortie scheduling effectiveness rate in ten days, flying 137 sorties and 247.7 hours with its seven F-16s.

The group received the Air National Guard Distinguished Flying Unit Award and the prestigious Hughes Trophy, only the second ANG unit so honored in the thirty-three-year history of the award. Furthermore, the group has many individual achievers, with 119 awards and decorations received during the year.

The Montana ANG unit has 1,000 members. "During the year, we placed special emphasis on recruiting, retention, and training of our personnel," Colonel Blair said. With 186 new people and a reenlistment rate of ninety-four percent, manning for the 120th reached an all-time high of 104 percent.


The unit is compiling an impressive record in higher education as well. As of March 1986, thirty percent of the unit's members were enrolled in the Community College of the Air Force, and sixteen members received associate degrees. Twenty percent of the unit is participating in the GI Bill.

"They are an outstanding unit whose level of mission capability and readiness, maintained with vintage fighter aircraft, is superior," said Maj. Gen. James W. Duffy, Adjutant General of the Montana National Guard. ■

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*Maj. Michael B. Perini joined the Air Force in 1972 after receiving his commission through AFROTC. He has served as Chief of the Public Affairs Division of the 1st Tactical Fighter Wing at Langley AFB, Va., and as a public affairs officer at Hill AFB, Utah, and Keesler AFB, Miss. His degree from Washington State University is in social studies, and he has a master's from the University of Southern Mississippi. He is currently on assignment in the Pentagon and frequently writes for this magazine.*





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# Manpower, Missions, and Muscle

BY CAPT. NAPOLEON B. BYARS, USAF

*The Air Force Reserve and the Air National Guard have a more modern look these days, typified by this F-16 from the 419th Tactical Fighter Wing, Hill AFB, Utah. Guard and Reserve units from throughout the country are modernizing their forces—indicative of their crucial role in maintaining global readiness.*



**O**VER the past decade, the Air National Guard and the Air Force Reserve have grown in manpower, missions, and overall muscle, to where today—in wartime roles—they provide a third of the tactical fighter capability, more than half of tactical airlift capability, and a fifth of strategic aerial refueling capability. In addition, they handle two-thirds of the air defense mission and provide nearly a third of the tactical air support capability.

This increased reliance on the Guard and Reserve as viable components of the Air Force force structure has changed the way both will perform if called on in combat.

“Reserve components are no longer in deep standby,” as one DoD official put it. “A number of units will go in the first week of combat.”

The change in roles didn’t happen overnight.

It began officially in August 1970 when then-Secretary of Defense

Melvin Laird directed that the Total Force concept be applied in all aspects of planning, programming, manning, equipping, and employing Guard and Reserve Forces. This marked a dramatic change in the orientation of reserve forces, fully integrating them with active components of US military forces.

Three years later, Secretary of Defense James R. Schlesinger announced that Total Force was no longer just a concept. “It is now a



policy that integrates active, Guard, and Reserve forces into a homogeneous whole," he said.

Several factors made possible the shift to the Total Force policy.

For starters, the 1971 Selective Service Act that placed ceilings on the size of the active force concomitantly limited the President's options for expanding the military solely to the mobilization of reserve forces. The post-Vietnam reductions of personnel and equipment allowed for their release to the Guard and the Reserve.

adjustment. Both equipment modernization and increased mission support remain high on the list of priorities for both the Air National Guard and the Air Force Reserve.

From F-106s and F-4s to F-15s and F-16s, the Guard and Reserve fighter force is sporting a more modern look. The Guard received its second unit of first-line fighters when the Georgia Air Guard joined the Louisiana Air Guard in converting to the F-15 last June. The second F-16 unit at Kelly AFB, Tex., also went operational this year, and six

tion line. Overall, the fighter force will build from 216 to 228 aircraft in FY '87.

C-141s are replacing a number of C-130s at Andrews AFB, Md., as the Air Force Reserve assumes an expanded strategic airlift mission.

In FY '87, the first Reserve C-5A-equipped unit at Kelly AFB, Tex., will grow from five to eleven aircraft. Current plans call for that number to increase to a total of fifteen primary authorized aircraft by FY '89. A second C-5A unit at Westover AFB, Mass., has also been an-



*The Gunsmoke '85 weapons loading event, shown here, was won by the 434th TFW, Grissom AFB, Ind. Guard and Reserve units had an outstanding record of achievement in 1985, winning the triple crown of Air Force competitions. They were victorious in the Volant Rodeo and the SAC Bombing and Navigation Competition as well as in Gunsmoke '85.*

### Shift to Total Force

Perhaps the most compelling impetus behind the shift has been that of cost. The Congressional Research Service compared the cost of an active-duty fighter squadron and a Reserve one and found that the latter costs approximately one-third less than the active squadron to operate. And while Air Force officials agree that Guard and Reserve units are usually less expensive to maintain than similar active units, they point out that cost savings are primarily the result of lower activity levels. Still, if you combine savings with congressional pressures to cut expenditures for defense, the attractiveness of reserve components is apparent.

With ample support from Congress and DoD, the shift to Total Force policy has been one of steady

more air defense units—in Massachusetts, Florida, New Jersey, Arizona, Vermont, and Montana—are scheduled to convert to the F-16. An F-4 unit will convert to F-15s in Hawaii.

On the strategic airlift side, the C-5A and C-141 StarLifter are now flown by the New York and Mississippi Air Guard, respectively.

"We are no longer 'weekend warriors' or a part-time force," Maj. Gen. John B. Conaway, Director of the Air National Guard, said. "The Air National Guard is committed to global readiness."

The Air Force Reserve modernization program is also on track. The last F-105s have been replaced with F-16s. Plans call for a new F-16 unit at Luke AFB, Ariz., in FY '87. This unit will be equipped with twenty-four F-16s direct from the produc-

tioned. The transfer of C-5As to the Air Force Reserve results in a double savings. Because they are flown less, there are reduced operating costs and extended service life.

On the tactical airlift side, sixteen C-130Hs added during FY '85-86 replaced an equal number of older C-130As. C-130As are expensive to operate and to maintain because of their outdated technology.

Although basing plans have yet to be disclosed, reserve forces will also receive the C-17, provided that the program proceeds on schedule. Gen. Duane H. Cassidy, Commander in Chief of the Military Airlift Command (MAC), is on record as stating that reserve forces will receive forty-eight organic C-17 aircraft. (See also the article by General Cassidy on p. 114 of this issue.)



Additionally, Reserve Associate units will make up forty percent of the aircrews for 104 active aircraft, in keeping with the growing trend to realize additional savings by putting more of strategic airlift into the Air Force Reserve.

Still, Air Force officials insist that cost savings alone are not the sole factor determining whether or not to transfer missions to the reserve forces.

"There are three general guidelines the Air Force Reserve uses to evaluate the feasibility of transferring a mission from the active force to the reserve forces," says Maj. Gen. Sloan R. Gill, Chief of Air Force Reserve.

"First and foremost it must be a wartime requirement for the mission," General Gill emphasized. "Second, it must be a cost-effective peacetime alternative with no loss in combat readiness. Finally, we must be able to recruit and train the required number of people in the proper skills to support the mission."

These guidelines have kept the Guard and Reserve from growing too fast too soon and from going in the wrong direction, such as toward peacetime missions. The Guard and Reserve are there to provide wartime mission capability.

### Triple Crown

And if performance in Air Force competitions is an accurate indicator of how well the Guard and Reserve have adjusted to their new role and modern equipment, there's no need to worry. Last year, the Air Force Reserve won both team and individual event honors in the Triple Crown of Air Force Competitions—Volant Rodeo, Gunsmoke, and the Strategic Air Command (SAC) Bombing and Navigation Competition.

In MAC's Volant Rodeo 1985, the 94th Tactical Airlift Wing (TAW) from Dobbins AFB, Ga., earned top honors over thirty-two competing units. The 459th TAW at Andrews AFB, Md., and the 315th Military Airlift Wing (MAW) Associate crew won the short-field landing competition and the C-141 aircrew division, respectively. The Associate 446th MAW, McChord AFB, Wash., won the C-141 engine-running cargo-offloading event.

This year, in MAC's Volant Rodeo Tactical Airlift Competition, reserve forces again earned top honors as the 145th Tactical Airlift Group (ANG), a C-130 unit based at Douglas Municipal Airport, Charlotte, N. C., won best overall unit title.

In the Tactical Air Command (TAC) Gunsmoke fighter gunnery competition held at Nellis AFB, Nev., last October, F-16s from the 419th Tactical Fighter Wing (TFW), Hill AFB, Utah, outperformed sixteen other units. The 419th TFW scored best overall in aerial gunnery, bombing, maintenance, and munitions-loading categories. The 434th TFW, Grissom AFB, Ind., won the weapons-loading event, and the 442d TFW, Richards-Gebaur AFB, Mo., placed first in the maintenance event.

At SAC's Bombing and Navigation Competition in November, the 452d Air Refueling Wing KC-135s walked away (or flew away) with the Saunders Trophy for a second time as the best KC-135 air refueling unit. The unit also won the celestial navigation trophy.

### Reasons for Success

Why do the Air Force Reserve and Air National Guard perform so well when matched against the active force?

Blue-suiters from both sides agree that the experience factor and unit stability give reserve forces an edge. On the average, Guard pilots have a 350 flying-hour advantage over their younger active-duty counterparts. Reserve pilots enjoy a 1,000 flying-hour advantage. Additionally, the Guard and Reserve are rich in personnel who fought in Southeast Asia and who thus have the benefit of combat experience. This, coupled with All-Volunteer Force programs designed to enlist more prior-service individuals in the reserve forces, makes experience a strong trump card.

Also, reserve units enjoy stability, with personnel often working in the same unit year after year. This continuity in manpower results in high levels of confidence and improved performance.

The extent to which the Air Force is committed to integrating the Guard and Reserve into the full spectrum of force employment is

evidenced by participation of these units in overseas deployments and exercises.

In one of the largest deployment of fighters since World War II, the ANG sent nine KC-135s and thirty-six A-7s to Europe to support and take part in Coronet Buffalo. In April, ANG F-4Ds began a new air defense alert mission at Ramstein AB, Germany. In addition to a number of other deployments in Europe, Air National Guard units also flexed their muscles during exercises from North Africa to the South Pacific to Panama.

"Our overseas deployments temporarily move entire flying units to theater locations, along with ground support personnel, civil engineering, tactical control, and combat communication units," said General Conaway in testimony before Congress. "Such deployments furnish the Air Guard with realistic, valuable, theater-specific training."

Air Force Reserve units were no less-well-traveled. F-16s from the 419th TFW, Hill AFB, Utah, flew nonstop to Skrydstrup, Denmark, to take part in an exercise with NATO elements. A-10s from the 434th TFW, Grissom AFB, Ind., deployed to northern Italy. Both deployments were part of exercise Checkered Flag, which brought tactical air units from the US to bases in Europe and the Pacific. Air Force Reserve units also participated in exercises and operations at such other overseas locations as Panama and Honduras.

### Manpower Increases

Perhaps the most telling sign of increased muscle in the reserve forces is their significant growth in manpower over the last decade. Air National Guard strength, 90,992 in FY '76, is projected to be 111,000 by the end of FY '86. Air Force Selected Reserve strength increased from 48,370 to more than 77,400 over the same period.

Where reserve forces once increased the size of the force by twenty-four percent in 1976, today they would increase the size of the force by thirty-two percent. Guard and Reserve are programmed for continued growth through 1990.

Some critics of Total Force warn that there will be inherent problems in mobilizing such a large force on



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short notice. In addition, they see the potential for state politics to interfere with the activities of the new global Guard.

In what is known as the "One Hundred-K Recall" the President can order up to 100,000 members of the Selected Reserve to active duty for up to ninety days to augment any operational mission. This would include members of both the Guard and Reserve. He could also, with congressional concurrence, mobilize a much greater force of up to 1,000,000 Ready Reservists from all services for up to twenty-four months. To be successful, a national mobilization would require practice in notification procedures and substantial public support.

Air Force Reserve officials insist that all units can be mobilized in twenty-four hours and deployed within seventy-two hours. "All our flying units not in conversion status are combat ready," General Gill said.

And although State Governors are becoming increasingly vocal about when and where the Guard

policy and national security objectives, while providing a State militia uniquely qualified for local disaster and public safety missions," General Conaway explained.

The humanitarian missions of Guard and Reserve units are visible peacetime activities in direct support of the public. In one twelve-month period, for example, the Air Force Reserve flew 142 search-and-rescue missions and was credited with saving seventy-nine lives.

#### Piece of the Action

Across the board in nearly every area, reserve forces contributions to the Total Force add up to a big piece of the action.

By the end of FY '86, the Air Guard will possess sixty-five percent of all USAF combat information systems forces, fifty-five percent of engineering and installations forces, thirty percent of the civil engineering forces, fifty-five percent of tactical weapons control, and seventy-two percent of the aircraft control and warning forces. The Air National Guard also contributes ten

percent of the weather forecasting forces.

The Air Force Reserve also has a large combat support capability. It provides sixty-four percent of aeromedical evacuation units as well as twenty-two percent of tactical hospitals and clinics. In the aircraft battle damage repair (BDR) arena, the Reserve provides nearly sixty percent of the capability.

Reserve and Guard units also fly weather-reconnaissance and surveillance missions. These include tracking major hurricanes and tropical storms. In support of Air Force operations, the Air Force Reserve provides twenty-eight percent of the weather-reconnaissance aircraft and twenty-three percent of rescue and recovery aircraft.

DoD's commitment to relying on Guard and Reserve muscle is clear. In his report to Congress, Secretary of Defense Caspar Weinberger noted that improvements in equipment, manpower, and readiness measures stand as testimony to the fact that reliance on a Total Force policy is not a hollow slogan. ■



**A-7s, such as these from the 162d TFW, Tucson, Ariz., are operated by ANG units in eleven states and Puerto Rico. Currently being modified to improve its night and all-weather capabilities, the A-7 initially demonstrated its outstanding kill capability in Southeast Asia and continues to be a major component of the Total Force.**

can be used—especially so when its deployments are to countries in Central and South America—officials insist the Guard can be counted on.

"We exist to support US foreign

*Capt. Napoleon B. Byars, USAF, is currently assigned to the Secretary of the Air Force Office of Public Affairs. He holds a bachelor's degree in journalism from the University of North Carolina and a master's degree in communication from the University of Northern Colorado. He was a Contributing Editor of AIR FORCE Magazine in 1984-85 under the Air Force's Education With Industry program. He continues to write regularly for this magazine.*



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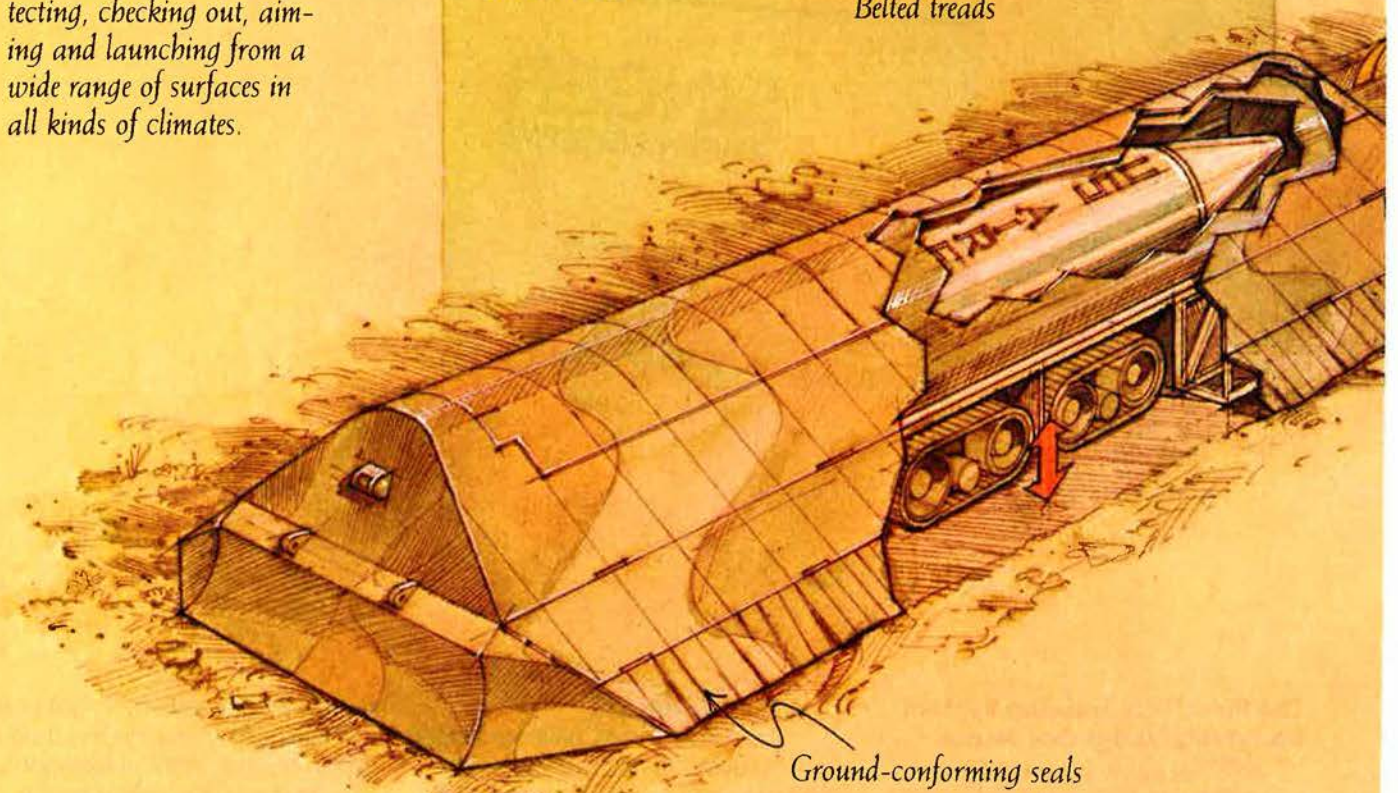
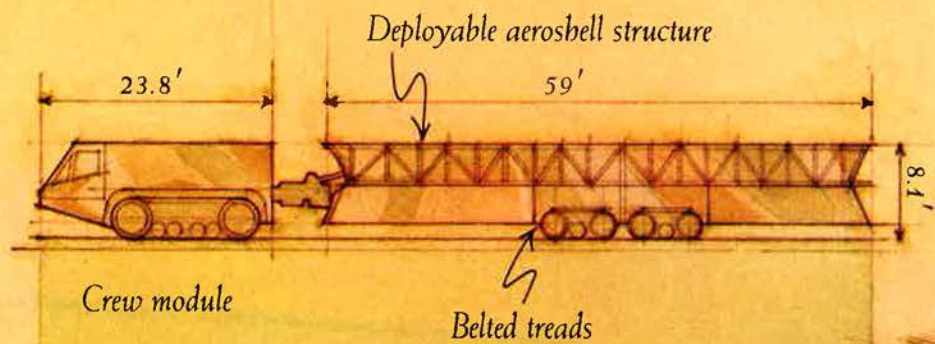
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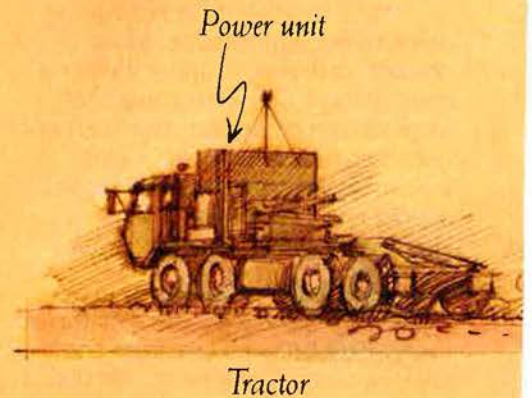
# Missile launchers that go just about anywhere.

A missile system's effectiveness can depend heavily on high mobility as well as survivability. In some 30 years of meeting these two goals, Martin Marietta has addressed virtually all of the engineering and integration challenges facing planners of next-generation mobile missiles. These issues include transporting, protecting, checking out, aiming and launching from a wide range of surfaces in all kinds of climates.



## Hard Mobile Launcher

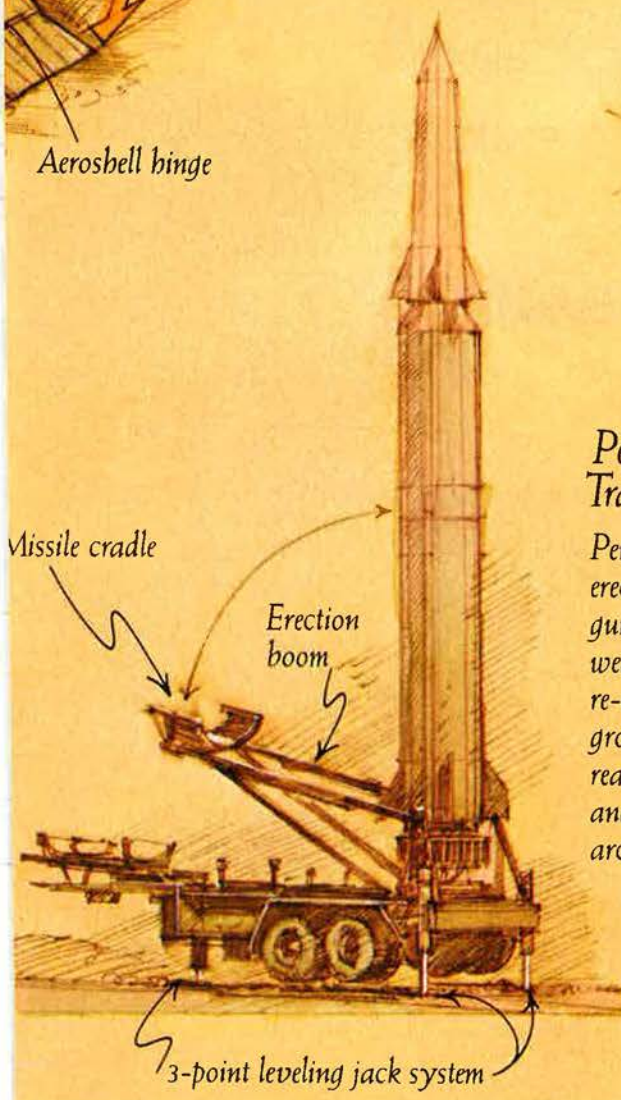
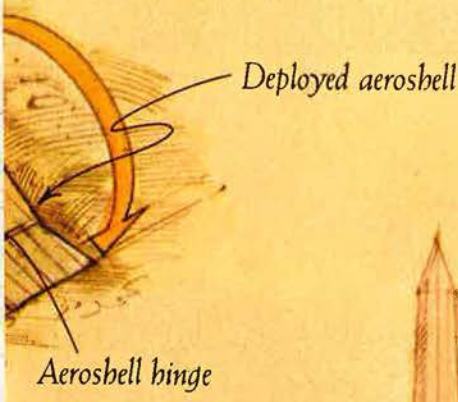
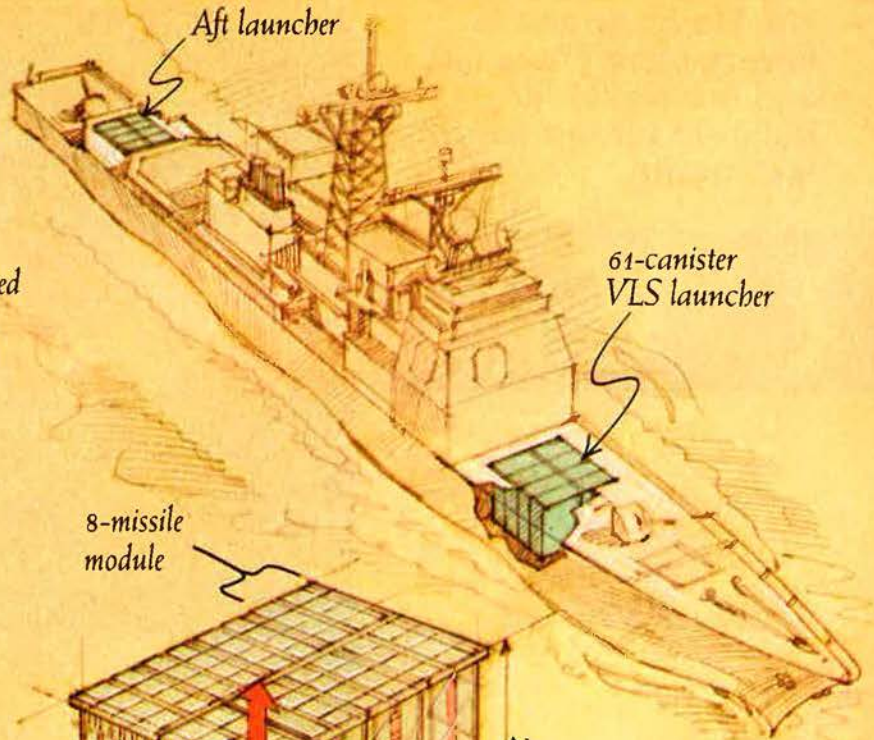
With belted treads for maximum on/off road, all-weather mobility, this launching system for the Small ICBM requires no site preparation.





## Vertical Launching System

A mix of canister-stored missiles, stowed in protected below-deck locations, combats surface, air and underwater threats.



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The Navy air arm is seventy-five years old, and the Naval Air Reserve turned seventy last month.

# CARRIERS JUBILEE

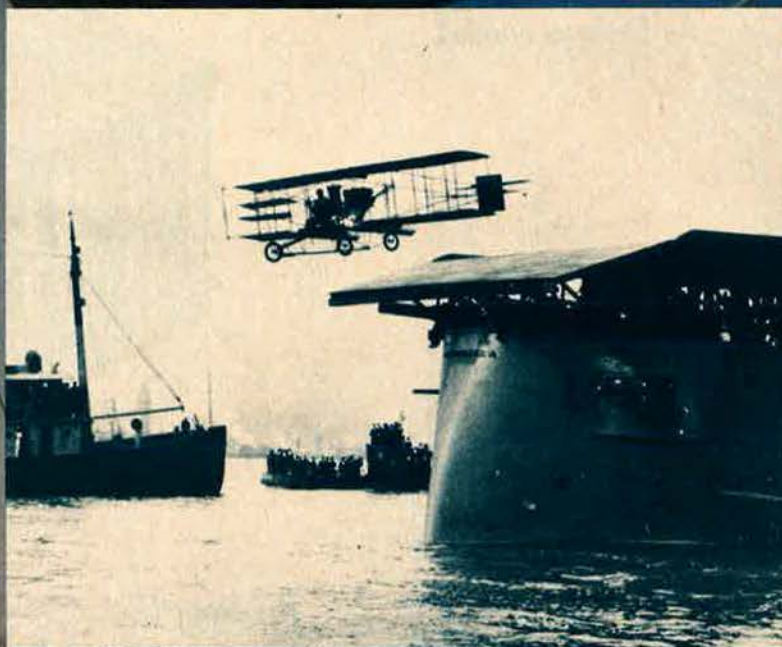
BY PETER B. MERSKY

**T**HIS year, the US Navy celebrates the seventy-fifth anniversary of the creation of its air arm—the largest, most diverse such dedicated group of aircraft and ships, personnel and programs in the world today. Seventy-five years ago, on May 8, 1911, the Navy allocated funds for the purchase of two Curtiss biplanes, among the very first aircraft bought by any government for its military.

On November 14, 1910, Eugene B. Ely of Davenport, Iowa, demonstrated the feasibility of operating aircraft from ships when he rolled his tiny plane down the eighty-three-foot wooden platform built over the forward deck of the cruiser USS *Birmingham* and flew toward the Norfolk, Va., coast, only two and one-half miles away. Later, on January 18, 1911, Ely landed on and then took off from the armored cruiser USS *Pennsylvania* anchored in San Francisco Bay.

The first operations from a *real* aircraft carrier (not a modified cruiser) took place on October 22, 1922, when Lt. V. C. Griffen launched from the USS *Langley* (CV-1) in a single-seat Vought VE-7SF. Lt. Cmdr. Godfrey de Courcelles Chevalier landed his Aeromarine on the *Langley* on October 26.

The period immediately following World War I was one of great devel-



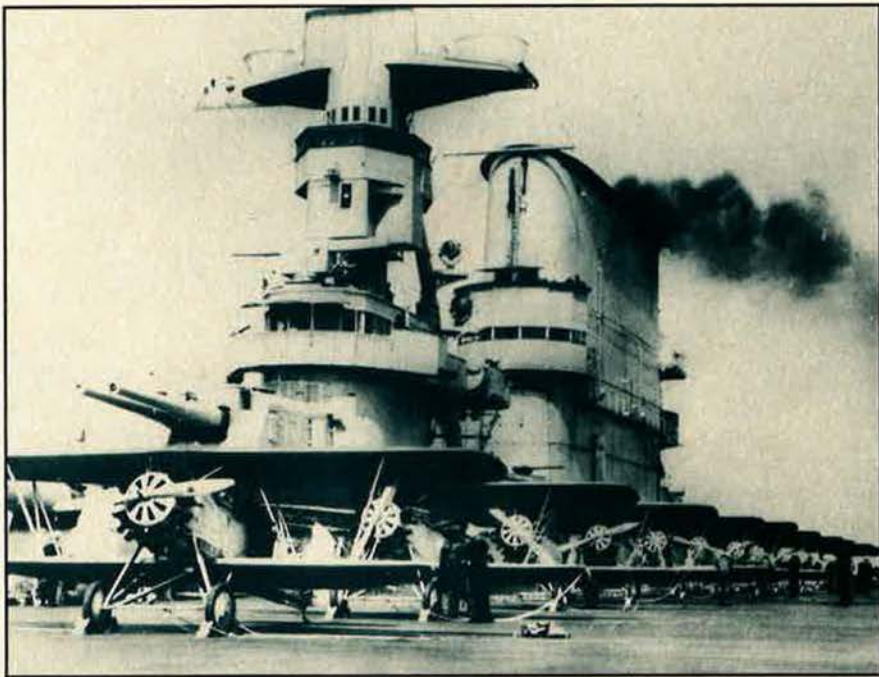
Taking off from a carrier has certainly changed in seventy-five years. Eugene Ely's liftoff from the deck of the USS *Pennsylvania* in 1911 (inset) is a far cry from the launch of close to 60,000 pounds of Grumman F-14 Tomcat in 1986. This F-14 is from the Naval Air Reserve.





—Photo by George Hall





Originally a private venture, the Boeing F2B fighter was typical of post-World War I carrier aviation—an open cockpit biplane with fabric covering. One of the world's first acrobatic teams, the Three Sea Hawks, flew this type. This lineup of F2Bs was taken on the USS Saratoga (CC-3) circa 1929.

opment, especially in carrier arresting gear. Lt. (later Admiral) Alfred M. Pride developed a system using wires oriented beamwise. The landing aircraft's hook, positioned at the tail, snagged a wire, pulling it out and stopping the plane safely.

The Navy's first aircraft carrier, the *Langley*, was commissioned on March 22, 1922. By July 1922, Congress approved funds for two additional carriers to be converted from the battle cruisers *Lexington* (CC-1) and *Saratoga* (CC-3).

Developments begun in December 1911 enabled Commander Kenneth Whiting to inaugurate the catapult installed on the *Langley* on November 18, 1922. Hydraulic catapults, developed in the mid-1930s, were used throughout World War II.

As the prosperous decade of the 1920s slipped into the 1930s and the Great Depression, the military continued aeronautical development. By the last half of the 1930s, the US Navy was in the forefront of aviation progress.

The series of sturdy, barrel-fuselaged biplane fighters produced by Grumman—the F2F and F3F—finally gave way to the predictably stubby F4F Wildcat, which actually began as another biplane. The F4F was the Navy's only fighter until mid-1943 capable of dealing with the

pace-setting Japanese Zero. For an aircraft that was nearly stillborn and did not join the Fleet until 1940, the Wildcat turned in a tremendous performance and, in one form or another, flew from the beginning to the end of the war in 1945.

The carrier-based monoplane bomber also took time to arrive. By 1937, however, the Douglas TBD Devastator—a torpedo bomber with a singularly inappropriate name—became the first monoplane to serve in squadron strength aboard a carrier. Its operational stablemate, the Douglas SBD Dauntless dive-bomber, joined the Fleet in 1940 and enjoyed a career as successful as that of the TBD was not.

During World War II, aircraft carriers evolved into a major naval weapon, although only the US, Britain, and Japan maintained fully developed carrier fleets.

### Carriers on the Cutting Edge

On the eve of total global conflict, US carrier aviation was in a state of evolutionary flux, characterized by a potpourri of old and new technologies. Biplanes were still in use, especially in supporting roles, but the sleeker, more capable monoplane was rapidly appearing in strength.

The purpose of the Japanese attack on Pearl Harbor on December

7, 1941, was the destruction, or at least the crippling, of the US Fleet, especially the aircraft carriers. But only the *Enterprise*, *Saratoga*, and *Lexington* were in the Pacific, and at the time of the attack, they were at sea. Thus, they escaped damage and were available at a crucial period.

*Saratoga* was quickly put temporarily out of service by a Japanese torpedo on January 11, 1942, leaving the *Enterprise* and *Lexington* to make the first raids against enemy positions in the Marshalls in February. These early operations showed that while the Wildcat enjoyed robust construction and heavy firepower, it was nowhere near as maneuverable as its primary opponent, the Mitsubishi A6M2 Zero.

The SBD Dauntless, however, met with consistent success. Rock-steady in a dive, nimble enough to dance with a Zero if it had to, and armed with a reasonable number of machine guns, the Dauntless carried the brunt of the Navy's carrier offensive for the first eighteen months of the war.

New carrier aircraft were on the way, but they would not come until late 1942. Only the Grumman TBF Avenger, a replacement for the obsolete TBD torpedo bomber, joined the fleet in time for the pivotal Battle of Midway in June 1942.

The carrier battles of Coral Sea in early May and Midway a month later stopped the Japanese steamroller, giving the Allies breathing space after the terrible surprises of Japanese conquests and setting the stage for the first Allied offensive, the invasion of the Solomons and the little island of Guadalcanal.

US carrier aviation was in the vanguard throughout the long fight in the Solomons. But at one point, only the *Enterprise* stood lonely duty. The *Lexington* and the *Yorktown* were sunk at Coral Sea and Midway, respectively. *Saratoga* had taken another torpedo on August 31, the *Wasp* was sunk in September, and the *Hornet* went down in October. Only the "Big E," with its Air Group 10, patrolled the deadly "Slot" during the fall of 1942. (The *Ranger* was preparing to support Operation Torch; the Allied invasion of North Africa in November, and was unavailable.)

Help was coming, however, in the

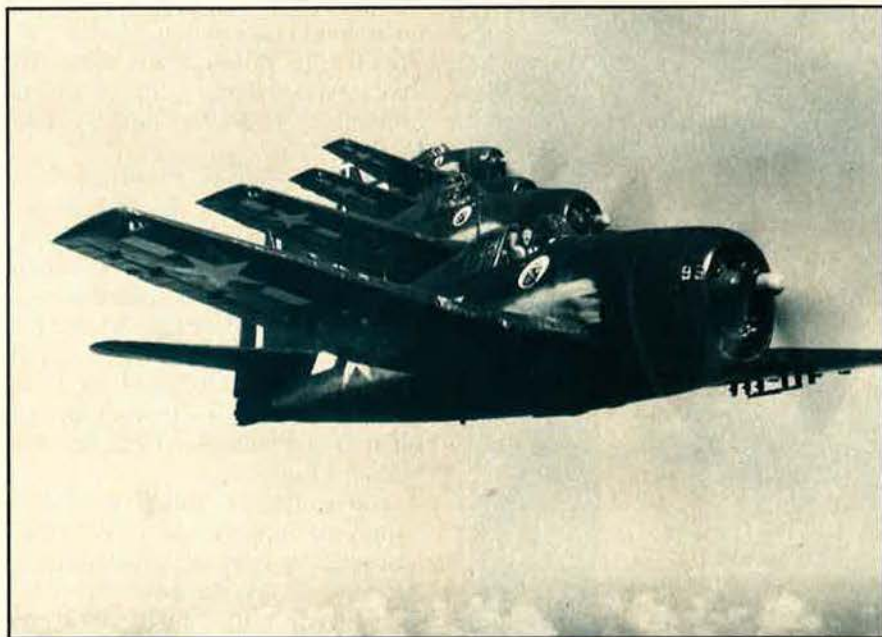


form of new ships from America's factories and shipyards. Two classes of carriers filled the void. The *Essex*-class ships were the largest, with 872-foot flight decks and 27,100-ton displacements. Another class also appeared: the light carrier (CVL). Though not so big or complex as the *Essexes*, the CVLs could be produced more quickly and cheaply.

The new carriers also had new aircraft, such as the Grumman F6F Hellcat, the Vought F4U Corsair, and the only moderately successful Curtiss SB2C Helldiver.

### Leyte Gulf and Beyond

The last great naval air battle in the Pacific, the so-called Marianas Turkey Shoot, took place on June 19, 1944. During this massive, day-long engagement, the Japanese lost more than 300 aircraft in four separate raids and attacks by US carrier-based bombers. Fewer than thirty US aircraft were lost, only half in actual combat.



**One of the most significant carrier aircraft of World War II was the Grumman F6F Hellcat. Credited with the destruction of almost 5,000 enemy aircraft, the Hellcat accounted for nearly seventy-five percent of the Navy's air-to-air kills.**

The operation to liberate the Philippines led to the climactic Battle of Leyte Gulf in October 1944 and the demise of the Japanese fleet as an effective weapon.

By the Iwo Jima landings in February 1945, carrier aircraft were used mainly for fleet defense against the kamikaze suicide aircraft and as close air support air-

craft, since the Japanese had lost much of their effectiveness in air-to-air combat.

Boasting the largest fleet in the world at the end of the war, the US Navy commanded ninety-nine carriers of various classes. Several more were partially completed, including three ships of a new class, the CVB, or battle carrier. The *Midway* and *Coral Sea* enjoyed extraordinary careers and are still active fleet carriers more than forty years after construction.

In December 1945, Royal Navy Lt. Cmdr. Eric Brown landed a de Havilland Vampire aboard HMS *Ocean* for the first jet carrier landing. He quickly turned around and performed the first jet takeoff as well. A McDonnell FD-1 Phantom flown by Lt. Cmdr. Jim Davidson made the first American jet landing in July 1946 aboard the *Roosevelt*.

America quickly developed its jet industry, and by 1950, jet operations aboard US carriers were routine. A major area of carrier aviation devel-

opment included the introduction of radar-directed landing aids.

Meanwhile, the British developed the angled deck, which featured a separate landing area angled off the main deck. This arrangement permitted simultaneous launching and recovery operations, a capability not available with straight-deck carriers of the time.

Additional programs developed the British-designed steam catapult, deck-edge elevators, and the "hurricane bow," which enclosed the entire forward area below the flight deck to give carriers better sea-keeping capabilities.

### Old and New in Korea

The five years of peace following World War II ended in the summer of 1950 when the US found itself again in combat in Asia, this time against a Communist enemy. The only US carrier on station was the *Valley Forge* (CV-45), which on July 3 launched the first strikes against the North Korean capital of Pyongyang, together with aircraft from the British carrier HMS *Triumph*.

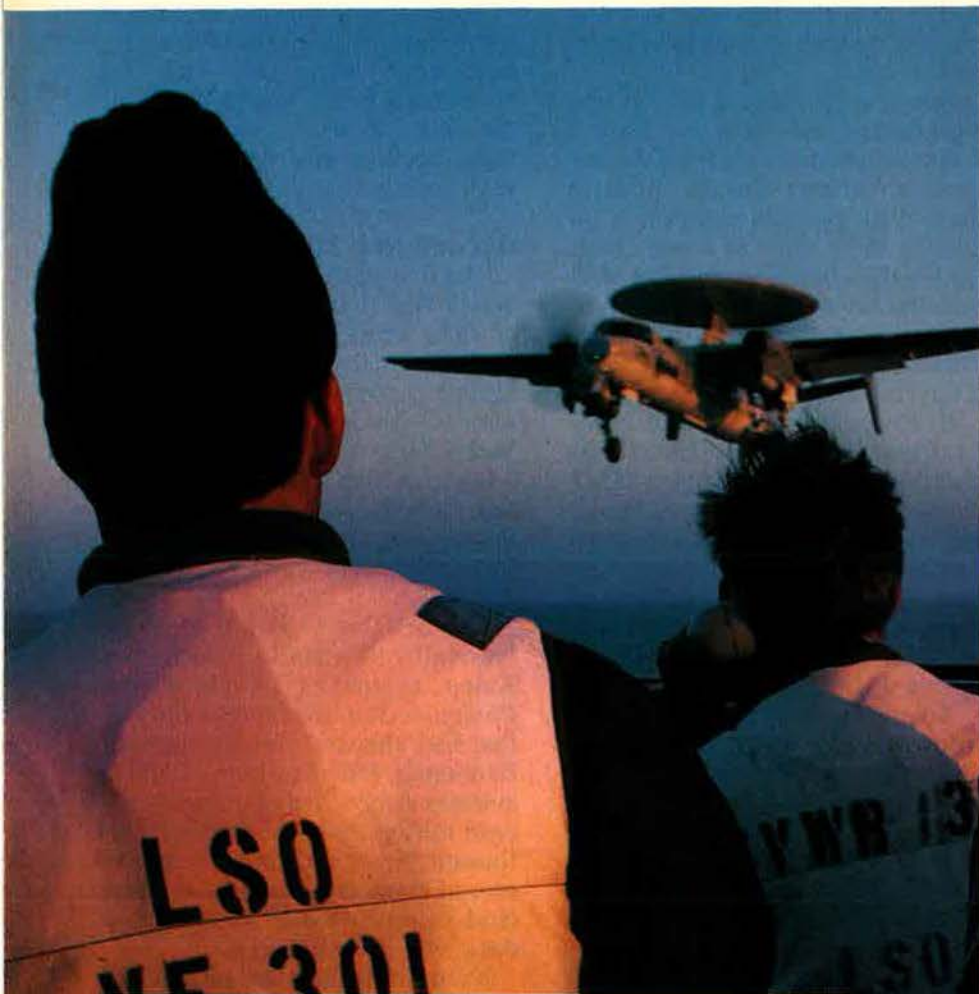
The first Navy jet kill came on November 9, when Lt. Cmdr. Tom Amen, skipper of VF-111 on the *Philippine Sea*, shot down a MiG-15 that had attacked Amen's flight of Grumman F9F Panthers. Carrier aviators disposed of nine enemy aircraft during the three-year war, although Navy and Marine pilots scored many more kills flying from land bases or while on exchange duty with the Air Force.

Korea brought a mixture of old and new technology represented by the mixed air groups aboard the carriers operating off the peninsula. World War II-vintage F4U Corsairs, once the last word in naval fighters, flew with Douglas AD Skyraiders, bearing the brunt of the Navy's bombing campaign. The Panther and McDonnell F2H Banshee single- and twin-engine jets, respectively, carried the same armament as their predecessors in the mid-1940s and were used generally in the same roles: fighter/escort/fighter-bomber.

Carrier fighters sometimes escorted Air Force B-29s far beyond the range of the USAF's regular fighters. In August 1951, Panthers of the CVG-5 on the *Essex* escorted a group of B-29s that bombed the Communist railyards at Rashin in northeastern North Korea.

After Korea, several new jet aircraft appeared, including the radical tailless Chance Vought F7U Cutlass and the delta-wing Douglas F4D Skyray. The Skyray enjoyed a bit more success than the Cutlass and ended its days in the Marine re-





Getting the naval aviators and their planes off of and onto the ship is an art for the deck crews. A Grumman F9F Panther, one of the mainstays of the 1950s, gets the rev-up signal in the inset photo, while landing signal officers watch a Grumman E-2 Hawkeye come aboard in the larger picture. Naval Air Reservists and equipment play a vital role.

—Photo by George Hall

serve. McDonnell brought out the F3H Demon, a twin-engine fleet fighter, initially underpowered and no more than a transitional type.

The only three new aircraft in the third generation of jets of the mid-1950s to stay for twenty-year hitches and beyond were the Douglas A4D (A-4) Skyhawk, Chance Vought F8U (F-8) Crusader, and the Douglas A3D Skywarrior. All three had distinguished careers in combat in Southeast Asia and still serve today, although in drastically diminished numbers.

The McDonnell Douglas F-4 Phantom II, the most successful warplane of the post-World War II period, entered service in late 1960 and flew with the Navy, with the Air Force, and with the Marines in Southeast Asia.

### Carriers in the South China Sea

In August 1964, Communist torpedo boats attacked US destroyers operating in open waters, giving President Lyndon Johnson the excuse he needed to commit US support for the South Vietnamese. By 1965, carrier fleets were rotating in and out of the South China Sea on a regular basis.

After the first Flaming Dart bombing operations in 1965, a continuous schedule of raids, under the name Rolling Thunder, involved air resources of the Navy, Marines, and Air Force. The tempo increased dramatically in 1966 when major strikes were launched in June against the North's petroleum and oil (POL) facilities, originally forbidden targets.

The hectic pace found the Navy's supply of carriers was insufficient. The limited fleet of antisubmarine carriers, or CVSs, older ships that did not normally handle jets, were redesignated CVAs and equipped with a limited form of attack air wing. The converted CVS/CVAs served until 1970, when the ASW mission was integrated back into the bigger ships and the smaller CVS was retired.

The Grumman A-6 Intruder and the Vought A-7 Corsair II, considered a replacement for the A-4, made their operational debuts in Vietnam and became the primary carrier-based bombers of the war.

The nuclear-powered *Enterprise*



(CVAN-65) steamed into the South China Sea in December 1965, marking the first use of nuclear power in combat. She would also make one of the last combat cruises during the fall of South Vietnam ten years later.

The problem of shipboard fires on aircraft carriers—there were three major ones during the 1960s—was so serious that after the *Forrestal* fire in 1967, a special panel, the Aircraft Carrier Safety Review Panel, was convened that August to discuss the problem. The findings resulted in several developments, including remote-control fire-fighting systems and increased training for crews in fire survival.

After a three-year lull, US carriers were again in heavy combat in early 1972 when the North Vietnamese thrust into South Vietnam in a massive drive to win the war. By July, six carriers were steaming up and down the coast. On May 8, *Coral Sea* launched Navy and Marine A-6s—the first USMC aircraft embarked on a carrier since 1965—in the first aerial mining of major ports.

During April and May 1972, the smaller carriers, *Hancock* and *Ori skany*, sent their aircraft mainly against targets in the South, trying to stem the Communist advance, while the larger ships sent strikes against the North in Operation Linebacker I. As expected, the flight crews flew into a hornet's nest of SAMs and antiaircraft guns surrounding Hanoi and Haiphong.

On May 10, several large strikes against North Vietnamese industrial complexes brought the MiGs up in force. Navy Phantoms shot down seven MiGs, three going to the VF-96 crew of Lt. Randy Cunningham and Lt. (j.g.) Willie Driscoll. These two aviators had previously accounted for two MiGs, and during a swirling series of engagements that day, they got three MiG-17s, the only triple US kill by a single crew during the war. Following their third fight, their F-4 was hit by a SAM, and they punched out. They were eventually rescued and

returned to the *Constellation*, a little wet but happy as the first US aces, and the Navy's only aces, of the war.

### New Technology

America's involvement in Southeast Asia exercised the Navy's carrier task forces to the greatest extent since Korea and beyond the technological limits of WW II.

By 1977, many of the Vietnam-era flight crews had left the cockpit or the service entirely. Even the older ships and aircraft were leaving the scene, with new types coming



**ABOVE:** A Grumman F-14 Tomcat, the fleet's air-superiority fighter, prepares for a catapult launch. **BELOW:** The flight deck of the USS *Constellation* is a crowded place as Lockheed S-3A Vikings (left), McDonnell Douglas F/A-18s Hornets (on the bow), and a mixture of Grumman A-6 Intruders and EA-6B Prowlers can be seen.



—Photos by George Hall

into the fleet to take their places.

The Grumman F-14 Tomcat made its first fleet deployment in 1975—and on a combat cruise at that—on the *Enterprise*, off Vietnam in the last desperate hours of the struggle. Designed as a fleet defense fighter to succeed the F-4, the Tomcat, eventually called “Turkey” by its crews, is an extremely capable air-to-air platform. The arrival of TARPS, the Tactical Air Reconnaissance Pod System, gave the Tomcat an important second mission.

The Lockheed S-3A Viking, an ASW platform to replace the aged Grumman S-2 Tracker, had its share of proponents and detractors. Nicknamed “Hoovers” because of the unique vacuum-cleaner-like sound of their huge fanjet engines, the S-3s are capable aircraft, but require



## 1911 and the Navy's First Airplane

The year 1911 saw many initial developments and events that laid the foundation for naval aviation. In addition to Ely's landing on the *Pennsylvania*, the first waterborne flight was conducted by pioneer aviator Glenn Curtiss at North Island, San Diego, Calif., on January 26. In February, Curtiss taxied his seaplane alongside the *Pennsylvania*, and the aircraft was hoisted aboard, then returned to the water to make the return flight to North Island.

In March, the sum of \$25,000, the first appropriation for naval aviation, was allocated by the Bureau of Navigation, and taking the Wright Co. up on its offer, the Navy sent Lt. John Rodgers to Dayton, Ohio, for flight training.

In April, Capt. Washington Irving Chambers, who had been an enthusiastic observer of Ely's takeoff from the *Birmingham* six months previously, reported for duty at the Bureau of Navigation. Chambers had been designated in charge of all correspondence relating to aviation. In May, Chambers prepared the requisition for two Curtiss planes, thereby formally establishing the Navy's air arm.

July saw the first flight of the Curtiss A-1, which took off from the Curtiss base at Lake Keuka, Hammondsport, N. Y., on July 1. The flight lasted five minutes, reaching a height of only twenty-five feet. Three other flights were made that evening, including two by Lt. T. G. Ellyson, who eventually became Naval Aviator No. 1. Five days later, Captain Chambers inspected a site near the Naval Academy in Annapolis, Md., which in September became the first base for naval aviation.

One of the main concerns involved a search for a suitable launching device. The value of shipborne aircraft was obvious, if only as an aerial observer vehicle.

On September 7, 1911, Lieutenant Ellyson conducted an experiment at Hammondsport. He took off in the A-1, running down an inclined wire rigged from the beach to the water. The A-1 slid down the wire and lifted off smoothly from the water.

The following week, Ellyson addressed the sartorial aspect of naval aviation when he listed requirements for aviator's flight gear. These included a flight helmet, with detachable goggles and ear coverings with holes so that the pilot could hear the engine, a leather coat and trousers, rubber boots, and a life preserver. As the year progressed, the Navy's training program added a maintenance syllabus for enlisted mechanics and electricians.

By the time the cold weather had sent the Curtiss school personnel to warmer climes in San Diego, experiments in night flying, night bombing, and even close air support had been accomplished or were in the final planning stages. Soon to come were experiments in radio, heavy bombing, and torpedo attack from the air, as well as mechanical developments for the aircraft. Indeed, it can be said that from 1911 to 1914, the airplane gained most of the necessary developments that would carry it through the first three years of World War I. Much of that development had come from the efforts of the small band of staunch advocates of naval aviation and the first group of naval aviators.

long hours of dedicated maintenance.

Although the Marines were the first to take the McDonnell Douglas F/A-18 Hornet into squadron service, the Navy quickly followed. Initial production and political problems notwithstanding, the F/A-18 will be the carrier jet of the 1990s, having replaced the F-4 and eventually to take the place of the A-7.

### Libya, Grenada, and Lebanon

In 1981, Libyan dictator Col. Muammar Qaddafi declared that Libyan sovereignty extended for 200 miles from the Libyan coast. His threats to attack ships venturing into the Gulf of Sidra precipitated an incident involving aerial combat. For several days, US aircraft engaged in tentative maneuvering against Libyan fighters, and on August 19, after the Libyan fighters fired missiles at the F-14s, *Nimitz* F-14s shot down two Su-22s, the first victories for the Tomcat.

In response to the growing Communist Cuban influence, the US led an invasion of the island of Grenada on October 25, 1983. En route to Lebanon, the *Independence* and the A-7s of Air Wing 6 supported the Grenada invasion.

Departing the Caribbean, *Inde-*

*pendence* resumed its main deployment to the eastern Med. Tension was high as a result of the bombing of the Marine barracks in Beirut on October 23; 241 Marines died in the explosion. Navy F-14 TARPS aircraft also took occasional hostile fire as they made runs over rebel positions around Beirut. The *Independence*, recently arrived on station, along with A-6s from the *Kennedy* mounted the first large-scale strike since Vietnam. The mobility of the SAM sites, a new wrinkle in aerial defense since Vietnam, made pinpointing enemy defenses difficult. This strike achieved only moderate results.

US carrier planes again went into action against Libya in 1986. Still claiming his 200-mile limit, Qaddafi drew a so-called "line of death" across the Gulf of Sidra, promising quick action against any US ships that crossed it. With the same resolve as five years earlier, three carriers sailed toward the Gulf on a schedule of exercises.

On March 24, the Libyans fired several SAMs at US aircraft. The

US response was swift. A-6s and A-7s from *America* and *Saratoga* made limited retaliatory strikes against the SAM sites and against Libyan patrol boats that ventured too close to the US ships. A second raid on the night of April 14/15, in conjunction with USAF F-111s from England, struck bases in Tripoli and Benghazi.

As the Navy moves into the last half of the 1980s, its carrier fleet continues modifications and modernization. Three nuclear-powered aircraft carriers, the *Theodore Roosevelt* (CVN-71), *George Washington* (CVN-72), and *Abraham Lincoln* (CVN-73), are planned or under construction. The old warriors *Coral Sea* and *Midway* will serve for a while longer, and the Navy will either retire or perhaps replace the old training carrier *Lexington*. The introduction of new aircraft, such as the F/A-18, the updated F-14D, the A-6F, and the S-3B, will continue to keep US carrier aviation where it has always been, what naval aviators like to call "on the tip of the spear." ■

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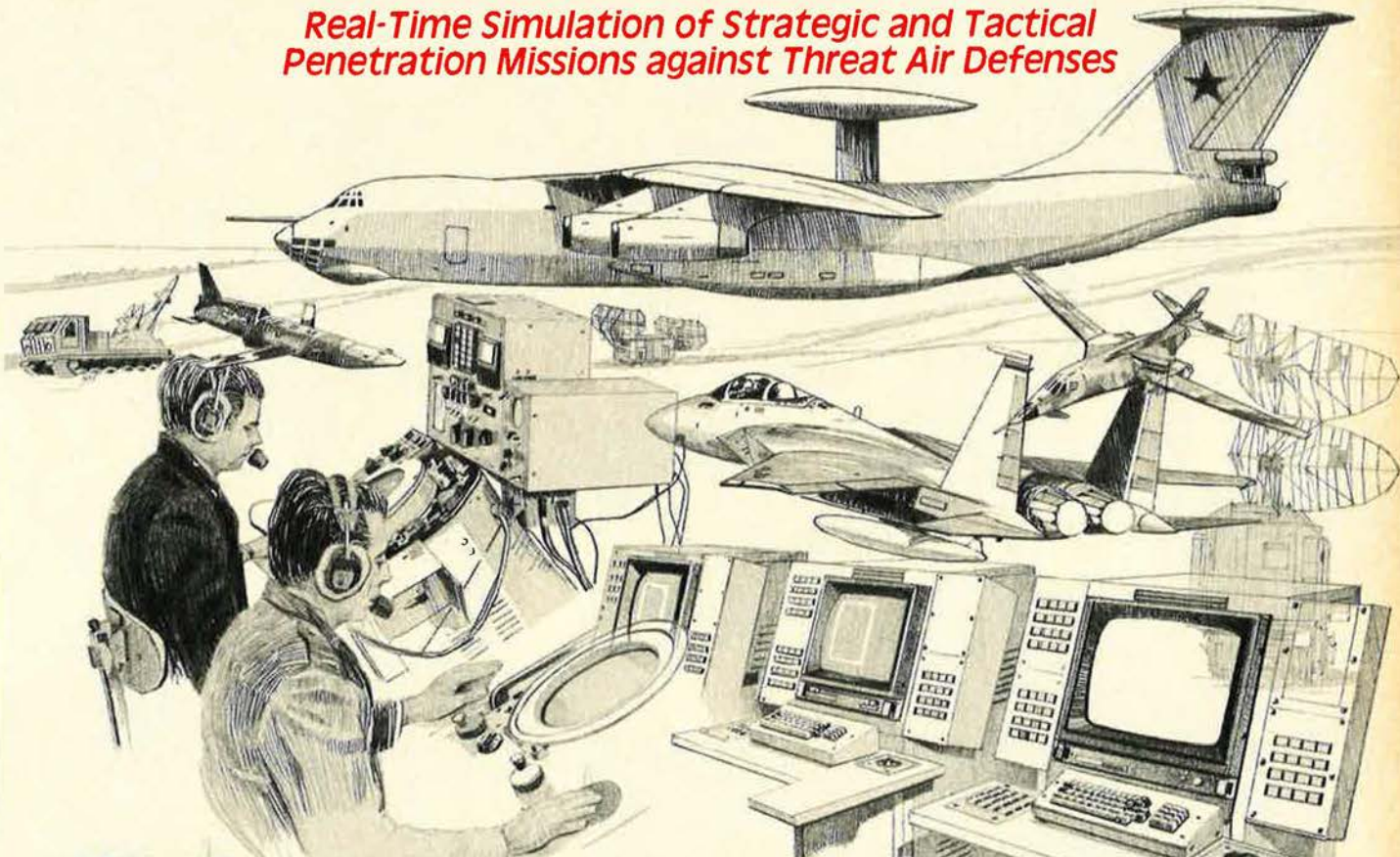
*Peter Mersky is an assistant editor for Approach, The Naval Aviation Safety Review, a monthly publication of the Naval Safety Center, Norfolk, Va. He has written three books on US Naval and Marine Corps aviation, including The Naval Air War in Vietnam. A commander in the Naval Reserve, he lives in Norfolk.*



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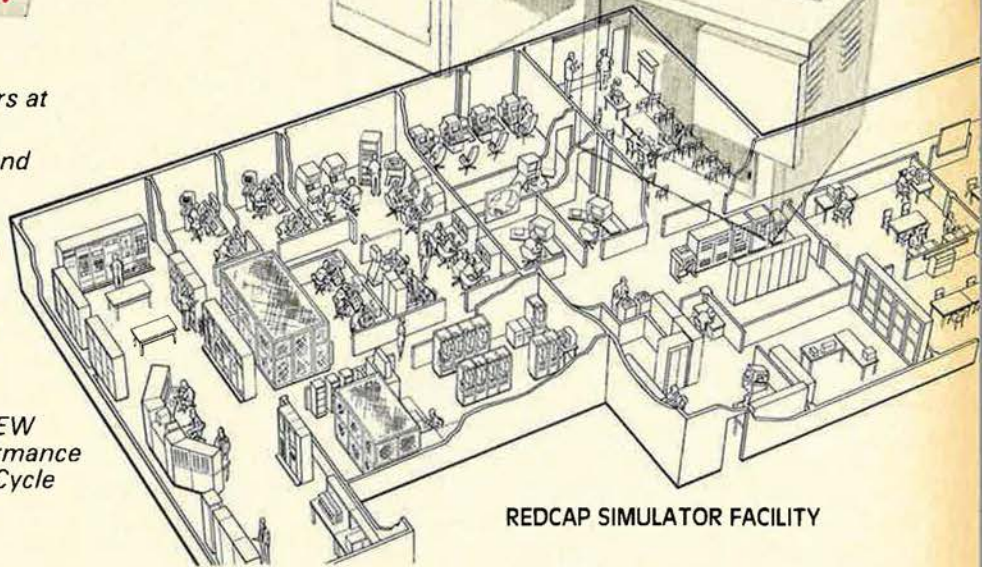


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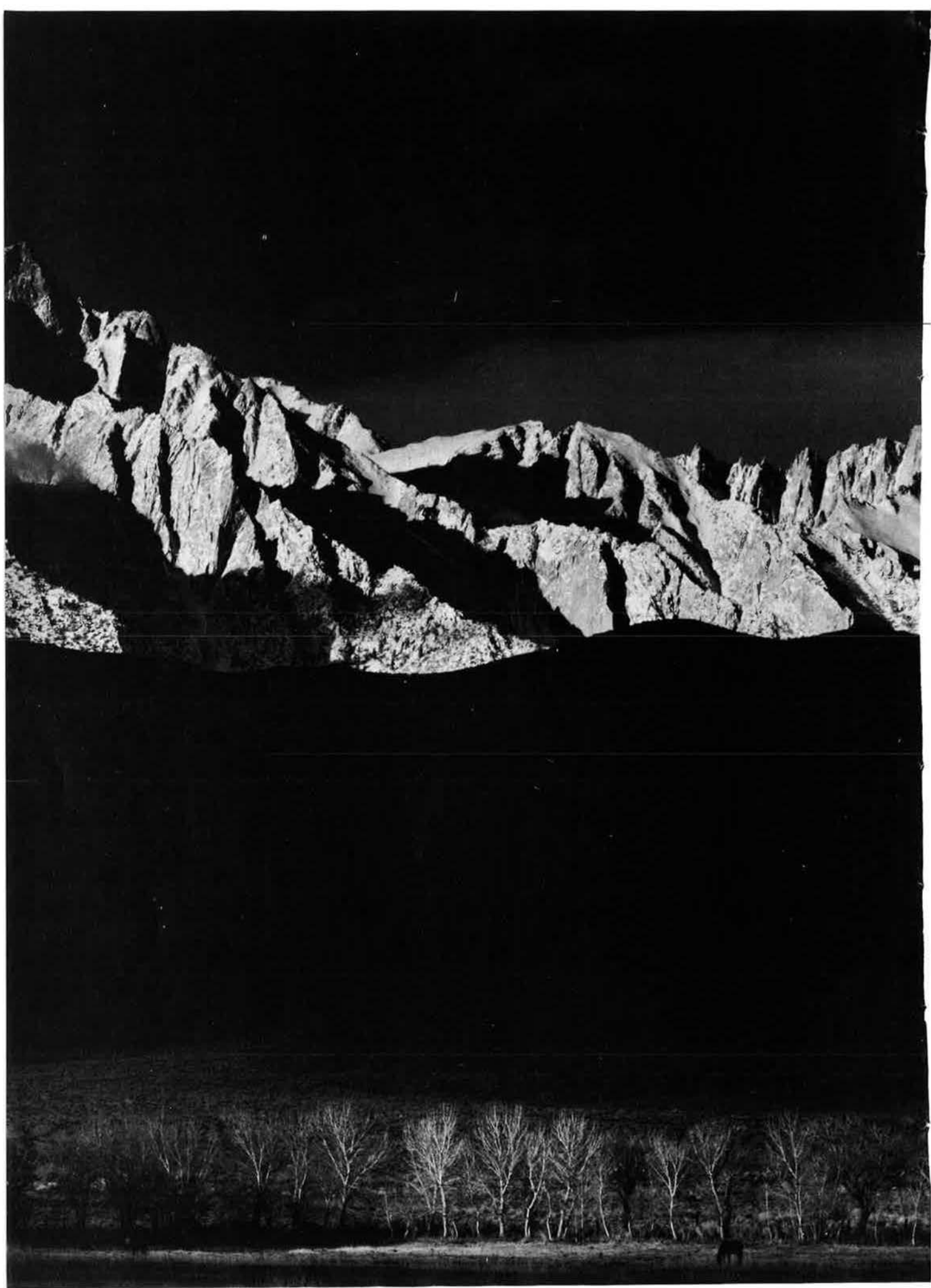
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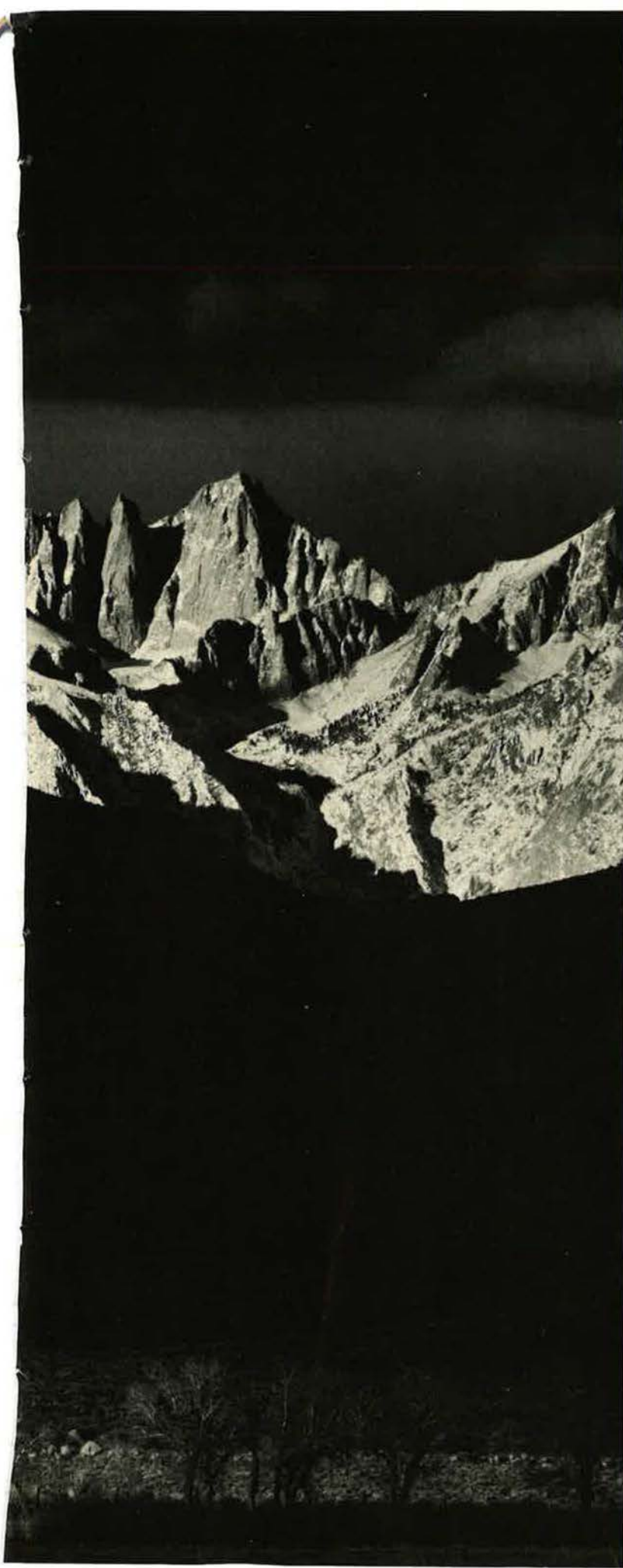
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# MAC's





# Moment of Truth

BY GEN. DUANE H. CASSIDY  
COMMANDER IN CHIEF, MILITARY  
AIRLIFT COMMAND

**L**T. GEN. Bill Tunner was a man who got results. He was the last—and most successful—commander of the China-Burma-India airlift over the Himalayan Hump during World War II. Prior to his arrival, the CBI aircrews were flying 13,000 tons of supplies into China, but aircraft accidents were eating up lives at the rate of three Americans for every thousand tons of supplies delivered.

General Tunner made the Hump operation the greatest airlift in history—up to that time. At the end of his tour, American pilots were flying more than 45,000 tons of supplies a month, and the accident rate was a tenth of what it had been before his arrival.

Three years later, in 1948, General Tunner topped his own record when he led the Berlin Airlift. When the Korean War broke out, he was sent to the Far East as commander of the Combat Cargo Command, where he and his people supported the Inchon invasion and the allied withdrawal from Chosin Reservoir.

After serving as Commander of USAFE and at Hq. USAF as Deputy Chief of Staff for Operations, General Tunner finally got the job he always wanted most in his life—command of the Military Air Transport Service (MATS).

When General Tunner took command of MATS on July 1, 1958, it was nothing like today's Military Airlift Command. In General Tunner's day, MATS was seen primarily as the world's largest regularly scheduled airline, but it was an airline hamstrung by inefficiencies. Airlift airplanes were so scattered throughout the Department of Defense that, in General Tunner's words, "It is impossible to say exactly how many planes there are

*There is an old slogan in transport units that says while MAC will never fight a war, no war could be fought without MAC. Movement of troops and supplies in both peace and war has always been MAC's primary mission.*



and where and under what command they can be found."

Moreover, those airplanes that were in MATS were very limited. In the early 1960s, he summarized his perception of the problem when he wrote: "Because of [the] neglect of our airlift forces during the 1950s, America is weaker today than it should be, and further, this weakness, though ameliorated by the emergency purchase of some 'off the shelf' planes, will continue through 1966."

The airlift forces (strategic and tactical airlift and the special operations force) the United States had available in the late 1950s came as the result of the doctrine established in the early years of the Eisenhower Administration. The principle was called Massive Retaliation.

Massive retaliation, in the words of Secretary of State John Foster Dulles, meant that we would "depend primarily upon a great capacity to retaliate instantly and by means and places of our own choosing." If we were faced with any type of aggression, we might strike at the source of that aggression—the Soviet Union and/or the People's Republic of China—with nuclear weapons.

Massive retaliation made perfect sense based on the assumptions President Eisenhower made about the world situation at the time. Eisenhower had campaigned on a peace and economy platform, and the emphasis on massive retaliation with nuclear weapons fit well with this economy drive. At the same time, Eisenhower and the American people were dissatisfied with the outcome of the Korean stalemate and wanted nothing more to do with limited wars.

Nuclear forces were cheaper to establish and maintain than was a balance between nuclear and conventional weapons, and the slogan "The Biggest Bang for the Buck" meant that America would rely on nuclear weapons to deter any type of aggression.

Translating this policy into forces resulted in the Air Force receiving sixty percent of defense procurement dollars, and of this amount, the lion's share went to the Strategic Air Command.

The brunt of the budget and force cuts was borne by the Army. There

seemed little need for a large ground force when, in the words of Gen. Matthew Ridgway, "The day when wars had limited effects is past. . . . War, if it comes again, will be total in character."

There also was little incentive to exploit airlift's flexibility to support ground forces in light of predictions such as those made by nuclear physicist Edward Teller that fighting forces on a nuclear battlefield would be measured not in battalions or in divisions but in commando groups of five to fifty men.

Airlift's primary mission under massive retaliation was the support of the nuclear strike forces. Tactical airlift forces stood by in Europe and the Far East for the prestrike movements of weapons and strike aircraft.

Since the strike aircraft of the time could only operate from long, paved runways, there seemed to be little need to design transports to land on short, austere landing strips. Historian Ray Bowers, in *Tactical Airlift*, notes that in 1956, "the TAC operations analysis directorate, forecasting the next fifteen years of tactical airlift evolution, reaffirmed the importance of air logistics in an atomic war, and denied the desirability of short-field capabilities promised by the new technology of the time."

At the same time, the capabilities of air assault and special operations airlift declined dramatically. In 1955, Exercise Sagebrush and a TAC symposium both noted the "deemphasis of mass airborne operations in this thermonuclear age," and at the same time the Air Force terminated its unconventional warfare mission and had disbanded its special operations wings entirely by 1957.

### Operation Big Slam

The effects of this strategy of massive retaliation on this nation's airlift capability was exhibited in an exercise designed by General Tunner, called Operation Big Slam.

General Tunner stated that there were two major reasons he held this exercise: "When I had first taken command of the Military Air Transport Service, I had noted that, though our personnel seemed to be doing their jobs diligently, there seemed to be a lack of *esprit de*

*corps*, the all-out enthusiasm I liked to have in my command. Morale improved as we went along, but we needed some dramatic operation to buck up our personnel, get them on their toes." The second reason for the Exercise, General Tunner added, was that "if done on the scale I envisioned—and I wanted to do it big or not at all—the maneuver could not fail to attract the attention of the press and the public to MATS in specific and to the potentialities and shortcomings of air transport in general."

The maneuver General Tunner envisioned was airlifting a large body of troops to Panama, or to the Philippines, or to Europe. As it turned out, Operation Big Slam's mission was to fly—in fifteen days—21,000 Army troops from fourteen onload bases in the United States to Puerto Rico and return, while at the same time continuing to support MATS' normal missions around the world.

On the surface, Operation Big Slam was a highly successful exercise. Airlifters made 1,250 round trips in 50,496 flying hours, carrying 21,095 troops and 10,949 tons of cargo. But despite this record, the airlift available was insufficient and obsolete.

General Tunner noted that "out of the 10,000 tons of cargo we brought in, there was only one light tank, few vehicles—some with empty gas tanks to lighten the load—and little artillery. Many troops were landed without a single round of ammunition."

The press wasn't slow to pick out the deficiencies. After the first week of the exercise, Richard Fryklund, of the *Washington Star*, wrote: "The biggest Army-Air Force Strategic Airlift in history, going on now between the United States and Puerto Rico, seems to be a demonstration of inadequacy. . . . The Air Force planes being used are too few and too old. And much Army equipment is too big to be carried by air. Despite the fact that this exercise is a record breaker . . . the force trickling into Puerto Rico is a rather weak one. . . ."

"If the men were being sent to fight a small and poorly equipped enemy not too far from home base and if time were not too important, the airlift would be a success. But if



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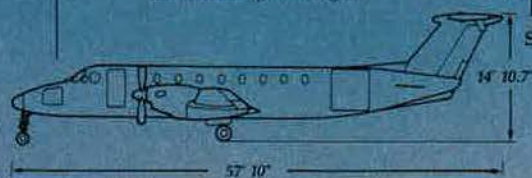
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the Army had to fight a substantial force a long distance away in a hurry, it would be in trouble."

Operation Big Slam took place in the last two weeks of March 1960, and General Tunner couldn't have planned it for a better time. At the same time the press was reporting the exercise as a spectacularly successful failure, Rep. L. Mendel Rivers (D-S. C.) was conducting hearings in a Special House Committee on National Military Airlift.

These hearings became the focal point for a series of interrelated issues that questioned America's ability to deter and fight limited aggression.

First of these issues was the resignation, the previous June, of the Army Chief of Staff, Gen. Maxwell Taylor. He had argued against the strategy of massive retaliation since 1955, and his resignation was seen as a protest against the Eisenhower Administration's continued reliance on that strategy. In January 1960 his

At the same time, Gen. Thomas White and Gen. Lyman Lemnitzer, the Air Force and Army Chiefs of Staff, respectively, were attempting to agree on airlift requirements to support the Army in a limited war. The difficulty in providing this support was that the Air Force had the ability to move the required numbers of troops, but it didn't have enough equipment to do it in the time required by the Army.

The Air Force's problem was twofold. First, it was difficult to determine how much airlift was enough. General White explained that "limited-war options were so infinite that you could not state a simple limited-war requirement for airlift." The second problem was that the Air Force didn't have the money, given the current strategy, for airlift.

As a result, the Air Force was accused of not providing airlift, and there were even suggestions that the airlift mission should go to another

is to establish a requirement for it and provide the funds."

Representative Rivers and his Airlift Committee felt certain that this funding wouldn't be initiated by the Department of Defense. "There was no sentiment whatsoever in the Defense Establishment for the support of interim modernization of MATS," Representative Rivers noted, "and there was open hostility in some quarters outside of the Defense Establishment."

Operation Big Slam, coming as it did in the middle of the hearings, dramatically pointed out the inadequacies of airlift in either a general or limited war. The committee recommended that airlift be modernized and increased, and its findings were wholeheartedly accepted by Congress. In the final budget passed on the Hill, funds for airlift were two and one-half times what was originally requested by the Department of Defense.

Other than beginning the modern-



**Gen. William H. Tunner, the driving force behind the revitalization and continued development of airlift, organized Operation Big Slam in March 1960. The operation was designed to build esprit de corps and to demonstrate to the press and public the potentials and shortcomings of airlift. The operation achieved the desired results. This is a C-124 Globemaster II of the type used in the operation.**

book, *The Uncertain Trumpet*, was published. In it he charged that this country's nuclear force would not deter small wars and that we needed a strategy of flexible response to deter wars at all levels of conflict.

service. General White's answer to these accusations was to state he wanted airlift, but couldn't get it "within the budget guidelines and within the priorities. . . . If there is to be more airlift, the only question

ization of the airlift force, another major side benefit of these hearings was that for the first time the services jointly participated in a discussion of airlift. During the hearing process, Generals White and Lem-



nitzer came to an understanding on the Army's airlift requirements and on the Air Force's obligations to support the Army. "At least," General White said, "the Army and the Air Force will be together on some subjects that we have not been together on in the past."

### Flexible Response

These hearings on airlift marked a turning point for the Air Force and the Army. They marked the first tentative ratification of the theory of flexible response, a strategy that President Kennedy announced exactly one year after Operation Big Slam.

Flexible response was meant to give the President the capability to make deliberate choices in weapons and strategies to respond to an adversary's challenge. Flexible response is the strategy we still have today, and it encompasses a triad of conventional, theater nuclear, and strategic nuclear forces.

A critical element of flexible response is mobility. As President Kennedy wrote, we must be able "to alter the direction of our forces to meet rapidly changing conditions or objectives at very short notice and under any circumstances."

Yet from the time that President Kennedy took office until the early years of the Vietnam War, the airlift airplanes we had on hand—a product of the massive retaliation strategy—had to strain to meet the new demands of flexible response.

At the start of the large-scale deployment to South Vietnam in 1965, the C-141 was on the assembly line, but was not yet operational. The backbones of the cargo fleet were the C-124 and C-133, and both were becoming obsolete. The C-124 was extremely slow, compared to the planes the aircraft industry of the time was building. The C-124 took about ninety-five hours of flying time to complete the round trip from Travis AFB, Calif., to Saigon—or at the utilization rates used then, a little more than thirteen days. The C-133 was slightly faster and had greater range, but flight-safety modifications made to the C-133 in 1965 limited its usefulness. The C-130 did not have the range and speed required for strategic airlift, and the few C-135s the command had as interim airplanes did not have suffi-

cient load-carrying capability or outsize cargo capability.

By bringing on the C-141s and the C-5s and then straining those airplanes far beyond their expected utilization rate, we were able to support the early years of flexible response, in Vietnam, in the Dominican Republic, and in Korea during the *Pueblo* crisis.

Today, it's even more critical to have the mobility to support that strategy of flexible response. Soviet proxies, on the prowl in many regions in the world, make it possible for the USSR to threaten friendly nations both directly and indirectly. The Soviets have improved their ability to project military power in the Middle East, Africa, the Persian Gulf, and the Pacific. The situation is aggravated because these areas are geographically distant from the US, in places where we have no shield of land-based forward deployment.

To meet these threats, we have made dramatic improvements to our intertheater airlift fleet in the past few years. Since 1980, airlift capability has increased by about thirty-five percent, and by 1991, after the purchase of fifty new C-5Bs and forty-four additional KC-10s, the increase will be almost seventy-five percent.

Yet even this improvement will only provide 47.8 percent of the 66,000,000 ton-miles per day (MTM/D) capability we need to sustain our military strategy. (This 66 MTM/D is only a *reasonably attainable* goal. We will need far more than that; 66 MTM/D will only give us a minimal capability to support four wartime scenarios developed by the Congressionally Mandated Mobility Study: individual invasions of Saudi Arabia, Iran, and NATO, and finally, an invasion of Saudi Arabia followed by an invasion of NATO.) Only by adding the C-17 to our airlift inventory will we be able to provide the necessary additional intertheater airlift capability to build toward our 66 MTM/D goal and ensure a modern airlift force for the 1990s and beyond.

As we build toward this 66 MTM/D, MAC's recommended 1998 force structure will:

- Retire 180 older C-130s between 1991 and 1998.
- Retire fifty-four C-141s as they

reach the end of their useful service life by 1999.

- Transfer eighty C-141Bs to the Air Reserve Force beginning in 1986.

- Acquire 180 C-17 Primary Aircraft Authorized (PAA) by 1998.

- Retain 110 PAA C-5s to be manned by active-duty, Guard, and Reserve personnel.

- Retain a minimum of 11.4 MTM/D cargo-carrying capability in the Civil Reserve Air Fleet (CRAF) Program.

- Retain a minimum of 144.9 million passenger-miles per day in the CRAF program.

- Contain a mix of C-5s, C-141s, C-17s, and C-130s in the active, Guard, and Reserve forces.

### Lessons from the Past

However, having a more capable airlift force—having just the capability to deliver intertheater cargo at a rate of 66 MTM/D—will not automatically ensure us the capability of flexible response. We must continually reexamine the lessons from the past: why some courses of action were followed and others rejected; why some were successful and others were not.

The first lesson we can learn from the decade of the 1950s is that the planners in the Army and the Air Force failed to work together *effectively* to determine how much airlift would be enough.

General Tunner noted that "prior to Big Slam, the Army and the Military Air Transport Service had not worked together for their common good and for the common good of the nation."

Fortunately, this kind of thinking is a thing of the past. One of the initiatives contained in the Air Force-Army Memorandum of Understanding signed on May 22, 1984, by General Gabriel and General Wickham established the means for the Air Force and Army to develop joint inter- and intra-theater airlift issues.

MAC and the Army's Training and Doctrine Command have formed two permanent offices to work mutual airlift/user requirements and problems: the Airlift Concepts and Requirements Agency (ACRA) at Scott AFB, Ill., and the Army Airlift-Airborne Coordinating Office at Fort Leavenworth,





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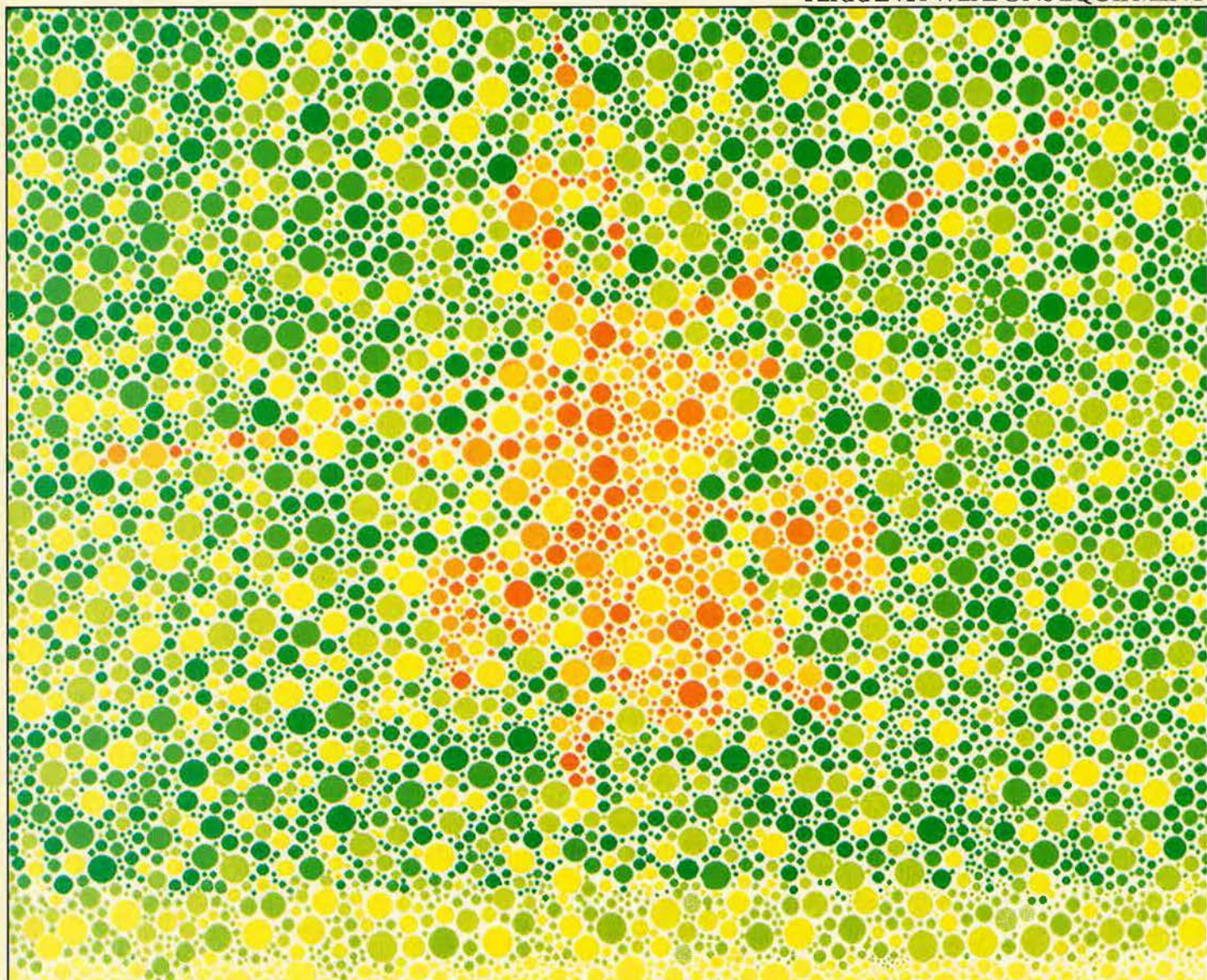
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Kan. At the same time MAC is a charter member of several groups that convene periodically to address Army/Air Force issues. Among these are the Joint Air Movements Board; the Joint Tactics, Techniques and Procedures Review Group; the Joint Technical Airdrop Group; and the Airdrop Working Group.

One of the most significant achievements MAC and TRADOC have made working together is to begin to solve the problem that plagued the Air Force in the late 1950s: how to determine intratheater airlift requirements, given the infinite variations of limited-war deployments.

To assist in answering this question, the Airlift Concepts and Requirements Agency, made up of Army and Air Force people, has conducted a qualitative analysis of the intratheater airlift needs of the Unified Commanders. The Unified

When this analysis is matched up with the JCS/OSD Worldwide Intratheater Mobility Study—a quantitative study of intratheater mobility needs—we will have a good understanding of what MAC must have to support the AirLand Battle.

### Managing Conflict

One of the major dilemmas faced by security planners of the Eisenhower years was that there was only enough in the budget for either strategic forces or conventional forces, not for both. In the arguments over those limited resources, one side argued that since a strategic nuclear war with the Soviets could result in the complete destruction of the country, our ability to deter or win such a war should be the first priority of military policy.

The other side argued that the most *probable* threat facing the nation would be the numerous small conflicts; therefore, we should

Now, that has changed. Through an effort that consumes more than twice as large a percentage of their GNP as US defense spending, the Soviet Union has become a military superpower. As their forces have expanded, our challenge today is to maintain a balance of forces adequate for both nuclear and conventional deterrence.

Today the strategic balance has driven conflict to a lower level, a level referred to as “manageable,” compared to the nuclear exchange, and our country finds itself—sometimes very alone—as the world manager of conflict.

Our prime concern as managers of conflict will be managing time. As Samuel Huntington aptly put it: “U.S. wars in the future may or may not be limited in goals, geographic scope, or material resources. They will inevitably be limited in time. This means that when the U.S. applies force, it must be able to apply



**MAC provides both strategic and tactical airlift at all times and under all kinds of weather conditions. The venerable C-130 has been the backbone of the tactical airlift fleet for more than thirty years, and the Hercules will be in action for a long time to come. This photo was taken at a recent Reforger exercise.**

Commanders told ACRA how they plan to fight battles in their theaters, and ACRA has determined, qualitatively, how MAC is going to support the war the commanders are going to fight.

place greater attention toward building up a strong conventional force.

In the 1950s, the partisans of the strategic forces dominated, and America's nuclear preeminence was unchallenged.

it expeditiously. Hence, high priority should be given to creating the transport capacity and support which will enable the U.S. to deploy substantial numbers of troops to Third World trouble spots in very



short periods of time. If we are going to win, we are going to have to win quickly."

There are two reasons why managing time is so important in managing conflict. First, possession of an airlift force capable of deploying substantial numbers of troops quickly is an essential step in lengthening the nuclear fuse. As an example, our inability to send enough divisions to Europe fast enough to counter a Warsaw Pact invasion across central Europe without first having to threaten the introduction of nuclear weapons makes the acquisition of airlift a critical element in reducing the threat of nuclear war in Europe.

The second element of this time/conflict management is seen in the term "window of opportunity"—that time-frame in which the combat commander can act with a strong force to prevent or defeat a potential threat. That window of opportunity is the time we will have to limit the intensity of a war. It is the time we will have to end hostilities by employing the right mix of forces that won't create risk or risk escalation. It is impossible to predict the size of this window of opportunity, but one thing is certain: The commander must have the right forces at the right place and at the right time. In this way the battlefield commander can concentrate his power against what Clausewitz called the enemy's Center of Gravity—the focal point against which all military energies should be expended.

### The Imperatives of Airlift

As we attempt to define the nature of the airlift force this country needs to manage time/conflict, there are certain imperatives of airlift we should keep in mind. These imperatives are lessons we can draw from the past as we meet the uncertainties of the future. These imperatives are:

- Since the beginning of World War II, airlift has become increasingly critical to battlefield success in every conflict.

- The requirements for airlift have almost always been greater than was expected at the beginning of the conflict, and the variety of missions performed by airlift increased measurably as the conflict developed.

- Airlift has been capable of sustaining large forces, sometimes for considerable periods of time. Even with the small airplanes of World War II, significant quantities of POL [petroleum, oil, and lubricants] and other supplies were moved by airlift.

- Airlift was the only means of sustainment for ground units whose whole lines of communication were temporarily cut.

- We're most likely going to fight where and when we least likely expect to fight.

- The final imperative is that when the time comes to fight, there will be lots and lots of customers for airlift.

As we apply these imperatives of airlift, it is very easy to limit thinking about what airlift really is and the flexibility it really has.

When people think of airlift, they tend to package it in simple categories. As people discuss strategic airlift, they think about C-141s and C-5s, and nothing more. As they talk about tactical airlift, they think about C-130s, and nothing more. Similarly, as they talk about special operations airplanes, they think only of MC-130 Combat Talons and AC-130 gunships, and MH-53 Pave Low helicopters.

That view of airlift forces is logical. It's also myopic. It's the thinking of the past; good planning for the war just fought, but it ignores the present and the character of the future.

The fact is, when you think about airlift, you must think about what resources can be brought to bear to solve the problem at hand.

The underlying message of the operational concepts discussed today—such as the AirLand Battle—is that warfare is no longer wrapped up in neat strategic, tactical, and special operations packages.

To support this year's NATO Exercise Flintlock—an unconventional warfare exercise—we not only used MC-130s specifically designed for special operations, but also C-141 and C-130 Special Operations Low Level (SOLL I) airplanes as well as rescue HH-53s and HC-130s. In the same way, a Navy SEAL team may be airdropped under cover of darkness to a beachhead by a SOLL C-141, and by the turn of the century, a corps com-

mander may be attacking an opposing force with troops tactically employed in a C-17 flying nonstop from Fort Bragg, N. C., to the forward line of battle.

The point is, when an airlift force supports a commander, airlift cannot be thought of as an airplane; it is a system that includes a variety of airplanes. With this understanding, the classic distinctions between tactical and strategic airlift become blurred. It's not a matter of a few airplanes, or a type of airplane for a given theater. It, indeed, is a system of airplanes that can be used across the entire spectrum of conflict.

### Three Essential Elements

The success or failure of this airlift system depends on three essential elements: first of all, MAC's people; second, the command and control of people and machines; and third, but not third to any of these, the airplanes and the equipment needed to support those airplanes.

Our active and reserve force team is the highest quality we've ever had. MAC's flexibility resides in the inherent capability of its people; they make the system work. In Operation Big Slam, despite the obsolete airplanes, this team proved its capabilities and *esprit de corps*. The airlift team flew troops through some of the worst turbulence ever seen in the Caribbean, landed onto the Puerto Rico staging field at intervals of slightly less than four minutes, unloaded the troops and cargo, gassed up, and went back for more. This teamwork kept the exercise a smooth and efficient operation. MAC's team is doing the same today.

If we always did everything as we planned to do it—and if our plans were always perfect—then our people could follow those plans by the numbers, and we'd succeed. However, that never happens. Our aircrews have to follow the second-, third-, or fourth-best decisions; they are the ones that give much of the flexibility to the airlift system.

To maximize this key element—the airlift team—you need the right airplanes, designed for the job and that will work, and a command and control capability that is flawless.

Command and control of MAC's airlift and special operations forces in the future will be a tough require-



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ment because we face two conflicting demands. On one hand, we face and will face continuous operations on a truly global scale. Controlling these operations will be more complex as we emphasize our ability to operate in a tactical and special operations environment—for the most part under peacetime rules.

On the other hand, if we go too far in controlling global operations, we could be criticized for being overly "Mother MAC"—directing everything from the top. Allowing that to happen will not give local commanders the flexibility to make operational decisions.

To reconcile these two conflicting demands of improved C<sup>2</sup> and improved local flexibility, we must know just about everything that's going on if we're to manage and not waste airlift. However, at the same time, we've clearly identified what information needs to be at which echelon.

We must provide a redundant sys-

Global Decision Support System. This is a JCS-sponsored project that will serve as the DoD state-of-the-art command center. This system will demonstrate, for the first time, several generic state-of-the-art command and control systems. Other CINCs can take the lessons learned from our operational experience and apply these lessons, eliminating a great deal of risk from their command center improvement programs.

However, having a state-of-the-art command center won't do any good unless we can communicate with the people in the field. To control MAC's total system, we have under way a high-priority program that spans the gamut from merging communications and computer technology, to establishing local networks at the wings, to putting deployable communications systems in the field.

We have a wide number of C<sup>2</sup> projects designed to improve

ter, and with the Unified Commanders.

MAC's command and control upgrade program is focused on meeting the challenges of time/conflict management. By expanding digital communications and improving our survivability, we will be able to make the most of limited communications time, interact with the command and control systems of the other CINCs we support, and take the burden off of them and their communication systems.

Although command and control will play a vital role in bringing MAC to the right place at the right time, we also have to have modern, efficient airplanes designed for our missions.

MAC's missions are performed along the entire spectrum of conventional conflict, and along this spectrum there are no limits to the types of contingencies in which MAC's core special operations airplanes are capable of responding.



**A C-141 unloads at Point Salinas airport during the Grenada landings of 1983. MAC played an important role in the operation, as the command airdropped Army troops, brought in all manner of supplies, including Army helicopters on board C-5s, provided troop support with AC-130 gunships, and performed psychological warfare missions with EC-130 and MC-130 aircraft.**

tem that ensures information flowing both ways. That system does not exist today, and you can therefore assume that we waste airlift.

We're taking several steps to amend that. A major one is the

MAC's airlift and special operations capabilities. We're adding secure voice, antijamming, and EMP protection to upgrade communications with our people in the field, with the National Military Command Cen-

By their nature, many of the contingencies special operations forces would fight in will develop in situations short of war. For this reason, special operations missions should be designed to avoid major conflict



and prevent war, if possible. Thus, the importance of special operations cannot be overemphasized, and when considering the airplanes to support these operations, there are certain essential elements that should be considered. These core elements of SOF are:

- Special operations missions are normally joint missions. To perform effectively, special operations units must work efficiently with both military and civilian government agencies.

MAC special operations forces train—on a continuing basis—with the elements of special operations forces of the other services; in this way we can fight as an integrated team, and theater CINCs can tailor forces to meet changing requirements.

- The application of airpower in a special operations environment is not “separate airpower,” but specialized airpower.

A broad spectrum of US Air Force combat assets can be used for special operations missions as the need dictates. The system of airplanes that makes up MAC’s special operations forces provides the capability to respond—in a flexible manner—to the threats and to a wide range of crises.

- In today’s threat environment, to increase survivability, special operations missions must be thoroughly planned and flown at long range in a night, adverse weather, low-level flight regime. Because of the special nature of their missions, special operations forces must have up-to-date equipment and the logistical base to support that equipment. Inherent to any and all special operations missions is the trust that must exist between the human element and their equipment.

MAC’s special operations forces don’t have that up-to-date equipment, but we’re acquiring it. The Air Force has taken this on and has initiated several programs to increase special operations capabilities.

We have eighty-eight programs funded and under way now to improve special operations airplanes, including the Combat Talon II, enhanced MH-53s, new gunships, and the CV-22A. We are adding a number of modifications to core and augmenting SOF airplanes, such as

electroluminescent lighting, improved threat protection, and night vision goggles/head-up displays.

At the same time, we have improved the responsiveness of the special operations logistics maintenance support. MAC has a common worldwide logistics base that supports both special operations and strategic/tactical airplanes. The SOF assets we have on board now share much commonality with the rest of the MAC system. This gives us the infrastructure—both in logistics and personnel—to support our special operations forces.

- There is almost no limit to the types of contingency that might necessitate a response by a special operations capability. The threat is worldwide; thus, an effective special operations force must be supported by an effective command and control network.

MAC’s command and control capability will be the state of the art for the Department of Defense, and as the program is developed, MAC’s special operations forces will be melded into the system.

- Finally, special operations units are ideally suited for peacetime activities designed to prevent the escalation to war.

As such, special operations airplanes should have the lowest possible visibility. With MAC’s worldwide signature, the capability exists to move special operations forces throughout the MAC system without drawing undue attention to them.

#### **Plans for the C-17**

Operation Big Slam pointed out to airlift planners and the public at large that the airlift airplanes of the time were characterized by small capacity, short range, and expensive operating costs.

In a similar way, our latest major operation in the same theater, Operation Urgent Fury (the evacuation of students from Grenada), pointed out some limitations of today’s airlift flexibility.

Point Salinas airfield—the primary airport from which we operated in Grenada—is like many other airfields we expect to operate from in future contingencies. Point Salinas had a very small parking area that would only hold one C-130 when we arrived there. The parking ramp

was not large enough for C-141s, and the only way we could bring a StarLifter into the airfield was to land it to the east, park at the end of the runway, land another C-141 into it, turn both of them around, offload their cargo, and take them off into the west.

Point Salinas airfield is typical of airfields in many regions in the world; there are few airfields with parking ramps large enough to accommodate a heavy flow of large, limited-maneuverability transports. Possible runway interdiction and the need to bed down reinforcing fighter and combat support units further reduce this number. As a result, the potential for an airlift flow being restricted by airfield saturation can become a major problem.

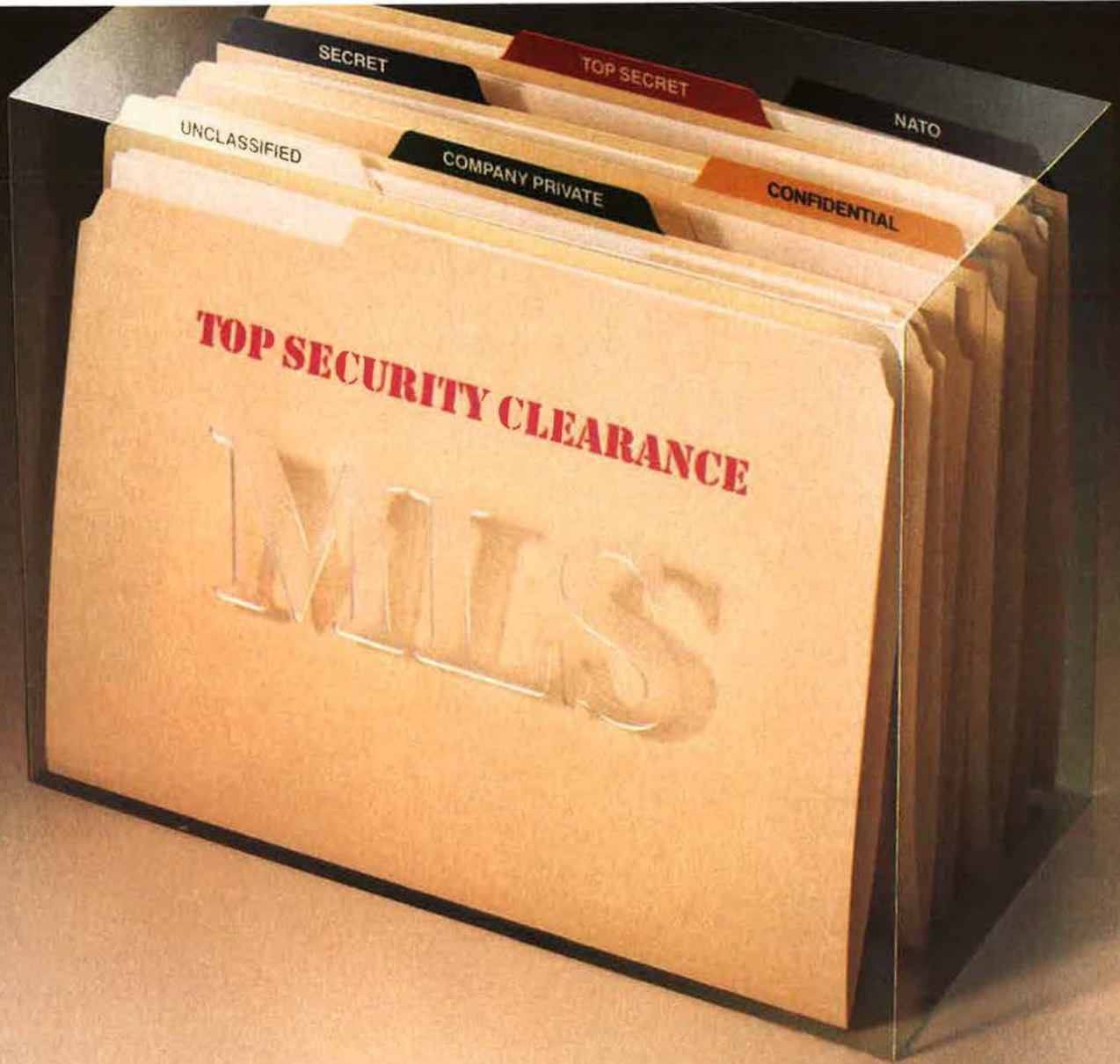
Also, in certain areas of the world—such as the Middle East, Africa, and South America—the limited number of major airfields could have a significant impact on the time required to deliver a force into combat, especially if the airlift flow into that airfield must be restricted or if a long overland march is required from the offload base to the battle area.

The solution to this problem lies in the C-17. It is capable of delivering cargo directly where it is needed. Through its capability to operate out of small airfields and their associated cramped parking ramps, the C-17 can deliver people, equipment, and supplies to the brigade level and even further forward, if required. On a 500,000-square-foot ramp with a single entry point, eight C-17s (because of their ability to back and their ground maneuverability) can be parked for loading or offloading in the same space required for three C-5s. Translating these numbers into a typical airlift flow results in those C-17s delivering almost three times the cargo of the C-5s.

The C-17, however, is more than just an airplane that can maneuver on the ground. It is an airplane designed for the need—both intra- and intertheater: direct delivery, combat offload, low-altitude cargo extraction, and the capability to operate in higher threat environments.

The C-17 incorporates proven technology and lessons learned in terms of aircraft size, performance, and cargo capability. It will give the





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These avionics and advanced cargo-loading features give us the ability to reduce the crew size to three people vs. the five to seven required in other airplanes. However, there are other savings in the C-17 that do not have the ready visibility of the savings achieved in crew members. Because it is designed and war-

However, arguments about cost are not the primary determinant of whether to buy this airplane. The real issue is the ability of the Military Airlift Command to give the Unified Commanders unrestrained mobility and flexibility so that they may prevent battle or that they may surely win in battle.

In this context, the best argument for the C-17 was given by Lt. Gen. Carl Vuono, then Army DCS/Ops and Plans, who testified with me to Congress about the airlift needs of this nation.

General Vuono said, "Military strategy, doctrine, and tactics go down simply to this. The winner on the battlefield is the one who has superior forces at a decisive time and place. For ground forces to be able to achieve this in many places around the world, we must have the support of the C-17."

The flexibility to maneuver to many places around the world is the essence of airlift.

Michael Howard, the noted British military historian, suggests that in the future, land warfare between the nuclear powers may become more a matter of posturing and maneuvering than of actual fighting. He states that land warfare may become something like warfare in the days before Napoleon, in which "men who had much to lose and little to gain from war . . . fearfully committed their forces to battle and maneuvered them cautiously."

In this type of world then, where maneuvering becomes a substitute for fighting, a capable and believable airlift force serves as unambiguous evidence of our ability to project military power. The Military Airlift Command will provide our country the ability to react very quickly and stabilize some very unstable places. In a world where wars are limited in time, airlift can be the stabilizing factor in preventing small crises from escalating into large conflicts. ■



**The McDonnell Douglas C-17 is MAC's highest-priority item. The new airlifter, which can carry items as large as the M1 tank and can back up while on the ground, will be a vital link in achieving MAC's goal of being able to transport 66,000,000 ton-miles of cargo per day.**

ranted for reliability, maintainability, and availability, we will be able to man a typical C-17 maintenance unit with approximately thirty-two percent fewer people than an equivalent C-5 unit.

*As Commander in Chief of the Military Airlift Command, Gen. Duane H. Cassidy directs the management of all strategic and tactical airlift forces worldwide to ensure operational support to unified and specified commands. A command pilot and a senior navigator, he has accumulated more than 8,000 hours of flying time in a wide variety of aircraft, including SA-16s, C-121s, B-47s, B-52s, and C-141s.*



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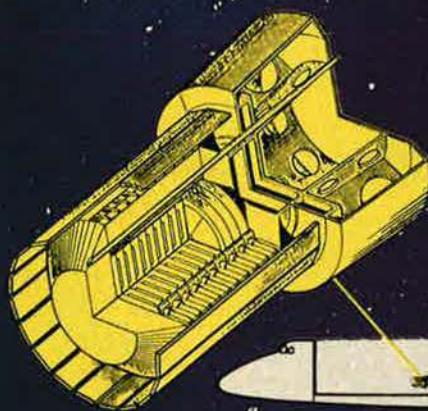
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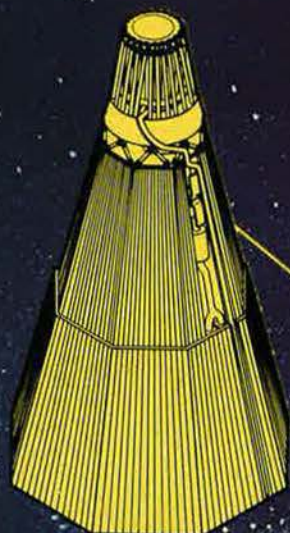
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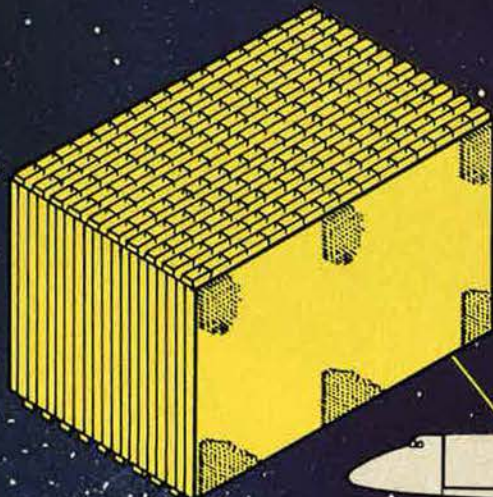
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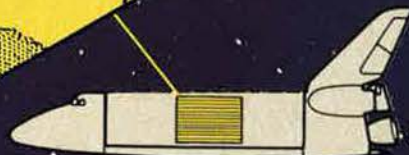
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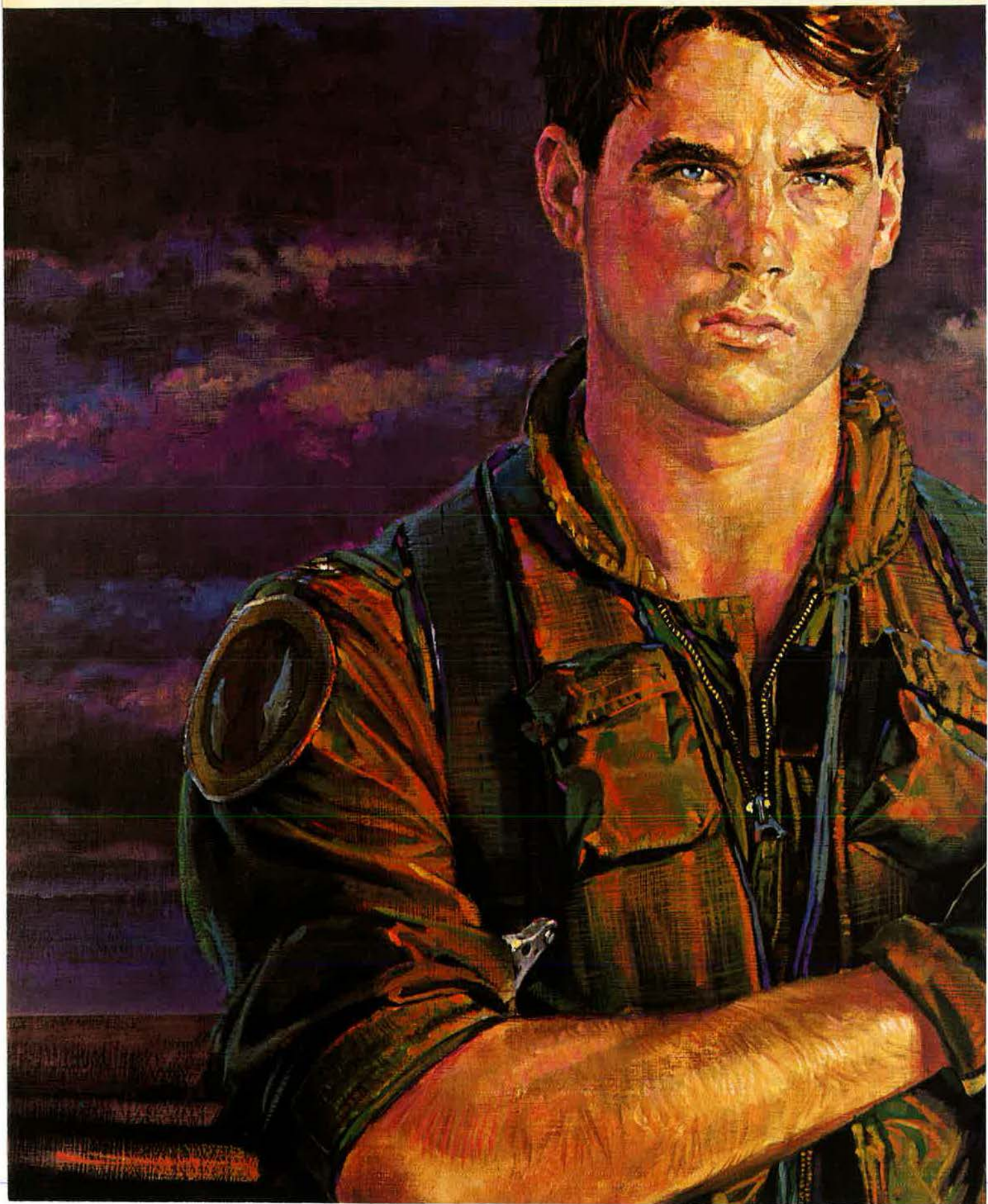
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**"The highest possible priority" in strategic modernization is C<sup>3</sup>I—by order of the White House.**

# Top Priority For C<sup>3</sup>I

**BY EDGAR ULSAMER**  
SENIOR EDITOR (POLICY & TECHNOLOGY)

One of the major stumbling blocks to effective C<sup>3</sup>I is getting satellites such as this Navstar GPS into orbit. (Depiction by Erik Simonsen)

**I**N THE recently issued National Security Decision Directive NSDD 178, President Reagan accorded C<sup>3</sup>I programs the "highest possible priority" within the Administration's strategic force modernization package. This commitment, Assistant Secretary of Defense for C<sup>3</sup>I Donald C. Latham told the Air Force Association's C<sup>3</sup>I and Electronic Warfare Symposium on June 26, 1986, in Boston, Mass., is no hollow abstraction: "We put our money where our mouth is. Command control and communications funding has gone up from about \$10 billion in FY '81 [the first Reagan budget year] to better than \$20 billion in FY '86. We asked for between \$24 billion and \$25 billion in FY '87 [and plan to continue this uptrend] with about \$27 billion allocated to C<sup>3</sup> in FY '88 under the Defense Department's latest POM [program objective memorandum]."

While Secretary Latham provided no specific figures about the intelligence portion of the overall C<sup>3</sup>I budget, he pointed out that "the 'I' side has grown at about the same rate as the 'C<sup>3</sup>' component in terms of both tactical intelligence and national foreign intelligence programs." In the aggregate, C<sup>3</sup>I accounts for about twenty-five percent of all DoD program elements. This total includes funding of C<sup>3</sup>I systems used by the Special Operations Forces (SOF), such as Combat Talon II aircraft  
*(Continued on p. 138)*



**Aircraft might achieve stealthiness by matching the radar returns of background clutter.**

## Smart Skins and Other Wonders

Among the most stunning technological prospects unearthed by the Air Force Systems Command's Project Forecast II analysis are the so-called "smart skins," Brig. Gen. Eric B. Nelson, AFSC's Deputy Chief of Staff for Plans and Programs, told AFA's Electronics Symposium in Boston June 26. He described "smart skins" as "devices that are too small for the eye to see—but not yet down to the atomic level—[that can] gang together like phased arrays." This technology makes possible "the transmission, reception, and processing of information right in the skin [of aircraft and missiles] with microstructures" in the micron (one-thousandth of a millimeter) range. The payoff from "smart skins," he suggested, could be a "new generation of 'Stealth' vehicles." Stealthiness in a radar sense is achieved at present by soaking up the energy that "is incident on the body that we are interested in and reradiating it in another frequency [or] we bounce it off in some way so it doesn't go back to the place where it came from," meaning the hostile radar receiver.

But there is a third way to achieve Stealth that involves matching the clutter of the background, he told the AFA meeting: "The best way to do this is to look just like your background." He explained that if it is possible in the case of low-flying aircraft to "sense with an array [on the vehicle's underside] what the clutter, meaning the ground, looks like—and if you can make the topside of the aircraft look like the clutter in a frequency and power sense—then you have done something nearly ideal: You have made a chameleon out of your airplane." He added that this chameleon approach to Stealth would be applicable also to systems other than aircraft.

The promise of "smart skin" technology is not confined to Stealth and probably will be applied first to communications systems because they have the lowest power requirements. Other potential applications for smart skins are in the electronic warfare

field and in the field of micron-size lasers.

Two other daring Project Forecast II concepts in the electronics field described by General Nelson—the study's codirector—involve microwave heating of the ionosphere and distributed sparse spacecraft arrays. The latter technology, he explained, is born of the "at least perceived problem" of spacecraft survivability: "If you have a monolithic, space-based radar [that costs about \$1 billion each and] may cover an area of two to three tennis courts, some people perceive that as a very unsurvivable system, even though it's hard to get to and there are ways to defend it." It is possible, however, to "take the radar apart and to break it into about forty to fifty separate radars while retaining the original system's power aperture" and, hence, identical capabilities, he said.

Further, "if you are able to distribute these separate radars in space so that there is some distance between them, [Soviet laser weapons have] a harder time picking off all the bits and pieces, and you get some built-in graceful degradation as well as some backup capability." Each of the some forty elements of the proposed distributed sparse array would be about two feet wide at the bottom, about forty feet long, and seven feet high, he said, adding that "the cost of putting up these elements is probably only about one-third to one-half again as much as a monolithic space-based radar."

The gain in survivability may well be worth the extra cost, as may be the option to increase the system's aperture simply by launching "another load of these modules and putting them into the array." The basic challenge of such a system lies in the engineering field: "The trick is to make the devices know where they are in relation to one another."

The incentive to create "space mirrors" by heating the ionosphere stems from the intrinsic handicaps of OTH-B (over-the-horizon backscatter radars), because "the ionosphere

isn't always there, such as at night or when you are looking north," General Nelson explained. Hence Project Forecast II's idea to "generate an artificial ionosphere some fifty miles above the surface level through microwave heating." Two "transmission systems" would be involved—an extremely powerful one that initially creates the "mirror" and one that requires smaller power levels because its function is merely to maintain the ionized layer in the ionosphere generated by the initial microwave burst. Such a system, General Nelson said makes it "possible to put the mirror where you want it, [which in turn permits] closer-in surveillance than is possible with an OTH-B system."

Another highly promising concept "invented" by Project Forecast involves the twin technologies of robotics and "telepresence," according to General Nelson. This initiative, he explained, "gets away from the R2D2 syndrome of trying to develop a robot with a processor that approximates the human brain. Instead, this concept uses the robot for what a robot is good at doing, *i.e.*, being in an environment where the human body doesn't hang together very well." At the same time, telepresence sidesteps the impossible, namely replicating the human brain. Tactile recognition, for instance, is sensed by a robot in space or in a lethal CBR (chemical/bacteriological/radiation warfare) environment and "transmitted to a glove that the human then feels. Sensing functions by the robot could include visual, auditory, or even olfactory sensations, General Nelson said.

One technology area that Project Forecast II approaches with caution is artificial intelligence, a widely glamorized field "that we have chosen to back off from," he said. "We don't even use the term and [instead] plan to put our emphasis over the next ten to twenty years on 'expert systems.' We may be shortsighted, but our senior review group was concerned about going overboard in an area that we didn't understand" even in terms of how it could be used. —E.U.



and Pave Low helicopters, according to Secretary Latham.

The challenge in the C<sup>3</sup> area now is "to produce and put out systems that work," he told the AFA meeting. But there are formidable obstacles, ranging from the current stand-down of all major US spacelaunch systems and "unreasonable" stretch-outs of the acquisition cycle to congressional meddling in specific programs and concepts, he warned.

Speeding up the acquisition process calls for a sustained "government-industry team effort" that, he predicted, will be the primary, initial task of the new Under Secretary of Defense for Acquisition and the new acquisition executives of the services. In this context, he suggested that if the pending reorganization of the Pentagon's acquisition hierarchy fails to mandate straight-line reporting by the under secretaries for acquisition of the services to the under secretary of defense for acquisition, it will turn out to be a "hollow reorganization."

Because assured US access to space is—and will for some time continue to be—"shut down, we have very important [C<sup>3</sup>I] satellites sitting in warehouses." In this context, he cited specifically the Navstar Global Positioning System satellites, some of which will have to be stacked up on the ground "because we can't get them up into space." In terms of user equipment alone, the Pentagon has programmed between \$5 billion and \$10 billion in support of GPS, according to Secretary Latham.

Between 25,000 and 30,000 user sets—ranging from man-packs to F-16 receivers—are coming into the inventory of the services, but won't be of any use until the system's space segment achieves operational status. Originally, that status was to have been attained by the end of 1988, but in the face of the protracted stand-down of the Shuttle and the Titan 34Ds, obviously that time frame can't be met, he pointed out. Even though a joint House-Senate conference recently approved the Defense Department's special \$600 million supplemental to resuscitate US military spacelaunch capabilities, he said, there would be no major US satellite launches—with the exception of three Atlas/Centaur launches involving Navy communications satellites—"for a couple of years."

He added that toward the end of this year, one Titan 34D is likely to achieve operational status, but may not be usable immediately because of extensive damage to the launchpad at Vandenberg AFB, Calif. The explosion of a Titan launcher at that facility earlier this year caused about \$70 million worth of damage to the launchpad that might require up to eight months to repair. Because of the stand-down caused by the *Challenger* tragedy at the beginning of this year, two Titan 34D failures—one last summer and the other one this spring—and a subsequent breakdown involving a Delta launcher of NASA, "the most powerful nation on the face of the earth [is tragically stymied], without any ability of going into space with any meaningful" payload. This US paralysis is in marked contrast with the Soviets who "launch on the order of a hundred spacecraft a year and [whose] launch success rate is in the high ninety percent range," he reported.

The Defense Department is working its way out of the current impasse by means of a "balanced launch strategy" that envisions the use of "both the Shuttle [at the

# In the aggregate, C<sup>3</sup>I accounts for about twenty-five percent of all DoD program elements.

rate of] about six to seven launches a year and of ELVs to the tune of a baker's dozen a year." The Defense Department's spacelaunch recovery plan involving a mixed fleet approach is well under way. Secretary Latham suggested: "We have our act together, if only NASA and the rest of the government could follow suit."

Brig. Gen. Robert R. Rankine, Jr., the Air Staff's Director for Space Systems and C<sup>3</sup>, told the AFA symposium that the first Titan 34D-7, known as a complementary ELV (so called because it can take a fifteen-foot-wide by forty-foot-long Shuttle-bay-equivalent payload weighing 10,000 pounds to geosynchronous orbit), will become available in the last quarter of 1988. The first of the currently mothballed Titan II ICBMs will be refurbished and reactivated as spacelaunch vehicles in mid-1988; the first MELV (medium ELV) is likely to enter the inventory late in 1989; and the Orbiter replacing *Challenger*, if produced as currently planned, is to achieve operational status some time in 1990, according to General Rankine. The current inventory, although idled because of the multiple stand-downs, consists of the three Space Shuttles and about twenty-five ELVs, he added.

As part of the Air Force's spacelaunch recovery program, a number of CELVs—in addition to the ten vehicles already programmed—is to be acquired. Also, spacecraft from now on will be "dual compatible," meaning they will be configured so that they can be launched by either the Shuttle or expendable launch



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vehicles, he said. The Titan IV, previously known as the Titan 34D-7, will be the only launcher for the Centaur-G upper stage. Following the *Challenger* disaster, this liquid-fueled "upper stage" vehicle was disqualified for use by the Shuttle for safety reasons.

In spite of the current spacelaunch stand-down, General Rankine said, the Air Force will continue to carry out about "three-fourths of DoD's space business"—mostly involving C<sup>3</sup>I missions—or "about one-third of the nation's total spending on space operations."

#### **"Emotions" Blocking Joint-STARS?**

Stubborn and entrenched congressional opposition to the Joint Surveillance and Target Attack Radar System (Joint-STARS), Secretary Latham suggested, is largely an "emotional issue." That emotion is fueled by concerns over the C-18 as the system's test-bed that would carry both the moving target indicator radar and the joint Air Force/Army battle staff. Current Air Force plans—at least temporarily thwarted by the House Armed Services Committee's "zeroing" of funds for this program—call for Joint-STARS deployment on two platforms. One is an interim C-18 aircraft to meet the operational requirement in the 1990s, and the second is a follow-on, more survivable platform. The question that Congress finds so vexing, according to Secretary Latham, is "should we buy a large number of C-18s [refurbished and modified Boeing 707 jetliners], or should we buy only a few and have some other [air vehicle] carry the radar?" He expressed hope that Congress will be able to resolve the present deadlock within this budget year, adding that the Defense Department very recently "submitted a special report on [these contentious issues that puts special emphasis on] the so-called follow-on platforms."

Lt. Gen. Melvin F. Chubb, Jr., the Commander of AFSC's Electronic Systems Division, defended the Joint-STARS program as "the most important thing we can do over the next five years" in the conventional warfare arena. Pointing out that Joint-STARS at present is enmeshed in the same kind of overblown apprehensions about vulnerability that delayed the highly successful E-3A AWACS by five years in the last decade, the ESD Commander stressed that with the new system, the conventional warfare capabilities of both the Army and the Air Force will be increased geometrically:

"Instead of hitting targets that *were* targets twenty-four hours ago, we can hit them in real time. The Army sees them on the ground, and we [the Air Force] see them while they are airborne. We are going to see everything that moves on the ground—in the ground clutter—and we are going to [spot a target when it's] stopped. We are going to produce so much data for the US Army and the US Air Force that neither can possibly [feel short-changed by] Joint-STARS. We search, we spotlight, we interleave, we look at moving targets, and we look at still targets so that our whole doctrine can change [to the point] where the Air Force is running tanks and the Army is running aircraft."

A make-or-break element for such demanding missions as the NATO follow-on force attack (FOFA) concept, Joint-STARS provides an electronic "high ground" over the battlefield from which to delay, disrupt, and

## **Congressional concerns about vulnerability and choice of platform are hampering Joint-STARS.**

destroy first- and second-echelon hostile armored forces. Toward this end, Joint-STARS, in real time, detects, tracks, and transmits exact enemy location and position update information to friendly attack forces. At the same time, the system provides corps commanders with wide-area-surveillance information for rapid maneuver of forces and real-time battlefield management.

The Joint-STARS full-scale development contract was awarded in the fall of 1985 to a Grumman/Norden/Boeing team. That team, in concert with the ESD system program office, is "off and running," according to General Chubb: "We are putting a twenty-foot-long antenna on the 707 [test-bed]. The trick is to have very precise tolerances from one end [of the sensor] to the other because [of the cardinal requirement] of getting the sidelobes [stray energy] down to zero and in order to [maximize] target resolution so that we can tell a truck from a tank over pretty good distances."

The ESD Commander spiked claims by congressional skeptics about Joint-STARS's excessive vulnerability with the assertion that, on the battlefield, "everything is vulnerable, whether it's a wing of F-16s sitting on the ground or a 'shopping mall'-size command and control facility" that currently performs a fraction of the job that Joint-STARS is capable of. Stressing that Joint-STARS is "a heck of a lot less vulnerable than most things" used on the battlefield at present, General Chubb pointed out that "we are going to [bolster] the system's survivability with quite a few protection devices. We know the kind of



things the Soviets will try to do to take out AWACS and Joint-STARS, [with the result] that we are designing electronic systems to protect [these assets] against those threats."

The same kind of arguments concerning alleged vulnerability that are being leveled against Joint-STARS, he charged, kept the initial AWACS production rate at between two and three aircraft a year. That—compared with the programmed annual production rate of between twelve and twenty-four aircraft—"drove unit costs through the roof." While he acknowledged that vulnerability is a legitimate concern that must be dealt with, he said the tradeoffs make the case for Joint-STARS compelling: "Do you want the operational capability to [exploit the Air Force's demonstrated capability to deliver air-to-ground weapons with a two-foot CEP] to hit real-time targets, or [are you willing to settle for] targets that are three days old?"

He stressed that without Joint-STARS, "frankly, we don't have the air-to-ground support" that the Army requires. "If we don't get Joint-STARS, we are going to get a lot of [makeshift] things on helicopters that will do a half-baked job," General Chubb predicted. At the same time, reneging on Joint-STARS is likely to lead to the fielding of "a few very sophisticated platforms that can provide some data for some very special people [presumably in the intelligence community] that will do some good, [but won't compare] to an operational commander having his own system to watch what the enemy is doing on a continuous basis."

#### **USAF Tardy on RPVs?**

The Air Force, Secretary Latham claimed, is lagging behind OSD and some of the other services on the issue of remotely piloted vehicles (RPVs): "They [USAF] are on a different frequency, [but maybe] they are coming around." The Army, he explained, is working on RPVs in the form of the "controversial and expensive Aquila [program]." So far as the Navy and the Marine Corps are concerned, he found that "they have stepped up to the problem." To "some extent," the Air Force is participating in an umbrella program that is to be carried out by all the services on a joint basis, Secretary Latham told the AFA meeting. This umbrella program includes short-range, medium-range, and long-range RPVs: "The Air Force decided to join forces with the Navy. The Air Force will do the sensor part and the Navy the air vehicle elements of the effort. Somehow they will produce a vehicle."

Secretary Latham said that he was "quite skeptical that the Air Force will follow through," but did not explain why. He maintained that "RPVs hold great utility for a number of missions, and they can be made quite inexpensively," as demonstrated by the Israelis who used RPVs with considerable imagination in the last "fracas" in Lebanon. "I think the Air Force needs to rethink how they would use RPVs, not only with regard to C<sup>3</sup>I work but for other operations and in other ways to defeat air defenses," Secretary Latham asserted.

Secretary Latham also reserved some implied criticism for the Air Force in connection with the planned avionics package of ATF, the advanced tactical fighter. Suggesting that "we haven't learned our lesson yet," he said it was his contention that the next-generation fighter

# **The Soviets are "eating our lunch" on communications security, Latham says.**

can't be "a 'star ship' that goes in with a wingman or by itself, fights its way through the defenses, does its mission, and returns." The right way, in his view, is a "shared on-board, off-board system" involving RPVs, signal intelligence information, remote radars, and such on-board systems as the Advanced Self-Protection Jammer (ASPJ) and the Integrated Electronic Warfare System (INEWS).

ASPJ, a key element of the avionics suites of the F-16 and several Navy aircraft, Secretary Latham said, "is a very sophisticated jammer that causes [hostile aircraft] to think we are at a place other than where we are at." INEWS, he added, is the "next-generation box" and, like its companion system, ICNIA (integrated communications, navigation, identification avionics), is designed to enhance the performance of ATF and its Navy counterpart, the Advanced Tactical Aircraft (ATA) across the board.

But Lt. Gen. William E. Thurman, then the AFSC Vice Commander and now the Commander of AFSC's Aeronautical Systems Division, told the AFA meeting that neither ICNIA nor INEWS will be available when the ATF prototype begins flight test. As a result, the Air Force decided on a dual-track approach to the development of ATF, involving flying as well as ground-based prototypes. The benefit of this approach, General Thurman said, is that the flying prototype, on the one hand, gets into the air early "so that we can get the very complicated airframe/avionics integration work under



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way." The avionics prototype on the ground, on the other hand, "allows us to take all our boxes, integrate them, and literally to fly missions before you get into the aircraft and start its engines." By backing off from approaches that don't work in the ground-based prototype, the Air Force expects to save both time and money that otherwise would be eaten up in flight-testing unworkable arrangements, he suggested.

ICNIA, Secretary Latham added, will place strong emphasis on communications security, with the National Security Agency "working very closely with the Air Force and the Navy to make sure that this happens." The Soviets, he claimed, "are eating our lunch when it comes to communications security, on the battlefield, strategically, and between [defense] companies." With regard to the latter category, he announced that, effective October 1, 1986, all industrial contractors working on classified programs will have to demonstrate secure voice and data-transmission capabilities or be disqualified.

### Strategic C<sup>3</sup> Concerns

"The jury is still out with regard to the C<sup>3</sup> challenge" associated with the new Small ICBM (SICBM) program, according to Secretary Latham: "We are having quite a dialogue [between OSD] and the Air Force over what is the most effective way to handle such a system." The key question, he suggested, "is how do you launch when you really want to [although] the crew is incapacitated or not even there?" While not all the details concerning the design and deployment of the SICBM are as yet firm, Secretary Latham predicted that the missile would carry from one to three RVs, with Congress likely to legislate that its weight be around 37,000 pounds.

Equally foreordained is the requirement for the SICBM's mobility, involving hard-mobile launchers "that will be based on federal land and, on warning, disperse on this federal land, stop, and launch." The crew, he said, will consist of two drivers: "The missile is automatically interrogated from a control source—whatever it is—questioned about its status, and then given the launch order." The crew's only function is to drive the HML (hard-mobile launcher), according to Secretary Latham.

The as-yet-unresolved challenge, he claimed, is what constitutes the most effective command and control mechanism for such a mobile weapon, especially with regard to "great survivability, great [protection against] unauthorized launch, and great [certainty] that it can be launched when we want to." A lot of work has been done by the Pentagon in this regard, and "the technology is here so that we can be absolutely sure [that there won't be any] unauthorized or inadvertent launches." The C<sup>3</sup> aspects of the SICBM program presumably will have to be settled at least in rough terms by the end of this year, when the decision on program go-ahead is to be made.

Another C<sup>3</sup> system under contention is GWEN, the Ground Wave Emergency Network, according to General Chubb. GWEN, in fact, is an "overlay" on the nation's commercial communications system that is to provide failsafe communications between the NCA (national command authorities), major command centers, missile warning sites, and US-based nuclear forces. Full-scale development of the prototype network, including relay

stations, input and output ground and airborne terminals, and receive-only terminals has been under way for several years. Full operational capability is to be achieved by 1990.

But "things are not going smoothly for us" so far as GWEN is concerned, according to the ESD Commander: "As a matter of fact, there is a real media circus going on that is keeping GWEN out of a few states." He emphasized that "GWEN really is no more than a radio relay system [that makes clear to the Soviets if] they think of starting [an attack] that we have sufficient [command and control connectivity]" to be able to regroup and respond. The environmental phobias against GWEN fostered by the media are groundless, according to the ESD Commander. GWEN's relatively small relay towers, which are being portrayed as a major health hazard, in fact "put out only about 600 watts for a few minutes a day, compared to your local radio station, which puts out 50,000 watts twenty-four hours a day. It's hard to imagine how this could hurt anybody, but obviously we are not doing a good PR job" countering these claims. Ultimately, the EMP-resistant system will consist of between 100 and 200 relay towers that broadcast in the low-frequency band in the manner of commercial AM/FM stations.

### The Software Challenge

In general, over the next five years, the central task of the SDI (strategic defense initiative, or "Star Wars") program is to solve a host of C<sup>3</sup> problems. In particular, this boils down to finding a "software system that is flexible, fault-tolerant, expandable, and above all else, testable," Dr. Gerold Yonas, SDIO's Chief Scientist and Acting Deputy Director, told the AFA symposium. To meet this challenge, the Pentagon has just decided to set up a National Software Test-bed facility at Falcon AFS, Colo.

General Chubb suggested that "it's getting to be a software world." He underscored this contention by pointing out that the first massive military computer user, the SAGE system, worked with only "60,000 lines of [computer software] code. We are now up [against systems that use between] one and three million lines of code. In the case of SDI and ADI [the companion air defense initiative], we are getting into the tens of millions of lines of code." He added that ESD recently examined twenty-five major programs and found that during their developmental phases, more than half of their cost were in the software rather than the hardware sector.

While the importance of software design is increasing rapidly and transcends the hardware criteria, "today you can go to see the top program managers in industry and you will find that he knows everything there is to know about the hardware [aspects]. But if you ask him about software, he brings in somebody else." Turning to the industry representatives attending the AFA symposium, General Chubb urged that "sometime soon things [have] got to change to where the software wizard runs the program rather than the hardware man." He conceded that industry's skewed orientation "is not the contractors' fault. We created the wrong environment by making a big deal out of the hardware, and the companies just followed suit."



# About half the near-term SDI budget will go to solving C<sup>3</sup>I and software problems.

He explained that some contractors are in the midst of building up high-caliber software teams whose leaders eventually might take over program management functions. ESD, General Chubb said, is encouraging these trends by sending out its own software team to highlight these issues for contractors. The Air Force will increase its emphasis on warranties in the software field in the full recognition that "if the companies make lots of money on warranties, we get super products" that work flawlessly and more than make up for the cost of the warranty.

Another troublesome aspect of the software problem cited by the ESD Commander involves the tendency even "among some of the largest companies" to bid on Ada, the Pentagon's standard programming language, without "even knowing what Ada is." He added that "we don't want to cram Ada down everybody's throat, but eventually Ada experience will be a plus" for industrial contractors.

The almost exponential growth in the capability of computational systems clearly foreshadows increasing challenges for software designers, the ESD Commander told the AFA symposium. By way of a benchmark, he pointed out that "we now can squeeze 2.5 giga [one billion] bits of data into a box that fits into a half-sized rack. In Rome [at the Rome Air Development Center, N. Y., an ESD component], we have gone to the next step [into] the optical and photon world, where we can cram 10,000 gigabits [of data] into one rack."

In practical terms this means, for instance, that the Defense Mapping Agency's comprehensive "digital map" of the world is stored on about 50,000 tapes at this time. "If you ask for a readout of this digitized information, it takes roughly between twenty-four and forty-eight hours to get it, depending on your priority. But with optical storage we will be able to do the whole thing in one rack and get readouts in about five seconds." Among the potential benefits that can be derived from optical data storage are dramatic reductions in the size of intelligence data fusion and battle-management systems, according to General Chubb.

The C<sup>3</sup>I problems, in general, and the associated software challenges, in particular, are likely to cause SDIO (SDI's program office) to allocate "about half of our budget over the next five years to the eyes and ears [the command control and communications elements] of the system." Secretary Latham characterized SDI's C<sup>3</sup>I challenge as "the long pole in the tent, compared to kill devices, whatever they might be," because weapons that "can't be targeted make little sense." Charging that so far as ballistic missile defense (BMD) concepts are concerned, there is a lot of "view-graph engineering" making the rounds. Secretary Latham suggested that "we have got a long way to go."

General Chubb, in similar fashion, believes that strategic defense against both ballistic missiles and air-breathing threats "involves a range of problems." He added that in his view, "we have not yet found the best way of dealing" with them in the C<sup>3</sup>I context. Both he and Dr. Yonas agreed that one of the toughest problems associated with strategic defense is elemental, *i.e.*, "finding" cruise missiles, especially designs incorporating low-observable technologies.

In looking at SDI from a broad strategic and political perspective, Dr. Yonas suggested that this program is much tougher than the World War II Manhattan Project or the Apollo moon-landing project because of an unbroken chain of countermeasures that the Soviet Union can be expected to field over SDI's life cycle: "In looking at the range of [potential] countermeasures, [it becomes clear] that SDI needs to be built flexibly, with growth potential so that the Soviets would see that if they deploy countermeasures, our technologies could get ahead of—and stay ahead of—any countermeasures." A major countermeasure challenge lies in lightweight decoys and the idea of making "some real RVs look like decoys and the other way around. The emphasis [thus] is on the eyes and the brains of the system [staying smart]."

In a general sense, Dr. Yonas suggested that current public tendencies to treat SDI as a potential bargaining chip at arms-reduction negotiations with the Soviets "will get us nowhere. SDI is not a bargaining chip, but a bargaining catalyst to drive down offensive force levels on both sides in an inwardly spiraling fashion." He suggested that SDI might be approached in a gradual, staged fashion, with the initial emphasis on a "limited effectiveness [of the defenses] in terms of large area protection that, coincidentally, would be of value by protecting our military forces." ■

*(The second part of this report on AFA's C<sup>3</sup>I and Electronic Warfare Symposium will appear in the October issue of AIR FORCE Magazine.)*



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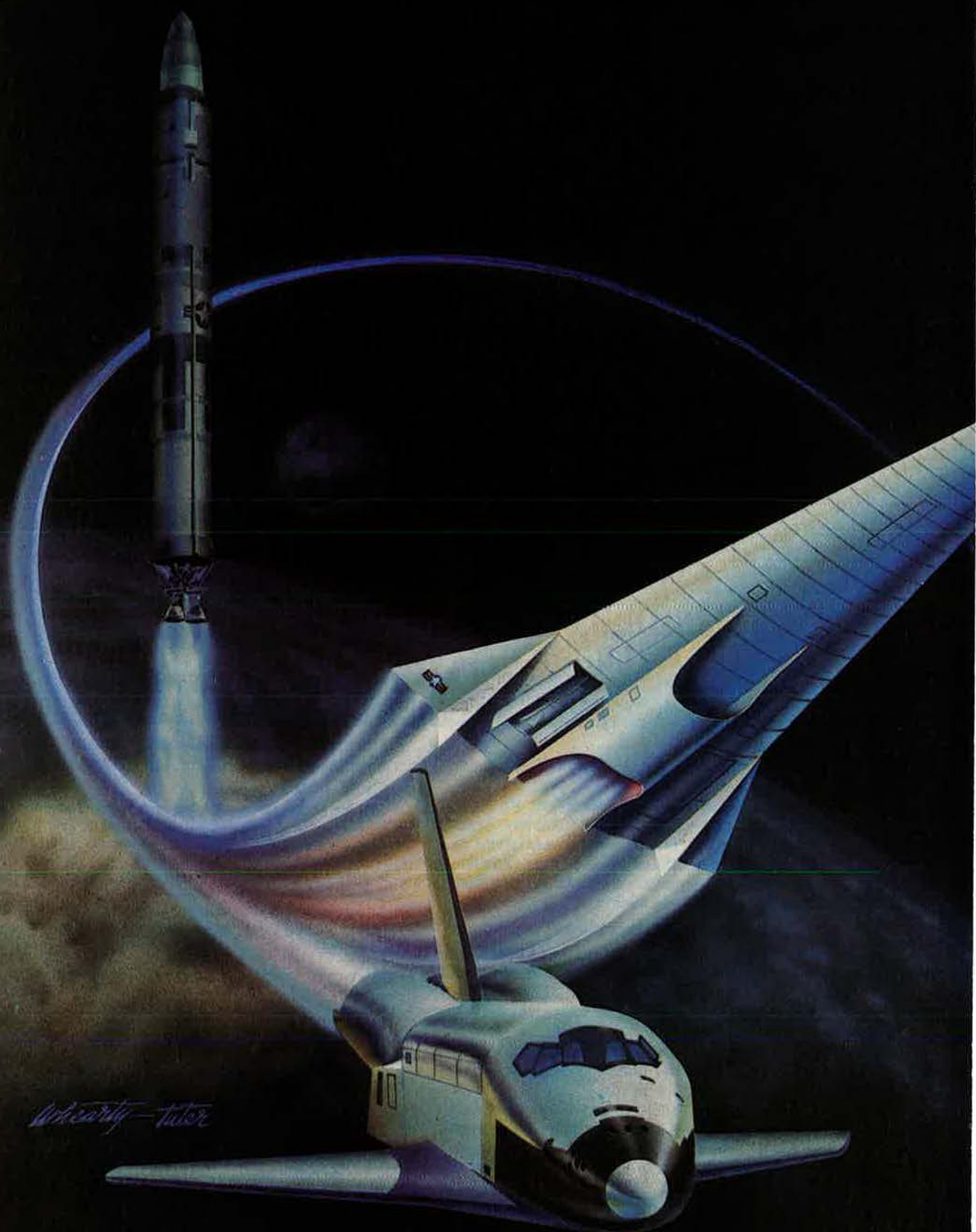
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## VIEWPOINT

# Reformers and Their Solutions

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

*This is not the first time that interservice parochialism has been a subject of concern. And in the past, centralization has not proved to be the answer.*



Admiral Halsey, according to reports, became exasperated with interservice squabbling during the Pacific war. If he had his way, Bull Halsey said, he would peel off all uniforms, put the troops into fatigues, and stencil "U.S. Combat Forces" across their butts.

It is a fact of military life that we tend to become, if not zealots, at least partisans. Not long ago, the Commandant of the Marine Corps, Gen. P. X. Kelley, was widely quoted as saying that to ask a military man to be equally loyal to a service other than his own was like asking him to be as loyal to his mistress as to his wife. His analogy may have been unfortunate, but the point is clear. Joining a military service is not usually a transitory affair. Like marriage, it has some of the elements of a religious commitment.

When the first great battles over service unification were being fought after World War II, the Army and its semi-independent offshoot, the Army Air Forces, lobbied for a single secretary, a single military boss by whatever title, and functional services: land, sea, and air. This proposal was rightly viewed by the Navy and Marines as a threat to the existence of naval air and the US Marine Corps.

The compromise worked out by Gen. Lauris Norstad and Adm. Forrest Sherman laid the basis for things as they are today. Naval aviation, far from being absorbed into a functional air arm, has become the principal reason for the surface fleet. The Marines, of course, have not only survived but have become one of the world's largest armies.

Now, thirty-nine years after that September day when James Forrestal

took his oath as the first Secretary of Defense, there is a movement afoot to change the nature of the armed forces. No one has yet suggested Admiral Halsey's solution, but some of the proposals are getting close.

There is, for example, Edward Luttwak's concept of a national defense staff composed of career officers who would, at about the fifteen-year mark, leave their services forever to assume an ecumenical function. Then, there is the idea advanced by the staff of the Senate Armed Services Committee to create a senior advisory council of four-star officers on their last tour of duty. These worthies, it is presumed, would abandon their former parochial views in favor of loftier considerations. We can refer the Senate staff to General Kelley for a judgment on how well that would work.

Nevertheless, the military reform movement is widespread, and there are going to be changes. Maybe not radical ones, if sanity prevails, but one can never tell these days. The proposal to combine service staffs with those of political appointees is an appalling idea, one that would demoralize professional military people. But surely there are too many intelligent members of Congress to allow this bit of organizational travesty even to come to a vote.

One proposed change, and one that seems to have particularly upset the Navy, would give the unified commanders the same authority over their naval forces as they now have over those of the Army and Air Force. If passed, this legislation would severely alter the traditional naval chain of command, especially in the Mediterranean.

It seems curious that military reform should be occupying so much attention at a time when the services appear to be working together better than ever before. The Grenada operation may have had its confused moments, but as *ad hoc* operations go, it succeeded well enough. One way or another, there must have been some lessons learned, for the Libyan air strike was a model of interservice coordination. A few years ago, the Navy and Air Force probably could not have pulled it off.

A significant point about the Libyan attack was the decentralized nature of the command arrangements. Centralized control of military operations has been the governing philosophy ever since Vietnam, and with uniformly dreary results. Mayaguez, Desert One, Lebanon—all suffered from too little delegation to the on-scene commanders. Modern communications had made Washington interference almost irresistible. The attack on Qaddafi, once the decision was made, was turned over to the Commander, Sixth Fleet, for execution. The participants, Navy and Air Force, were exactly what Admiral Halsey had in mind—US combat forces in close coordination.

And so, if the reformers will just step back for a minute from their new organizational charts and ponder the real problem afflicting our defense forces, they may hit on the notion of decentralization. The concept of centralized control has a stultifying effect on military forces. The Berlin Airlift had its gravest crisis when its major base, Fassberg, nearly ground to a halt. The cause was a fascination with efficiency—maintenance people in one huge impersonal outfit, pilots in another. The cure was simplicity itself—reorganize back to traditional and inefficient squadrons. We went through a similar painful learning process with our tactical fighter units and centralized maintenance.

Somewhere in all this conglomerate approach to defense management lies the reason behind our undeniably ineffective system for spending procurement dollars. A new airplane now takes more than its weight in paperwork and more years than is reasonable to reach production. The P-51, arguably the most decisive airplane in World War II, was produced almost without paperwork. Hap Arnold and Toey Spaatz liked it, even if Wright Field didn't, and that was that.

Meanwhile, as Congress ponders giving total authority to the unified commanders, they might recall that unified commanders are not celestial creatures who descend from heaven; instead, they come from the services, and they are apt to be as parochial as anyone else. ■



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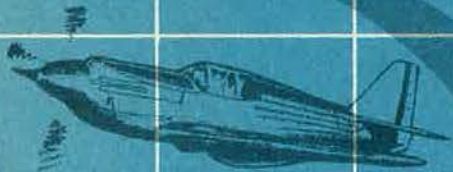
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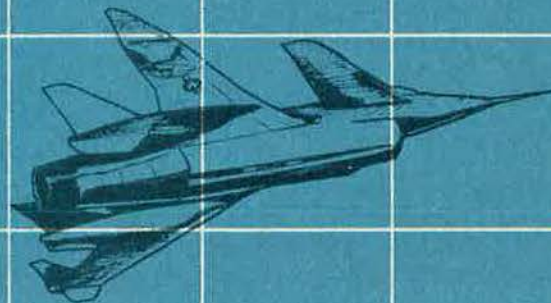
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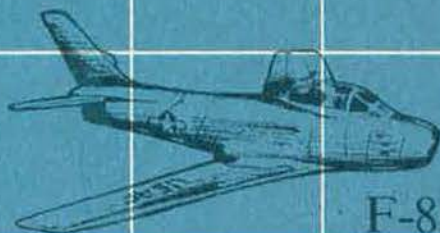
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# Standing Up for Airpower

Stuart Symington recalls that the arguments didn't end with the establishment of USAF as a separate service.

BY JAMES P. COYNE

**W**HEN President Harry S. Truman decided to reorganize the US military establishment after World War II, Stuart Symington, then Assistant Secretary of War for Air, was given the job of getting a reorganization bill through Congress. There were two key provisions in the original bill. First, the new Department of Defense would be headed by a Secretary of Defense with statutory administrative control over the services. Second, a new service, the US Air Force, would be formed.

"It was a tough assignment," Mr. Symington recalled during an interview with *AIR FORCE Magazine* at his retirement home in New Canaan, Conn. "The services, especially the Navy, were adamantly opposed to a Secretary of Defense who could do more than coordinate the activities of the services. A lot of fellows in the Army weren't too happy over the prospect of losing their Air [although the official Army position, reported to Congress, favored a separate Air Force]. And the Navy was adamant that no Naval air activities, people, or planes were to go under the authority of the new Air Force. These points of view had strong support in Congress."

Mr. Symington, of course, was successful. After almost two years of tough selling on Capitol Hill and



*Then-Secretary Symington welcomes the crew of the B-50 Lucky Lady II back to Carswell AFB, Tex., after their 1949 round-the-world flight.*



negotiating with the Army and Navy, the National Security Act of 1947 was passed. It was signed into law on July 26. Executive Order 9877, which laid out the functions and roles of the three separate but equal services, was issued from the White House.

### A Separate Air Force

Exactly thirty-nine years ago this month, on September 18, 1947, the US Air Force became a separate service. The Navy retained its own air arm and missions, however, and the new Secretary of Defense, James Forrestal, was given only coordinating authority over the services. The new Secretary of the Air Force was Stuart Symington.

In a narrow Air Force sense, he recalled, the fight had been won decisively, and the situation was fine. The country had a separate Air Force. But from a broader Air Force viewpoint, the situation was not perfect. Mr. Symington and the Air Force uniformed hierarchy, led by Gen. Carl A. "Tooney" Spaatz, first USAF Chief of Staff, had wanted a stronger Secretary of Defense, as provided for in the original bill. Under the reorganization, the service Secretaries retained as much power as the Secretary of Defense. This has sometimes precluded the presentation of a unified military position to the President.

The role of the Air Force Secretary, he said, "is to support his service chief, but not to become involved in purely military or operational matters. Logistics support, budgetary matters, and systems acquisition are some of the biggest responsibilities of a service Secretary."

In the middle and late 1940s, Mr. Symington was firmly behind the acquisition of the Convair B-36, the world's first intercontinental bomber. He had seen it in mockup form at the manufacturer's plant in San Diego in 1941. It was powered primarily by conventional reciprocating engines. Opponents of an intercontinental bomber wanted the Air Force to wait for the Boeing B-47, which was still on the drawing board. The B-47 was an all-jet, much-faster bomber, but with less range than the B-36. The Air Force bought the B-36, followed by the B-47 and then the Boeing B-52.

### Questions and Claims

A big part of the job, Mr. Symington said, even after the Air Force was established, was fighting "the denigration of airpower." Secretary of Defense Forrestal once called him and said, "I understand bombers cannot operate without fighter support, and that was proved in World War II."

Mr. Symington responded by taking Gen. Curtis E. LeMay, USAF's top strategic bombardment expert, to the Secretary's house for dinner. There, General LeMay described leading a bombing mission with no fighter escort over one of the toughest targets in Europe. The Americans suffered losses, he reported, but most of the force survived, and the target was completely destroyed. "'That's good enough for me,' the Secretary said, and we never heard that slur again," Mr. Symington recalled.

On another occasion, Mr. Symington said, President Truman wanted to fire an Air Force general because he had said B-29s had sufficient range to bomb the Soviet Union. At the time, the State Department was concerned that the Soviets might be insulted. Mr. Symington arranged an appointment for the general with the President, and the general's career stayed intact.

One of the biggest impediments to getting a separate Air Force, he said, had been the group of people, some of them with high Air Force rank, who believed and stated publicly that airpower alone could defend the country. These people, followers of the Italian air strategist Giulio Douhet, "hurt us all pretty bad because everybody resisted that. And, of course, it's not true."

Top Air Force leaders believed that airpower, in concert with land and seapower—not airpower alone—could win wars, he said. As an example, Mr. Symington recalled, "When General Spaatz decided to retire, he eliminated from the eligibility list one of the three top candidates to succeed him because he was 'on the record' too often claiming wars could be won by airpower alone."

But there were pleasures, too. One was seeing the famous Gen. George S. Patton change his mind about the effectiveness of airpower. In 1942, Patton had confronted a

young officer escorting Mr. Symington on an overseas trip. Flicking the Air Force wings on the officer's tunic, he said contemptuously, "Those things never killed anybody. They're not worth a good goddamn. Tanks kill. Tanks are what count."

After the invasion of Europe, Patton led his armies deep into enemy territory, but then had to halt because his tanks were out of gasoline. "They were sitting ducks," Mr. Symington said, "but his flank was solidly protected solely by Gen. O. P. Weyland's XIX Tactical Air Command." (In fact, one German division surrendered to Weyland.) Later in the war, General Patton, remembering how effectively airpower had shielded his tanks, walked up to General Spaatz and asked, "Will you do me a favor? Turn me around and kick me!"

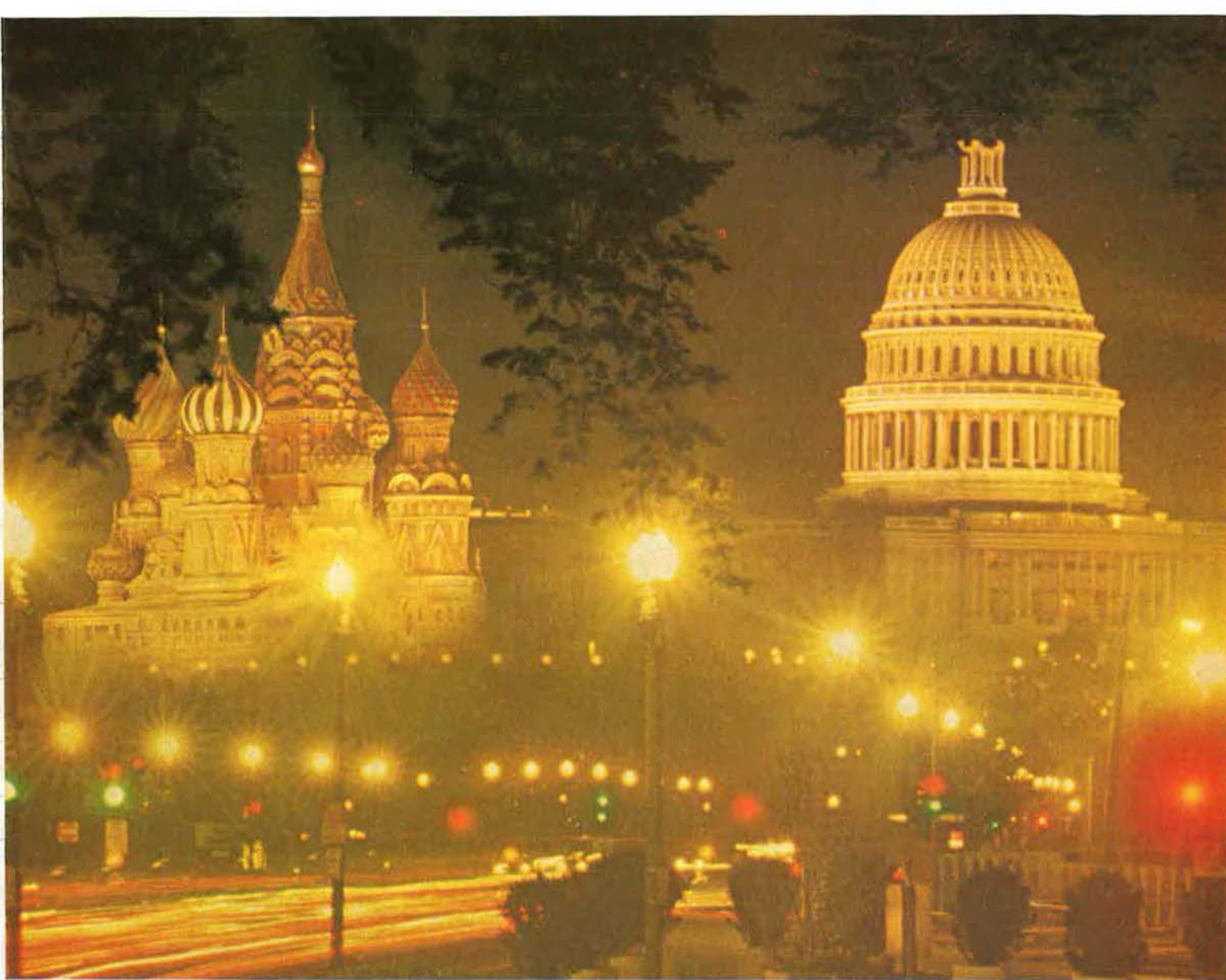
### Unjust Criticisms

Mr. Symington is particularly incensed about unjust criticisms of World War II airpower still being published in this decade. For instance, he singles out Harrison Salisbury, former Moscow correspondent for the *New York Times*, and his memoir, *A Journey for Our Times*.

Mr. Salisbury claims in his memoir that the USAAF bombed Germany by day because the British, who were there first, had taken the night bombing mission for themselves. "Salisbury turns the truth around. The British flew at night because they had experienced large losses bombing in daylight, especially when their bomber forces attacked in single file," Mr. Symington explained. "Furthermore, they believed in area bombing, which could be done at night, whereas the Americans believed in pinpoint, precision bombing, which worked much better in daylight. We also believed that with our tightly knit box formations, we could defend our bombers much better than could the British. The British chose area night bombing because it fitted their equipment and their beliefs. We flew daylight raids for the same reason," he said. "Salisbury's version is patently absurd."

One of his toughest jobs, Mr. Symington said, was fighting to retain enough equipment and people to provide sufficient strategic, tac-





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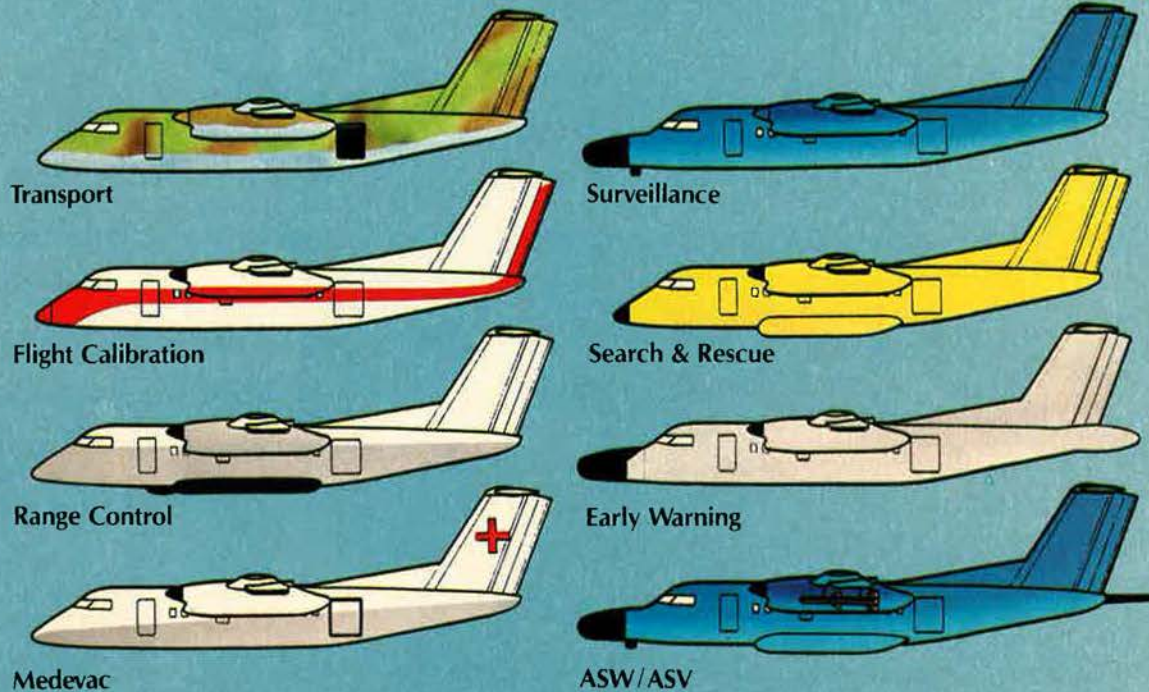


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**Gen. George S. Patton (here second from left) favored tanks over airpower until after the invasion of Europe when on one occasion his flank was saved by Gen. O. P. Weyland's tactical fighters. This conference, at an advanced headquarters "somewhere in Europe," brought together (from left) Generals Carl "Tooe" Spaatz, Patton, Jimmy Doolittle, Hoyt S. Vandenberg, and Weyland—all top US combat leaders. When USAF became a separate service and Symington its first Secretary, Spaatz became first Chief of Staff.**

tical, and air defense forces for a viable defense of the country during the period of peace between the end of World War II and the start of the Korean War. The Air Force minimum recommended force was seventy groups.

"When we started, I went to Tooe and said, 'What do you need—minimum—to carry out the mission the Air Force has been given?' He ordered a study that took several weeks. Then he came back and said, 'We need seventy groups.' It was a well-thought-out, well-documented requirement." But as military funding got tighter and tighter, supporting a force that large became impossible.

Mr. Symington stated publicly that he could not support the tight 1949 military budget, and he personally told President Truman that he could not support the 1950 budget, which was even tighter. By then, the Air Force was down to forty-eight groups. "We were being criticized in the press for, in effect, being disloyal to the Administration. We weren't disloyal, we were just trying to say, 'If you want us to do this job, we've got to have that much.'"

Finally, in early 1950, he resigned in protest against inadequate defense spending. Later that year, the United States became embroiled in

the Korean conflict, and military spending was on the upswing again.

#### **Clear-Cut Chain of Command**

Mr. Symington believes that early attempts to give the Secretary of Defense administrative control over the services are analogous to today's attempts to reorganize the Joint Chiefs of Staff and give the Chairman more authority. "There should be a clear-cut chain of command from the President on down," he said, "and the JCS Chairman should be in it."

Yet, he said, he has observed strong opposition to this today, especially from some high-ranking Navy leaders testifying before Congress. He strongly supports the proposals of retired JCS Chairman Gen. David Jones that would put the Chairman in the operational chain of command and give him his own staff (at present, the Joint Staff works for the JCS as a body, not for the Chairman).

This view is based on experience. Before he came into government, Mr. Symington recalled, he had been head of the giant Emerson Electric Co. Before that, he was a consultant who specialized in re-

organizing corporations and companies that were having operating difficulties.

"I learned there are three things a man has to know to do a good job," he said. "The first thing is, to whom does he report? The second thing is, who reports to him? And third, what is he supposed to do? Under the current arrangement, the first two questions, so far as the relationship between the Chairman of the Joint Chiefs of Staff and the service chiefs is concerned, are not answered. I believe in civilian control of the military. But under the civilian leadership, there should be somebody who is the boss of the building. That's true every place else."

Results of this JCS reorganization, Mr. Symington believes, will be lower military spending and much more efficient use of resources by the services. "With somebody definitely in charge, the organization will work much more efficiently," he said.

(Stuart Symington was elected to the US Senate from the state of Missouri in 1952. He was never defeated for reelection and retired in 1977.—THE EDITORS) ■

*James P. Coyne is a veteran fighter pilot who, after his retirement from the Air Force in 1984 as a colonel, served this magazine as Senior Editor before accepting the position of Executive Editor of Signal Magazine last spring.*





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*There are nearly fifty major career fields open to NCOs in the Air Force today. With more than 39,000 people, security police is the largest NCO career field by far. This staff sergeant is discussing ramp and flightline security procedures with an A-10 pilot.*



**E**VERY now and then, someone suggests that the Air Force restore its warrant officer (WO) program to give senior NCOs added career opportunities. Others say USAF should copy the Navy's limited-duty-officer (LDO) plan or think up yet another way of squeezing more layers between commissioned and noncommissioned officers' ranks. None of these things is likely to happen any time soon.

The Air Force may expand its airmen commissioning programs modestly when it needs new sources of officers. But it has little interest in bringing back warrants and even less in setting up some other "almost-officer" status above the senior NCO grades.

The fact is that the Air Force already uses its top noncoms in many positions that the other services would fill with WOs, LDOs, or fully commissioned officers. Considering the pay they receive and the responsibilities they have, USAF's top-tier noncoms probably are the best management bargain any service has found. Why change a successful formula?

NCOs themselves would doubtless like to see their pay raised to match the responsibilities they carry. But few seem to see warrant or LDO status as a real career advancement. For many, anything

short of direct commissioning into the field grades would amount to stepping from the top rung of one rank ladder to the bottom of another.

That view would not have been so common even a decade ago. It has evolved with the development of USAF's NCO corps itself. And how that all happened—by a combination of planning, necessity, congressional pressure, trial-and-error, and sheer luck—is the subject of what follows.

Traditionally, the Air Force marks September 26, 1947, as the date of its divorce from the Army. Actually, it was little more than a separation agreement that President Truman signed on that date. The final settlement had yet to be worked out, and, like many a newly liberated spouse, the Air Force would spend the next several years searching for its own identity. Ironically, for a service that thought it already had set its own pace and style, the search for a workable personnel system would be one of its hardest.

The new force began with about 305,000 charter members. The officers included some of the pioneer flyers, but most were men who had joined either just before or during World War II. They had won their commissions as West Pointers, ROTC graduates, "ninety-day won-

ders," or aviation cadets. Some of them had only high school diplomas. Most of the warrant officers were former NCOs who had risen to the top of the enlisted ranks and, following Army's career system, moved into the WO ranks as the next layer of supervision.

The enlisted force numbered about 263,000 and included veterans of the prewar Air Corps, World War II enlistees and draftees, and a sprinkling of recruits. Many EM were serving on aircrews as gunners, radio operators, and flight engineers. More than 100 still were flying as enlisted pilots. There were a few enlisted women, now known as "Air WACs," who were assigned to separate squadrons and who worked mainly in clerical jobs. There were appreciable numbers of former officers to whom the Air Force had offered master sergeant stripes when it could not keep them on in commissioned status during the postwar cutbacks.

And there was yet another category of troops caught somewhere between the services. Several thousand Army officers and enlisted men remained with their parent service but served as Special Category Army with the Air Force (SCARWAF). Mostly engineers and construction workers, the SCARWAF were to be on loan to the Air Force



**USAF's personnel management mistakes have usually come when the Air Force underestimated what the enlisted force could do.**

# The Evolution of The Air Force NCO

**BY BRUCE D. CALLENDAR**

only until it could build its own support forces. As it turned out, the arrangement continued until the mid-1950s.

## **Army System Inadequate**

From this mix of members and borrowed help, the Air Force began to fashion a force suited to its new and growing needs. Fairly soon, it became apparent that many of the systems inherited from the Army were not going to work. One was the personnel system.

It was a relatively minor problem in the officer ranks. The Army's philosophy of linking officer specialties with specific branches of the service provided a logical basis for the transition from Air Corps to Army Air Forces to Air Force. Rated officers, who would perform USAF's primary mission and thus claim the bulk of its command positions, already were "branch qualified," and AAF organization tables provided for most of the support officer positions.

Warrant officers and enlisted members were another matter. Army's military occupational specialty (MOS) system was a complicated index of skills leading from private through master sergeant into the warrant ranks. It included the old AAF skills and a number of support specialties appropriate for

any unit. But it also had numerous skills that had little or nothing to do with the Air Force mission, and the codes it did have were inadequate to describe the EM who were to become key technicians, supervisors, and middle managers.

By 1951, USAF officials had shaped a new system of Air Force specialty codes (AFSCs). These defined duties more clearly, got rid of unneeded Army skills, and allowed for the addition of specialties to meet the coming explosion of technology.

Under the new system, warrant officers still held the top (superintendent) positions on the enlisted ladders. For a time, officials considered creating two separate enlisted tracks within each career area. One would have been for noncommissioned leaders and the other for technical specialists. Fortunately, the idea was dropped. Otherwise, the Air Force, like the Army, might have spent the next thirty-five years struggling with an unwieldy specialist system.

While it struggled with weighty problems of form and structure, the Air Force was making more visible changes. In 1948, it replaced Army stripes with V-type grade insignia. In 1949, it approved a distinctive uniform and outlawed such carryover Army devices as shoulder

patches. USAF leaders envisioned a dignified, uncluttered, military business suit. Critics noted the resemblance to the RAF uniform, officers mourned the passing of their Army "pinks and greens," and EM complained that they were being mistaken for bus drivers. But at least USAF members no longer looked "Army," and that was something.

Soon, the Air Force began to sound different as well. In 1950, it dropped the term "soldier," and Air Force enlisted members became "airmen." Military police became USAF's air police (later security police). Army airfields became Air Force bases. Commanding officers became simply commanders. And most major commands worked the word "Air" into their names. Shedding the outward evidences of the Army connection was one thing. Breaking with "the Army way" in other respects was something else.

One of Army's more basic principles had been to pass as much independence and authority as possible to lower unit levels. In the case of the Army Air Forces, air groups were the key operational units, and their squadrons were "home" to individual members.

## **The Power of the Squadron**

Critics of today's centralized,



seemingly impersonal Air Force see the return to the close-knit squadron as the means of restoring *esprit de corps*. For all its remembered virtues, however, the squadron concept of the AAF and the early Air Force had as many now-forgotten drawbacks, particularly for enlisted members.

For one thing, it gave tremendous power to the squadron commander and his immediate subordinates, including the first sergeant. In this period, long before the airman performance report was conceived, squadron commanders gave airmen simple character and efficiency ratings. These one-word evaluations could make or break enlisted ca-

member's career than did his own skill or ability. Simply put, the rule was that if the unit had a vacancy in a particular grade, the squadron commander could pick the person to fill it. He could promote to any of the enlisted grades, including master sergeant, and "bust" to any level down to private. At least theoretically, a commander had power to peel the stripes from a master sergeant and pass them to the nearest private.

In theory, this gave the promotion power to the leaders who best knew the needs of their units and the qualifications of the candidates. But it also offered opportunities for favoritism and politicking and put a pre-

sioned grades. Many units now had more vacancies than they could fill.

As the AAF had done during World War II, USAF now went on a promotion binge. When the Korean action ended and USAF growth was halted well short of planned levels, airmen again faced uncertain futures. With all its determination to be different, the Air Force seemed to have repeated most of the Army's mistakes and had found no better approach to managing its enlisted force.

Officials began a series of moves to control enlisted promotions and, with them, the use of EM themselves. Some of these moves worked and some didn't, but all had at least a part in shaping the enlisted career system. One early mistake was the dual (temporary/permanent) promotion approach. Another was the power given to commanders to name "acting NCOs," who could wear the stripes of sergeants but not draw the pay. Both experiments were dropped after a few years.

### Beginning of Centralization

Among the early steps in the right direction was the end, in 1953, of the unit vacancy rule and the beginning of centralized promotions. Gradually and often against strong command resistance, USAF took over the process, tying promotions to Air Force-wide vacancies. In time, it linked quotas to specific career fields and even to individual specialties. The idea was to limit promotions in overmanned skills and promote heavily in those with shortages. In time, USAF hoped to reduce any surplus by attrition and retraining.

Unfortunately, Air Force's data-processing system at the time wasn't up to the demands of such an effort. Headquarters issued complicated instructions for controlling the percentages of eligibles who could be promoted in each skill. At the same time, it published detailed retraining advisories, showing the skills from which and into which EM should be retrained. More than once, officials were embarrassed to find they had allowed promotions into skills from which they were retraining and had frozen promotions in some of those into which it was pushing retraining.

Airmen were not happy with the



*Soon after its establishment as an independent service, the Air Force began making changes to its uniform to distinguish airmen from Army soldiers. In 1948, the V-type shoulder stripes were added, and in 1949 a blue suit was designed that eliminated such Army holdovers as shoulder patches. This picture, taken shortly after the change, shows the old and the new.*

reers. Assignments, transfers, and discharges were at the pleasure of the commander, and EM in the lower ranks even needed "the old man's" permission to get married.

In a sense, the squadron's first sergeant held even greater power. The "first shirt" could grant or withhold permission to see the commander. He also was keeper of the sick book, lord of the duty roster, and guardian of the three-day pass.

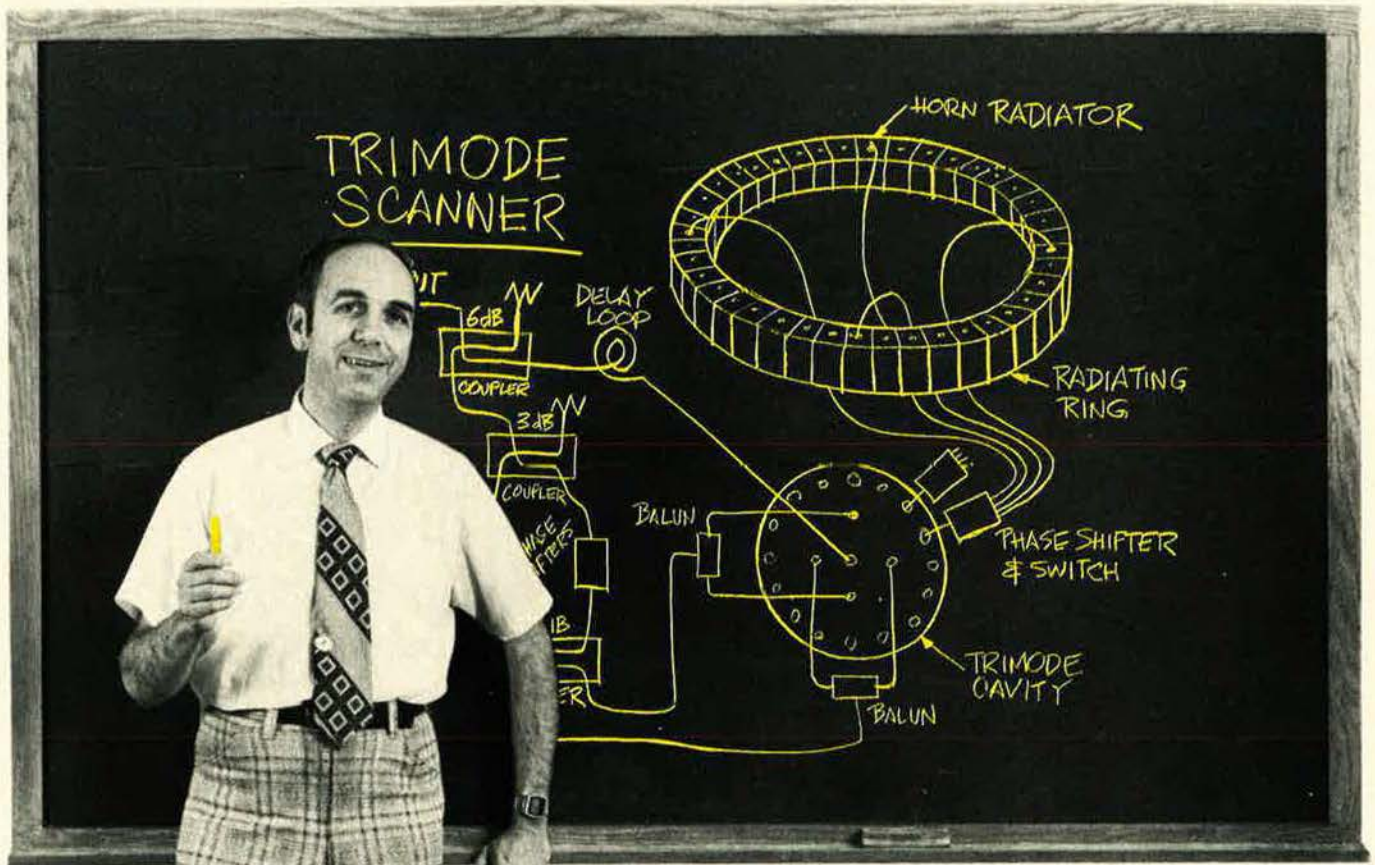
The real problem for ambitious airmen, however, was the system's commitment to the "unit vacancy" rule for promotion. It governed both assignments and promotions and often had more to do with shaping a

mium on being in the right place at the right time. When somebody in the outfit retired, died, or shipped out, somebody else could move up.

For a time, there were few promotions for anybody because the service had begun life already top-heavy with NCOs, including those former officers who had come back as master sergeants. With its planned expansion suddenly quickened by the Korean War, however, the picture changed dramatically. By 1951, Air Force strength had doubled, and a year later it was pushing one million. Most of the former officers who had been serving as NCOs returned to their commis-



# Dave Lerner on a new approach to omnidirectional coverage.



Phased-array antennas to provide coverage for all horizontal directions have presented designers with some difficult problems. But now a circular phased array incorporating the Trimode Scanner, invented at Lockheed Electronics, has solved those problems. Dave Lerner, Lockheed consulting scientist, explains: "Linear phased arrays individually cover only a limited horizontal angle. Four such arrays frequently are needed to provide 360-degree coverage. Linear arrays also have another significant disadvantage. The shape of the radiation beam changes as it is scanned. This change in shape causes errors in systems that use linear antennas to determine the horizontal direction of a signal source.

"Circular arrays provide 360-degree coverage with only a single antenna. While the array complexity is generally comparable to four linear arrays, the radiation beam shape is constant as the antenna is scanned. This enables horizontal angles to be measured accurately with the antenna.

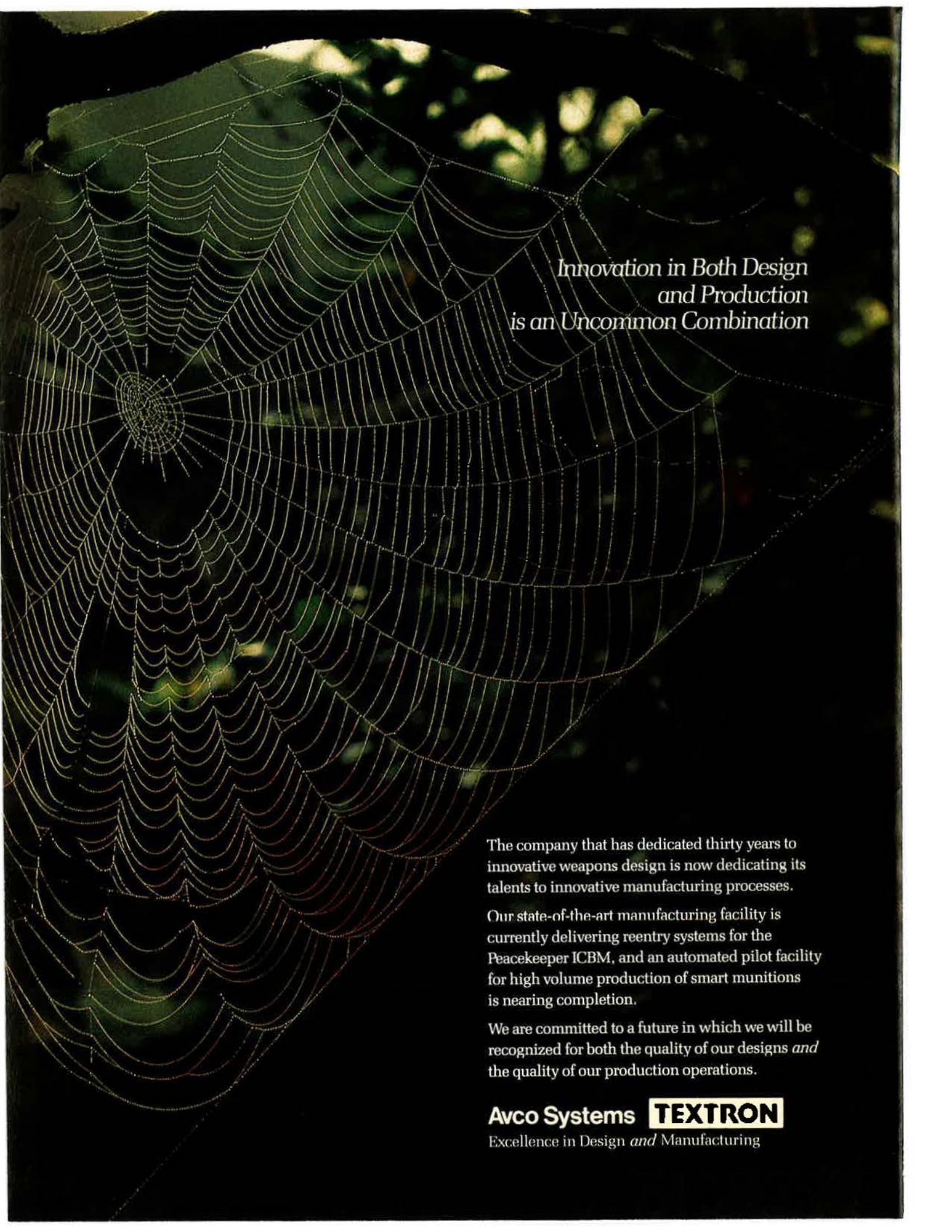
"Circular antennas, however, have posed design problems in connecting the RF signal between the array and a single transmitter and receiver. It is necessary to control both phase and amplitude distribution at the array as the beam is scanned. The Trimode Scanner, named for the three electromagnetic modes in the microwave cavity, does exactly that. It moves the amplitude distribution around the array as the beam direction is scanned."

The result? Another Lockheed advance in radar technology. One that is simple, free of moving parts, and, as Dave Lerner says, greatly increases the efficiency and reliability of the circular array system. Lockheed Electronics, Plainfield, New Jersey 07061.

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new controls either. Under the unit-vacancy rule, at least they had been able to see roughly what their promotion chances were. Now, their units might be short of NCOs in the very fields in which promotions were frozen because of Air Force-wide surpluses.

Ironically, while the promotion system seemed to go from bad to worse, the Air Force was making a number of major efforts in other areas to improve the quality of the airman force and build a strong corps of noncoms. By the early 1960s, for example, it had developed an airman performance report patterned after the officer rating system. It had begun specialty-knowledge testing as a requirement for advancement up the career ladders. It had issued regulations defining noncom duties and responsibilities, and it was building a network of leadership schools and NCO academies.

By now, too, the services had two new NCO ranks to use. Congress had established pay grades E-8 and E-9 in 1958, and the Air Force was filling them quickly. Officials have insisted for years that the Air Force did not set out deliberately to replace its warrant officers with these "supergrade" NCOs. Whether it was calculated or coincidental, however, the Air Force stopped appointing new warrants nine months after the new grades were created. Soon, the superintendent-level skills at the top of the airman career fields were being filled by senior and chief master sergeants.

None of this activity seemed to reduce the complaints about the promotion system, however. Indeed, many airmen reasoned that the Air Force was spending a great deal of time and attention on their professional development, but leaving their promotions to a largely invisible and apparently not very efficient process of selection. Unpromoted airmen had no way of knowing where they failed or how they could improve their chances, and the problem of skill imbalances seemed no nearer solution.

By the mid-1960s, Congress was receiving so many complaints that Chairman L. Mendel Rivers (D-S. C.) of the House Armed Services Committee named a subcommittee to look into the matter. That panel

held hearings on the promotion systems of all the services, but it clearly was most concerned about the Air Force. In fact, it seemed impressed by the Navy's promoting sailors on the basis of test scores and urged the Air Force to follow suit.

USAF officials did not want to copy the Navy. Their reluctance was more than a matter of pride. They felt that the Navy system put too much emphasis on test scores and too little on performance and other factors. But USAF's own system was not working, and it was under heavy pressure from both Congress and the Defense Department to try something new.

### **WAPS and TOPCAP**

The program that the Air Force developed over the next several years went well beyond Navy's simple "point" system and into a broad scheme for force management. In time, Defense would urge the other services to study the Air Force approach.

The Air Force's new promotion system was designed to duplicate, using what amounted to a mathematical formula, the process that a live selection board goes through in making its choices. The "weighted airman promotion system" (WAPS) considered performance reports, test scores, seniority, and decorations, giving each factor roughly the same weight that a human board would assign them. EM were selected within each AFSC on the basis of their overall scores, and those not picked received "report cards" showing roughly where they were weak.

WAPS gave airmen a more visible selection system, but it did not solve the problem that had plagued the promotion system almost from the start. No matter how well qualified a candidate was, his promotion chances still depended on whether or not vacancies existed for his skill. All of USAF's elaborate efforts to cure the overage/shortage problem seemed ineffective.

Then, in 1971, Defense approved USAF's broad new plan to manage the enlisted force not just by juggling promotion quotas but also with a series of broader controls. With its usual penchant for long titles that can be reduced to catchy acronyms, the Air Force called it

the Total Objective Plan for Career Airmen Personnel (TOPCAP).

Oversimplified, TOPCAP was to balance the EM force by regulating gains and losses at several points. EM would be recruited on the basis of their potential to fill skill vacancies. After their first hitch, airmen would be reenlisted against specific needs in the career force. At various points, those who did not progress beyond certain grades would be separated or retired under the same "up-or-out" principle long applied to officers.

Eventually, USAF hoped, TOPCAP would reduce grade and skill overages by attrition. More immediate problems would be handled by retraining surplus EM into shortage skills. Unfortunately, this long-range approach still did little for the airmen awaiting promotion in surplus AFSCs. No vacancies still meant no promotions.

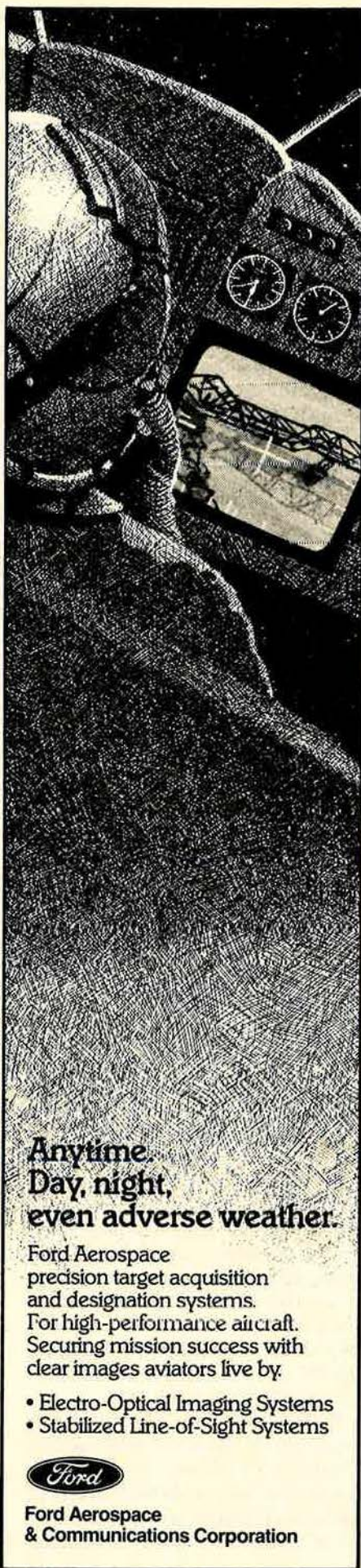
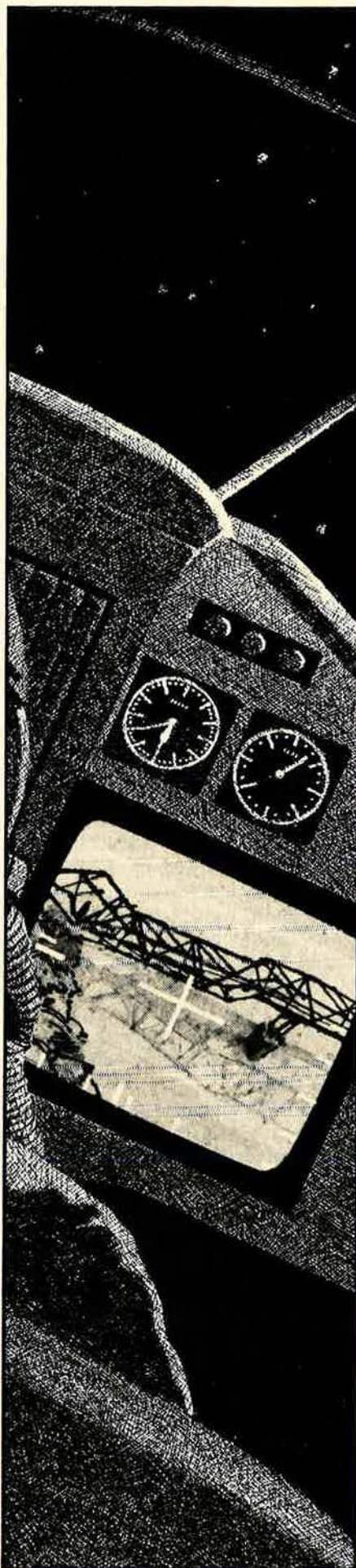
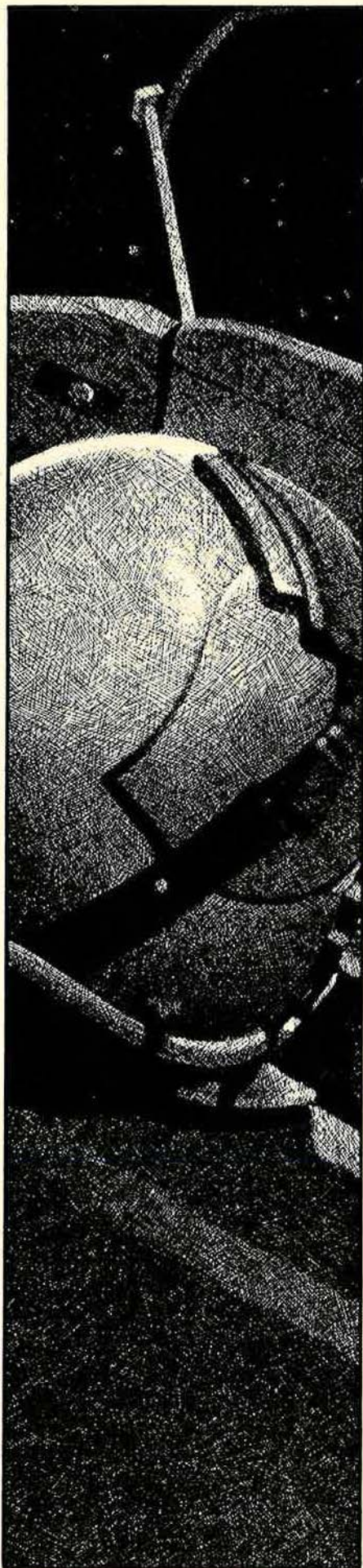
In 1972, however, the Air Force made what amounted to an end run around the old manning problem. Regardless of overages and shortages, it decided, roughly the same percentages of eligibles would be promoted in each career field. After years of trying to control the overages by holding back on promotions, USAF now advertised "equal selection opportunity" for all specialties. It would take care of the inevitable grade/skill overages by retraining the surpluses. Officials hoped that this, at last, would force the service into a serious retraining effort.

In a way, the Air Force's struggle to solve its enlisted promotion problems had led it to develop a full-blown career plan for airmen. In the past, the services usually had reserved that kind of attention for officers. Now, officials were pouring much the same time and attention into top enlisted management. All of which is not to say that the Air Force had solved all its enlisted management problems.

The WAPS system still draws criticism. The general inflation of performance reports has made test scores the key factor for selection. Some EM would like to see more weight given to seniority. Others think formal education should be a point-gaining factor.

The TOPCAP philosophy remains pretty much intact, but parts





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**As the Air Force grows more technical, the need for NCOs trained in the latest technologies to keep the machinery running will grow. The jobs done by airmen may not be as glamorous as some, but they are no less vital to the Air Force's mission.**

of the original concept have never been set in motion. While first-termers are denied reenlistment for failing to advance, USAF has not yet forced EM out for not climbing above sergeant after eight years of service.

The equal-promotion-opportunity idea also has survived more or less as planned. But, again, officials have been reluctant to launch the full-blown involuntary retraining program that was proposed to accompany it. And the equal-opportunity rule itself has removed one of the old incentives to voluntary retraining—the desire to escape from a field that is frozen for promotion.

The Air Force also has strayed from the letter of equal opportunity on occasion. It made a one-time exception some years ago for the security police field. The modest additional quota designed to boost sagging SP morale brought such demands from other career fields that USAF vowed “never again.” Another exception was granted in 1982, however, when the Air Force allowed slightly higher promotion quotas in skills with chronic, critical shortages.

And, in a move back toward the days when unit commanders had broad promotion powers, USAF has set aside small quotas for the

early promotion of young EM selected locally as fast burners.

### **The Three-Tier Approach**

Recent years also have brought other refinements in the NCO system, including what USAF now calls the three-tier approach. It divides the nine EM grades into three levels of rank and responsibility. The lowest is made up of trainee-apprentices, the middle tier of technician-supervisors, and the top level of supervisor-managers. USAF has reworked its professional military education system for EM to support this concept with a series of progressively more advanced courses in leadership and management.

Today, NCOs in the top tier fill many slots that once were considered officer billets. The Air Force began converting such positions as early as the mid-1960s, but became bogged down for some time in an almost comic debate over nomenclature. It was all right, most officials agreed, for a chief master ser-

geant to do the work of a commissioned officer, particularly if it saved the government money. But it was not proper, some said, to include the term “officer” in his title. An NCO could be “custodian” of a fund, for example, but not a “billetting officer.” In time, this resistance faded, and the list of officer-type duties open to NCOs grew substantially.

Officials are fond of counting the number of former officer jobs now held by NCOs. It seems to be the kind of statistic that impresses commissioned officers with how far the enlisted force has progressed. Most NCOs seem more interested in the considerably larger number of key management positions that NCOs have carved out on their own. With all its past problems and remaining shortcomings, the Air Force enlisted system probably is unique among all the services.

Where the Air Force has failed along the way, it usually has been because those making the decisions about the enlisted force have misread the capabilities and aspirations of enlisted members. Somehow, they had failed to notice that EM no longer were just good mechanics who could diagnose an engine by its sound but couldn't read the tech manuals. They didn't realize that NCOs had become highly skilled technicians as well as enlisted leaders. They didn't sense that the quality of NCO leadership had kept pace with the quality of the officer force and had, in some cases, outdistanced it.

Where the system has worked, sometimes with surprising success, it generally has been because planners, enlisted and commissioned together, simply weighed the services' needs and the enlisted resources realistically and put the two together wisely. In that sense, the status of noncoms has not really changed so much. They always have functioned best, it seems, when they have been given a job to do and turned loose without too many limitations and instructions about how to do it. ■

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*Bruce Callendar served as a Fifteenth Air Force B-24 bombardier during World War II. He was recalled to active duty as an information officer during the Korean War. Between terms of active duty, he earned a B.A. degree in journalism at the University of Michigan. In 1952, he joined the staff of Air Force Times and in 1972 became the Editor. Mr. Callendar is now a free-lance writer and lives in Virginia.*



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Sixty years ago, these American airmen aroused aviation interest in an entire hemisphere.

# Eaker's Pan-American Mission

BY JAMES PARTON

**S**IXTY years ago, the United States was worried about Latin America. The problem then was far simpler than those confronting the nation in 1986 and was solved by a dramatic exploit that has gone down in history as one of the great early feats of military aviation. One important participant was Ira C. Eaker, son of a Texas farmer, who had enlisted as a private in 1917 and who rose after a long and illustrious

career to be a four-star general and one of the Air Force's greatest leaders. In 1926, aged thirty, he was a captain serving in Washington as assistant executive officer on the staff of Maj. Gen. Mason Patrick, then chief of the Army Air Corps.

"We got some very disturbing reports," he explained in an oral history interview many years later. "By we I mean Washington, the political and military community, about in-

roads the Germans were making in South America with Junkers planes, some on floats. Somebody said: 'The only way we can stop this and keep the Germans from sending their airplanes into South America is for us to send a flight down there and interest these people in our programs.' . . .

"We felt, even at that early time, that there ought to be some community of weapons between all the peo-



Three of the five Loenings that participated in the historic Pan-American mission, shown here beached at Paita, Peru, for an overnight stop. Eaker and Fairchild flew in the San Francisco (center); San Antonio and Detroit are not pictured.



ples of this hemisphere. It would be ridiculous to get into a war, defending the Western Hemisphere, and have the Brazilians armed with rifles that our ammunition wouldn't fit. . . . They would have had European equipment, and they would have been cut off in a war situation from the source of it. That's no good."

When approval for the Pan-Amer-

particular glory, since their plane, *San Francisco*, was the only one that completed the entire 23,000-mile journey, making every scheduled stop. The property now of the Smithsonian, it is on loan to the Air Force Museum at Wright-Patterson AFB, Dayton, Ohio.

#### Front-Page Coverage

The Pan-Am Flight was widely

tensive test to the amphibian airplane. President Calvin Coolidge sent a goodwill letter to the president of each of the twenty-three Pan American countries, to be delivered by the flight."

The plane was the OA-1A amphibian, newly designed by Grover Loening for observation work. Its canoe-shaped hull was duralumin over wood, with fuselage on top and



Capt. Ira C. Eaker and Lt. Muir S. "Santy" Fairchild had to complement each other's skills and be congenial in temperament to ensure a successful mission. According to Eaker, they "shared a determination, almost an obsession, to get the *San Francisco* home safely." The other crews were similarly well matched.

ican Goodwill Flight came from the State Department and the White House, Maj. H. A. Dargue was appointed commander. His team consisted of three captains, of whom Eaker was one, and six first lieutenants.

One of the latter, Muir Fairchild, became Eaker's copilot. A sober, scholarly young man who had flown bombers in France in World War I, Fairchild was destined, like Eaker, for greater distinction: He would become a lieutenant general and, after World War II, first commandant of the Air University. He was known as "Santy" because he had once gotten out of a cockpit in winter with his head, mustache, and uniform solidly frosted with snow.

The Pan-American Flight, begun in America's sesquicentennial year, captured world attention. Captain Eaker and Lieutenant Fairchild won

publicized at the time, with front-page coverage almost every day in all major US newspapers and many foreign ones. The *National Geographic* devoted fifty-one pages to it in October 1927, and Eaker added colorful details in an article he wrote for *AIR FORCE Magazine* in 1975. He recalled that "the idea for the flight came from General Patrick . . . who had earlier planned the round-the-world flight by four Douglas World Cruisers—a 26,000-mile journey that took 175 days in 1924. . . ."

"Our relations with Central and South America needed attention (a condition that seems to recur periodically). The purpose of the flight was to further friendly relations with Latin American countries, to encourage commercial aviation, to provide valuable training for Air Corps personnel, and to give an ex-

two wings spreading forty-five feet. The engine was a water-cooled Liberty of 400 horsepower mounted upside-down so that the three-bladed aluminum propeller could clear the hull's upturned beak. Fully loaded, the Loening amphibian weighed nearly three tons and could cruise at eighty-five to ninety mph.

Mounting the engine upside-down created special maintenance problems. Unless the piston rings were perfectly fitted, oil leaked past, fouling the spark plugs. It was normal at each stop to remove the twenty-four plugs and clean and replace them before starting the next leg of the journey.

Another time-consuming, laborious task was refueling. Gasoline had been stored in steel drums along the route. It had to be hand-pumped through a chamois-covered funnel into the tanks, at a normal



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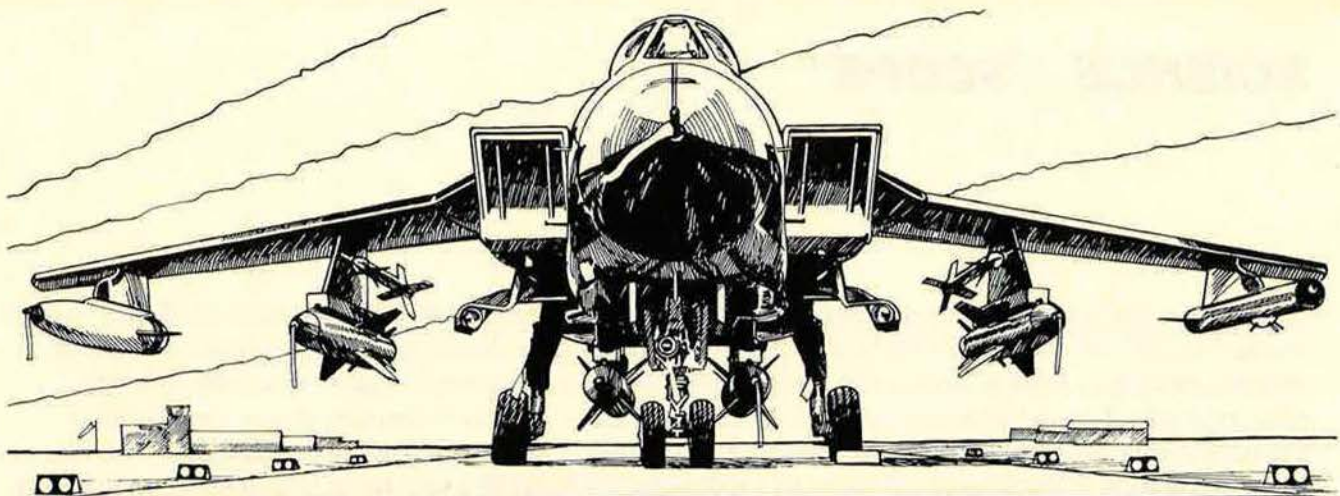
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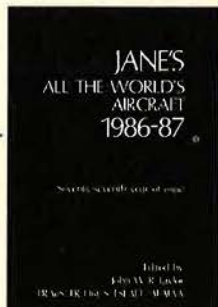
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"Subsequent events," Eaker's memoir continued, "proved that this team pairing had special significance for the success of the mission. The two pilots had to be congenial in temperament, and they must complement each other's qualifications. 'Santy' Fairchild and I developed a plan for joint labor during the training period. We also soon learned that we shared a determination, almost an obsession, to get the *San Francisco* home safely.

"We agreed that we were a two-man partnership in which each would invest his total assets—his reputation, his ambition, even his life. This shared realization ensured maximum effort of our team. I have no doubt the other plane crews devised similar plans. For example, all the pilots alternated daily in flying their planes."

### Diplomatic Stops

The flight route called for a diplomatic stop at the capitals of all the countries of Latin America except Bolivia, whose 13,000-foot altitude was too high for the Loening planes. Included were Great Britain's Guiana, Jamaica, and Trinidad and France's Guiana and Guadeloupe. The schedule included fifty-six flying days and seventy-seven days ashore for diplomatic ceremonies and maintenance—a total of 133 days. As actually executed, the journey took fifty-nine flying days and seventy-four delay days and thus was completed exactly on schedule.

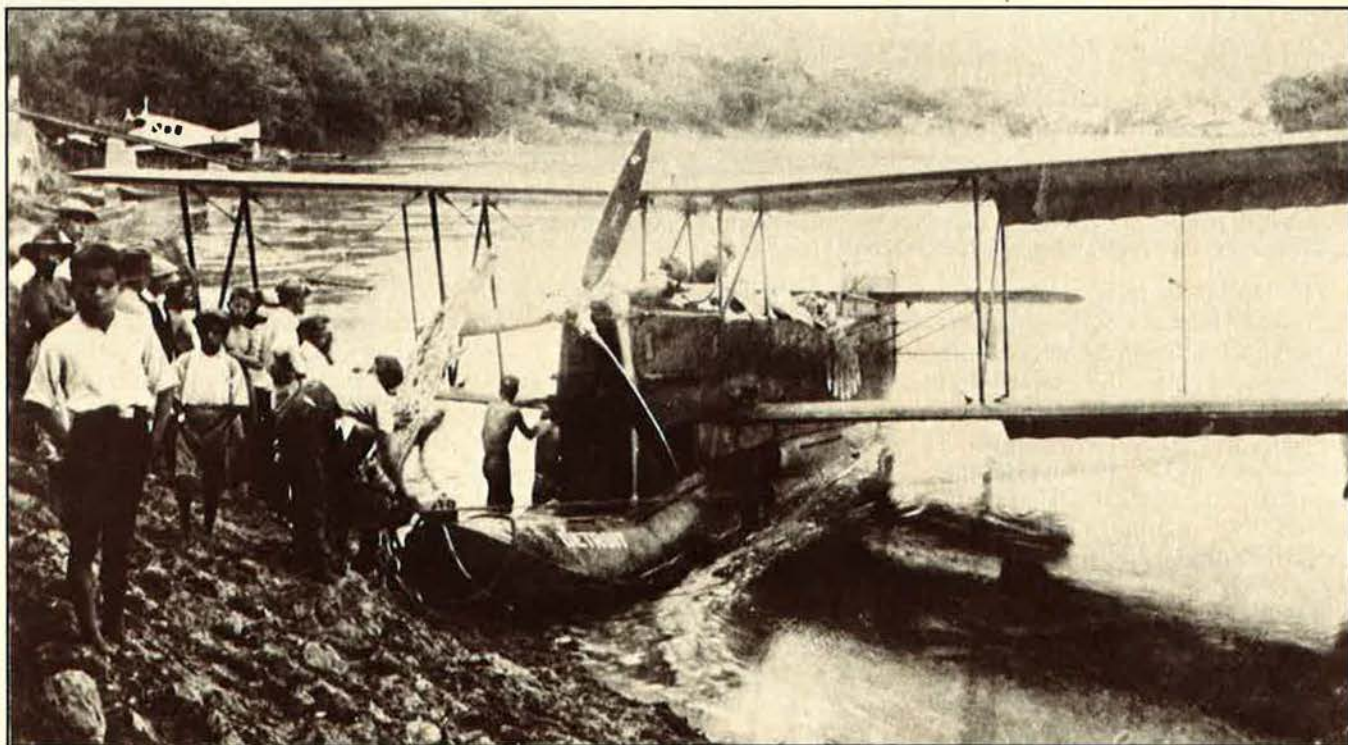
Before the actual takeoff from San Antonio on December 21, 1926, Major Dargue and his nine companions worked hard for several weeks—and not just in training for the flight itself. To maximize the diplomatic value of the expedition and promote the cause of aviation generally, each plane's chief pilot was expected to set up a cozy relationship with the city for which his plane was named.

In Eaker's case, he wrote to the San Francisco Chamber of Commerce on December 1, 1926, outlining the purposes of the flight and how it could benefit the city and the

state of California and offering to do business chores for them throughout Latin America. He also wrote the *New York Times*, offering to send regular reports from each way station. Since Eaker had been designated the official historian of the flight, he wound up doing this for most of the other crews as well as his own.

"It soon developed," he wrote, "that, after pilot and engineering ability, the principal crew requirement was physical stamina. Usually we were awakened at 4:00 a.m. in order to begin the day's flight by 6:00, since early morning hours provided the best flying weather. After a normal flight of four to six hours, we landed at primitive fields or in rivers or bays, then taxied onto beaches to facilitate maintenance and refueling, which normally required three to four hours. We thus arrived at our lodgings, arranged by the advance officers, late in the afternoon, discarded mechanic's overalls, and prepared for social functions.

"There was a banquet every night given by the American colony or by the officials of the country. These usually lasted, with the dancing that habitually followed, until midnight. So, to bed by midnight for four



The ill-fated *Detroit*, which later collided with the *New York* over Buenos Aires and crashed, killing both crewmen, is depicted here in the Magdalena River at Girardot, Colombia. American concern over inroads made by the Junkers hydroplane (seen here in the background) into Latin America helped prompt the Pan-American flight.



hours of sleep before the 4:00 a.m. call for a new day of flying, mechanical maintenance, and social or protocol events. The latter could not be avoided or slighted since, after all, the first priority of our mission was diplomatic. Captain McDaniel remarked near the end of our flight that we had danced more miles than we had flown."

after crossing the equator in Ecuador, passing into the south temperate zone in southern Chile, crossing the high Andes, and reversing the process as we flew northward from southern Argentina. Communications were recognized as a problem, but there was little we could do since radios were not installed in aircraft until years

"The next plane to have serious difficulties was the *San Antonio* in Colombia . . . necessitating an engine change. . . . It was nineteen days before the spare engine arrived and a month before the *San Antonio* joined the flight in Brazil.

"Next came the turn of the *San Francisco*. From Valdivia, Chile, we were to turn east, flying across



Nearly 100 Uruguayans rush to help the downed *San Francisco*. Ropes were attached to the landing gear and the plane was successfully hauled onto the beach out of rough seas off Montevideo. The *San Francisco* suffered little damage and continued on to Havana and then home without further incident.

The ten young men, average age thirty-two, had, of course, been exhaustively briefed in advance. State Department counselors instructed them not to attempt foreign languages: "Realize what we think of people who speak English ungrammatically. . . ." This, Eaker observed, "was a great relief." Flight surgeons admonished them to drink only boiled water and "to avoid native foods. An airplane on a long flight is a poor place to have diarrhea."

They also received lectures on meteorology, "important since we were leaving the north temperate zone in winter, proceeding to the northern hemisphere tropics and,

later. We did work out a set of hand or plane signals."

#### Yankee Ingenuity

"As I relive the memories of this flight, the principal operational experiences involve a succession of aircraft accidents and mechanical problems. The first occurred when the *New York* crash-landed in Guatemala . . . shearing off its landing gear and damaging the pontoon. Through the engineering skill of Captain Woolsey and the combined effort of all of us, the hull was repaired and the plane shipped by rail to a nearby lake, from which it was flown to France Field, Panama, for complete repair. . . .

the Andes . . . which at that point had peaks rising to 9,000 feet. Our planes, loaded with fuel for the six-hour flight, had a maximum ceiling of 12,000 feet. Since the Andes were expected to be cloud-covered, we had agreed not to attempt formation flying but to negotiate this difficult leg singly.

"It was my turn to pilot. . . . There was solid cloud cover, as we anticipated. After about an hour, when we should have been halfway across the Andes, our engine began to lose power, and we started to settle into the clouds. I asked Fairchild if he wanted to take to his parachute. He shared my view that landing on an ice-covered Andean peak,



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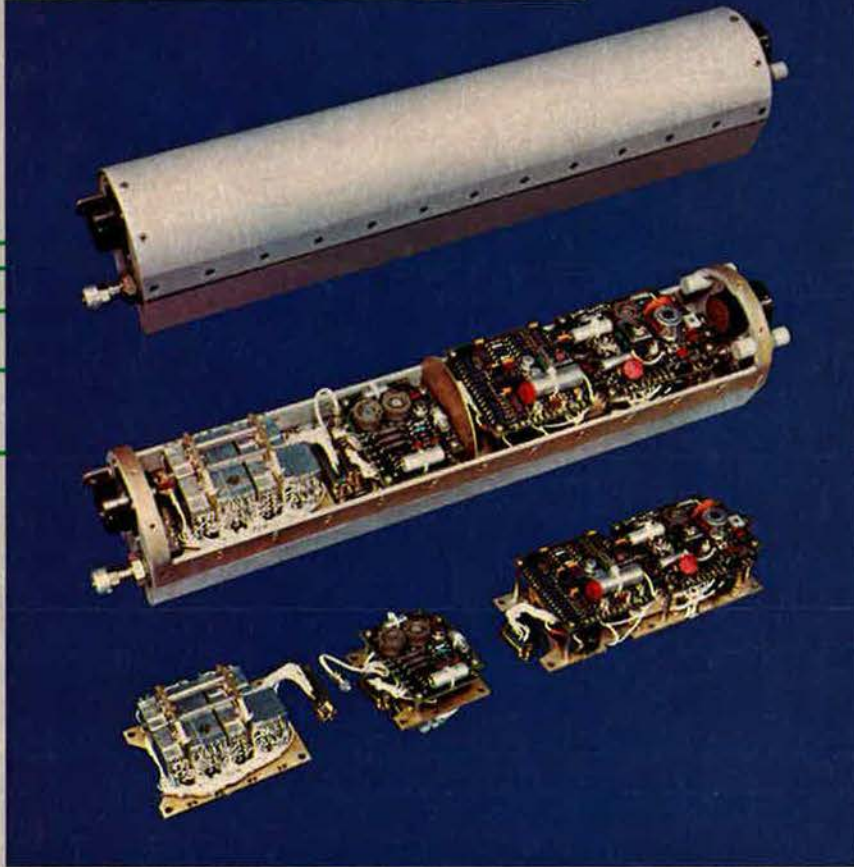
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**President Calvin Coolidge, flanked by Major Dargue (left) and Captain Eaker (right), awards the first DFCs ever to the crews of the Pan-American Goodwill Flight at Bolling Field, D. C. The mission achieved its goal of promoting interest in American aviation technology among the nations of Central and South America.**

probably with a broken leg, was scarcely to be preferred over sticking with our plane. I held the plane at seventy miles per hour, just above stalling speed at that altitude, and settled into the clouds, expecting to crash momentarily.

"At 7,000 feet we were out in the clear over a lake. Fairchild became very excited. He stood up in the rear cockpit and showed me a crude terrain sketch that contained a lake similar to the one we were over. He shouted, 'This looks like the lake on this sketch the British engineer gave me at the banquet last night. He was a member of a survey team exploring a prospective rail route across the Andes. He told me the Andes could be crossed east of Valdivia at 6,000 [feet] by following the pass containing this lake.'

"In the meantime, I was flying around the perimeter of the lake trying to bring our coughing engine back to normal power. When the ice in the carburetor melted, we turned east and soon came out over the plains of Patagonia. Four hours later we joined our companions, who had begun to worry."

#### **Accident in Argentina**

The only tragic accident happened a few days later over Buenos Aires when two of the four remain-

ing planes, the *New York* and the *Detroit*, collided while breaking out of a diamond formation. Major Dargue and Lieutenant Whitehead escaped by parachute from the *New York*, but Captain Woolsey and Lieutenant Benton went down with *Detroit* and were killed instantly.

The two remaining planes, *St. Louis* and *San Francisco*, flew on to Asunción, then back down the River Plate to Montevideo, where *San Antonio* rejoined them. The three-plane flotilla completed the remaining 10,000 miles up around the bulge of Brazil and the Carib islands without further accident beyond a forced landing for *San Francisco*. Captain Eaker described what happened next this way: "Waves threw us up on the beach, and about 100 natives rushed out of the bush. They got on a rope and, like a long team of horses, helped us pull the plane up on the shore."

At Havana, the last foreign stop before Miami and on home, "a US citizen came up to me and said, 'I

am a representative of a group headed by a Mr. Juan Trippe that proposes to survey a civil aviation route over much of your Goodwill Flight. Could I borrow your maps?' A few weeks later Pan American Airways began that survey." It became the basis of Pan Am's Latin routes.

Upon arrival at Bolling Field, Washington, the eight weary flyers lined up in their rumpled coveralls to be greeted by President Calvin Coolidge, who was wearing a gray Homburg perched squarely on his brow while other dignitaries wore toppers. Coolidge gave the eight flyers the first Distinguished Flying Crosses, a medal authorized by Congress a few months before.

Eaker summed up as follows: "There can be little question that the Pan-American Goodwill Flight accomplished its mission. At an estimated cost of about \$100,000, it had aroused the aviation interest of Latin American nationals and heads of state. Many of them had never seen an airplane before." ■

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*James Parton is a historian who lives in Hanover, N. H. During World War II, he served as Gen. Ira Eaker's aide. He founded the American Heritage Publishing Co. in 1954. In 1980, he was the editor and publisher of the eight-volume set Impact, The Army Air Forces Confidential Picture History of World War II. This article is adapted with permission from the new book "AIR FORCE SPOKEN HERE," General Ira Eaker and the Command of the Air, by James Parton, published this August by Adler & Adler.*



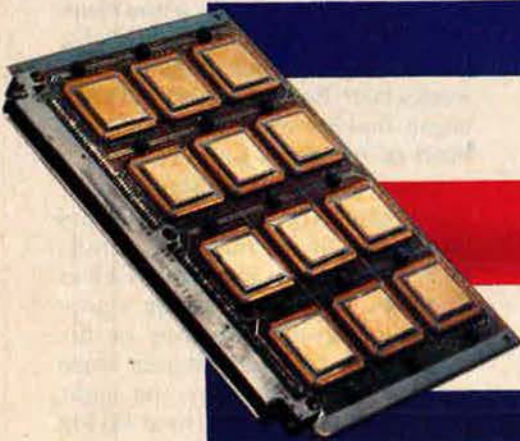
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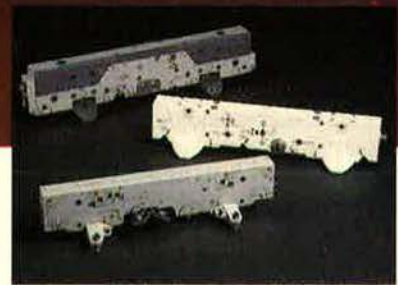


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# Gauntlet of Fire

Ed Michael's crippled B-17 had been hit by everything from fighters to small arms, but there was no bailing out on this mission.

BY JOHN L. FRISBEE  
CONTRIBUTING EDITOR

**S**TORIES of heroism and loyalty among Eighth Air Force B-17 crews and about the stamina of that great airplane abound, but few can equal that of the mission of April 11, 1944, flown by Lt. Edward Michael, pilot of the *Bertie Lee*. It was the twenty-sixth time over enemy territory for all but three of the crew. Their target: a ball-bearing factory at Stettin, seventy-five miles beyond Berlin. The *Bertie Lee*, a 305th Bomb Group Fortress based at Chelveston, was in the last element of the bomber stream and was carrying a load of forty-two 100-pound incendiaries.

At 10:45 a.m., about four hours after takeoff, the *Bertie Lee* took the first of many hits as flak tore a large hole in her left wing. A few minutes later, the crew watched as thirteen B-24s of another formation were shot down by enemy fighters. The Luftwaffe was out in force that morning.

Thirty miles south of Berlin, more than 100 fighters struck the B-17s in the most desperate attack

Ed Michael had ever seen. In a second attack, Michael's B-17 was hit by 20-mm shells. Two engines and most of the instruments were knocked out, the top turret damaged, and Michael was seriously wounded in the right thigh. The *Bertie Lee* was forced to drop out of formation as Michael fought to gain control of the badly damaged bomber. Then a crewman reported that the incendiaries were on fire. The burning bombs couldn't be released. It was a matter of minutes before they exploded or melted control cables running through the bomb bay.

Lieutenant Michael ordered the crew of the apparently doomed B-17 to bail out. All but copilot 2d Lt. Franklin Westberg took to their chutes—or so Ed Michael thought. Westberg refused to go until Michael, bleeding profusely, was safely out. Before they could resolve that issue, fighters struck again. Michael dove into a cloud bank, breaking out at 2,500 feet just as the wounded flight engineer, Sgt. Jewel Phillips, staggered into the cockpit, unable to put his chute on. A surprised Michael helped Phillips with the chute and watched him go out the lower hatch.

The bombs now had been burning for about twenty minutes. Michael and Westberg, knowing they already had stretched their luck, were preparing to bail out when the nose gun began to fire. With his intercom out, bombardier 2d Lt. John Lieber wasn't aware of the fire or that most of the crew was gone. His own chute lay in shreds, torn by a 20-mm shell. When he refused to take Michael's chute, Michael and Westberg climbed back into their seats, determined to stay with Lieber and perhaps to crash-land in France if the bomber held together that long.

Lieber was finally able to release the bombs, which had burned through the left side of the fuselage, destroying all control cables and wiring on that side of the plane. To make the situation even more

desperate, the bomb bay doors wouldn't close, further slowing the *Bertie Lee* as she limped along on two engines. But now there was at least a remote chance of making it back to England. Then the fighters came in again, and Michael headed for the deck. In one of five attacks, the windshield was shattered, leaving no forward visibility as they wallowed along at treetop height, taking hits from ground fire that knocked out the rudder and damaged the elevators.

Two and a half hours after the *Bertie Lee* was first hit, the North Sea appeared ahead. At long last, land came in sight, below them an RAF field at Grimsby. Again, Michael ordered Westberg and Lieber to use the two remaining chutes. With two engines and most of the instruments out, the landing gear and flaps inoperative, a badly shot up tail, bomb bay doors open, the ball turret gun pointing straight down, no forward visibility, and a pilot on the verge of collapse, the odds were against surviving a crash landing. Again, Westberg and Lieber refused.

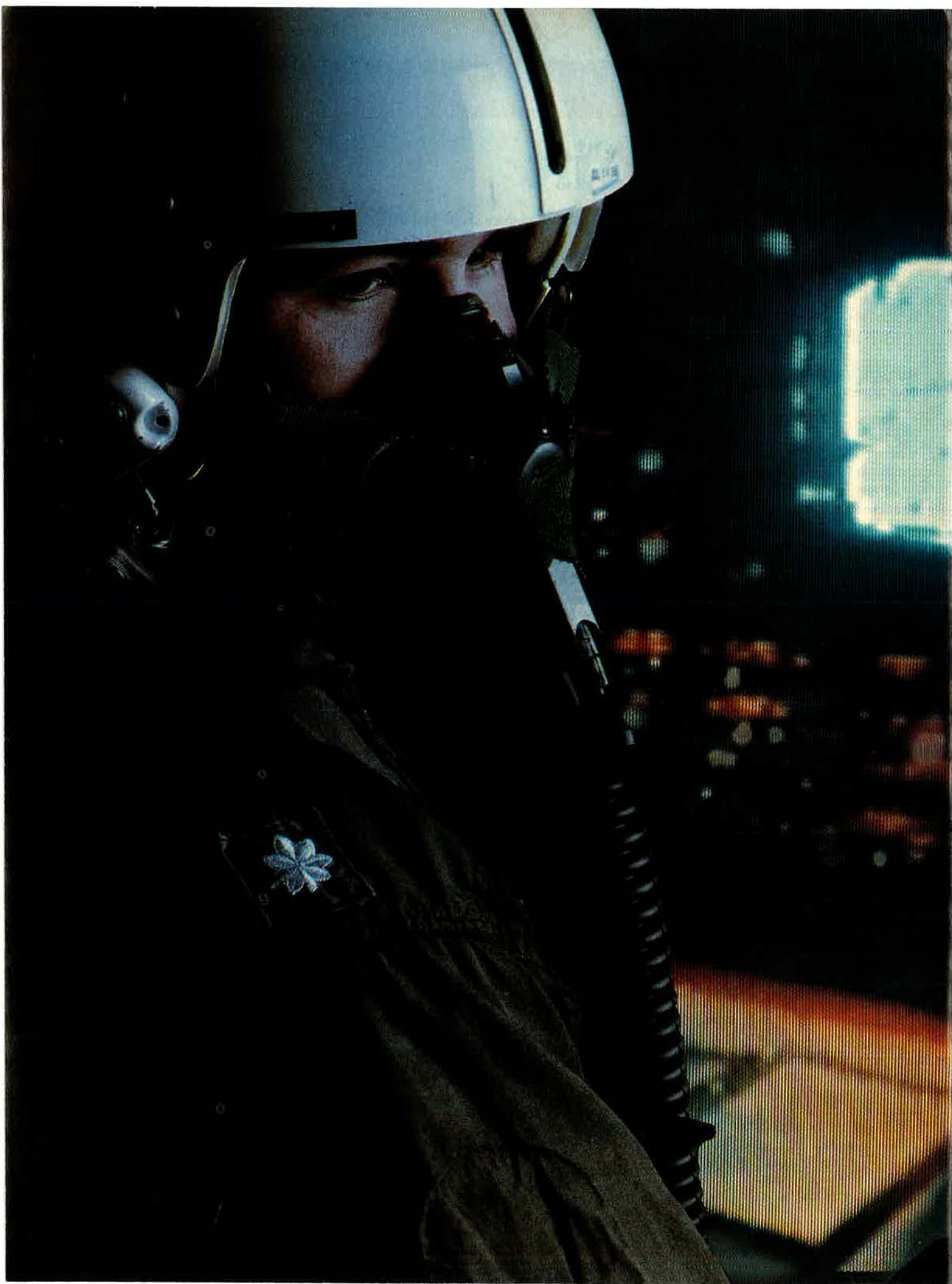
In a feat of superb airmanship, Michael put the B-17 down safely on the turf at Grimsby. As it skidded to a stop, he passed out from shock and loss of blood. During seven weeks in hospitals and the months that followed, Michael was obsessed by the thought that all of his crew would have returned if he hadn't—sensibly—ordered them to bail out. Were they dead or alive?

Gradually information filtered in that six crew members were POWs. Only Sergeant Phillips, who had been on his first mission, was not accounted for. Then Ed Michael was ordered to Washington. There, on January 10, 1945, President Roosevelt awarded him the Medal of Honor. That same day, word arrived that Sergeant Phillips was safe in a POW camp. Retired Lt. Col. Ed Michael still can't say which, for him, was the greater event of that eventful day. ■



Now retired, Lt. Col. Ed Michael lives in Fairfield, Calif.







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# AIRMAN'S BOOKSHELF

## Silent Threat

*Sword and Shield: The Soviet Intelligence and Security Apparatus*, by Jeffrey T. Richelson. Ballinger Publishing Co., Cambridge, Mass., 1986. 279 pages with abbreviations, acronyms, figures, and tables. \$16.95.

The Ronald Pelton spy trial left a murky tale of counterspies and codebreakers in its wake. The secrets that Pelton was convicted of selling the Soviets caused "exceptionally grave damage," a National Security Agency official testified.

Normally, the entire gamut of intelligence gathering is hidden from most citizens, as was the case here. Yet its impact quietly affects us all.

Even harder to uncover are details about the Soviet Union's growing espionage capabilities. To the Soviets, spying is not a new tool. History reveals many examples of Russian leaders establishing organizations to detect and suppress conspiracies and dissent.

The first Russian secret police organization was set up by Czar Nicholas I in response to the "Decembrist" uprising of December 14, 1825, with the intent of preventing similar occurrences. Hence, the Third Section came into being on July 3, 1826. The Third Section had sweeping powers. In 1833, an American envoy reported to the President that "you can scarcely hire a servant who is not a member of the secret police."

Today, in contrast to the United States, which has more than twenty-five distinct intelligence organizations, the Soviet Union relies on two organizations—the *Komitet Gosudarstvennoy Bezopasnosti* (KGB), or Committee for State Security, and the *Glavnoye Razvedyvatel'noye Upravleniye* (GRU), or Chief Intelligence Directorate of the General Staff—to perform the kind of services performed by the US intelligence community. Additionally, the KGB performs many functions that in the United States are the responsibility of agencies not considered part of the

intelligence community. Furthermore, the KGB has functions that are not performed by any US government agency—for example, supervision of religious affairs.

*Sword and Shield* is not just another book on intelligence gathering. What distinguishes this book from others is that it is one of the most detailed accountings in years of the Soviet intelligence apparatus.

Author Jeffrey Richelson takes a close look at the structure and functions of the KGB and GRU. The KGB is an immense organization, with between 500,000 and 750,000 employees and 100,000 domestic informants. Its border troops account for the largest single component of the KGB—between 200,000 and 250,000 personnel.

One of the largest directorates in the KGB is Directorate S, the Illegals Directorate, which selects, trains, and deploys the KGB officers who live in foreign countries under false identities and who have no admitted connection to the Soviet Union. Other KGB units are responsible for developing and maintaining surveillance equipment. The Eleventh Department, for instance, provides disguises.

The Ninth, or Guards, Directorate is responsible for both the personal security of the Party leadership and the physical security of important installations. The personnel of this Directorate, according to Richelson, are the most thoroughly and intensively screened of all. They are the only individuals in the Soviet Union permitted to carry loaded weapons in the presence of Party rulers.

The GRU, on the other hand, focuses its efforts outside the Soviet Union. The GRU, with more than 5,000 members, collects information on the structure and capabilities of foreign armed forces, doctrine and target plans, alliances between foreign nations, technology with military or possible military applications, and the resources of other nations.

Richelson's background brings credibility to his work. He is an Assistant Professor of Government at

American University in Washington, D. C., and has been teaching a course in Soviet intelligence for the past two years.

Written and organized for easy access, this volume is a comprehensive sourcebook on the Soviet intelligence machine. The reader will find excellent descriptions of the Soviet national security apparatus, which includes the Politburo, the Defense Council, the military, the research institutes, industrial and scientific committees, and Tass, the official Soviet news agency. Tass, Richelson notes, provides cover for Soviet intelligence officers operating abroad.

Soviet human intelligence (HUMINT) operations are directed against political, military, cultural, scientific, and economic aspects of both domestic and foreign societies. According to Richelson, chief targets for KGB penetration in the US include the President's Cabinet and the National Security Council, the State Department, the US Delegation to the UN, the Passport Office of the State Department, the Department of Defense, military intelligence, the Permanent Military Group of the NATO staff in Europe, the CIA, the FBI, the National Association of Manufacturers, industry, banking houses, scientific centers, and governing organs of the leading political parties in the US and other influential public and political organizations.

Richelson stresses that the Soviet HUMINT program directed against the US organizations noted above and against similar foreign organizations produces valuable intelligence. Aggressive Soviet intelligence agents find it relatively easy to penetrate open Western societies. The FBI estimates that of the 280 Soviets assigned to their Washington diplomatic mission, approximately 130 (forty-six percent) are KGB or GRU agents. Furthermore, the FBI believes that thirty-five percent of the 1,300 Soviet personnel stationed in the US are intelligence officers.

Richelson opens the book with information on security and intelligence in Russia before the Bolshe-



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## AIRMAN'S BOOKSHELF

viks, a description of the KGB and GRU, and the use of embassies by the Soviets for espionage. He goes on to describe how the Soviet Union's use of technical collection systems is increasing. He emphasizes that while HUMINT is important for both the US and the Soviet Union, technical collection systems are the most significant and valuable source of intelligence.

He also analyzes what intelligence information is available to the Soviets from open sources. He writes, "Though the Soviet Union has trailed the US in the development of reconnaissance technology, it has been able to partially compensate by tapping the immense source of freely available data in congressional hearings, trade publications, and newspapers, as well as through its human clandestine collection program."

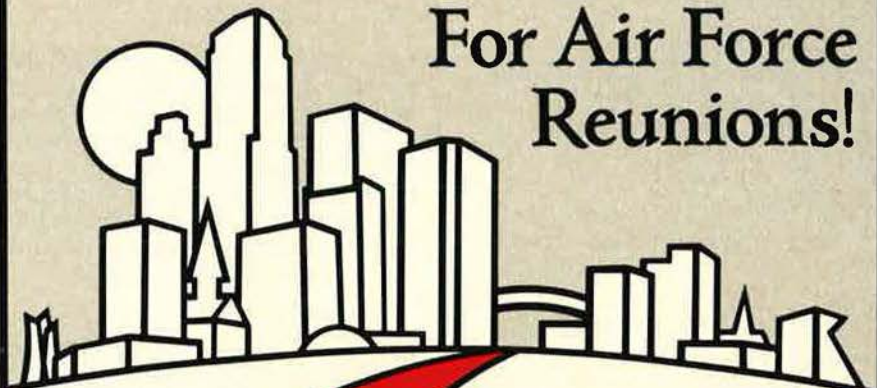
Information concerning political, military, economic, and scientific and technical matters appears in a variety of open publications. Richelson stresses, however, that open source collection presents the Soviets with several problems because of the sheer volume of data that must be analyzed and integrated with the data from clandestine sources.

The author also describes Soviet attempts to acquire advanced technology from Western sources, current Soviet counterintelligence programs, and "active measures," meaning such tactics as forgeries, propaganda, paramilitary operations, and assassinations. These latter activities are designed to influence foreign events. For example, the KGB may have faked, according to Richelson, a tape of a telephone conversation between President Reagan and British Prime Minister Margaret Thatcher during the Falklands War.

Finally, Soviet use of the Warsaw Pact and Cuban intelligence services, internal security operations, and political police operations are outlined.

Richelson concludes that even though the activities of the Soviet intelligence services should be monitored by the US and other foreign counterintelligence authorities, "it is important while monitoring and counteracting those activities not to treat them as something that places Western civilization in dire and immediate peril and, as a result, lose

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—Reviewed by Maj. Michael B. Perini, USAF. Major Perini is Deputy Chief, Operational Forces Branch, Media Relations Division, Secretary of the Air Force Office of Public Affairs.

### New Books in Brief

*The Air Force Officer's Guide*, by Lt. Col. John Hawkins Napier III, USAF (Ret.). The twenty-seventh edition of this guide, which has been published periodically since 1948, is an indispensable sourcebook for the would-be (or serving) Air Force officer. Laid out in clear fashion in this volume are the nuts and bolts of USAF officership—assignments, responsibilities of command, decorations and



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
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rank, career opportunities, family life, service organization, and so on. Particularly useful are the appendices on Air Force bases and suggested professional reading. Aspiring officer candidates will especially benefit from this book. With photos and index. Stackpole Books, Harrisburg, Pa., 1986. 416 pages. \$16.95.

*The Canadair Sabre*, by Larry Milberry. The classic jet fighter aircraft of the 1950s—the F-86—is the focus of this fact-packed, large-format book. Author Milberry skillfully blends history, technical information, and accounts of operational activities in this savory potpourri of Sabre lore. While the story centers on the Sabre from the Canadian perspective (more than 1,800 Sabres were built under license by Canadair in Montreal), American enthusiasts are certain to mine a wealth of information from this wide-ranging work. With illustrations, appendices, and index. CANAV

Books, Toronto, Canada, 1986. 372 pages. \$40.

*The Mighty Eighth*, by Roger A. Freeman. This landmark work on USAAF's wartime Eighth Air Force based in the United Kingdom has been reissued with many amendments and corrections in a new, updated edition. With illustrations, reference section, and index. Jane's Publishing, Inc., New York, N. Y., 1986. 311 pages. \$24.95.

*PAVN: People's Army of Vietnam*, by Douglas Pike. Author Pike here examines what he calls "probably the most astounding military phenomenon of our lifetime"—the People's Army of Vietnam, or PAVN. Now the third largest military force in the world, the PAVN has emerged from its obscure genesis in a mountain cave in northern Vietnam at the end of World War II to become a military colossus that now holds much of Southeast Asia in thrall. Author Pike, a noted specialist in Vietnamese communism, undertakes in this book to explain the "PAVN's place and role in terms of Vietnamese national philosophy and governmental behavior—what war colleges call 'concept of force application.'" Had it then been available, this penetrating book would have served American policymakers well during the ill-fated US involvement there. With appendices, bibliography, and index. Presidio Press, Novato, Calif., 1986. 384 pages. \$22.50.

*Pioneering Space: Living on the Next Frontier*, by James E. Oberg and Alcestis R. Oberg. James Oberg, a sometime contributor to this magazine, and his wife Alcestis here bring a human perspective to the topic of space exploration. "New ways of working, of seeing, of breathing, of thinking" await those who will venture into space, and the authors, relying on the speculations of scientists and other specialists and the testimony of those who have actually escaped the tug of gravity, describe what will likely greet us beyond the threshold of the earth's atmosphere. From the mundane—such as the mechanics of a zero-G toilet—to the sublime experience of first seeing our fragile blue globe from the depth of cold space, armchair spacefarers can here experience vicariously the life that our children will encounter on the next frontier. With a foreword by Isaac Asimov, and photos, appendices, references, and index. McGraw-Hill Book Co., New York, N. Y., 1986. 298 pages. \$16.95.

—Reviewed by Hugh Winkler, Assistant Managing Editor.

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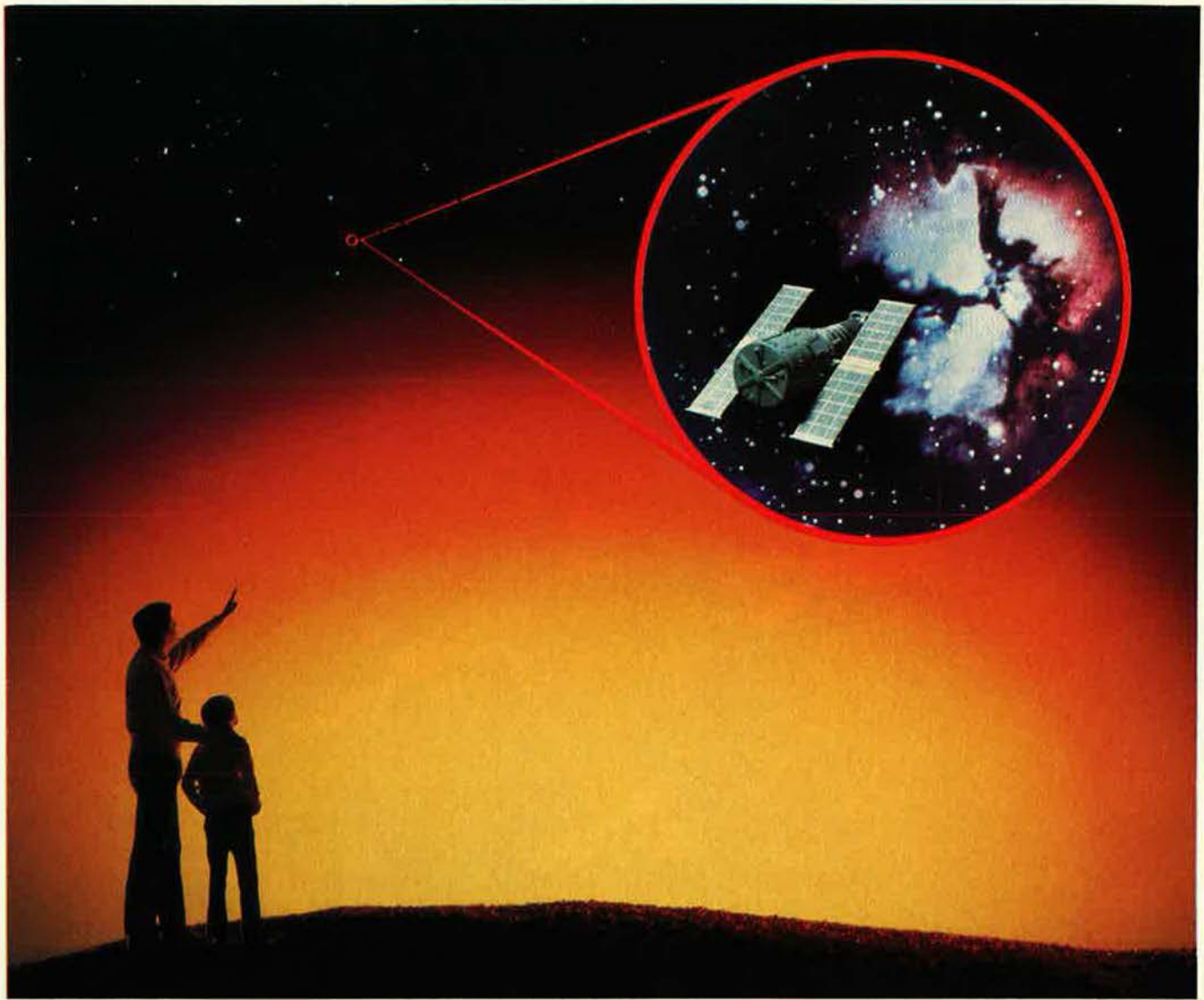
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# The **AFA** Councils

BY JAMES A. McDONNELL, JR.  
MILITARY RELATIONS DIRECTOR

**A**FA is an association of diverse constituencies. To represent these effectively, AFA relies heavily on insight and advice from representatives of these membership groups—and these representatives constitute an important element of the AFA volunteer structure.

The following volunteers were chosen by President Marty Harris to serve during 1986 because of their demonstrated interest and expertise in areas significant to AFA's mission: Mr. Warren Banes, Civilian Personnel Advisor; Brig. Gen. Robert A. Buethe, Jr., Medical Advisor; Maj. Gen. William L. Copeland, USAFR, Air Force Re-

serve Advisor; Dr. Kenneth Daly, Junior AFROTC Advisor; Brig. Gen. Russell C. Davis, Air National Guard Advisor; Lt. Gen. John P. Flynn, USAF (Ret.), Veterans Advisor; CMSAF Robert D. Gaylor, USAF (Ret.), Retiree Council Advisor; Col. Charlie B. Moore, Senior AFROTC Advisor; Mr. Kenneth A. Rowe, Civil Air Patrol Advisor; Capt. Thomas D. Shearer, Junior Officer Advisory Council Advisor; and CMSgt. Richard E. Williamson, Enlisted Council Advisor.

Additionally, the Junior Officer and Enlisted Advisors chair Advisory Councils made up of active-duty

members from these groups. These Councils, comprised primarily of representatives from each of the major commands (the Enlisted Council also includes the Air Force's Outstanding Airmen from the previous year) meet throughout the year. In addition to working on projects keyed to the needs of their peers, they also gather information on personnel concerns, Air Force-wide.

These concerns serve as a guide for AFA as its elected leadership hammers out, at Convention, the Defense Manpower Policy Paper that illuminates AFA's position on matters directly affecting people.

---

## AFA Policy Advisors



Banes



Buethe



Copeland



Daly



Davis



Flynn



Gaylor



Moore



Rowe



Shearer



Williamson



This year, the Councils reported to the AFA President, with a perhaps not-surprising congruity, that they each are most concerned with the projected erosion of retirement benefits. Second on the list for the JOAC was medical care, including dental benefits. Interestingly enough, this item was third on the list for the Enlisted Council while their second-place item—pay (comparability, caps, delays, etc.) was the third most important concern for the JOAC.

In surveying thousands of their peers to arrive at their consolidated listings, the Councils noted interest in other personnel areas ranging from educational opportunities to PCS out-of-pocket costs. All of this input is carefully considered as AFA's elected leadership crafts its annual people policy positions.

The Enlisted Council membership is: CMSgt. Richard E. Williamson (Chairman), Sgt. Russell E. Black, MSgt. Bruce E. Brady, MSgt. Richard T. Brisson, SMSgt. Donald L. Carlock, MSgt. David A. Castro, Sgt. Robert M. Christensen, SMSgt. James R. Craig (liaison), SMSgt. Miles W. Davis, SMSgt. Eddie Flowers, MSgt. Leslie E. Gore, Jr., SMSgt. Thomas E. Heinzinger, Sgt. Kathryn J. Kelleher, TSgt. Ramona K. Longbeam, MSgt. Ronald V. Rioux, MSgt. Leander Robinson, SSgt. Randall A. Tabor, Sgt. Reginald R. Washington, and MSgt. Jefferson P. Yoder. CMSAF James C. Binnicker, coincidentally a former AFA Enlisted Council Chairman, now serves as Enlisted Council Advisor.

The Junior Officer Advisory Council is made up of: Capt. Thomas D. Shearer (Chairman), 1st Lt. Gary Brinner, Capt. Daniel G. Brown, Capt. Joseph L. Brown, Capt. David F. Cortez, Capt. James S. Dalrymple, Capt. James P. Galloway, Capt. Sandra A. Gregory, Capt. Joyce F. "Sean" Habina, Capt. Brian P. Hoey, Capt. Patrick M. Howard, Capt. Martha J. Levarnsen, Capt. Pamela A. Mason, Capt. Steven F. Maurmann, Capt. Janice L. Mitchell, 1st Lt. Deanna J. Reeves, Capt. Danny D. Swank, Capt. Colleen G. Toussaint (liaison), and Capt. Steven J. Zamparelli. Maj. Gen. William J. Mall, Jr., USAF Director of Personnel Plans, is the JOAC Advisor. ■

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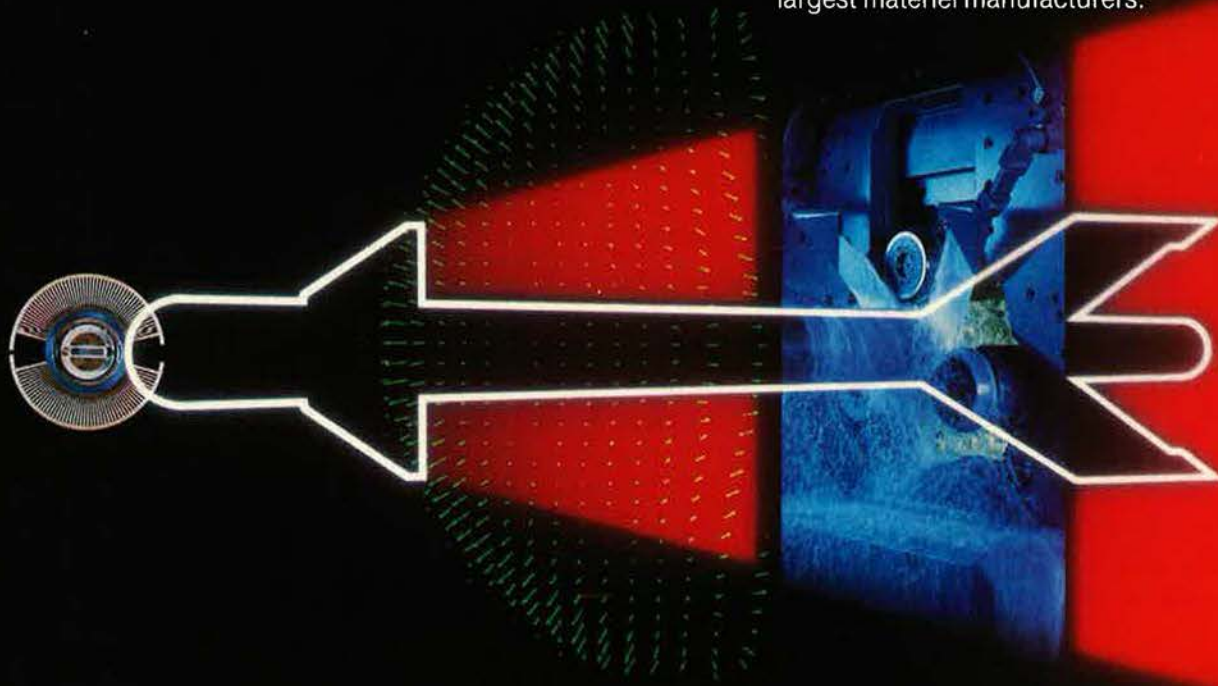
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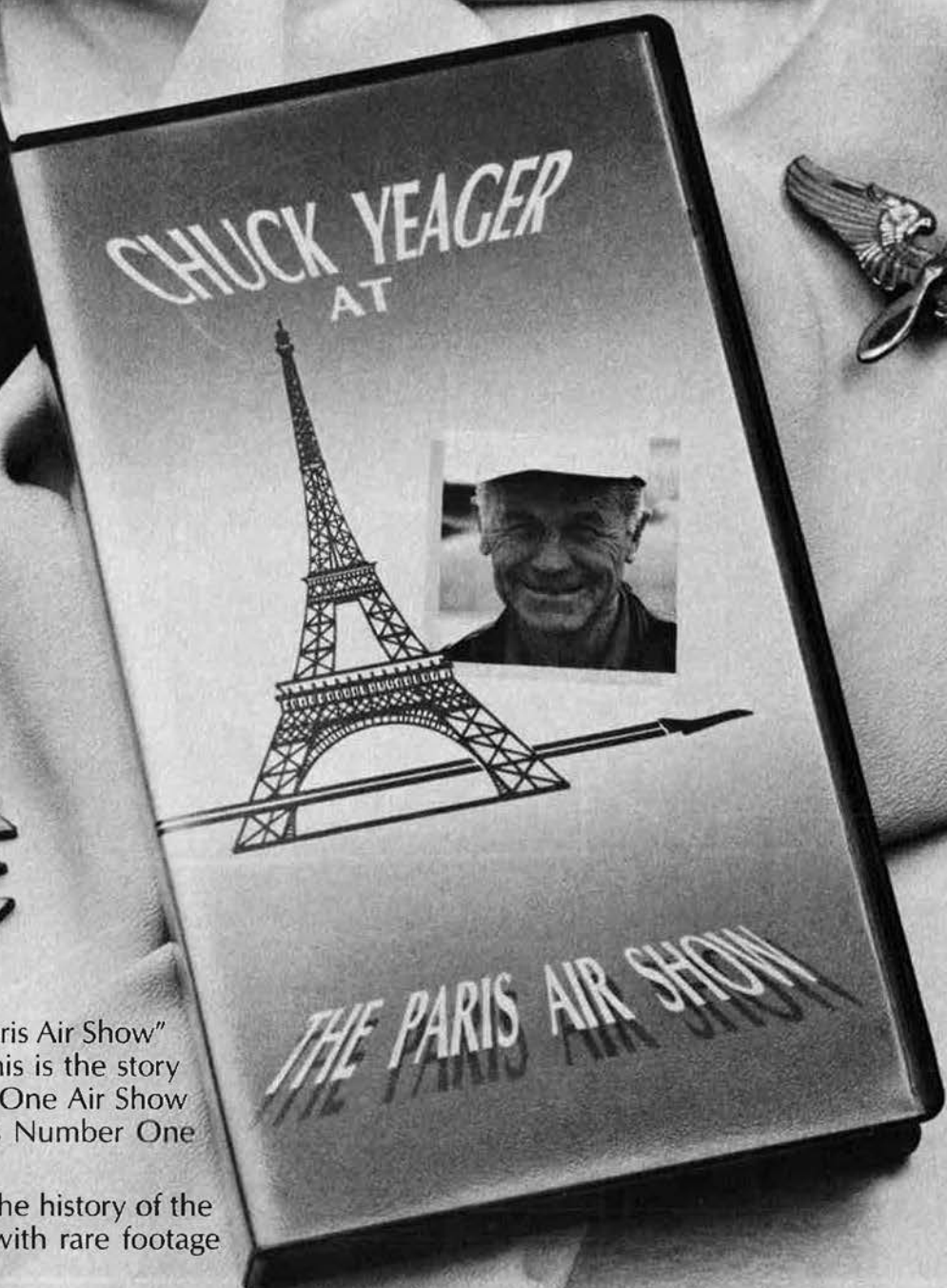
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# INTERCOM

By Robin L. Whittle, AFA DIRECTOR OF COMMUNICATIONS

## On the Scene

A firsthand look at the horrors of international terrorism was provided by retired **Maj. Gen. James L. Dozier, USA**, at the Florida Highlands Chapter's third annual Armed Forces Day luncheon on May 10. General Dozier recounted his harrowing kidnapping ordeal and subsequent dramatic rescue that occurred four years ago while he and his wife, Judy, were stationed in Italy.

Two members of the Red Brigade, disguised as plumbers "checking for leaks," rang the doorbell of his apartment. "They looked like plumbers and acted like plumbers," he said. After checking the apartment, they jumped Dozier and held a gun to his wife's head. He spent the next six weeks in a small tent inside a room. General Dozier was eventually rescued in a daring raid by Italian police disguised as terrorists.

Florida Highlands Chapter President **Roy Whitton** said that the Doziers' account was a chilling reminder of the sacrifices made by military families in support of America's



*Florida Highlands Chapter President Roy Whitton, left, presents a Chapter membership certificate to retired Army Maj. Gen. James L. Dozier during the Chapter's recent Armed Forces Day luncheon. General Dozier spoke on his kidnapping by terrorists.*



*One of AFA's newest Life Members is Tactical Air Command Commander Gen. Robert D. Russ, who accepted the Life Member certificate from AFA National Secretary A. A. "Bud" West, left, and Langley Chapter President C. D. "Chuck" Taylor during AFA's recent membership campaign at Langley AFB.*

defense worldwide. During the luncheon, which raised funds for the Chapter's Maj. Thomas B. McGuire Memorial Fund, General Dozier was made an honorary Chapter member. The Doziers' daughter is an Air Force captain stationed in Belgium, Mr. Whitton said.

In another Armed Forces Day celebration, **Richard E. Carver**, Assistant Secretary of the Air Force for Financial Management, addressed a luncheon in Denver, Colo., sponsored by AFA's Front Range Chapter and the local chapters of the Army Association, Marine Corps League, National Guard Association, Naval Reserve Association, and Navy League.

A fabulous Fourth of July celebration was staged by AFA's Lance Sijan/Colorado Springs Chapter, which annually raises funds for a community-wide celebration. This year marked the fifth time that the Chapter has been involved, reports Colorado AFA President **Tom Ratterree**.

Activities for the celebration included the Ottawa Air Command



Pipes and Drums, Mickey Mouse, and taste sensations from forty area restaurants. Sponsors of the event, in addition to the local AFA, included KLO-FM, KKTV, Domino's Pizza, Pepsi-Cola, Colorado-Wyoming Restaurant Association, Colorado Springs Cablevision/Channel Guide, and the Colorado Lottery. Also participating were the Air Force Academy's Wings of Blue parachute team and the National Gymnastics Village. "Local, state, and national political candidates were allowed to have booths on site in Memorial Park during the festivities," Mr. Ratterree said.

By the end of May, AFA had 25,481 Life Members—one of whom was recruited by AFA's Langley Chapter at Tactical Air Command. The new "lifer" is **Gen. Robert D. Russ**, TAC Commander, who was officially inducted during the AFA membership campaign on base. Officiating were AFA National Secretary **A. A. "Bud" West** and Langley Chapter President **C. D. "Chuck" Taylor**.

Grambling State University football coach **Eddie Robinson** joined a number of other dignitaries at a recent Ark-La-Tex Chapter function, reports Chapter President **Ken Black**. On hand were **Lt. Col. Thomas C. Carington**, Commander of the local AF-ROTC unit, and **Col. Perry Feldman**, Commander of the 2d Support Group at nearby Barksdale AFB, La.

In other Louisiana AFA news, the state convention was held at Barksdale AFB in June. Ken Black joined **Gerry Nistal** as one of the new State Vice Presidents. The new State President is **Paul Johnston**. Other officers are **Billie Hanrahan**, Secretary, and **Jane Snow**, Treasurer.

"The convention was well-attended, and there was excellent base participation," said **Ben Catlin**, AFA Assistant Executive Director for Manpower and Reserve Affairs. The banquet speaker was **Rep. Robert Livingston** (R-La.), and visiting dignitaries included AFA National Director **Dr. Frank Lugo**, South Central Region National Vice President **Cliff Ball**, Arkansas AFA President **Tom Williams**, and **Lt. Gen. and Mrs. Kenneth Peek**, among others.

**Phil Saxton**, AFA National Vice President for the Northwest Region, reports that an excellent Alaska AFA convention was held in Fairbanks recently. Banquet speaker was balloonist **Joe Kittinger, Jr.**, who arrived at the Fairbanks International Airport in a 1943 Beech Staggerwing that took three days to fly from Orlando, Fla. He recounted his journey of two years ago, when he became the first person

to fly solo across the Atlantic in a helium balloon, going from Maine to Italy during a 3,543-mile trip. "I did it for the adventure," he told the AFA crowd.

**Brig. Gen. Mike McRaney**, USAF Director of Public Affairs, was the featured speaker at the Mississippi AFA convention, which drew a large crowd from the community and nearby Air Force bases, reports **Dave Noerr**, AFA Assistant Executive Director for Field Organizations. The full weekend of activities was hosted by AFA's Golden Triangle Chapter, led by President **Billy Cox**, and featured two golf tournaments, a ladies' tour, a leaders' dinner and workshop, and the Saturday evening banquet with General McRaney.

During the evening, Mississippi AFA President **Gene Smith** was awarded an AFA national Medal of Merit. "They did a nice job on all of it," Mr. Noerr said.

In other convention news, the Florida AFA convention was held recently

Southeast Region and **Mrs. H. Lake Hamrick**, AFA National Directors **Dan Callahan** and **Herbert "Bud" West**, and the nation's top living fighter ace, **Col. Francis "Gabby" Gabreski**, USAF (Ret.).

Several new AFA chapters have been chartered recently. They include the Bozeman Chapter in Montana, led by **Ron Glock** and activated by the hard work of **Roy Davis**; the Eagle Chapter in Shiremanstown, Pa., led by **Edmund J. Gagliardi**; and the John Currie Memorial Chapter in Forked River, N. J., led by **Andrew E. Skiba**. Also, two chapters have recently been renamed. The Reno Chapter in Nevada became the **Dale O. Smith Chapter**, and the Clark AB Chapter in the Philippines is now called the **Bataan Memorial Chapter**.

**Bruce Kolofske**, Vice President for Aerospace Education for AFA's Dobbins Chapter in Georgia, reports that seven high schools in the Atlanta area have been provided copies of AIR FORCE Magazine and a list of the

### On Russ Dougherty's Watch

As we in AFA prepare to assemble for another National Convention this month, it is a good time to reflect not only on the tasks ahead but also on the progress and achievements thus far. In so doing, we should take special note of the dynamic growth of our Association during the tenure of Russell E. Dougherty, who served as our Executive Director from October 1980 until June 1 of this year.

During that period, membership increased by fifty-three percent, and the number of Life Members increased by 982 percent. The net worth of AFA grew by 202 percent. The number of chapters increased by eighteen percent, Industrial Associates by eighty percent, and Community Partners by 556 percent.

We built and moved into our new AFA headquarters building. AFA's affiliate, the Aerospace Education Foundation, was reinvigorated by a bold "New Directions" program. A change to our charter, granted by Congress, enables us to welcome into AFA additional thousands of young veterans without war service. And topping it all off was our "Gathering of Eagles" last spring, surely one of the most spectacular and successful aerospace events in recent memory.

Russ Dougherty would be the first to protest that this record of achievement is not his alone, and he would be right. But it is also obvious to any of us who have been involved or who have watched closely that the key ingredients were the vision, the leadership, and the amazing energy of Russ Dougherty. We—all quarter million of us in AFA—owe a great deal to this extraordinary man who has served us so well.

—BY MARTIN H. HARRIS, AFA NATIONAL PRESIDENT

in Cocoa Beach and featured an opening reception and barbecue "outdoors and in tents" at the Kennedy Space Center Museum, Mr. Noerr said. Luncheon speaker was **Scott Crossfield**, and the evening's banquet was addressed by **Brig. Gen. Ken Staten**. Dignitaries included AFA National President and **Mrs. Marty Harris**, National Vice President for the

Aerospace Education Foundation's Roundtables. Dobbins Chapter officials have also established an annual scholarship for junior and senior AF-ROTC cadets and Civil Air Patrol cadets that will be presented during the next school year. The fund is being built through Community Partnerships and renewals, officials say. Another Dobbins Chapter project is to





TWA Capt. John Testrake, pilot of the 727 airliner that endured a two-week hijacking ordeal at Beirut Airport during 1985, was honored recently by the International Order of Characters as "Pilot of the Year." With Captain Testrake are Connecticut AFA Vice President Al Hudson, left, and Lindbergh Chapter member and Order President Sergei Sikorsky, right.

sponsor a teacher to AFA's next tactical air warfare symposium in Orlando, Fla.

June was proclaimed "Air Force Association Month" by Blytheville, Ark., Mayor **Tom Little** in commemoration of the Blytheville Chapter's city-wide "AFA Community Partners Membership Drive" that was conducted throughout the month. Organizers included Chapter President **Bud Walters** and Vice President **Bill Jeffries**. Both men were on hand when Mayor Little signed the document.

TWA pilot **Capt. John Testrake**, who became a national hero in June 1985 while helping his passengers and crew survive a two-week hijacking ordeal aboard a 727 at the Beirut Airport, was honored recently by the International Order of Characters as "Pilot of the Year." He was awarded the honor by Charles A. Lindbergh Chapter member **Dr. James Crane**, Chairman of the Board of the organization. Dr. Crane founded the Order while serving as a flight surgeon with the Thirteenth Air Force in the early days of World War II. The organization provides scholarships for the children of deceased and infirm pilots.

Also active in the Order is Connecticut AFA Vice President **Al Hudson**. **Sergei Sikorsky**, also active in AFA's Lindbergh Chapter, is President of the Order.

## The Dean of American Proposal Consultants

...announces a new *inhouse* affordable *unlimited-attendance* **Competitive Proposal Seminar** that enhances your ability to move the evaluation in your direction, *make the cut, and win the BAFO.*



- Major thrusts: What it Takes to Win Today; Positioning for Successful Pursuit; How the Major Primes Do It; Marketing Intelligence — How to Use It; How to Plan, Manage, Write, Publish the Better Responsive Persuasive Proposal.

- He has: over 50 clients nationwide; conducted over 250 proposal/marketing seminars and training courses.

- He has *personally* worked on such proposals as: Space Station, SDI, Shuttle, MX, Trident, SSBN, SICBM, HML, MK-48, WWMCCS, HEDI, North Warning, MK-50, SADARM, FEPC, MK-12A, MEECN, WSC-3, UYK-43, LVTX, IWD Mine, LoAD, Harpoon, ABRES, MMPM, HIP, NESTF, DEO, EMETF, DSV, ESC, ALR-74, ACMI;

and support services for JSC, AFWL, NAVSEA, Fort Belvoir, WSMR, PMTC, Quantico, NOSC, Fort Huachuca.

- He has *personally* served such contractors as: GE, Honeywell, McDonnell Douglas, Northrop, Westinghouse, Boeing, Rockwell, IBM, EDS, IT&T, Textron, AT&T, GTE, EG&G, Motorola, CDC, FMC, Gould, Goodyear, Bell, 3M.
- His background: Marketing Manager for major primes; Government Official; University Professor; Newspaper Reporter; U.S. Military Service; Senior Member AIAA, NCMA, PSC.

For information, telephone:



JUDSON LAFLASH, *President*  
**GOVERNMENT MARKETING INC.**  
**818/887-9102**  
 (WOODLAND HILLS, CA)

*If you haven't worked with him, your competition probably has.*

### AEF—Thirty Years of Progress

On May 1, 1956, the Air Force Association created a new department (The Air Force Association Foundation, Inc.) to formulate and administer educational outreach programs. This separate but integral part of the Association was established as a nonprofit organization to carry out the Association's educational programs. AEF is supported through tax-deductible contributions.

Over the past thirty years, the Foundation (now known as the Aerospace Education Foundation, or AEF) has made much progress in educating AFA's membership and the public at large about the necessity for adequate airpower to maintain our national security.

By sponsoring symposia, seminars, workshops, and conferences on aerospace education and defense topics, the Foundation fulfills the following objectives:

- Educating the public so as to promote a greater understanding of aerospace development, which is so vital to our national defense and economic stability;

- Promoting publications that advance knowledge of aerospace development.

(Continued on p. 216)



# An AFA Almanac

## AFA's First National Officers and Board of Directors

(This panel of officers and directors acted temporarily until a representative group was democratically elected by the membership at the first National Convention.)

### OFFICERS

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

### BOARD OF DIRECTORS

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

## AFA's "Man of the Year" Award Recipients

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

YEAR	RECIPIENT(S)
1953	Julian B. Rosenthal (New York)
1954	George A. Anderl (Illinois)
1955	Arthur C. Storz (Nebraska)
1956	Thos. F. Stack (California)
1957	George D. Hardy (Maryland)
1958	Jack B. Gross (Pennsylvania)
1959	Carl J. Long (Pennsylvania)
1960	O. Donald Olson (Colorado)
1961	Robert P. Stewart (Utah)
1962	(no presentation)
1963	N. W. DeBenardinis (Louisiana) and Joe L. Shosid (Texas)
1964	Maxwell A. Kriendler (New York)
1965	Milton Caniff (New York)
1966	William W. Spruance (Delaware)
1967	Sam E. Keith, Jr. (Texas)
1968	Marjorie O. Hunt (Michigan)
1969	(no presentation)
1970	Lester C. Curl (Florida)
1971	Paul W. Gaillard (Nebraska)
1972	J. Raymond Bell (New York) and Martin H. Harris (Florida)
1973	Joe Higgins (California)
1974	Howard T. Markey (Washington, D. C.)
1975	Martin M. Ostrow (California)
1976	Victor R. Kregel (Texas)
1977	Edward A. Stearn (California)
1978	William J. Demas (New Jersey)
1979	Alexander C. Field, Jr. (Illinois)
1980	David C. Noerr (California)
1981	Daniel F. Callahan (Florida)
1982	Thomas W. Anthony (Maryland)
1983	Richard H. Becker (Illinois)
1984	Earl D. Clark, Jr. (Kansas)
1985	George H. Chabbott (Delaware) and Hugh L. Enyart (Illinois)

## AFA Units of the Year

YEAR	RECIPIENT(S)
1953	San Francisco Chapter (Calif.)
1954	Santa Monica Area Chapter (Calif.)
1955	San Fernando Valley Chapter (Calif.)
1956	Utah State AFA
1957	H. H. Arnold Chapter (N. Y.)
1958	San Diego Chapter (Calif.)
1959	Cleveland Chapter (Ohio)
1960	San Diego Chapter (Calif.)
1961	Chico Chapter (Calif.)
1962	Fort Worth Chapter (Tex.)
1963	Colin P. Kelly Chapter (N. Y.)
1964	Utah State AFA
1965	Idaho State AFA
1966	New York State AFA
1967	Utah State AFA
1968	Utah State AFA
1969	(no presentation)
1970	Georgia State AFA
1971	Middle Georgia Chapter (Ga.)
1972	Utah State AFA
1973	Langley Chapter (Va.)
1974	Texas State AFA
1975	Alamo Chapter (Tex.) & San Bernardino Area Chapter (Calif.)
1976	Scott Memorial Chapter (Ill.)
1977	Thomas B. McGuire, Jr., Chapter (N. J.)
1978	Thomas B. McGuire, Jr., Chapter (N. J.)
1979	Robert F. Travis Chapter (Calif.)
1980	Central Oklahoma (Gerrity) Chapter (Okla.)
1981	Alamo Chapter (Tex.)
1982	Chicagoland-O'Hare Chapter (Ill.)
1983	Charles A. Lindbergh Chapter (Conn.)
1984	Scott Memorial Chapter (Ill.) & Colorado Springs/Lance Sijan Chapter (Colo.)
1985	Cape Canaveral Chapter (Fla.)

## H. H. Arnold Award Recipients

AFA's highest Aerospace Award is the H. H. Arnold Award. Named for the World War II leader of the Army Air Forces, it is presented annually in recognition of the most outstanding contributions in the field of aerospace activity.

YEAR	RECIPIENT(S)	YEAR	RECIPIENT(S)
1948	Hon. W. Stuart Symington, Secretary of the Air Force	1968	Col. Frank Borman, USAF; Capt. James Lovell, USN; and Lt. Col. William Anders, USAF—Apollo-8 Crew
1949	Maj. Gen. William H. Tunner and the men of the Berlin Airlift	1969	(no presentation)
1950	Airmen of the United Nations in the Far East	1970	Apollo-11 Team (J. L. Atwood, Lt. Gen. Samuel C. Phillips, USAF, and Astronauts Neil Armstrong, Col. Edwin E. Aldrin, Jr., USAF, and Col. Michael Collins, USAF)
1951	Gen. Curtis E. LeMay and the personnel of Strategic Air Command	1971	Dr. John S. Foster, Jr., Director of Defense Research and Engineering
1952	Senators Lyndon B. Johnson and Joseph C. O'Mahoney	1972	Air Units of the Allied Forces in SEA (Air Force, Navy, Army, Marine Corps, and the Vietnamese Air Force)
1953	Gen. Hoyt S. Vandenberg, former Chief of Staff, USAF	1973	Gen. John D. Ryan, USAF (Ret.), former Chief of Staff, USAF
1954	Hon. John Foster Dulles, Secretary of State	1974	Gen. George S. Brown, Chairman, Joint Chiefs of Staff
1955	Gen. Nathan F. Twining, Chief of Staff, USAF	1975	James R. Schlesinger, Secretary of Defense
1956	Senator W. Stuart Symington	1976	Senator Barry M. Goldwater
1957	Edward P. Curtis, Special Assistant to the President	1977	Senator Howard W. Cannon
1958	Maj. Gen. Bernard A. Schriever, Commander, Ballistic Missile Division, ARDC	1978	Gen. Alexander M. Haig, Jr., USA, Supreme Allied Commander, Europe
1959	Gen. Thomas S. Power, Commander in Chief, Strategic Air Command	1979	Senator John C. Stennis
1960	Gen. Thomas D. White, Chief of Staff, USAF	1980	Gen. Richard H. Ellis, Commander in Chief, Strategic Air Command
1961	Hon. Lyle S. Garlock, Assistant Secretary of the Air Force	1981	Gen. David C. Jones, Chairman, Joint Chiefs of Staff
1962	Dr. A. C. Dickieson and John R. Pierce, Bell Telephone Laboratories	1982	Gen. Lew Allen, Jr., USAF (Ret.), former Chief of Staff, USAF
1963	The 363d Tactical Reconnaissance Wing, TAC, and the 4080th Strategic Wing, SAC	1983	Ronald Reagan, President of the United States
1964	Gen. Curtis E. LeMay, Chief of Staff, USAF	1984	The President's Commission on Strategic Forces (the Scowcroft Commission)
1965	The 2d Air Division, PACAF	1985	Gen. Bernard W. Rogers, USA, Supreme Allied Commander, Europe
1966	The 8th, 12th, 355th, 366th, and 388th Tactical Fighter Wings, and the 432d and 460th Tactical Reconnaissance Wings		
1967	Gen. William W. Momyer, Commander, Seventh Air Force, PACAF		



## AFA's National Presidents



James H. Doolittle  
(1946)



Thomas G. Lanphier, Jr.  
(1947)



C. R. Smith  
(1948)



Robert S. Johnson  
(1949-50)



Harold C. Stuart  
(1951)



Arthur F. Kelly  
(1952)



John P. Henebry  
(1956)



Peter J. Schenk  
(1957-58)



Howard T. Markey  
(1959)



Thos. F. Stack  
(1960)



Joe Foss  
(1961)



John B. Montgomery  
(1962)



George D. Hardy  
(1969-70)



Marlin M. Ostrow  
(1971-72)



Joe L. Shosid  
(1973-74)



George M. Douglas  
(1975-76)



Gerald V. Hasler  
(1977-78)



Viclor R. Kregel  
(1979-80)

## AFA's Regions, States, and Chapters

The figures on the right indicate the number of affiliated members as of March 31, 1986. Listed below each Region is the name of the National Vice President for that Region.

<b>CENTRAL EAST REGION</b>	<b>12,099</b>	Merced County	904	Buckeye Skypower	210	Boston	400
William L. Ryon, Jr.		Monterey Bay Area	254	*Capt. Eddie Rickenbacker Memorial	762	*Chicopee	350
<b>Delaware</b>	1,394	Pasadena Area	193	Cincinnati	362	Laurence G. Hanscom	573
Delaware Galaxy	1,157	Redwood Empire	447	Cleveland	666	Minuteman	201
Diamond State	237	Riverside County	1,202	Manfield	200	Otis	189
<b>District of Columbia</b>	1,928	Robert H. Goddard	1,309	Mid-Ohio	368	Paul Revere	322
Nation's Capital	1,928	Sacramento	3,183	Steel Valley	280	Pioneer Valley	82
<b>Kentucky</b>	671	San Bernardino Area	2,136	*Wright Memorial	5,074	Robert V. Pace	136
General Russell E. Dougherty	529	San Diego	1,061	<b>Wisconsin</b>	1,186	Taunton	119
Lexington	142	Tennessee Ernie Ford	944	Badger State	213	*Worcester	222
<b>Maryland</b>	2,989	<b>Guam</b>	605	Billy Mitchell	727	<b>New Hampshire</b>	1,104
*Baltimore	740	Guam-Arc Light	605	Madison	246	Amoskeag	156
Central Maryland	342	<b>Hawaii</b>	1,290	<b>MIDWEST REGION</b>	<b>10,206</b>	Pease	948
Thomas W. Anthony	1,907	*Hawaii	1,290	Charles H. Church, Jr.		<b>Rhode Island</b>	213
<b>Virginia</b>	4,889	<b>Nevada</b>	1,717	<b>Iowa</b>	294	Metro Rhode Island	213
Danville	32	Dale O. Smith	365	All-Iowa	157	<b>Vermont</b>	173
Donald W. Steele, Sr., Memorial	1,943	Thunderbird	1,352	Richard D. Kising	137	Burlington	173
Jack Manch	115	<b>GREAT LAKES REGION</b>	<b>19,164</b>	<b>Kansas</b>	1,376	<b>NORTH CENTRAL REGION</b>	<b>3,584</b>
Langley	2,079	Hugh L. Enyart		Air Capital	1,011	Paul G. Markgraf	
Leigh Wade	87	<b>Illinois</b>	4,602	Garden City	50	<b>Minnesota</b>	681
Lynchburg	50	Chicagoland-O'Hare	1,315	Topeka	315	General E. W. Rawlings	602
Richmond	273	Richard E. Carver	104	<b>Missouri</b>	2,414	Richard Bong	79
Roanoke	147	Illini	684	Central Missouri	541	<b>North Dakota</b>	1,715
Tidewater	163	Land of Lincoln	106	Harry S. Truman	612	Concrete Mixers	16
<b>West Virginia</b>	228	Scott Memorial	2,270	Ozark	148	General David C. Jones	704
Chuck Yeager	228	West Suburban	123	Spirit of St. Louis	1,113	Happy Hooligan	119
<b>FAR WEST REGION</b>	<b>30,921</b>	<b>Indiana</b>	2,182	<b>Nebraska</b>	6,122	Red River Valley	876
Thomas W. Henderson		Central Indiana	428	Ak-Sar-Ben	5,859	<b>South Dakota</b>	1,188
<b>Arizona</b>	4,656	Fort Wayne-Baer Field Area	251	Lincoln	263	Dacotah	219
Cochise	(new)	Grissom Memorial	722	<b>NEW ENGLAND REGION</b>	<b>6,482</b>	Rushmore	969
Frank Luke	1,039	Gus Grissom	162	Arley McQueen, Jr.		<b>NORTHEAST REGION</b>	<b>14,271</b>
Green Valley	49	Lawrence D. Bell Museum	24	<b>Connecticut</b>	1,605	John P. E. Kruse	
Phoenix Sky Harbor	1,506	Lester W. Johnston	47	Central Connecticut	123	<b>New Jersey</b>	4,589
Sedona	130	South Bend	283	Charles A. Lindbergh	252	Admiral Charles E. Rosendahl	165
Tucson	1,932	Southern Indiana	159	First Connecticut	294	Atlantic City Area	257
<b>California</b>	22,653	Terre Haute-Wabash Valley	106	Flying Yankees	143	Garden State	36
Antelope Valley	484	<b>Michigan</b>	3,272	General Bennie L. Davis	54	Greater Camden Area	167
David J. Price/Beale	775	Battle Creek	262	Igor Sikorsky	197	Hangar One	164
*Fresno	500	General Claire Chennault	190	Northern Connecticut	318	High Point	70
General Curtis E. LeMay	1,159	Hoyt S. Vandenberg	332	Sergeant Charlton Heston	115	*Hudson	110
*General Doolittle/Los Angeles Area	2,273	Huron	474	<b>Maine</b>	793	John Currie Memorial	(new)
General Robert F. Travis	2,967	James H. Straubel	361	Eastern Maine	200	Mercer County	118
*Golden Gate	654	Kalamazoo	56	Southern Maine	129	Middlesex	104
Greater Los Angeles Airpower	1,403	Lake Superior-Northland	1,188	Spudland	464	New Jersey Public Affairs	52
High Desert	805	Lloyd R. Leavitt, Jr.	74	<b>Massachusetts</b>	2,594	New Jersey Wing CAP/AFA	44
		Mount Clemens	317			*Passaic-Bergen	405
		PE-TO-SE-GA	18			Sal Capriglione	150
		<b>Ohio</b>	7,922				



## AFA's Board Chairmen

(Pictured are Chairmen who never served as National President)



George C. Kenney  
(1953)



John R. Alison  
(1954)



Gill Robb Wilson  
(1955)



Edward P. Curtis  
(1946)



Carl A. Spaatz  
(1950)



James M. Trail  
(1958)



W. R. Lovelace II  
(1963)



Jess Larson  
(1964-66)



Robert W. Smart  
(1967-68)



Julian B. Rosenthal  
(1959)



Jack B. Gross  
(1963)



John G. Brosky  
(1981-82)



David L. Blankenship  
(1983-84)



Martin H. Harris  
(1985-86)



Daniel F. Callahan  
(1979-80)



Edward A. Stearn  
(1985-86)

Teterboro-Bendix	84	Boise Valley	528	Fort Smith	100	<b>North Carolina</b>	<b>3,336</b>
Thomas B. McGuire, Jr.	2,091	Magic Valley	102	Razorback	152	Blue Ridge	177
Tri-County	56	Snake River Valley	413			Kitty Hawk	84
Union Morris	473			<b>Louisiana</b>	2,489	Piedmont	322
Wings	43	<b>Montana</b>	640	Alexandria	329	Pope	1,199
<b>New York</b>	6,068	Big Sky	613	Ark-La-Tex	1,414	Scott Berkeley	1,065
*Albany	271	Bozeman	27	Baton Rouge	283	Tarheel	276
Brooklyn "Key"	600			Greater New Orleans	463	Triad	213
Chautauqua	100	<b>Oregon</b>	1,099				
Colin P. Kelly	911	Eugene	296	<b>Mississippi</b>	3,221	<b>Puerto Rico</b>	154
Forrest L. Vosler	317	*Portland	803	Golden Triangle	1,047	San Juan	154
General Daniel "Chappie"	201			Jackson	91		
James, Jr., Memorial		<b>Washington</b>	4,296	John C. Stennis	2,083	<b>South Carolina</b>	3,130
Genesee Valley	258	Central Washington	108			Charleston	1,005
H. H. Arnold	398	Greater Bellingham	18	<b>Tennessee</b>	2,013	Clemson	234
Hudson Valley	165	Greater Seattle	1,193	Chattanooga	151	Columbia	422
Iron Gate	359	Inland Empire	1,093	Everett R. Cook	378	Ladewig-Shine Memorial	570
Lawrence D. Bell	443	Tacoma	1,884	General Bruce K. Holloway	481	Swamp Fox	899
Lloyd Schloen-Empire	65			H. H. Arnold Memorial	483		
Nassau-Mitchell	365	<b>ROCKY MOUNTAIN REGION</b>	<b>9,214</b>	Lt. Gen. Frank M. Andrews	520	<b>SOUTHWEST REGION</b>	<b>30,723</b>
New York Air Reserve & CAP	57	William J. Gibson				Bryan L. Murphy, Jr.	
Niagara Frontier	192	<b>Colorado</b>	5,462	<b>SOUTHEAST REGION</b>	<b>21,454</b>		
Plattsburgh	500	Blue Barons	88	H. Lake Hamrick		<b>New Mexico</b>	3,457
Queens	278	Colorado Springs/Lance Sijan	2,961			Albuquerque	1,585
Suffolk	234	Flatirons	153	<b>Florida</b>	9,517	Fran Parker	1,234
Thomas Watson, Sr.	130	Front Range	1,470	Air Commando	205	Llano Estacado	638
Westchester-Falcon	224	General Robert E. Huyser	92	Beaches of Jacksonville	33		
		Long's Peak	120	Cape Canaveral	1,277	<b>Oklahoma</b>	5,616
<b>Pennsylvania</b>	3,614	Pueblo	110	Central Florida	1,128	Altus	615
Airport Number One	284	Silver & Gold	406	Citrus Belt	124	Central Oklahoma (Gerrity)	3,740
Altoona	59	Weld County	62	Eglin	1,697	Enid	965
Beaver Valley	99			Florida Gulf Coast	129	Tulsa	296
Brandywine	134	<b>Utah</b>	3,138	Florida Highlands	127		
Col. Stuart E. Kane, Jr.	183	Gold Card	262	Florida Sun Coast	119	<b>Texas</b>	21,650
Eagle	(new)	Ogden	700	Gainesville	53	Abilene	1,181
Erie	112	Rocky Mountain	332	General James R. McCarthy	143	Aggeland	136
*Greater Pittsburgh	611	Salt Lake	541	Gold Coast	314	Alamo	7,508
Jimmy Stewart	28	Ute	1,068	Homestead	401	Austin	1,457
Joe Walker	104	Wasatch	235	Jax	151	Concho	378
Laurel Highlands	72			Jerry Waterman	1,465	Corpus Christi	128
Lehigh Valley	222	<b>Wyoming</b>	614	John C. Meyer	196	Dallas	1,346
*Metropolitan Philadelphia	466	Cheyenne	614	Miami	97	Del Rio	476
*Mifflin County	118			Morgan S. Tyler	230	Denton	90
Montgomery-Delaware Valley	306	<b>SOUTH CENTRAL REGION</b>	<b>12,853</b>	Panama City	908	Fort Worth	4,454
Olmsted	396	C. Cliff Ball		Southwest Florida	183	Greater Amarillo	92
Pocono Northeast	112			Tallahassee	189	Heart of the Hills	157
Steel Valley	126	<b>Alabama</b>	2,630	West Palm Beach	348	Houston	1,017
York-Lancaster	182	Birmingham	400			Lee Glasgow-Waco	102
		Mobile	322	<b>Georgia</b>	5,317	Lubbock	851
<b>NORTHWEST REGION</b>	<b>8,888</b>	Montgomery	1,434	Athens	108	Northeast Texas	264
Philip G. Saxton		Selma	90	Atlanta	467	Paso Del Norte	143
		Tennessee Valley	306	Carl Vinson Memorial	2,890	Permian Basin	135
<b>Alaska</b>	1,810	War Eagle	78	Chattahoochee Valley	60	Rio Grande Valley	33
Anchorage	1,261			Coosa Valley	56	Wichita Falls	1,702
Fairbanks Midnight Sun	549	<b>Arkansas</b>	2,500	Dobbins	895		
		Blytheville	694	Savannah	345		
<b>Idaho</b>	1,043	David D. Terry, Jr.	1,554	South Georgia	432		
				Southeast Georgia	64		

\*These Chapters were chartered prior to December 31, 1948, and are considered original charter chapters.



opment, aerospace education, and our rich aerospace heritage; and

- Encouraging higher education in technological career fields for our youth.

**Roundtables:** The Foundation's Roundtables series is winding up its second season of timely, in-depth discussions of important aerospace and national security topics. These discussions feature key military, congressional, network news, education, and business leaders.

Roundtables are transcribed, videotaped, and distributed to cable and public television stations and American Forces Broadcasting as well as to the Chief of Staff of the Air Force, the Air Force Academy, ROTC detachments, and AFA chapters worldwide.

Topics of future Roundtables will complement the themes of forthcoming issues of AIR FORCE Magazine, and the Roundtable discussions will be held on a quarterly basis.

# INTERCOM

**Partners in Education:** The Foundation's Partners in Education Program (PIE), established in 1985 as an outgrowth of the White House Office of Private Sector Initiatives PIE program, serves to stimulate business and educational partnerships within the nation's public school systems.

Because of the increased demand for qualified technical personnel, the Foundation's PIE program will focus on the areas of science and math education. The business partner is asked to share personnel and material resources to alleviate the local school system's technical deficiencies. Stra-

tegic Air Command and the Deputy Chief of Staff for Manpower and Personnel have coordinated their activities with the Foundation's PIE program, and pilot programs are now being implemented in the communities serving Ellsworth and Vandenberg AFBs.

**Aerospace Heritage Series:** The Foundation has published numerous technical and historical books, including *Crusade for Airpower: The Story of the Air Force Association*.

In 1984, the Foundation started its own Aerospace Heritage Series with the publication of *The Chiefs*, a biography of the first eight men who have served as the Chief Master Sergeant of the Air Force. In 1985, Volume II in the Series, *Valor*, was published. It is a collection of stories recounting the valorous acts of airmen and women since the early days of aviation.

To support the foregoing projects, the Foundation relies on several resources.

The General Jimmy Doolittle Educational Fellowship Program was established in 1974 and named in honor of the famed aviation pioneer and World War II Medal of Honor recipient. It generates funds to support the Foundation's educational outreach programs, such as the Roundtables and Partners in Education Program. Individuals contribute \$1,000 to designate a Fellow, and corporations contribute \$15,000 to become Corporate Fellows.

The General Ira C. Eaker Historical Fellowship Program was established in 1981. It generates funds to support and perpetuate knowledge of America's rich military and civilian aerospace history through the Foundation's publishing projects. Again, an individual sponsor donates \$1,000, while corporations contribute \$15,000 to become Corporate Fellows of the Foundation.

Since AEF's mission is ongoing and is all the more important in this technological age, the Foundation strives not only to help meet the growing need for scientific and technological expertise in future generations but to continue to fulfill effectively the educational mission of the Air Force Association and deliver the message of the need for aerospace awareness.

To help support these goals, the Sustaining Membership Program was launched in 1986 by AEF Chairman of the Board Sen. Barry Goldwater. This program provides an avenue for AFA members to support the Foundation's programs directly through tax-deductible contributions. For more information on this program, see the opposite page. ■

## AFA's Expanding Network of Active Units Overseas

### AFA UNIT

### LOCATION

#### United States Air Forces in Europe (USAFE)

Ankara	Ankara AS, Turkey
Appia	San Vito AS, Italy
Athens	Hellenikon AB, Greece
Cotswold	RAF Fairford, United Kingdom
Dolomiti	Aviano AB, Italy
Eagle	Soesterberg AB, The Netherlands
Eifel	Bitburg AB, Germany
Fens	RAF Alconbury, United Kingdom
Florennes	Florennes AB, Belgium
Gateway to Freedom	Berlin, Germany
Gregory E. Miller	Incirlik AB, Turkey
Hahn AB	Hahn AB, Germany
Izmir	Izmir AS, Turkey
Maj. Gen. Robert M. White	Heidelberg, Germany
RAF Bentwaters	RAF Bentwaters, United Kingdom
RAF Greenham Common/Welford	RAF Greenham Common, United Kingdom
RAF Mildenhall	RAF Mildenhall, United Kingdom
RAF Upper Heyford	RAF Upper Heyford, United Kingdom
Red Raider	Torrejon AB, Spain
Rheinpfalz	Ramstein AB, Germany
Wiesbaden	Lindsey AS, Germany
Zaragoza	Zaragoza, Spain
Zweibrücken AB Warrior	Zweibrücken AB, Germany

#### Pacific Air Forces (PACAF)

Bataan Memorial	Clark AB, Philippines
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1973	The Role and Significance of the B-1 Strategic Bomber
1974	The Air Force as a Unique National Resource
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1977	The Imperatives of National Readiness
1978	Theater Defense for the 1980s
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1981	Freedom Is Not Free
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# UNIT REUNIONS

### Air Commando Ass'n, Inc.

The Air Commando Association will hold its reunion on October 10-12, 1986, at the Hurlburt Officers' Club in Hurlburt Field, Fla. **Contact:** Gen. Hienie Aderholt, USAF (Ret.), P. O. Box 7, Mary Esther, Fla. 32569. Phone: (904) 243-4601.

### AAS Conclave

The Arnold Air Society Independence Hall Squadron will host the 1986-87 Tri-Area Conclave on November 7-9, 1986, in Philadelphia, Pa. **Contact:** Bonnie A. Waldron, Arnold Air Society, Independence Hall Squadron, AFROTC Cadet Group 750, St. Joseph's University, Philadelphia, Pa. 19131. Phone: (215) 879-7310.

### Ranch Hands

Members of the Vietnam Ranch Hands will hold their reunion on October 11-13, 1986, in Fort Walton Beach, Fla. **Contact:** Jack Spey, 850 Tarpon, Fort Walton Beach, Fla. 32548. Phone: (904) 243-5696.

### Tactical Recon

Tactical Reconnaissance units will hold a

reunion on October 10-12, 1986, at the Holiday Inn in Fort Walton Beach, Fla. **Contact:** Lt. Col. James B. Story, USAF (Ret.), P. O. Box 488, Niceville, Fla. 32578. Phone: (904) 678-3318.

### 4th Emergency Rescue Squadron

The 4th Emergency Rescue Squadron is planning a reunion in conjunction with the Air Rescue Association to be held on September 17-20, 1986, in Williamsburg, Va. **Contact:** William R. "Mac" McGregor, P. O. Box 98, St. Germain, Wis. 54558. Phone: (715) 479-8801.

### 5th Liaison Squadron

Members of the 5th Liaison Squadron who served in Burma will hold a reunion on October 10-11, 1986, in St. Louis, Mo. **Contact:** Floyd G. Whitney, Jr., 3 Blair Pl., 7200 Porcher Ave., Myrtle Beach, S. C. 29577. Phone: (803) 449-4135.

### 30th Bomb Group

Members of the 30th Bomb Group will hold a reunion on October 18 at the Hilton Hotel in San Bernardino, Calif. **Contact:** Bob McGinnis, 6120 N. Camellia, Temple City, Calif. 91780. Phone: (1-818) 287-6370.

### Class 42-A

The Cadet Class 42-A (Kelly, Foster, and Ellington Fields) will hold a reunion on September 19-21, 1986, in Dayton, Ohio. **Contact:** Col. Lou DeSandro, USAF (Ret.), 12618 Eveningside Dr., Sun City West, Ariz. 85375. Phone: (602) 584-5608.

### 43d Bomb Group Ass'n

Members of the 43d Bomb Group will hold a reunion on October 8-12, 1986, at the El Tropicano Hotel in San Antonio, Tex. **Contact:** Lloyd Boren, 102 Beechwood, Universal City, Tex. 78148. Phone: (512) 658-5978.

### 320th Bomb Group

The 320th Bomb Group will hold a reunion on October 2-4, 1986, in Hartford, Conn. **Contact:** Stu Rowan, 108 Aspen, Hereford, Tex. 79045.

### 353d Fighter Group

Members of the 353d Fighter Group, 8th Air Force, including the 350th, 351st, and 352d Fighter Squadrons, 440th Air Service Group, 1260th MP, will hold a reunion on October 15-19, 1986, at the Diplomat Hotel in Hollywood, Fla. **Contact:** Charles Graham, The Army-Navy Club, 1625 I St., N. W., Room 123, Washington, D. C. 20006-3098. Phone: (202) 628-8400.

### 384th Air Refueling Squadron

The 384th Air Refueling Squadron will hold a reunion on September 25-28, 1986, at the Quality Inn in Chicopee, Mass. **Contact:** Charles W. Gray, 818 18th St., N. W., #750, Washington, D. C. 20006. Phone: (202) 822-9618.

### 405th Fighter Group

Members of the 405th Fighter Group will hold a reunion on October 2-5, 1986, at the Hickory Knob State Park near McCormick, S. C. **Contact:** W. Arthur Barrow, P. O. Box 31, Daphne, Ala. 36526. Phone: (205) 626-0859.

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### 437th Troop Carrier Group

The 437th Troop Carrier Group, including the 83d, 84th, 85th, and 86th Troop Carrier Squadrons, will hold a reunion on October 29–November 2, 1986, in Williamsburg, Va. **Contact:** Robert Maycan, 360 Walker Ave., Greenacres City, Fla. 33463. Phone: (305) 965-1145.

### Reunion Notices

Readers wishing to submit reunion notices to "Unit Reunions" should mail their notices well in advance of the event to: "Unit Reunions" AIR FORCE Magazine, 1501 Lee Highway, Arlington, Va. 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

### 486th Bomb Group

The 486th Bomb Group, which served at Station 174 in Sudbury, England, will hold a reunion on October 15–19, 1986, in Hollywood, Fla. **Contact:** Robert H. Nolan, 2676 Augusta Dr. N., Clearwater, Fla. 33519. Phone: (813) 784-9661.

### 530th Fighter Squadron

Members of the 530th Fighter Squadron, 311th Fighter Group, who served in Burma and China will hold a reunion on Septem-

ber 25–28, 1986, at the Executive Inn in Nashville, Tenn. **Contact:** Ax Hiltgen, Reunion Committee, P. O. Box 708, Floral City, Fla. 32636.

### AFROTC Det. 675

Members of AFROTC Detachment 675 will hold a reunion during the November 8, 1986, weekend to celebrate the fortieth anniversary of the University of Oklahoma campus. **Contact:** Capt. David Alkove, USAF, Tinker AFB, Okla. 73145. Phone: (405) 325-3211. AUTOVON: 884-1110.

### 868th/63d Bomb Squadrons

The 868th Bomb Squadron and the 63d Bomb Squadron will hold a joint reunion on September 25–28, 1986, at the Sea Point Hotel in San Diego, Calif. **Contact:** V. D. Splane, 2676 Blanding Blvd., Middleburg, Fla. 32068. Phone: (904) 282-9371.

### 2d Bomb Wing

The 2d Bombardment Association is planning a reunion for the 2d Bomb Wing and would like to hear from members (past and present) of the 2d Bomb Wing who would be interested in attending this event.

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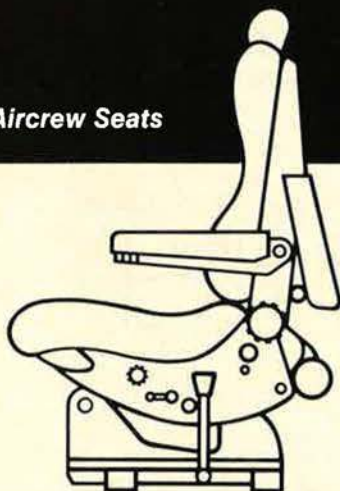
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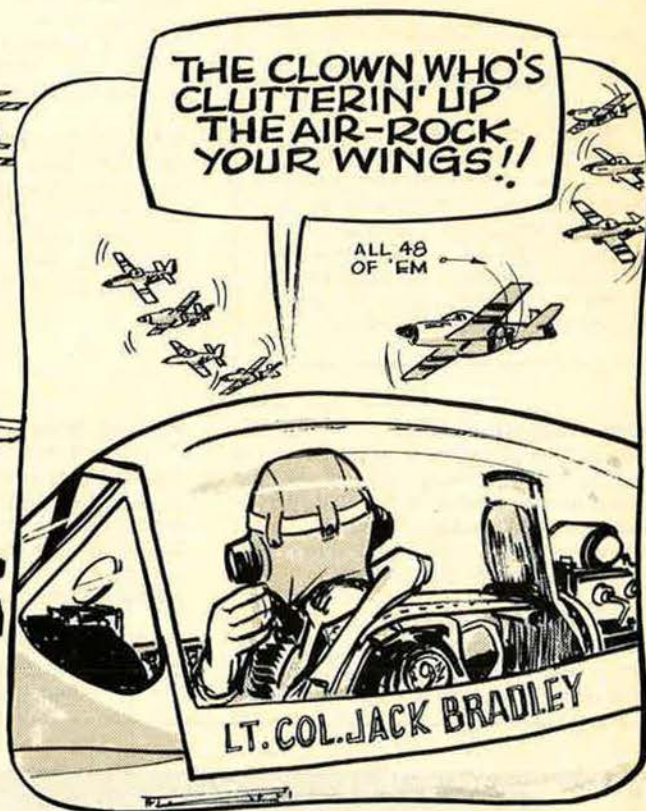
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PUFF  
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