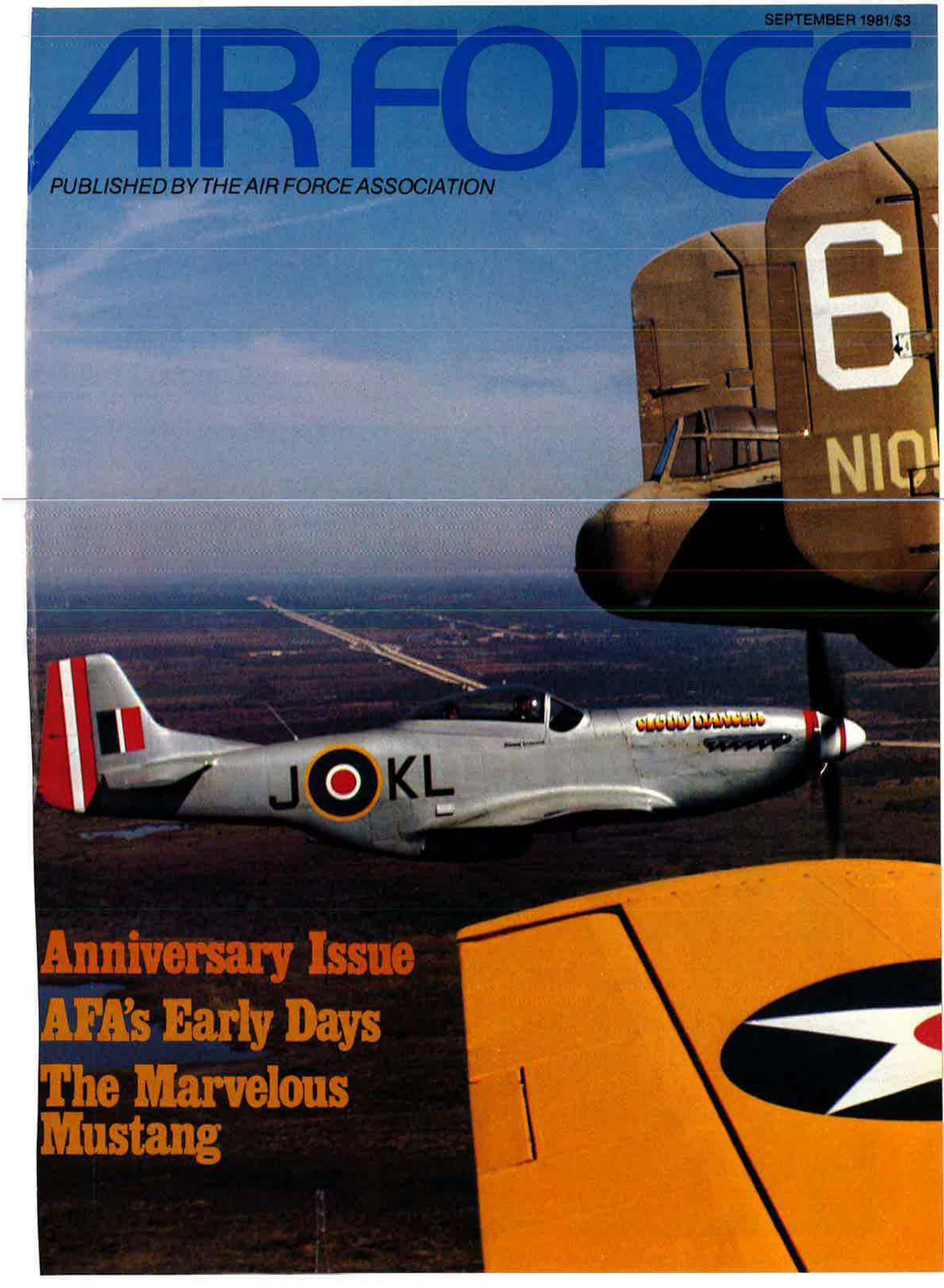
SEPTEMBER 1981/$3

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION



Anniversary Issue

AFA's Early Days

The Marvelous Mustang

In the Beginning, we

For over a quarter-century, Ford Aerospace has been the company to start things. Important things in every aspect of the Space Mission.

In 1957, we participated in the design and development of the first major U.S. military spacecraft tracking network. Today, we're still servicing that network – now the USAF Satellite Control facility, the largest of its kind.

In 1963, we began building the Mission Control Center at Johnson Space Center, and we've provided total system support ever since. This expertise is helping

were there.

us today to design the Operational Control Centers for the NASA and DoD Space Shuttle and the Spacelab payloads.

In 1965, the NORAD Combat Operations Center became operational within Cheyenne Mountain and we were there as prime contractor for major segments of the communication, display, and space computational systems. We've been in the Mountain ever since providing total system support.

And what of future challenges? Ford Aerospace is prepared to meet those challenges, as it was in the beginning.

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At LSI we design impossible dreams . . . then we make them real. And it all began more than 30 years ago.

In 1949 we were awarded the Collier Trophy for development of the very first high-volume production autopilot for jet aircraft. That was the beginning of many innovations, including:

- The first high-volume production autopilot for jet aircraft (F-84 & F-86D)
- The first jet fighter autopilot coupled to an ILS receiver (F-86D)
- The first jet transport autopilot (KC-135)
- The first solid state 3-axis damper (F-104)
- The first control augmentation system with control stick steering (F8U-3)
- The first production two-channel fail passive automatic flight control (A-7)
- The first production fly-by-wire computer and sidestick controller (F-16)
- The first completely programmable mission computer for RPVs (AQM-34L)
- The first Category 3A automatic landing system to be certified concurrent with the airframe (L-1011)

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AIR FORCE MAGAZINE

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This Month

SEPTEMBER 1981 • VOLUME 64, NUMBER 9

ABOUT THE COVER

Jimmy Leeward's P-51 Mustang provides close cover for John Marshall's B-25 Mitchell in this shot from a T-6 during the Valiant Air Command's Air Show held last February in Florida. For more on "The Marvelous Mustang," see p. 144 of this year's "Anniversary Issue." (Staff photo by Art Director William A. Ford)

Departments

Was Earhart lost? Shot down and taken prisoner? Did she ditch? Somewhere, amid 250,000 square miles of ocean, may lie the answer.

Even today, speculation about Amelia Earhart's last flight rages on. But whatever her mission and fate, there's no doubt about the stature of this unique American heroine. With her daring, record-setting flights, some of them solo, she captured the world's imagination.

Small wonder, then, that her disappearance touched off a month-long search covering over a quarter-million square miles. And involving more than a dozen ships and over 60 aircraft.

Did she really lose her way and ditch?

If the Air Force's new Global Positioning System had been around, that might not have happened. The satellites in this planned system will relay signals enabling users to know their exact position—within a mere 50 feet, in any weather, day or night—anywhere on the globe.

To achieve such accuracy, the IBM-developed ground facility will periodically measure each satellite's precise location, predict its position between contacts, calibrate the onboard atomic clock, and provide the navigation signals.

In another Air Force program, Data System Modernization, IBM is upgrading the Satellite Control Facility with new equipment and software technology. The system will allow close monitoring and control of the numerous satellites of all types now in use as well as those that will be aloft in coming years.

Complex tasks like these benefit from IBM's special skill: our ability to marshal many specialized systems to a common purpose. We've also done this in antisubmarine warfare. Avionics. Electronic countermeasures. Command, control and communications. Plus a wide range of other fields.

In fact, the more complex the task and systems are, the more IBM can help.

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Historical facts verified by Historical Evaluation and Research Organization.

AN EDITORIAL

Beware the Wide and Easy Path

IN THE Preface to his 1913 edition of *All The World's Aircraft*, Fred T. Jane wrote, "The air strength of any nation in case of war resides in its efficient flying men and in its own productive capacity." A few sentences later, he added, "Firms capable of building efficient machines cannot be improvised." Fred Jane died in 1916, but his authoritative reference books and his words live on. His remarks on "air strength of any nation" are as pertinent today as on the eve of World War I, when military airpower's infancy began.

The Air Force Association, in its thirty-five years, has always worked hard to keep alive the sinews of airpower, whether human or material. That has not always been an easy task. In fact, one can find in this anniversary issue of AFA's magazine much evidence that its early years were very hard indeed. Hard years for AFA, and hard ones for the newly independent US Air Force. In the extract from AFA's forthcoming book, Jim Straubel recounts instances of the early struggles for the Association's survival. They were dicey days, and AFA's health was not always vigorous. The most instructive portions of Jim Straubel's writings are the descriptions of how the obstacles were overcome, the challenges met and mastered. Those of us who joined AFA in its robust maturity are collectively grateful to the few who built it up. We can best show our gratitude by continuing to build the Air Force Association as an effective force for ensuring that the air strength of this nation is always ready to fight—and win—when called.

Part of AFA's present strength is its financial condition. Again, that is a far cry from thirty-five years ago. In his tribute to Jack Gross, AFA's Treasurer *(p. 163)*, Fred Musi tells how the Association's "book value" has improved. From a minus-seventy-five cents in 1961 to $30 per "share" in 1981 is a remarkable achievement.

The point is this: The people who built AFA had to travel a rocky, difficult road. That is also true of those who now sustain and expand it. Most of the population will choose the wide and easy path; so do many politicians and national leaders. But, as Air Force Secretary Verne Orr notes *(p. 70)*, the Air Force is having to recover from former policies that chose the "wide and easy path" of curtailed commitments. The rebuilding is not easy, because it means leaving the easy path and traveling a tough one. The tasks are hard, whether in retaining key people, building up long-neglected spares stocks, or in deciding which weapon and other systems to develop.

The Air Force Association's role in redressing the deficiencies takes many forms. But its strength and effectiveness will have the most telling effect because of two important points: AFA has never avoided the hard, rocky road when the goal was right; and AFA members, though diverse, share a common recognition of the difficulties and are willing to work to overcome them.

The diversity of AFA's membership helps achieve those successful results. It is the "Air Force Association," but its members are civilian as well as military, outside of government as well as in it; representative of the population in demographic terms, but singularly exceptional in devotion to ensuring that the nation's air strength is ready.

Thus, AFA members can make a difference in working to smooth some of the figurative rough spots and potholes along the tough road the Air Force now travels. Cases now receiving the most press attention are the MX basing and strategic bomber choice. Occasional mass media attention is devoted to the All-Volunteer Force. But AFA members are aware of—and working to overcome—additional problems and challenges.

Two current instances where AFA members can point out the pitfalls of the "wide and easy path" come immediately to mind. The "pay cap" is one. It is easy and politically expedient for Congress to impose a "pay cap" on senior civilian and military careerists. But the result has been a disaster in terms of motivating and keeping senior people. Up to fifty Air Force civilian Senior Executive Service jobs are vacant. The pay cap of $50,112 has squeezed out persons who could fill those jobs. Soon, all generals will be getting the same pay, also a result of the cap. For Congress to change this pernicious situation would require choosing the hard path—forgo congressional raises, but grant them to the senior careerists.

The draft is another "wide and easy path." Many savants claim the draft will solve the ills of the flawed All-Volunteer Force. Not so. The draft yields entry-level people, and the problem right now is retention of skilled, experienced ones. As Gen. Lew Allen, Jr., the Air Force Chief of Staff, pointed out recently, "You can't draft experienced NCOs."

So, as AFA begins its thirty-sixth year, its members can be proud of the past and have faith in the future. If they will continue to beware the wide and easy path and keep on the hard road, US air strength will be vigorously ready.

—F. CLIFTON BERRY, JR., EDITOR IN CHIEF

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We're the Missile Systems Division of Rockwell International.

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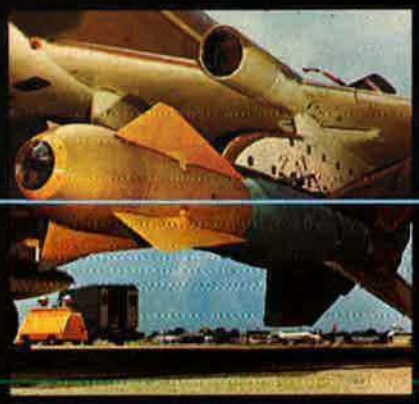

against heavily defended, high-value targets.

HELLFIRE Anti-armor Modular Missile System, for another. It's ready for production. HELLFIRE's launch and leave capability gives helicopters the ability to hide behind protective terrain as the missile seeks its target when the target is remotely designated.

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Systems engineering that's right on target.

Add a couple of you may not need the

Needless to say, the purchase of different aircraft to meet different mission requirements is, to some extent, inevitable.

A jet fighter will never double as a cargo plane.

But the number of aircraft types you need to buy in order to perform such missions as priority personnel transport, cargo transport, air ambulance service, flight inspection/calibration, pilot and systems training, remote surveillance, search and rescue and reconnaissance and mapping can, in fact, be reduced dramatically.

To one.

For example, a Canadair Challenger outfitted for cargo transport can quickly be converted into a 28-passenger people-hauler. Or a 14-passenger people-hauler with a large cargo area.

A Canadair Challenger outfitted for priority transport of V.I.P. personnel can, with the addition of two partitioned operators' consoles, easily double as a surveillance or flight inspection/calibration aircraft.

A Challenger outfitted for remote sensing and surveillance can quickly be refitted for reconnaissance and mapping.

A Challenger outfitted as an air ambulance or MED/EVAC aircraft can, with relative ease, switch to a flight inspection/calibration interior. Or an advanced pilot and systems trainer interior. Or a maritime surveillance/search and rescue interior.

All told, the variations of equipment you can move into and out of a Challenger are far too numerous to mention.

What's just as important, the Challenger gives you more AC power to run it on than any other aircraft in its class.

In fact, it's the only all-AC electrical system you'll find on any jet short of the latest commercial airliner. Unlike DC systems, AC gives you the benefits of extreme light weight in relation to power produced and far less chance of electrical failure due to low current, constant frequency and the obvious fact that there's no need for cumbersome inverters.

As for those of you who just want to get from point A to point B, you'll find the Challenger will fly you more economically and in greater comfort than any comparable jet in the world.

Overall, the Canadair Challenger averages a 22% lower rate of fuel consumption per mile than a Gulfstream III, virtually the same rate of fuel consumption per mile as the far smaller Falcon 50 and, hard as it may be to believe, a 24% lower rate of fuel consumption per mile than the small, short-range T-39.

Yet the Challenger is actually bigger than all of them in the one dimension crucial to passenger comfort and a realistic working environment width.

Measured at the floor line, both the Canadair Challenger and the bigger, even longer-range Canadair Challenger E are roughly 30% wider than the Gulfstream III, and 48% wider than the Falcon 50.

And speaking of range.

With the Challenger's big fuel tanks and extremely low rate of fuel burn, you can cross the Pacific with one stop, fly from New York to the Middle East with one stop or fly from Washington to London non-stop.

Or, getting back to multiple missions, fly a thousand miles out for, sa remote surveillance and still remain on station for four to five hours before flying back.

To find out more about the aircraft that can perform the roles of two or three or four aircraft, just call Mr. James B. Taylor, President of Canadair Inc., at 203-226-1581. Or write Canadair Inc., 274 Riverside Avenue, Westport, CT 06880.

canadair challenger

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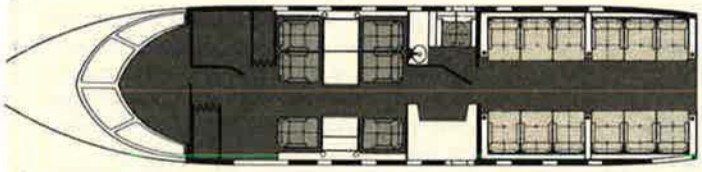
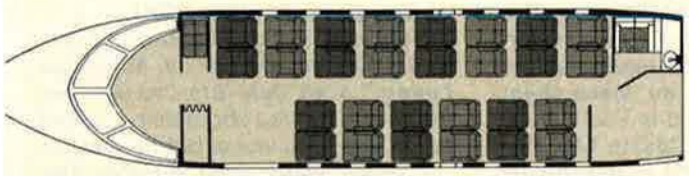
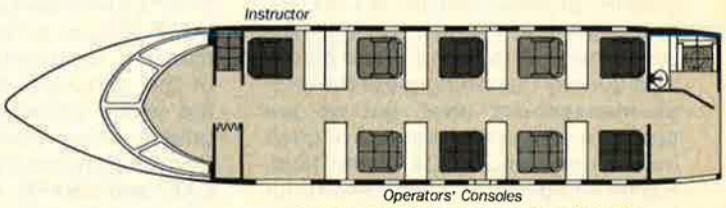


VIP Interior

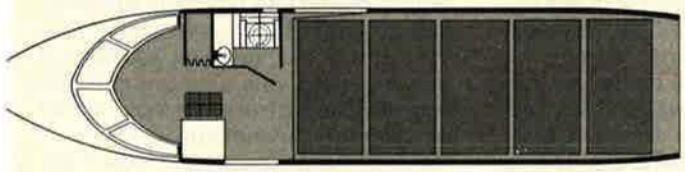
Flight Inspection/Calibration



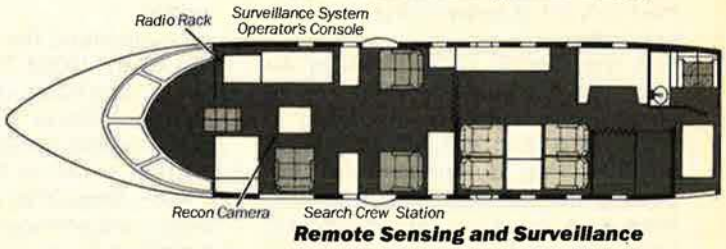
28-Passenger Interior



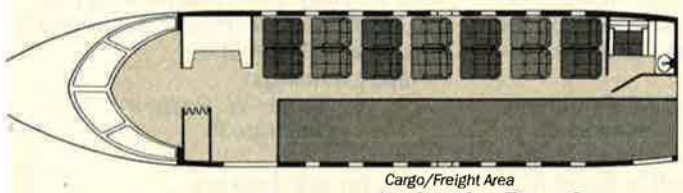
Advanced Pilot and Systems Trainer



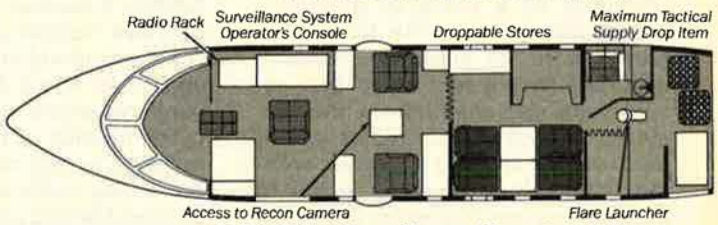
Cargo Configuration



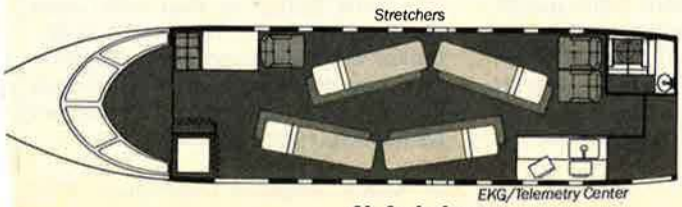
Remote Sensing and Surveillance



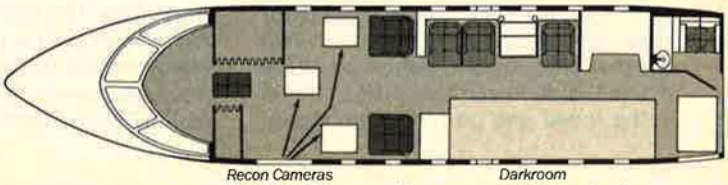
Passenger/Freight Configuration



Maritime Surveillance/Search and Rescue



Air Ambulance



Reconnaissance and Mapping

AIRMAIL

Tip of the Iceberg

As a previous commander of the 601st Tactical Control Wing and subsequently Director of C³I Plans for AFSC, I have read and reread your July issue with great interest and concern. The blue pages in the center look surprisingly like the top of my recently vacated desk at Andrews AFB.

We can all take intense pride in the tremendous technological strides we have made since the early British radars guided the squadrons of Spitfires to intercept waves of German bombers during the Battle of Britain, but I want to expand on General Stansberry's statement on the retention problem at ESD [Electronic Systems Division] concerning middle-level management in the July article "C³: Modern Warfare's Nervous System."

Retention of qualified people is our greatest problem, not just at ESD, but in the whole C³I arena. Not only are we "between a rock and a hard place" with our key technologists at the middle-management level, but we are against a wall in the retention of qualified airmen and NCOs in the field. Exotic equipment is a liability without highly skilled people to operate it in the mud, in the snow, in the dust, and in combat.

In the mobile TACS [Tactical Air Control System], exemplified by the 507th Tactical Air Control Wing at Shaw AFB and the 601st Tactical Control Wing at Sembach AB, frequently the same person disassembles and packs a million-dollar computer or a piece of advanced comm gear, drives the truck that moves it to its deployed location, hammers in the tent stake that secures the equipment from the elements, unpacks, reassembles, gets it back on the air, and prepares, without a break, for a consecutive shift of maintaining its continuous operation because he or she is the only qualified five- or seven-level available to do the job for which three manpower slots are allocated. The other two people, who would rather be there where the action is, have had to throw in the towel and go to civilian industry where they can support their families at something above the poverty level.

Until we can afford an Air Force that pays the backbone of its operation a salary that holds it long enough to train it, give it some experience, then cash in on that experience, we might as well hold most of our advanced technology at Hanscom and Wright-Pat, because when we get it out in the sun and the rain, we won't know what to do with it.

General Stansberry just exposed the tip of the iceberg.

Col. Fleetwood Pride, Jr., USAF (Ret.)
Belfast, Me.

Wanderings of the TACS

It was indeed a pleasant surprise to open my July '81 issue and find "To Command the Sky," William P. Schlitz's excellent profile of our three USAF tactical air control wings. The mission, composition, and location of the personnel and equipment in the wings certainly do make them unique. I have worked in Tactical Air Control Systems (TACSs) in TAC, PACAF, and USAFE, and found the article to be factual, thorough, and well written.

I augmented the 82d Tactical Control Flight (602d TAIRCW) as Assistant Operations Officer during the historic October 1980 deployment to Saudi Arabia, when we built and operated Forward Air Control Post (FACP) Jubail in an environment never before experienced. I served subsequently a second tour there with my own 83d Tactical Control Flight. I feel I must comment on a couple of points contained in the boxes that accompany the article.

The mission of the TACS elements in Saudi Arabia was misstated on p. 70. To say these elements are "supporting AWACS aircraft in Saudi Arabia" shows a lack of understanding of the TACS not present in the rest of the article. The mission of supporting AWACS aircraft is performed by E-3A maintenance troops. AWACS aircraft and other lateral TACS elements, such as FACP Jubail and the TSQ-91 at the Sector Command Center at Dhahran, support the Royal Saudi Air Force Air Defense Center at Riyadh.

There is no such thing as a forward air control party as stated in the box on p. 72. The correct term is Forward Air Control Post. The FACP should not be confused with the Tactical Air Control Party (TACP). The former provides full-fledged sector command and control using approximately sixty personnel. The latter provides Air Force liaison for close air support of ground forces, using four to six personnel.

Again, thanks for a great article on a great group of dedicated professionals. I am looking forward to more coverage of the eternal wanderings and journeys of the men and women of the TACS.

Capt. Daniel K. Koslov, USAF
Davis-Monthan AFB, Ariz.

Wasps Down Another Pilot!

Doggone, this guy Frisbee beat me to it *("The Cloud With the Mild Blue Lining," p. 88, July '81).* I've been intending to tell you about being forced down, not by a wasp, but by wasps.

It was a warm early summer day. The Cessna 140 had been roosting out on the grass field since early morning. The line-boy spun the prop, and off I went for what was the shortest flight of my life. Just as the bird broke ground, one after another, the wasps began streaming out of that port tincan-like ventilator.

I'm still uncertain as to how I got down so quick. I suspect I either did a Jennie Immelmann or a hammerhead. Anyway, there was no wind that day, and I did roll myself out of the door in a 180° direction.

Happy landings!

Sidney W. Raymond, M.D.
Chicago, Ill.

Praise for the Tankers

General Milton's ringing praise for the aerial tanker in your July issue was long overdue. Not only has the tanker revolutionized aerial warfare, it is now the single most important airplane in our inventory. What can be accomplished without them?

Epsilon

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SCIENCE/SCOPE

The proposed F-15E Eagle can navigate with great precision during an attack mission with help from its radar. Even while operating in other modes, the radar periodically samples ground Doppler returns in three orthogonal directions for a split second. In this fashion the radar determines the aircraft's ground velocity far more accurately than the inertial navigation system (INS) can. This information can be used to correct the INS and to help deliver weapons accurately. On long interdiction missions, the pilot can update his position by looking for checkpoints on radar maps. The Eagle's AN/APG-63 radar, developed by Hughes under contract to McDonnell Douglas Corp., can be "missioned" with high-resolution radar ground mapping capability.

Laser designators, devices used by the military to pinpoint targets for laser-homing weapons, can now be tested automatically by a new computerized system. The laser is fired into a collimator to test laser energy output, beam divergence, pulse width, and boresight. Video imagery taken through the eyepiece, along with energy output data, is fed into a computer for analysis. The system, called the Automatic Laser Inspection Measurement System (ALIMS), was designed by the U.S. Army Missile Command to support production of Army laser designators. Hughes converted the design into a working system that is faster and more accurate than performing laser quality tests manually.

The TOW antitank guided missile is being improved under a new U.S. Army program. The first step will increase the missile's armor-penetrating capability with a redesigned five-inch-diameter warhead. The second step, called TOW 2, will include a heavier six-inch warhead and a microprocessor-based digital guidance set for increased accuracy and greater flexibility in guidance programming. The TOW 2's flight motor will be reloaded with an improved propellant for a higher impulse to compensate for the added weight of the warhead and other modifications. Hughes has produced more than 275,000 TOW (Tube-launched, Optically tracked, Wire-guided) missiles for the Army, U.S. Marine Corps, and 32 nations.

Certain military laser rangefinders should soon be improved now that researchers at Hughes have pinpointed long-suspected impurities in laser rods. Using a new dye laser technique in their spectroscopic studies of Nd:YAG (neodymium-doped yttrium aluminum garnet) laser rods, scientists uncovered a subtle crystal defect that cuts the laser's efficiency and brightness. They believe it will be possible to develop a process to increase the quantum efficiency of commercial Nd:YAG lasers from about 64 percent to the theoretical maximum of 91 percent.

Deliveries of a laser tank fire control system for the U.S. Army's M60A3 main battle tank have passed the 1000 mark as production continues at a high rate of 50 per month. The Hughes-built system gives crews a significantly better chance of hitting a target on the first round of fire. The sight unit is equipped with a laser rangefinder that provides accurate and almost instantaneous target range to the system's computer. The computer processes the range, along with wind, ammunition ballistics, and other necessary data, to send azimuth and elevation firing commands to the tank turret and main gun.

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AIRMAIL

I hesitate to criticize such an excellent article, but Lts. Lowell H. Smith and John Richter refueled over San Diego six years prior to the legendary *Question Mark.*

Modesty forbids me from mentioning the name of the lieutenant who first urged the Air Force to use cargo/tankers and in-flight refueling against the Japanese in WW II. Longer range surveillance and bombing could possibly have shortened the Pacific war by months, saving thousands of lives.

The Air Force's inability to recognize the potential of tankers until the RAF paved the way is inexcusable.

William J. Spelliscy
Orange, Calif.

Streamers and a Major Activity

The large picture of the Jaguar "creating contrails" from its wingtips is similar to one in an earlier *Science News ("Flying the Jaguar," p. 46, June '81).* I believe that the fighter in your picture was really creating "streamers." At least that's what we called them in WW II when we pulled them off the wingtips of T-Bolts. They appeared usually at low altitudes, high humidity, sometimes just after liftoff, and often when sucking-it-in on steep turns. Contrails result from the condensation of water vapor in engine exhaust, usually at high altitudes.

The interesting article, "USAF's Foreign Military Training" *(p. 52, June '81),* states that "the first major activity . . . was set up in August 1952."

I was a T-6 IP at Randolph in the spring and summer of 1950 when the first postwar batch of French cadets arrived. There was quite a flap searching out folks who might be able to speak some French, and there were some interesting times after we got started. Possibly it wasn't "major activity," but we would have argued that at the time.

Maj. Allen V. Mundt,
USAF (Ret.)
Reno, Nev.

Keeping Spin-offs in Mind

I just took time to read completely your AIR FORCE Magazine for April '81. Not only were the photo essays most delightful in a sort of soft focus style, but also the article on "Tardy Approach to High-Energy Laser Weapon Development?" (p. 18) was most informative.

Of the many defense systems being considered by DoD, only high-energy lasers and the Stealth bomber seem to have commercial technology spin-off capabilities. If the real end of increased defense spending is a stronger position at the SALT table, then it seems prudent to focus the R&D capabilities of industry toward the development of "ultimate" weapons, rather than intermediate ones.

Technology coming out of the Stealth program could move carbon-epoxy technology forward to commercial aircraft. Technology coming out of high-energy lasers could move metallurgy, fusion, and solar satellites forward. If the power to operate high-energy lasers was produced in space, that power could be used for space-based electronic, metals, and biochemistry work when not needed for destruction of incoming ICBMs.

I have no idea how DoD will spend its new money, but after the CBS Special Report on the Defense of the US and the experience of high-tech vs. low-tech, I would assume that we will see some new directions. Let's hope that our friends at Rockwell, etc., see the logic of creating defense systems that augment our other needs in energy development and new low-oil consumption systems.

John T. Schnebly
President
Thermotech Corp.
Glenwood Springs, Colo.

Delivering Thanks

Reference your April '81 article "USAF's Worldwide Aircraft Deliveries" by William P. Schlitz: We here at Detachment 3, 2d Aircraft Delivery Group, Robins AFB, Ga., thank you for the factual presentation of "The Group's" mission.

To read an accurate account of our mission in a professional magazine of AIR FORCE Magazine's stature is particularly pleasing.

Lt. Col. Thomas E. Gassman,
USAF
Robins AFB, Ga.

A Stearman Is a Stearman

I think AIR FORCE Magazine is tops—just fantastic! I have just enjoyed the July '81 issue, and I'm really looking forward to the thirty-fourth anniversary issue.

I am not one to nitpick and report every minor error I see in a magazine—in fact, I let most pass; some are reported by others, some are not. This time, however, I want to zero in on the article "The Cloud With the Mild Blue Lining" (p. 88) because of an error by my favorite illustrator, Bob Stevens. Yes, I am leaving Mr. Frisbee alone; he is a superb writer, and he punished himself severely in admitting to three dumb crack-ups in the space of only three months. (I loved that article!)

Concerning the illustrations, specifically the one on p. 89: The error is a prevalent one in the illustrating business today, so Mr. Stevens is certainly not alone. Boeing has published a nice calendar and depicted the *wrong* aircraft over the caption "PT-17." To most people, a Stearman is a Stearman, especially if we are talking about the Boeing Model 75 series. It has been licensed (for civil use) with Continental, Lycoming, Jacobs, Wright, and Pratt & Whitney engines—to name most of them. So, a Stearman is a Stearman and a PT-17 is also a Stearman, but the converse is not always true! My point is this: The illustration on p. 89 is a PT-13.

I especially enjoyed the editorial "Affinities and Reunions" (p. 4). Along that line, I am interested in forming a 35th Fighter Group Association and would like to hear from alumni of that unit who share the same sentiments. If there is such an association, they stay so quiet as to be "invisible"; if there isn't, let's remedy that deficiency!

Dalmer R. Ford
P. O. Box 1828
Warner Robins, Ga. 31099

• *Thanks to Mr. Ford for his letter and the kind words, but we're not sure we can agree with him on the illustration. The PT-13 and the PT-17 were both Stearman products. The PT-13A was powered by the 220-hp Lycoming R-680-7 engine. The PT-13B had the 280-hp R-680-11. The Army purchased 225 of the PT-13Bs between 1939 and 1941. An engine change in 1940 to the Continental R-670-5 in what was otherwise the PT-13A airframe resulted in the designation PT-17. A total of 2,942 of these was produced for the Army alone, with others for the Navy and export. Of his illustration on p. 89 of our July issue, artist Bob Stevens stoutly defends its integrity as a PT-17. "Why," he says, "all you have to do is look closely at the engine block and you'll see the Continental name tag!" Bob does concede, however, that the pursuing enemy aircraft is clearly a Bee-T-13, powered by a single Pratt & Whitney Wasp.*—THE EDITORS

Recognizing the Norm

Since leaving the Air Force, I have been engaged in college teaching, and I must say the OER [Officer Effectiveness Report] and APR [Airman Per-

How to prevent traffic jams

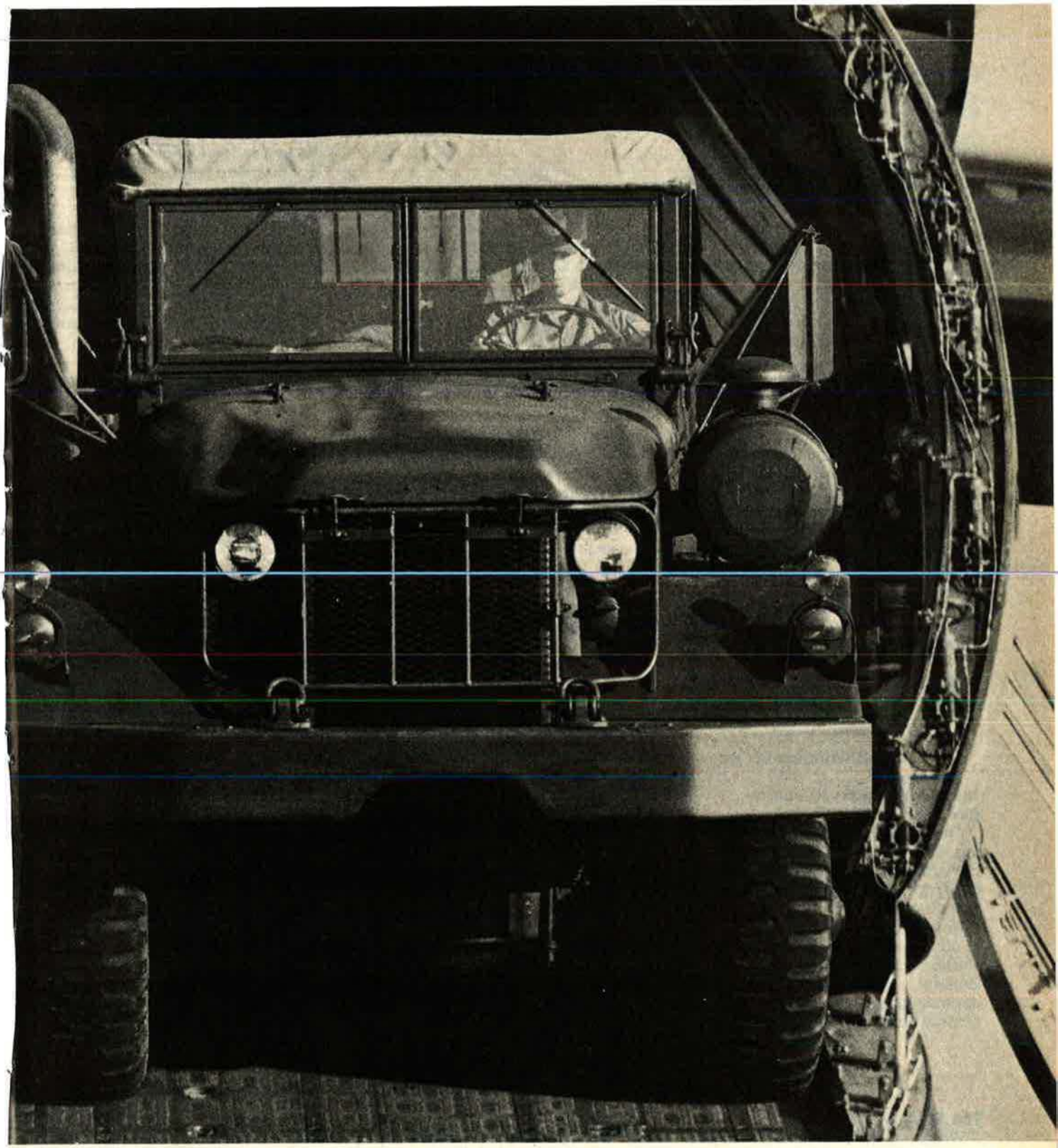
You need width in the cargo compartment, lots of it low to the ground. Width set high causes huge traffic problems.

You need wide ramps with shallow angles. Narrow ramps slow loading and unloading. Sharp ramp angles create severe loading and unloading problems.

You need cargo openings in the rear and in the front—for drive-on, drive-off, straight-through loading and unloading.

Anything less and you face traffic snarls in the airlifter and around the airlifter—and there are times when the situation simply demands the utmost speed in unloading.

Lockheed tests, confirmed in actual operations, revealed the ideal dimensions for a cargo compartment of an airlifter able to handle outsized equipment. The cargo deck should be 59 to 61 inches above ground—to permit short, low ramps. The cargo openings, fore and aft, should



in new military airlifters.

be 19 feet wide. This enables you to load two 5-ton trucks or two M113 personnel carriers side by side with safe margins. You can even drive two vehicles down the low, wide front ramp at the same time in crisis situations. As for height, you need 13.5 feet—enough to handle a bridge launcher. And the deck should be 121 feet long—enough, for example, to take two rows of four 5-ton trucks or 18 463L pallets.

When it comes to airlifters, Lockheed knows how. The engineers and skilled workers at Lockheed-Georgia have more experience, by far, in the demanding world of airlifters than anyone else.

Lockheed-Georgia

formance Report] "inflation" is almost exactly the same thing as "grade inflation" in the schools, and is susceptible to the same cure *("How Best Curb OER Inflation?" p. 95, April '81).*

The midpoint in the scale—five on a nine-point scale, C on the A through F grade scale—should be defined as "normal," and any evaluator both should, and easily could, be called on to explain a pattern of rating suggesting that the men he is judging are, as a group, very far out of the normal pattern.

There will always be some who are better than normal, and some who are very much better; for them, advancement should be accelerated. For those who are at the expected midpoint level, advancement should be at a predetermined rate, and, of course, those who are subnormal require special consideration, perhaps remedial training of some sort, or even forced separation. At any rate, advancement for such should be postponed, if not entirely precluded.

The advantage of this approach is that "normal" is, if not easy to define in words, at least generally recognizable, whereas a much higher degree of subjectivity necessarily surrounds such laudatory terms as "superior," "excellent," "very good," and the like.

Col. Arthur F. Stocker,
USAF (Ret.)
Charlottesville, Va.

Nuclear Weapons Rendered Useless?

The excellent July article "Exploiting Electronic Warfare" (p. 75) by General Larson presented an opportunity for exceptional insight of far-reaching possibilities for the future.

How ironic, fortunate, and lucky if, in our search for a new dimension in warfare such as that described by General Larson, we should coincidentally develop the means whereby nuclear weaponry would be useless.

Col. Roy W. Browne,
USAF (Ret.)
Hartville, Mo.

The Speedy A-26

We saw the first of the 13th Squadron, 3d Attack Group A-26s at Hollandia Strip. *(See "A-26: Three-Decade Aerial Workhorse," p. 92, July '81.)* As fighter pilots we were greatly impressed with the forward-firing power of the new aircraft, which as I recall amounted to something like sixteen forward-firing .50-caliber machine guns.

It sure looked like a helluva lot of airplane to us P-38 jocks of the 433d Fighter Squadron of the 475th Fighter Group, and a few days after looking

AIRMAIL

it over, Possum Squadron had the honor of escorting those first four A-26s from Hollandia to Manokwari where the A-26s blew the hell out of everything in sight.

On the way home, the CO of the 13th, quite casually, offered the following comment:

"Possum Squadron. We'll be leaving you now."

They'll be leaving us . . . a top Lockheed P-38 squadron? Like a number of other fighter pilots that day, I leaned forward in the cockpit and looked down at the A-26s to see what was going on. What was going on was the four A-26s pulling away from us at a steady speed. The 433d's CO, Maj. Warren R. Lewis, dipped the nose of his Lockheed, and we descended in a slight dive, trying to keep pace.

The A-26s were light, having expended a huge amount of ammo, fuel, and bombs, which did absolutely nothing to retard their forward motion. Lt. Joe Price began yelling that he was using fifty inches of mercury and couldn't keep up, so we leveled out and watched those A-26s head for Wakde Island before returning to Hollandia.

They left us.

A few days later I had the chance to sit in the cockpit of the A-26, and it was easy to see why the pilots of the 3d Attack were protesting. It was blind as a bat out the sides. Somebody standing on the ground with a slingshot could have hit them, and they'd never have known it.

It sure could go, though.

Carroll R. Anderson
Tracy, Calif.

Reactivate the B-58?

I would like to second Col. Harry P. Wilson's proposal in the June issue (p. 9) to reactivate and refurbish the B-58As sitting in the boneyard at Davis-Monthan AFB, Ariz. At last, someone who has some sense. The Hustler was always a good performer. Why it was deactivated, God knows. If the taxpayers bought them, they should get their money's worth out of them. It seems to me that if we

UNIT REUNIONS

AACS
Airways and Air Communications Service (AAF-USAF) alumni will hold a reunion on October 15–18, 1981, at the Doubletree Inn, in Tucson, Ariz. Reservation deadline is September 15. **Contact:** Everet O. Wogstad, P. O. Box 35215, Tucson, Ariz. 85740.

East Coast Fighter Pilots
The East Coast Fighter Pilots will meet on September 18, 1981, in Arlington, Va., at the Best Western Motel. **Contact:** "Doc" Broadway, phone: (703) 938-4047; or Col. Paul Brown, phone: (202) 697-8901.

Roswell Army Air Field
The Walker AFB Veterans Association reunion will be held on September 25–27 1981, at the Roswell Inn, Roswell, N. M. **Contact:** RAAF Veterans Association, P. O. Box 1023, Roswell, N. M. 88201.

3d Air Commando Group
The 3d Air Commando Group (serving in the Pacific) during WW II will hold its second annual reunion on October 9–12, 1981, at Hurlburt Field, Fla. **Contact:** Col. D. W. Maggert, 219 Yacht Club Dr., Fort Walton Beach, Fla. 32548. Phone: (904) 243-4648.

8th Photographic Recon Sqdn.
The annual reunion for the 8th Photographic Recon Squadron will be held on October 2–4, 1981, in Denver, Colo. **Contact:** Ernie "Barney" Ross, 9629 Yukon Ct., Broomfield, Colo. 80020. Phone: (303) 422-4242.

18th Weather Sqdn.
The 18th Weather Squadron, based in England during WW II, will rendezvous with the 8th Air Force Historical Society on October 15–18, 1981, in St. Paul, Minn. **Contact:** Arthur W. Gulliver, 5119 S. 81st St., Omaha, Neb. 68127.

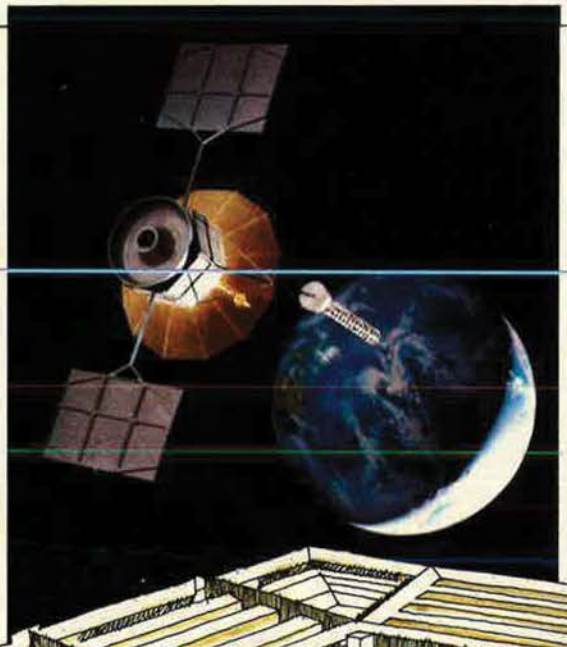
USAF Academy Class '61
The Class of 1961 will hold its twentieth reunion on September 17–20, 1981, at the US Air Force Academy, Colo. **Contact:** Lt. Col. Earle Saunders, DFSOG, USAFA, Colo. 80840.

64th Troop Carrier Group
The 64th Troop Carrier Group plans to hold its reunion on October 30–31, 1981, in San Francisco, Calif. **Contact:** Roger Coleson, Box 205G, Nanjemoy, Md. 20662.

98th Bomb Group (H)
The 98th Bomb Group "Pyramidiers" reunion will be held on October 6–8, 1981, in Albany, N. Y. **Contact:** Corey Orne, Box 553, Lake Pleasant, N. Y. 12108.

320th Bomb Group
The 320th Bomb Group will hold its reunion on September 8–12, 1981, in Sacramento, Calif., at the Red Lion Motor Inn. **Contact:** Stu Rowan, 108 Aspen, Hereford, Tex. 79045.

Instant Tactical Communications Anywhere



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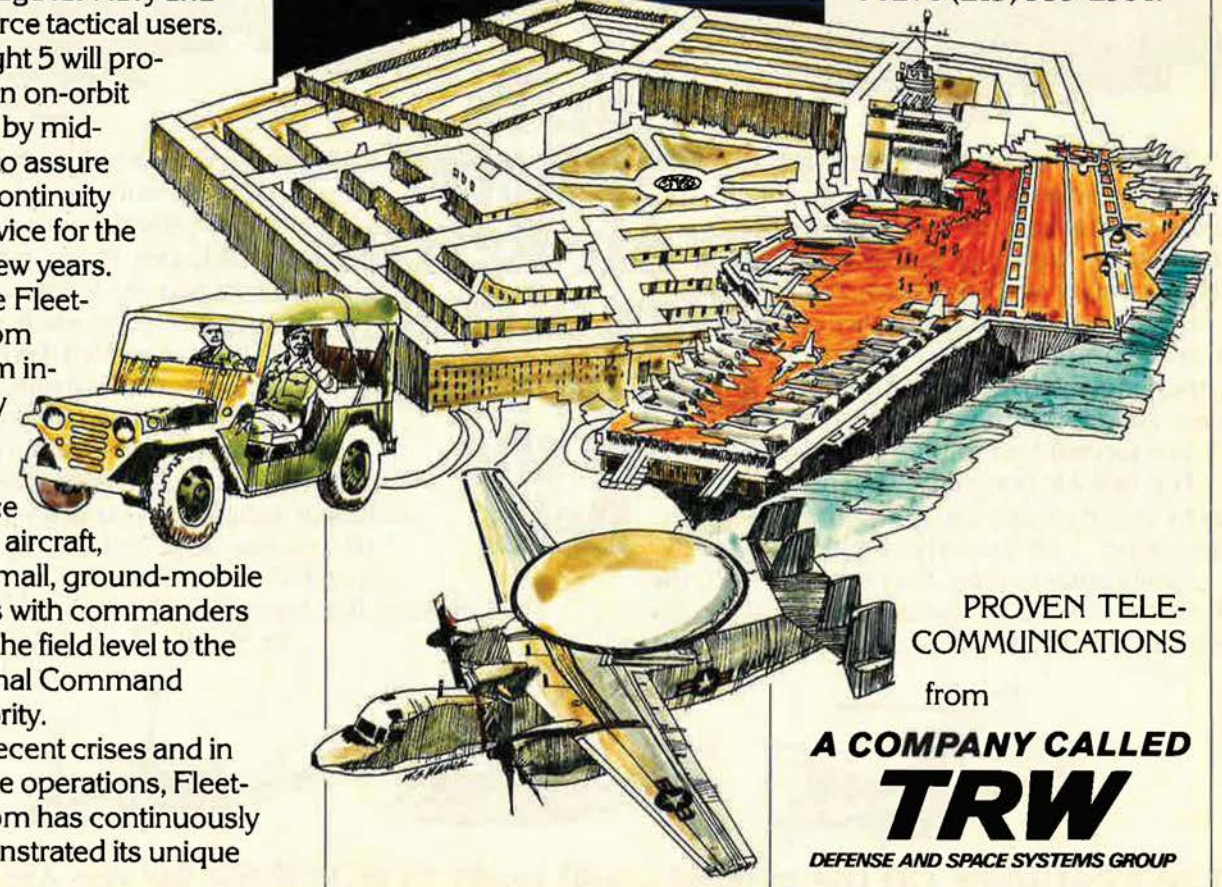
W.A. Kuipers,
TRW Systems,
One Space Park,
Redondo Beach, CA
90278 (213) 535-2591.



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Division of Textron Inc.

Bell's TiltRotor for Air Rescue. More airmen can be saved by the Bell!

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The proven Bell TiltRotor—it's a reality that is flying. And now is the time to plan for tomorrow's Combat Rescue, special operations and other important Air Force missions. For additional information on Bell's TiltRotor—what it *has* done and what it *will* do—contact Vice President, U.S. Government Marketing, Bell Helicopter Textron, P.O. Box 482, Ft. Worth, Texas 76101.

Bell's TiltRotor. Off the ground...and ready to go full tilt for the Air Force.

could transform the B-52 into a low-altitude penetration bomber we should be (and should have been) able to do the same to the B-58. Colonel Wilson made some excellent points.

Do not misunderstand me, I would very much like to have fully equipped wings of B-1s, but keeping the B-58As on the back burner would only be a prudent move, just in case.

Wesley T. Calderwood
Wantagh, N. Y.

Name That Mustang

Being somewhat of a Mustang fanatic, I was captivated by the background photograph used to advertise the upcoming September '81 issue of AIR FORCE Magazine *(June '81, p. 96).*

Upon initial examination, the photograph can be dated by the addition of the deflector plate behind the propeller spinner. These were installed during the postwar years to keep the oil thrown by the Hamilton-Standard propellers off the windshield.

Then, there is the individual with the flamboyant mustache removing the exhaust plugs and intake covers. Surely not Regular Air Force, so he must be attached to the Air National Guard, whose dress codes were more relaxed in that era. Yet even closer examination shows that these Mustangs are neither USAF or ANG, they are South African.

Deduction: the location of the photograph is Chinhae (K-10), South Korea, where the dust was so thick the flightline was usually IFR. The F-51s and the mechanic belong to No. 2 Squadron, South African Air Force, attached to USAF's 18th Fighter-Bomber Wing.

The background Mustang is SAAF #336, which was originally 44-72983. This aircraft departed Seoul AB (K-16), on a combat mission on July 26, 1951. Crossing the battle line northbound, the engine overheated and the pilot, Lt. J. G. F. Howe, was forced to bail out. He was rescued, uninjured, by UN forces and returned to K-16, the squadron's staging base.

I am researching the role of the F-51 Mustang and the history of the units that flew this aircraft during the Korean War. I would be interested in hearing from anyone connected with USAF's 8th, 18th, and 35th Fighter Wings; the 6146th Air Base Unit, ROK Air Force; No. 2 Squadron, SAAF; and No. 77 Squadron, Royal Australian Air Force. Any material borrowed will be carefully handled and returned.

David R. McLaren
2055 Sapphire Lane
Aurora, Ill. 60506

• *The amazed staff deduces that Mr. McLaren is either a psychic or has been riffling through our files when we weren't looking. Perhaps he was there, or has a copy of the photo. At any rate,* his *deductions are right on target.*—THE EDITORS

AIRMAIL

Mission and Victory Markings

I am in the process of researching a book on mission and victory markings applied to aircraft of all nations and all wars, as well as any used in peacetime, such as those on the mother ships that carry research aircraft aloft.

I've read that the U-2s used in Vietnam used a snake symbol to indicate overflights of North Vietnam, and I'm most anxious to obtain a photo showing this marking, or a good drawing of it.

Naturally, the more unusual mission and/or kill markings I can gather, the more interesting the book will be in the final run. Many variations of the simple outline of a bomb for a bomber mission and an enemy flag for a kill over an enemy aircraft were used. I am especially interested in obtaining more coverage on both Korea and Vietnam than I have at the moment, but anything from World War II will also be most welcome.

Another project that I am assisting a good friend with is what happened to the thirteen pairs of floats that were built for the C-47 conversion to an amphibian during WW II. Although some sources state that only one C-47 was actually modified to accept the floats and was flown with them, we believe that at least three different C-47s eventually had them fitted. They were built by the EDO Co., and we would appreciate hearing from anyone connected with the project who can shed any light on other C-47s so equipped, or tell us what eventually happened to the thirteen sets of floats.

Ernest R. McDowell
1922 West Berenice Ave.
Chicago, Ill. 60613

Keeping the Records Straight

I wish to correct any misrepresentation concerning the Simpson Center's Individual Aircraft Record Collection that may have unintentionally arisen from correspondence in your July issue (p. 13).

The Individual Aircraft Record Collection, covering more than sixty years, was for much of its life a working office file. As such, it was subject to the usual operational use that accompanies any healthy administrative growth. When bequeathed to the Simpson Center, the Individual Aircraft Record Collection had suffered the ravages that attend heavy use. Such ravages occasionally include meager information about certain individual aircraft.

However, the implication that records "have disappeared from the Simpson Center" imputes a totally unwarranted negligence. If the aircraft records arrived, we have them and can supply the data you request.

Dr. Richard E. Morse
Chief, Reference Division
Albert F. Simpson Historical Research Center
Maxwell AFB, Ala.

B-24 *Myasis Dragon*

I am in the process of building a one inch:one foot scale model of a B-24J. It will be radio controlled and entered in various competitions, including the National Championships conducted by the Academy of Model Aeronautics.

Why a B-24? I was an engineer and top turret gunner in WW II with the 404th Bomb Squadron, 28th Bomb Group, Eleventh Air Force, at Shemya in the Aleutian Islands.

In our squadron was a particular airplane—a real hangar queen. She never completed a mission. She was on the ground so much that the squadron painters had a ball with her (wasn't much else to do in the Aleutians). So they went to work, and the result was the prettiest B-24 ever seen. The nose turret was a nose, the navigator's windows were eyes, the bom-

AIRMAIL

bardier's window was part of a mouth, and scales were painted right to the edge of the forward bomb bay doors. They also named it *Myasis Dragon,* which was very appropriate.

The colors and markings of the above B-24 are what I would like to apply to my model. I need photos and any documentation of serial number, etc., that I can obtain. I need also to know the manufacturer—Convair, Ford, Douglas, or North American. Anything anyone can send me, I will copy and return.

I hope the model flies better than the original. Still, it was a pretty airplane.

MSgt. W. J. Hickman,
USAF (Ret.)
304 Mildred Dr. E.
Fort Worth, Tex. 76126

CCC in WW II

Before and after WW II, the US Air Forces had a ready reservoir of manpower coming out of Civilian Conservation Camps scattered throughout the nation. Some 4,000,000 served in the Corps during the period 1933–43, and most of them were ready for immediate military service, and served with distinction.

We would like to hear from anyone involved with the CCC camps to tell us about their CCC camp experiences and service during WW II. We would especially like to know if experience in CCC camps was a contributing factor to any success in the military service. Photographs and memorabilia, as a supplement to a response, will be welcomed.

The CCC lives again in the National Association of Civilian Conservation Corps Alumni (NACCCA). The Illinois Chapter will have its second statewide reunion of CCC alumni on September 26, 1981, and the National Association will have its second national convention in Kansas City, Mo., on September 8–11, 1981.

Hopefully, we will have a good report about the CCC boys' part in World War II.

Lt. Col. Andy M. Kmetz,
USAF (Ret.)
1715 W. Haven Dr.
Champaign, Ill. 61820

Sergeant Harris

I would appreciate any information concerning the World War II exploits of gunner TSgt. Arizona Harris.

While assigned to the Flying Fortress *Son of Fury* with the 306th Bomb Group, Eighth Air Force, he was posthumously awarded the Distinguished Service Cross. Sergeant Harris manned the top turret position on the January 3, 1943, mission to St. Nazaire. The aircraft was damaged and was ditched by the pilot, Lt. Charles Cranmer.

As the icy Channel waters began to claim the Fortress, FW-190s began to strafe the stricken ship as the remaining crew members began their hurried exit. Sergeant Harris returned fire from the top turret. The gun's chatter did not cease until the turret itself was completely submerged, carrying Sergeant Harris to his death.

All information received will be reviewed for a forthcoming article, and returned upon request.

Frank S. Carelli, Jr.
7908 Farnsworth St.
Philadelphia, Pa. 19152

Gun Barrel at Zaragoza

Hanging in the Officers' Club at Zaragoza AB, Spain, is a 20-mm gun barrel. It is chromed and mounted on a nicely finished wood display board. One can detect that there was some sort of plaque mounted on the wood, but the plaque is missing.

We believe that the display was presented to the base, or to a unit assigned here, prior to 1973. Can anyone fill us in on the history of the display?

If you know the story behind it, please drop us a line at the following address.

Maj. David Campbell, USAF
406th TFTW/DOA
APO New York 09286

P-47 Pilot Sylvan Feld

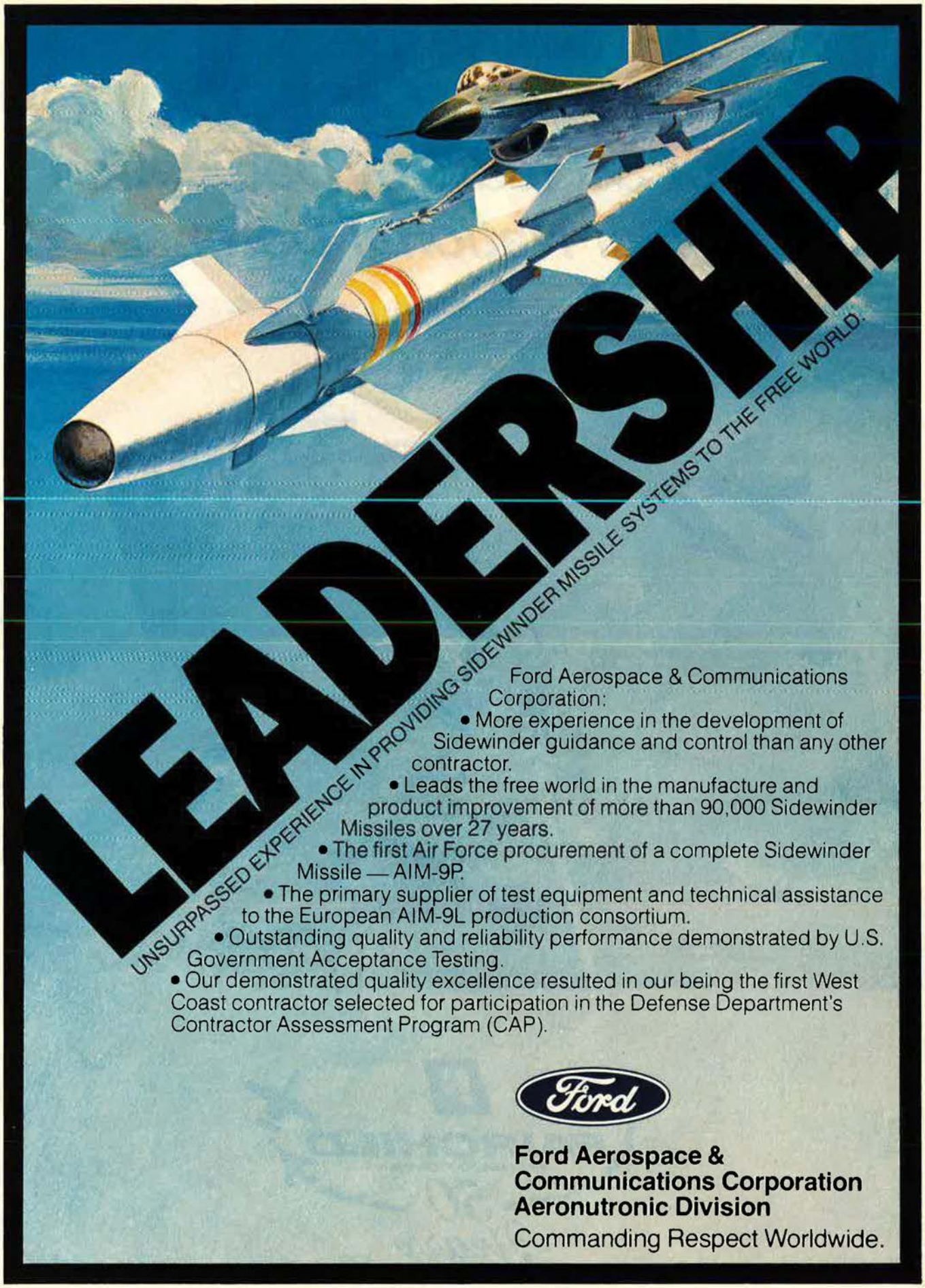
I hope to write a thumbnail history of Sylvan Feld, who was killed in 1944 while flying against the enemy in a P-47 with the 373d Fighter Group, Hq. Section.

Mr. Feld had been the highest scoring USAAF Spitfire fighter pilot with the 52d Fighter Group, 4th Fighter Squadron, prior to joining the 373d. Anyone who remembers Sylvan Feld can help reconstruct his history by writing to me at the address below.

Paul A. Ludwig
P. O. Box 9844
Queen Anne Hill
Seattle, Wash. 98109

F-86 Special Projects in Korea

Wanted: photos, color slides, and information on F-86 Sabre special projects in the Korean War.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AIRMAIL

I would like to hear from anyone in the 4th Fighter-Interceptor Wing who was connected with Project GUNVAL (20-mm cannon-armed F-86Fs), the rocket-assisted 4th FIW F-86Fs (the rockets were used to fight MiGs, not for takeoff), and the olive drab F-86As flown by 4th FIW pilots in 1951.

I would also like to hear from anyone with photos, color slides, and information on Project ASHTRAY RF-86As flown by the 15th Tactical Recon Squadron.

This information is to be used for my next book for Squadron/Signal Publications, titled *Airwar Over Korea*. Please contact me at the address below.

Larry Davis
Squadron/Signal Publications
4409 12th St., S.W.
Canton, Ohio 44710

AFROTC Detachment 670

The AFROTC Cadet Group of Detachment 670 is proud to announce its thirty-fifth anniversary celebration at Oklahoma State University on September 26, 1981.

The Cadet Corps has scheduled a full day of activities, including an F-4 four-ship flyover, a cadet drill team performance, a prominent guest speaker, a pot-luck lunch before the OSU-San Diego State football game, a campus-wide dance that evening, and many more open house activities. All are invited to join in the celebration.

For more information, write the address below.

Thirty-fifth Anniversary
AFROTC Detachment 670
Oklahoma State University
Stillwater, Okla. 74078

B-25 *Portland Rose*

In support of detailed historical research that our museum is currently conducting, we are seeking veterans of the 390th Bomb Squadron, 42d Bomb Group, Thirteenth Air Force, who have photographs or knowledge of a B-25 aircraft assigned to that squadron named *Portland Rose*, or members of her flight/ground support crew.

We have learned, thus far, that one of the assigned gunners was a Sgt. Edward W. Mahike.

Any assistance aiding our research will be deeply appreciated.

Capt. Terrill M. Aitken, OreANG
Military Museum and Resource Center
Camp Withycombe
Clackamas, Ore. 97015

Collectors' Corner

I would like to buy or trade USAF squadron (wing, etc.) patches for all active and inactive units—so check your old utilities and flight suits.

I also collect USAF wings and other USAAF memorabilia. State cost and condition and include your phone number.

John Miller
16035 8th Ave. N.
Plymouth, Minn. 55447

I am interested in obtaining information, booklets, and histories on famous planes such as the F-4 Phantom, F100, F-15, F-16, Thunderbirds, B-52, etc.

I would also like to receive USAF insignia.

Wilson Novo
Calle El Sol
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Casa #13 Tienda "Yolanda"
Santo Domingo,
Dominican Republic

Home, Sv

eet Home, for the AV-8B.

It is a fact that tactics in wartime will increasingly be to immobilize air bases, and in one fell swoop to eliminate the enemy's capacity to retaliate.

Because when you wreck a runway, you virtually disable a nation's tactical, conventional airplanes. If they're on the ground, they can't get off. If they're in the air, they can't get home.

The vertical/short take-off AV-8B, however, is no conventional airplane. It is powered by a Rolls-Royce Pegasus vectored-thrust engine. And has a higher survival rate than most. It can take off quickly, and land on a space just 75 feet square. It can operate from a flight deck, a road, a grassy field . . . and a bombed-out air base.

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IN FOCUS...

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

Washington, D. C., July 29

MX to Take to the Air?

Operating in lofty isolation from the Air Force and the Joint Chiefs of Staff, the Defense Department's civilian leadership in mid-July decided tentatively to confine deployment of MX to an air-launched mode.

This new approach is initially to involve deployment of 100 MX ICBMs on a like number of C-5 aircraft; later on "Big Bird," a specialized diesel-powered, propeller-driven large aircraft employing advanced technologies to achieve unrefueled loiter in excess of sixty hours, might take over from the C-5.

The MX-launching aircraft would loiter over ocean areas off the US coasts during periods of crisis. In peacetime, the aircraft would be dispersed, with probably four aircraft assigned to one base. One or two of the aircraft would be sitting on the runway with the crews aboard, ready to take off in case of warning of an impending attack, presumably by Soviet SLBMs. In case of such an attack, the aircraft not on alert probably would be lost.

There are indications that the air-launched MX plan drew heated, strong opposition from influential defense scientists and congressional experts. This circumstance as well as the Administration's desire to keep Congress focused on the pending tax bill appears to be responsible for the decision to delay until after Congress reconvenes in September any announcement of what actions, if any, are to be taken on MX.

What's more, the delay on MX probably will affect announcement of what steps the Administration plans to take on the multirole strategic bomber program since there is evidence that both decisions will be presented to Congress as a package.

Impetus for the air-launched MX concept comes from a special blue-ribbon panel headed by the University of California's Nobel Prize-winning physicist Charles Townes—which Secretary of Defense Caspar Weinberger convened earlier this year to review various basing modes and to make specific recommendations. So far, the panel has not been able to reach a consensus on any one basing mode other than to express a degree of preference for air-launched approaches.

Even though the panel turned in what was meant to be a final report, Secretary Weinberger asked the group to reconvene late in July and attempt to hammer out a clear-cut recommendation. According to some sources, the panel, in its reincarnated state, is to broaden its scope and look at the MX recommendation in the context of comprehensive strategic force modernization, including the multirole strategic bomber question.

It is ironic that to date the Air Force has neither been asked to study the air-launched approach nor been informed of the blue-ribbon panel's findings. The Defense Department also continues to strongly discourage the uniformed Air Force from presenting its views on the MX as well as on the multirole bomber program to outsiders. Congressional sources who are aware of this "gag rule" and of the Defense Department's disinclination to communicate with and consult the Air Force on its two principal strategic weapons programs are perplexed; upon taking office, the Reagan Administration vowed that whenever possible it would leave programmatic decisions up to the military professionals of the individual services. To date, the "music" that is being orchestrated by the Defense Department's civilian leadership does not seem to match the Administration's words.

From a political point of view, the air-launched MX concept undeniably offers several advantages. For one, such a stratagem eliminates the socio-economic and environmental concerns of influential politicians in Utah and Nevada, where the multiple shelters of the proposed MX/MPS would be located. Also, only a modicum of healthy cynicism is required to recognize that a major budgetary "plus" goes with air-launching MX; since neither the C-5 nor "Big Bird" concepts are anywhere near ready for deployment, very little "up-front money" needs to be committed to such schemes.

Concomitantly, the Administration could thus allocate funds "saved" from the "ready-to-go" MX/MPS approach to its most costly long-term defense goal, building up to a 600-ship Navy. Some congressional analysts suggest further that, because of technological and operational flaws and difficulties, the air-launched approach eventually might fall of its own weight, thereby freeing yet more defense funds for the Naval buildup or other purposes.

It should be noted that Air Force Secretary Verne Orr was quoted by both the New York *Times* and the Baltimore *Sun* as being critical of the air-launched MX approach. Secretary Orr, who according to the New York *Times* account confirmed that the Air Force had not been taking part in reviewing recent basing mode questions concerning MX, allegedly said at a press luncheon that the concept was based largely on untried technology and that it tended to erode the land-based ICBM component of the strategic triad. He was quoted as saying that there is not a great deal of difference, presumably in terms of contribution to nuclear deterrence, between air-launched ICBMs and air-launched cruise missiles.

This line of reasoning can be taken a step further. The survivability of "Big Bird," a large, slow aircraft designed to operate at a speed of about 100 miles per hour at an altitude of about 5,000 feet, is significantly below that of a B-1, whose quick engine start and rapid fly-out features boost vastly its chances of getting out of harm's way. Conversely, "Big Bird's" survival dictates that either some of the aircraft be airborne all of the time or that, at the very least, a portion of the force sit on the runways, engines running and with the crews aboard. Either way, severe hardships would be imposed on the crews that could induce personnel problems similar to those encountered by the Navy's nuclear submarine force.

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flawed for another reason: Without complex and futuristic external guidance assistance, it lacks the accuracy to destroy hardened counterforce targets, such as Soviet ICBM silos and command centers. Yet, that ability is the quintessential reason why MX is needed. Without this capability—that in a timely manner can be furnished only by ICBMs in the foreseeable future—the US strategic deterrent would revert to the atavistic MAD (mutual assured destruction, *i.e.*, indiscriminate "city-busting" posture) and hence cease to be credible and effective.

There is, of course, the possibility of linkage with the GPS Navstar system to provide an air-launched ICBM with the accuracy needed for hard-target kill. That system involves a constellation of position-fixing satellites that enable users on the ground and in the air to "navigate" with high accuracy. But there are two problems. GPS seems to be moribund because Congress so far this year has not funded the program. More important, GPS can't be relied upon in case of nuclear war because of its basic vulnerability to various forms of interference or destruction.

The only viable solution, therefore, appears to be an "inverted" or ground-based GPS system that uses hardened, proliferated "beacons" on the ground to provide ICBMs in flight with highly accurate position-fixing information. Since such a system, at least in theory, creates hordes of new US targets for Soviet nuclear weapons, its political burdens could rival those of MX/MPS.

For these and other reasons the Air Force has reaffirmed its commitment to MX/MPS, but without prejudice to follow-on systems that could be brought into the inventory in the 1990s or later. Also not ruled out is the possibility of starting MX/MPS with a lesser number of shelters and missiles than the notional baseline of 4,600 of the former and 200 of the latter requested by the Air Force.

While at this writing the enigmatic attitude of the Defense Department toward MX makes futile any forecasts about the fate of the program, there is one certainty: The continued delay beyond the congressionally mandated go-ahead date of March of this year will drive up the cost of the system—in whatever form it eventually might be deployed—and widen the "window of vulnerability" during which the Soviet Union enjoys a clear-cut strategic nuclear advantage over the US.

Holding both the MX and multirole strategic bomber programs in limbo

IN FOCUS...

also creates a fundamental problem in Congress's work on the FY '82 Defense Budget scheduled to go into effect on October 1, 1981. With the two principal strategic weapons programs neither defined by the Administration nor approved by Congress in a specific form, there is added impetus for both houses, and especially their Appropriations Committees, not to complete the appropriations process until the new fiscal year is well under way.

In the view of some experts, Congress won't pass the appropriations bill until December this year for this and other reasons. The consequence will presumably be a so-called continuing resolution, a device to keep defense spending at last year's level for as long as is necessary. It also means no "new starts," with the result that both programs are likely to be delayed until early next year.

A further, potentially fatal complication could arise also if the Administration opts for an air-launched MX: Congress is apt to reject this approach in the view of congressional defense experts. There appears to be widespread opposition to this concept on grounds that it is not operationally sound. Earlier this year, Congress specifically allowed itself sixty days from the day the Administration presents its MX program to reject it if both houses vote against whatever basing mode is proposed.

The B-1V Resurrected?

Congressional Republican leaders meeting formally with President Ronald Reagan and his key defense advisors early in July appear to have caused the Administration to reconsider its plan to confine the multirole strategic bomber program to the development and deployment of advanced technology bombers (ATBs), or "Stealth" designs. Several of the influential Republican lawmakers expounded the importance of a "near-term" solution, meaning in effect a B-1 variant along with development of the Stealth technology at a prudent pace. Prior to this White House meeting, the Administration had signaled to Congress that only ATBs were to be built.

The Air Force, as reported in this space previously, recommended to the Secretary of Defense that production of the B-1V should get under way at once. At the same time, work should be started to develop ATB test articles and to evaluate them under realistic conditions.

One of the country's most prestigious defense scientists, Dr. Edward Teller, meanwhile, cautioned against exclusive reliance on ATBs, asserting that in his view there exists a specific technological option—the nature of which he declined to divulge for security reasons—for negating the Stealth bomber. He told this column: "I wish that more thought and consideration be given to countermeasures to" Stealth technology.

The Need for Better Attack Assessment

Influential elements of the Administration, in the Pentagon and elsewhere, are becoming increasingly concerned about this country's inability to assess and categorize, in a timely way, the nature and scope of nuclear attacks on the US. Even though the present generation of early warning—also known as the DSP, or defense support program—satellites can detect individual Soviet ballistic missile launches relatively rapidly, the system lacks the ability of informing US decision-makers about the type of targets against which an attack is being mounted.

Yet, there is a critical need, for instance, to know within two or three minutes after launch that an impending attack might involve ICBM fields and bomber bases and to have high confidence that the information is sufficiently reliable to justify appropriate responses. DSP, at this time, is confined to providing information in support of a mutual assured destruction (MAD) posture, meaning simply a broad assessment of the number of Soviet ballistic missiles being launched.

Steps can be taken, however, to "program" the system to differentiate between an all-out attack and one confined to counterforce targets even before the DSP upgrade program—involving more sensors of an advanced type than currently deployed—makes available a new generation of early warning satellites.

The same kind of "programming," or algorithms, applied to the upgraded DSP would provide for yet greater differentiation of various attacks, boost the confidence levels of the assessment, and speed up the entire process. This issue, along with a range of other command and control problems, is being considered by a recently convened high-level Defense Department steering group

probing strategic "connectivity." In the sense of this examination, "connectivity" means the resilience of strategic command control communications and intelligence (C^3I) required to reconstitute itself following a series of nuclear strikes against the US. The feasibility of such enduring command and control capabilities is not yet clearly understood and at best contingent on significant technological advance.

Toward a Global Strategy?

Despite its superpower status, the US has chronically failed to formulate a truly global strategy, the Chairman of the Joint Chiefs of Staff, Gen. David C. Jones, told this column: "Even in World War II we lacked a cohesive strategy; we had a European and a Pacific strategy. Yet this was the closest we ever came to having a global strategy. After World War II, we formed in the Strategic Air Command a global strategy in terms of intercontinental nuclear forces, but other than that we handled the world on a regional basis."

The US fought the Korean and Vietnamese Wars largely by drawing down its forces elsewhere in the world and without benefit of a global strategy. "We could get by with that because we had strategic superiority and the Soviets at that time lacked appreciable power projection capabilities. But we no longer can afford to rob Peter to pay Paul. We simply can't afford to pull capabilities from one area to cope with problems in another without running unacceptable risks," according to General Jones.

The Joint Chiefs have been expressing concern in recent years over what they term a mismatch between announced national objectives and available forces. Compounding the problem, he said, is the likelihood that in this decade crises and conflicts will occur simultaneously in various parts of the world. "We will have to pay greater attention to how our action in one place will affect the situation in others," he said.

Integrating diverse policies—be they military, diplomatic, economic, or technological—into a cohesive and consistent global strategy is not achieved easily by a polycentric society, General Jones acknowledged. But progress is being made: "We have set up an interagency mechanism. In our interagency group we have launched discussions on how to formulate a cohesive strategy. There have been meetings by the National Security Council that dealt with some of the key issues, and I believe there will be more such meetings with the President."

IN FOCUS...

Washington Observations

★ Alleged Soviet "backwardness" in aeronautical avionics isn't what it is cracked up to be: The radar of the MiG-25, for instance, can spot an F-15 from sixty miles farther away than the F-15 can "see" the Soviet plane, according to Gen. W. L. Creech, Commander of the Tactical Air Command.

★ The Defense Advanced Research Projects Agency's great expectations in connection with its so-called blue-green laser system for communicating with submerged strategic submarines received a jolt when Navy analysts discovered that the proposed scheme might give away the location of the submarines in a more tell-tale fashion than the currently used "trailing wire" approach.

The Navy's ballistic-missile-launching submarines, or SSBNs, need to come close to the surface and deploy a trailing antenna wire in order to communicate. While doing so, they could be detected and attacked by an alert enemy. The blue-green laser that can penetrate both clouds and water would correct that circumstance.

Yet at the same time, the large laser mirror in space that reflects the laser communication to individual submarines could be monitored by Soviet space systems, which then could calculate the location of the SSBNs. While the blue-green laser could be used in a way that deceives Soviet sensors—by pointing at and sending bogus signals to points where the US submarines are not—there is considerable concern among naval experts that such ruses would be discovered by the Soviets.

★ Although the fate of the MX program is uncertain, the Defense Department, nevertheless, is moving toward development of a special warhead for the new ICBM. Air Force experts, for several reasons, are less than enthusiastic about the advanced large ballistic reentry vehicle for MX. The new warhead would drive up the cost of the MX yet reduce the number of warheads that the missile can carry.

The principal reason why the Defense Department favors the new design is that it would use less special nuclear material (SNM—various fissile elements required to initiate nuclear detonations, which are in short supply) than the Mk 12A, which is the Air Force's choice for the MX's warhead. The Mk 12A, or W78, warhead being retrofitted to Minuteman III ICBMs has a nominal or assumed yield of 330 kilotons. (The yield of nuclear weapons is somewhat unpredictable and can vary between half to twice the nominal yield.)

The new warhead, although originally designed to yield about 500 kilotons, is being scaled back to a yield slightly less than that of Mk 12A to conserve scarce SNM resources. As a result, the new warhead will weigh more yet produce less yield than the Mk 12A. Additionally, because of this country's hypercautious adherence to the 150-kiloton limit of the threshold test ban, the new warhead—which includes new as well as proven stages—can't be wrung out in underground testing.

★ A recent congressional report referred to "technical difficulties" involving the W80 warhead of the air-launched cruise missile (ALCM). Reportedly, these difficulties cause the weapon to fail under certain simulated "operational" conditions that appear to be well within the range of what the warhead would be exposed to under realistic wartime conditions.

★ One irony of the current Five-Year Defense Plan is that it slights one of the strategic programs that could prove paramount in the current "window of vulnerability," meaning the increasing susceptibility of the silo-based ICBM force to a Soviet first strike, compounded by the absence of a modern strategic bomber in the US inventory.

During that period, an inordinately heavy burden is being placed on the SLBM force in terms of providing credible strategic deterrence. Yet ABRES, the Advanced Ballistic Reentry System program designed to develop maneuvering warheads that can elude Soviet ballistic missile defense (BMD) systems, is being throttled back at a steep rate over the next few years.

Should the Soviets decide to actually deploy the advanced BMD systems under development, the deterrent capabilities of the US Navy's SLBMs could be reduced significantly. (SLBMs use MIRVs that approach their targets at lower speeds than ICBMs and thus are easier to intercept.) Equipping SLBMs with MaRVs (maneuvering reentry vehicles) of the type ABRES was to develop would enable these weapons to cope with advanced Soviet BMD systems. ■

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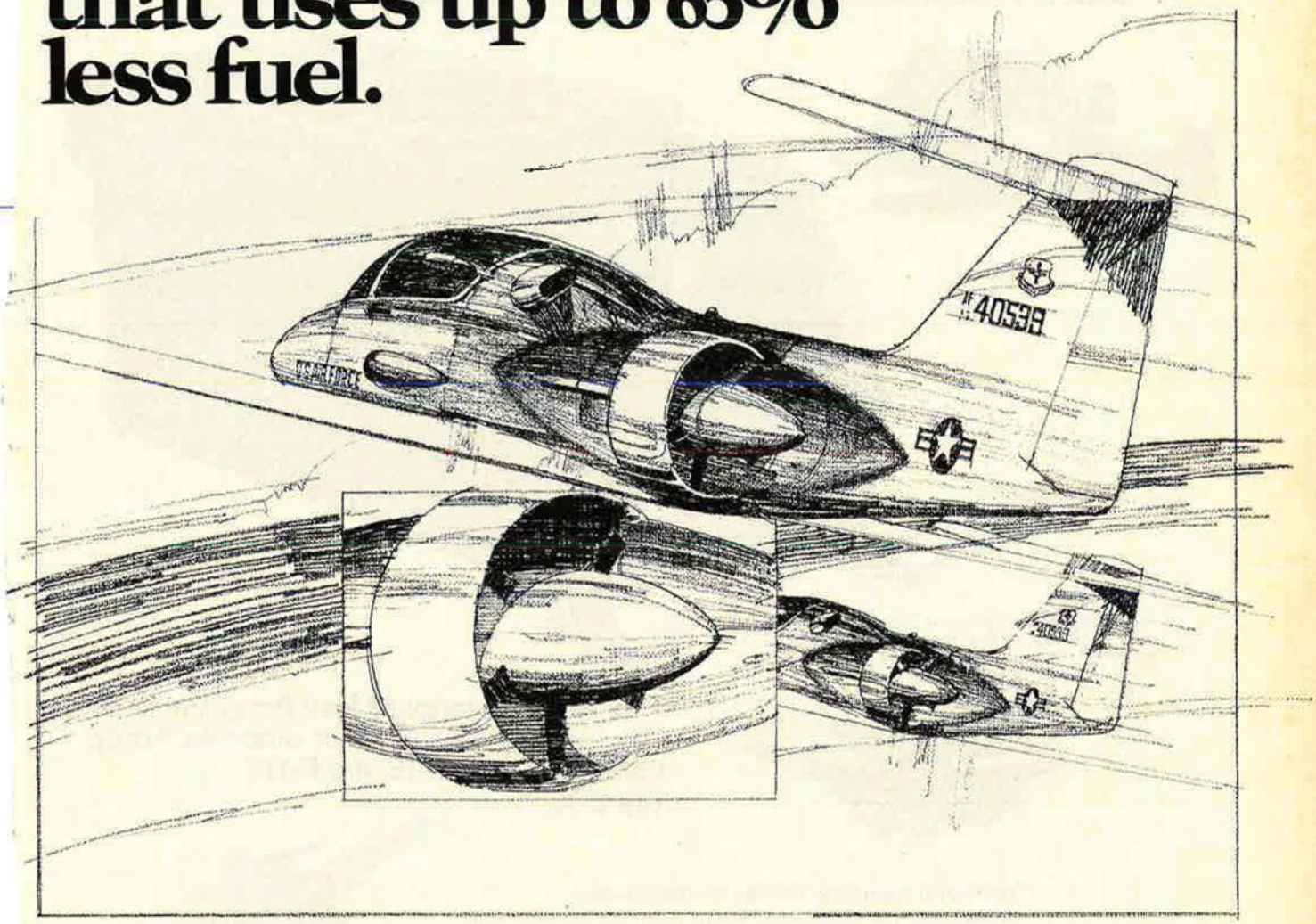

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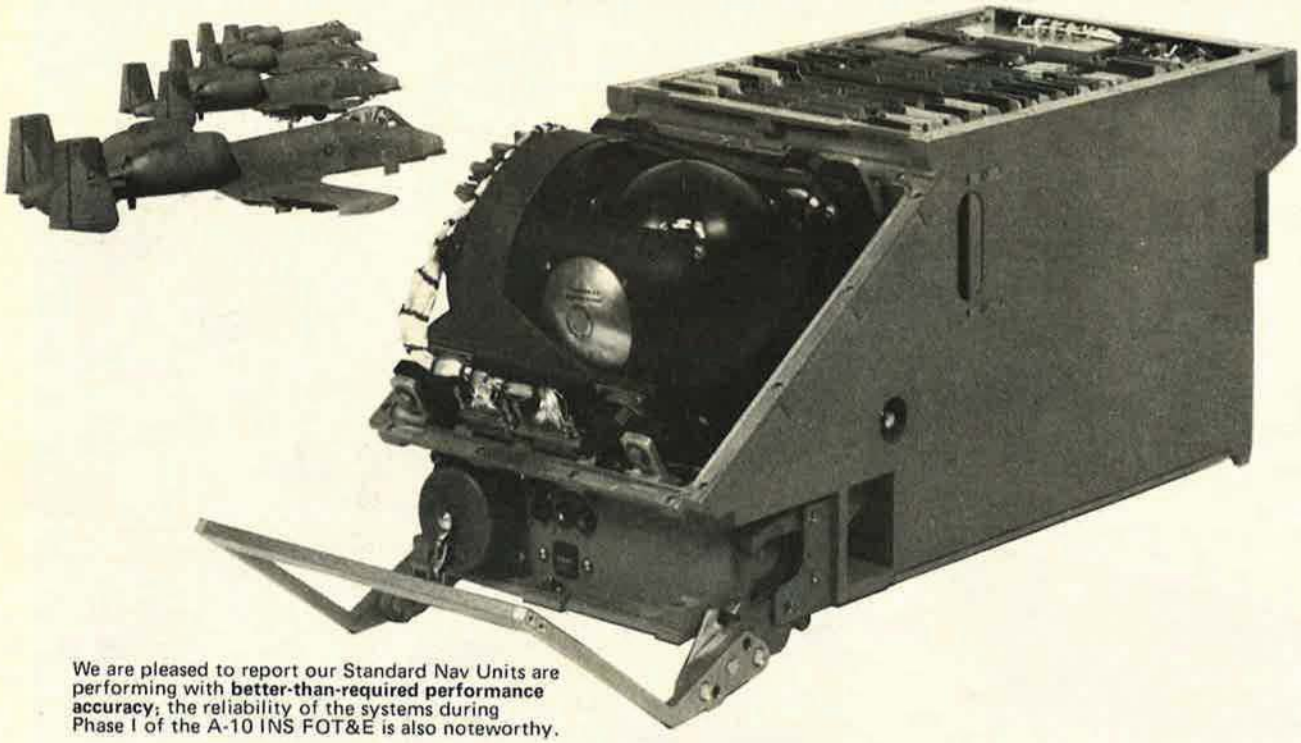

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AEROSPACE WORLD
News, Views & Comments

By William P. Schlitz, SENIOR EDITOR

Washington, D. C., Aug. 4

★ Suggestions concerning engine damage and failure netted USAF more than $20 million in savings and earned special awards for Air Force people.

Donald C. McGaughy, an aircraft engine mechanic foreman at McChord AFB, Wash., and John H. Garner, an equipment specialist at Barksdale AFB, La., have been named co-winners of the 1981 Air Force Suggester of the Year. Mrs. Susan E. Anderson, the suggestion program manager at Duluth International Airport, Minn., has been named 1981 Suggestion Program Manager of the Year.

In 1955, Mr. McGaughy submitted his first suggestion concerning a J57 engine, earning $15. Since then, he has submitted thirty-four suggestions with sixteen adoptions, representing $2,000,625 in USAF savings. His most significant suggestion, preventing costly accident damage to TF33-P7 engines, saved the Air Force $1.8 million. Mr. McGaughy was awarded $2,965 for the January 1980 suggestion.

Mr. Garner has benefited the Air Force not only in dollar savings but in job performance. His credits include AFA's Citation of Honor for the application of new engineering concepts into the Air Force Propulsion Maintenance Program and a nomination for a Presidential Letter of Commendation. Mr. Garner pocketed $22,090 and won the high-value suggestion award from the Air Force Chief of Staff for formulating a method to detect in-flight engine failures for KC-135 and B-52 aircraft before they occur. In its first year of use, the suggestion saved the Air Force $19 million, and future benefits of more than $16 million a year are expected.

Mrs. Anderson was cited for her sensitivity to the needs of other suggesters and managers, and for the outstanding reputation of her program throughout the Air Force. In 1979, she received the Aerospace Defense Command Suggestion Program Manager of the Year Award. Her program's suggestions in 1980 generated $110,120 in savings, earning runner-up for the TAC Suggestion Program Achievement Award.

★ Tactical satellite communications systems under development are assuming the appearance of props in a James Bond movie.

AFCC's Advanced Requirements Division, Scott AFB, Ill., recently demonstrated a portable, extremely lightweight unit that could be carried in a container the size of an attaché case.

The prototype model of an ultra-high frequency satellite communications terminal is compatible with the UHF Air Force Communications System and can be encrypted to provide secure voice transmissions, officials said.

The unit is equipped with a hand-held antenna that would be aimed at an orbiting satellite *(see photo)*.

It is one of several projects under way to improve tactical battlefield communications, including super-high frequency and extreme high frequency systems. The prototype unit is about half the size and one-third

Capt. Charles J. Swanson of the AFCC staff, Scott AFB, Ill., demonstrates a prototype satellite communications terminal under development that could fit into a container the size of an attaché case. See item above.

the weight of the AN/URC-101 manpack radios currently in service.

★ With the cost of aviation fuel now representing more than half of a flight's direct operating expense, the emphasis today is on conservation.

To that end, USAF is converting a civil aviation computerized flight planning operation to Military Airlift Command use.

The computerized system matches the aircraft, payload, and engines with worldwide weather information that is constantly updated. When called on, the computers perform some 500,000 calculations in under two minutes and furnish a flight plan that enables an aircrew to fly the most economical fuel-saving route.

Currently, Lockheed Aircraft Service Co., Ontario, Calif., is concluding the conversion of its JetPlan software to USAF computers at Air Force Global Weather Central, Offutt AFB, Neb. Other users of JetPlan include the airlines, NASA, the Navy, and more than 400 corporate customers.

USAF is testing its system—dubbed MACPLAN—at Travis AFB, Calif., and McGuire AFB, N. J. The initial test phases have involved C-5s and C-141s with the intention to include the C-130 fleet later.

The MACPLAN system is to be fully operational by year's end.

In a related matter, Warner Robins Air Logistics Center, Robins AFB, Ga., has awarded a $6.9 million contract for the production of 350 Fuel Savings Advisory Systems. Over the next three years, the systems are to be installed in the entire fleet of C-141Bs and C-5s.

The system is a derivative of Lear Siegler, Inc.'s commercial airline Performance Data Computer System of which 700 have been installed or ordered by sixty airlines, company officials said.

The military system consists of a computer and cockpit video display that indicates the best altitude and airspeed to fly. The device automatically adjusts the throttles for maximum fuel savings during all phases of flight. Tests have determined the system has saved as much as seven percent fuel during normal flights.

The systems will be produced by the company's Instrument Division, Grand Rapids, Mich.

In yet another fuel-saving move, national and international air routes are being restructured so that jetliners can follow the shortest, most fuel-efficient path between two points.

At the FAA Technical Center, Atlantic City, N. J., routes over domestic airspace are being studied as well as those over the Atlantic and Pacific Oceans.

AEROSPACE WORLD

WILLIAM A. ROGERS
1923–1981

Will Rogers, a working consultant of the Aerospace Education Foundation since 1969, died of cancer in July at St. Michaels, Md. He was fifty-seven.

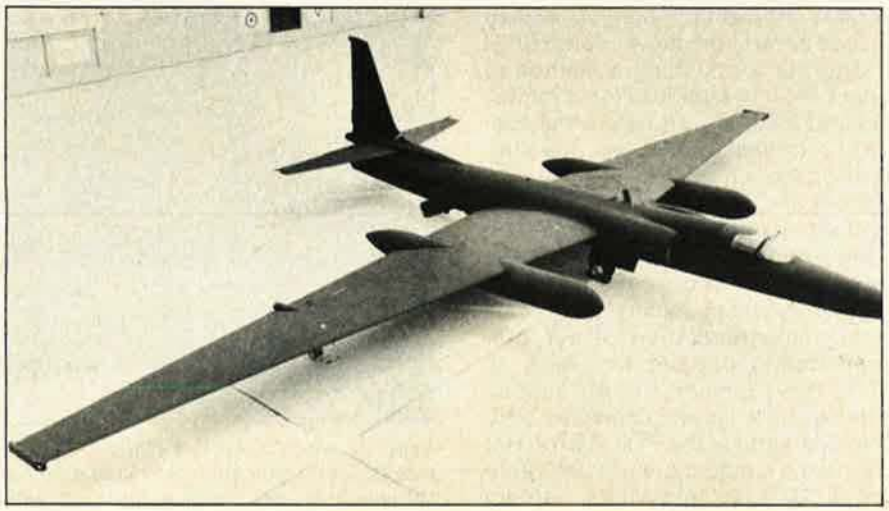
Will was a specialist in communications media and had extensive experience at both the national and international levels. He had a B.A. from Miami University of Ohio and an M.A. from Columbia University.

Prior to joining the Foundation he had held the following positions: Ford Foundation's Educational Technology Specialist in Southeast Asia; USAID Technical Aids Coordinator for Latin America and Director of the Latin American Regional Technical Aids Center in Mexico City; Senior Account Executive and Radio/TV Director, Ruthrauf and Ryan, Inc., advertising agency; and Vice President and Director of New Project Research, John Wiley and Sons, Inc., publishers.

This background was an asset to the Foundation, involved in applying aerospace technology to the advancement of education; this entailed the analysis, reproduction, packaging, and marketing US Air Force courses to the civilian educational community on a nonprofit basis. In these, he played a key role.

Mr. Rogers was an integral part of the Foundation's operations. He was indeed a "working" consultant who would roll up his sleeves and go to work. He will be remembered as a big guy with an analytical and innovative mind. He made his mark and saw the projects come to fruition throughout the nation. He will be missed by the Air Force Association and Aerospace Education Foundation family.

The late Will Rogers of AFA's Aerospace Education Foundation.



Right, the TR-1, an improved version of the U-2, following rollout in mid-July. *See item on p. 39.*

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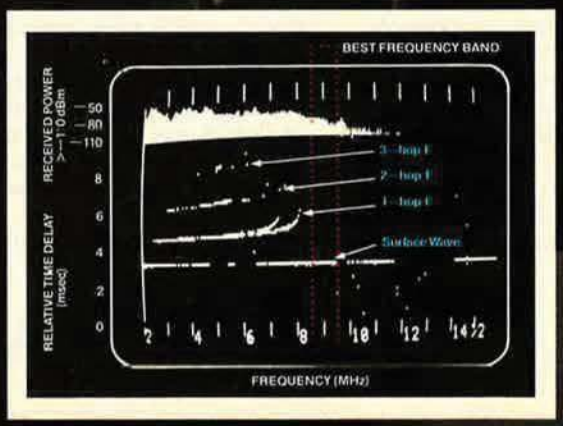

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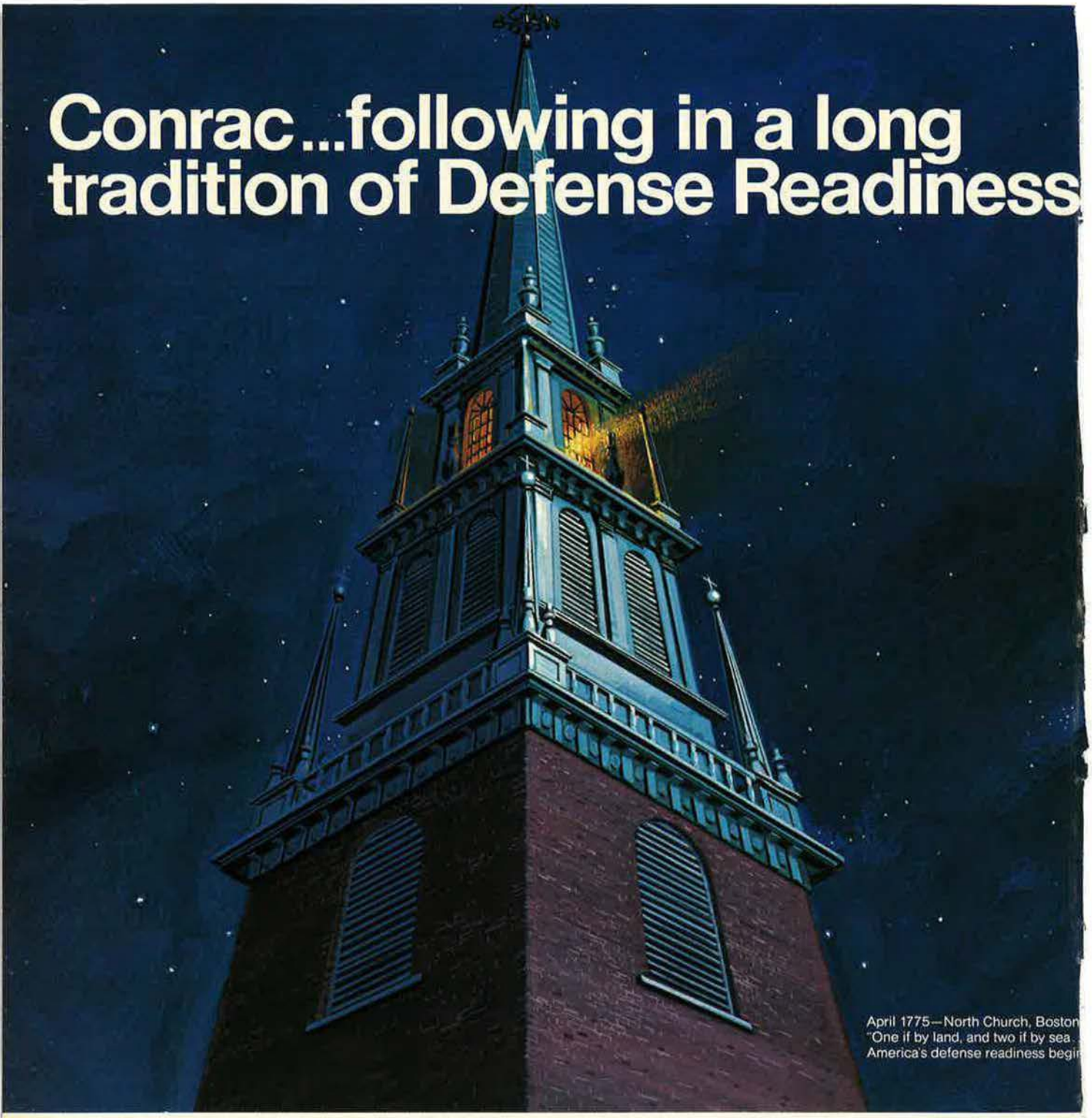

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Last October, for example, the separation of routes over the North Atlantic—one of the heaviest traveled areas—was reduced from 120 nm to sixty nm, thus providing airlines with additional routes and more flexible, economical operating procedures without curbing safety factors, officials said.

★ In mid-July, Lockheed rolled out the first of a planned thirty-five TR-1s USAF has ordered. This follows by about a month the acceptance by NASA of an ER-2 earth resources aircraft from the same assembly line under a joint program with USAF.

As has been noted previously, the TR-1 is an improved and enlarged version of the U-2. Its sophisticated sensors will be able to record information in a radius that extends several hundred miles. To that end, it is equipped with interchangeable noses, mission bay hatches, and instrument wing pods and will be able to heft nearly two tons of sensors and experiments.

The 70,000 feet (21,200 m) the TR-1 can reach in altitude necessitates the pilot wear a pressure suit, and this has led to the installation of a cockpit food warmer for space-type food tubes.

AEROSPACE WORLD

★ In testimony before the US Senate Small Business Committee, a major aerospace industry executive warned that steps must be taken if the nation is to improve its ability "to respond rapidly in a period of emergency."

Dr. Allen E. Puckett, board chairman and chief executive officer of Hughes Aircraft Co., said the danger stems from the decline or limited capacity of small businesses involved in defense contracting.

"We are genuinely concerned about the health of this supplier base," he said, adding, "if an emergency arose requiring an increase or 'surge' in our output of defense hardware, our ability to respond would be limited by the availability of our suppliers. We do not believe such surge capacity exists."

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AEROSPACE WORLD

Dr. Puckett further noted that many suppliers and subcontractors now prefer commercial business over defense work because of a better return on investment. Other reasons include the frequent starts and stops of federal procurement that lead to poor asset and labor utilization; payment based on outdated regulations; paperwork requirements; and antiquated tax laws and accounting systems.

Other factors cited were shortages of raw material and skilled labor.

The executive said that in 1980 Hughes spent $1.1 billion with some 8,400 firms throughout the country and of these about eighty-five percent were small businesses employing less than 500 people.

To accommodate lead times associated with the supplier base, Dr. Puckett said, it now requires twenty-four to twenty-seven months to deliver airborne radar systems, compared with twelve to fourteen months several years ago. "Similarly, aircraft deliveries have increased to forty-five months from thirty-two in the last three to four years."

The first operational C-5 refitted with new wings unloads a sixty-ton Abrams tank during flight evaluation. The aircraft has logged more than 550 hours in worldwide missions during the test program.

Among his recommendations: revised income tax laws to permit rapid recovery of capital investments;

BRAVING THE DESERT HEAT

Roughly half of 72d Tactical Control Flight personnel on site took time out from mission requirements to participate in Global I, the Air Force-wide "Volksmarch" held this past June. This may not sound like much except that the Fort Monroe, Va., unit was, at the time, on TDY at Exercise Elf One in Saudi Arabia.

With temperatures hovering around 100 degrees at 6:30 a.m., twenty-nine people took advantage of their day off to follow one of two courses laid out along the shores of the Persian Gulf. On one of the two days of the event, 72d Volksmarchers had to contend with an unexpected sandstorm with winds gusting up to thirty knots.

Despite prevailing conditions, twenty-eight of the twenty-nine participants opted to complete the twenty-km course. Three brave souls ran the entire course: SrA. Nate Bell completed it in one hour, forty-three minutes; SSgt. Dave Miller ran a close second at one hour, forty-five minutes; and SrA. Dan Sullivan, an augmentee from the 71st TCF, MacDill AFB, Fla., finished in one hour, fifty minutes.

The course was made all the more difficult by the fact that 72d personnel at Al Jubail were subject to Saudi law. Saudi Arabia is a dry country; there wasn't a cold beer to be found anywhere.

In a related athletic matter, 2d Lt. Aaron D. Byas of the 72d took a number of honors during the month of May while deployed to Al Jubail.

Byas took third place In the King Abdulassiz Royal Saudi Naval Base ten-km road race, with a time of forty-two minutes flat. He was one of fifty-five entrants in the annual event.

On May 15, at the University of Petroleum and Minerals open track meet in Dhahran, the former Southern Illinois University track star got a chance to run in his specialty—the 800-m race. He placed second with a time of two minutes, four seconds. Byas continued his winning performance in Dhahran with a first in the discus, third in the high jump, and fourth in the 100-m dash.

—2d Lt. Frederick Bridger, USAF

adoption of multiyear procurement; increased progress payment rates to reflect more accurately the cost of money and effects of inflation; and removal of excessive federal regulations.

★ USAF announced that TAC's 1st Tactical Fighter Wing, Langley AFB, Va., has become an element of the Rapid Deployment Joint Task Force.

The F-15 Langley wing replaces the Eagle-equipped 49th TFW at Holloman AFB, N. M., as part of the RDJTF. With the current focus of the joint task force on Southwest Asia, including the Persian Gulf area, the location of the 1st TFW on the east coast makes it better situated to respond than the unit based in the US's southwest.

Officials said that as many as 300 additional people may be assigned to the Langley unit to prepare it for its RDJTF role. And the wing's flying activity also will be stepped up slightly.

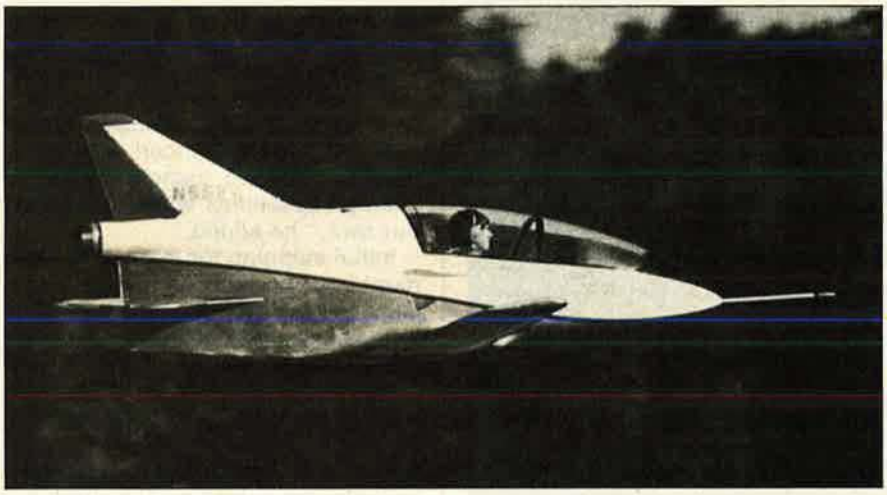
The 1st TFW is to receive newer C and D model F-15s to replace its older A and B models. The Cs and Ds are equipped with advanced avionics and are capable of being fitted with streamlined fuel tanks, thus permitting a wider range of operation.

USAF said that the Langley wing will retain its assignment of rapid global deployment and its air-superiority role in support of allied and US forces in addition to its RDJTF responsibility.

★ AFSC's Electronic Systems Division, Hanscom AFB, Mass., has become the focal point for all Air Force command control and communications countermeasures (C^3CM).

The C^3CM programs the division will oversee have dual objectives: to protect friendly C^3 systems from enemy activity and to attack hostile C^3. "Attack" means jamming as well as destruction.

"C^3 countermeasures offer great potential for seriously impacting an enemy's capability to fight, but it is not something that can be done hel-



Left, the all-metal Bede BD-5J, the world's smallest manned jet. It has a reclining seat, manually retracted landing gear, a "stabilator," and weighs about 1,000 pounds fully loaded. The plane is on view at the Air and Space Museum in Washington.

AEROSPACE WORLD

ter-skelter," commented Lt. Gen. James W. Stansberry, ESD's Commander. "It must be carefully orchestrated or else we will find ourselves working against each other.

"Placing a bomb on a target may be the best countermeasure for a certain circumstance, but it shouldn't be done while someone else is receiving valuable information by tapping into the data flowing from that target. Jamming a communications center must be done in concert with other efforts to deceive, exploit, or destroy enemy capabilities while preserving our own," he added.

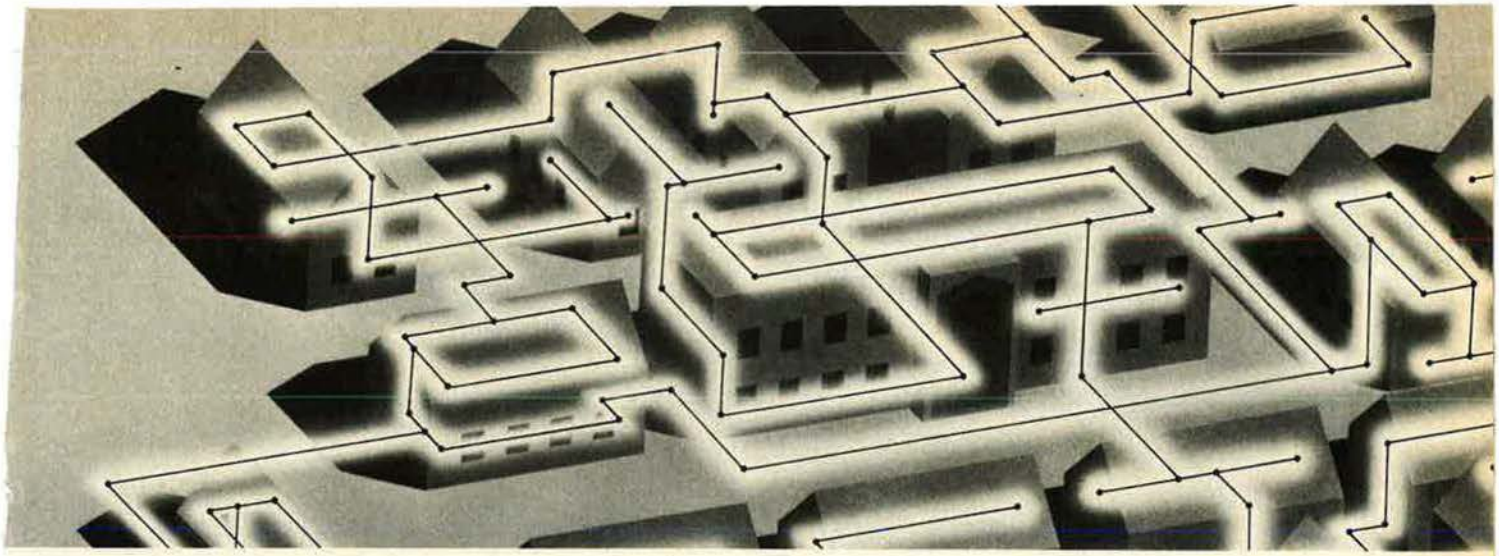
Initial manning for the new assignment is to come from the Division's Deputy for Development Plans. The unit is expected to expand to full Deputate status in October.

As central planner for AFSC, the Deputy for C³CM will work with the Command's product divisions, centers, and labs to produce a balanced, coordinated program. Development and acquisition of some C³CM systems will be done by the Deputate, as well as test and evaluation of systems bound for operational commands.

★ Switzerland agreed to purchase thirty-eight Northrop F-5 fighters, including six two-seat F-5Fs, at a total program value of more than $300 million. In 1976, the Swiss bought seventy-two F-5s.

The new pact calls for Swiss fabrication and subassembly of various parts and final assembly of the aircraft at a facility in Emmen, near Lucerne. The previous purchase provided only for the final assembly of aircraft in Switzerland.

The 3,500th aircraft in Northrop Corp.'s family of F-5/T-38 fighters and trainers. Switzerland has ordered another thirty-eight. See above.



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In operations Red Flag and Coronet Eagle, it has been established that the F-15 AIS will be where it is needed to maintain the Eagles...and can be set up, checked out, and operated by Air Force personnel.

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AEROSPACE WORLD

As part of the current agreement, Northrop and General Electric Co., which supplies the F-5 engine, have agreed to offset a minimum of fifty percent of their share of the contract. Under the previous order, the goal was a minimum of $135 million over an eight-year period, a goal exceeded within five years.

The most widely used US-built supersonic fighter in the world, the F-5 is operational in the air forces of twenty-eight nations.

★ **NEWS NOTES**—The US Army plans to **replace its classic M1911A1 .45-caliber pistol,** and a variety of .38-caliber revolvers currently in use, with a 9-mm handgun. The Army will procure the new weapon—designated the XM9—for all DoD agencies, with the first being issued to the Coast Guard in mid-1982. The purchase of 220,000 9-mm handguns over a five-year period will mark **the first major change in US military pistols** in more than a half century. The 9-mm handgun is standard to the US's NATO allies. The Air Force Armament Lab, Eglin AFB, Fla., is developing a flat-nosed projectile for the new weapon, which will take fifteen-round magazines and be capable of rapid reloading.

Edward C. "Pete" Aldridge has been named **Under Secretary of the Air Force.** He holds a B.S. in aeronautical engineering from Texas A&M and an M.S. in the same discipline from Georgia Institute of Technology. Mr. Aldridge has had considerable experience within DoD and industry. Prior to his appointment, he was an executive with the System Planning Corp., Arlington, Va., helping to analyze strategic, naval, tactical nuclear, chemical weapon, arms control, and long-range strategic planning areas. His last previous DoD post was as principal planning advisor to the Secretary of Defense. He is forty-three.

France's **Aerospatiale** and West Germany's **Messerschmitt-Bölkow-Blohm** have agreed to develop jointly, produce, and market before the decade is out **antimaritime missile systems** based on ramjet technology and capable of Mach 2-plus speeds and high maneuverability, the two companies announced.

Ben F. Lowell, president of the Aerobatic Club of America (and Treasurer of AFA's Colorado Flatirons Chapter) announced that the ACA will sponsor the **1981 US Aerobatic Championships October 5–11** at Grayson County Airport, Sherman, Tex., where members of the 1982 US aerobatic team will be selected.

In July, **John F. Shea,** the Deputy Chief of Staff for Plans, MAC, **was awarded DoD's Distinguished Civilian Service Award** for his work in improving US emergency airlift capability "through a series of visionary enhancement and modernization programs" he developed.

In July, the **remains of three Americans shot down over Vietnam** were returned to the US. They were identified by the Department of Defense as **USAF Capt. Richard H. Van Dyke** of Salt Lake City, Utah; **Navy Cmdr. Ronald W. Dodge** of Olympia, Wash.; and **Navy Lt. Stephen O. Musselman** of Texarkana, Tex.

Died: Maj. Gen. Robert H. McCutcheon, USAF (Ret.), a former Deputy Director of Contract Administration Services with the Defense Supply Agency, of cancer in Washington, D. C., in July. The long-time AFA member was sixty-three. ■

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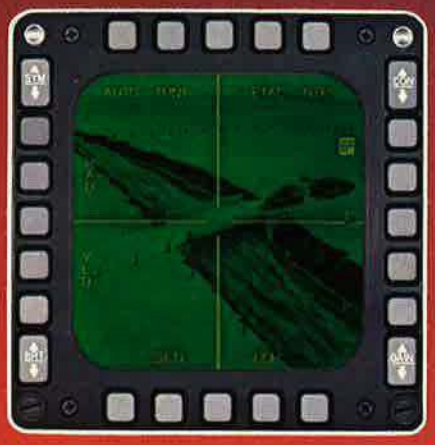

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CAPITOL HILL

By Kathleen G. McAuliffe, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., July 24

DoD Authorization

The House Armed Services Committee managed to steer the $136 billion FY '82 Defense Authorization bill through the House without incurring any battle scars.

The House brushed aside all opposition to MX, contracting out, the F/A-18, draft registration, multiyear procurement, DoD control of automatic data-processing equipment purchases, and expanded defense budgets.

The House adopted an amendment by Rep. James Hansen (R-Utah) providing that Congress has sixty days after the President makes a decision on a basing mode for the MX in which to reject the choice. This parallels the provision in the Senate's companion bill. The House also solidly rebuffed a backdoor attempt to cut the defense budget. An amendment by Rep. Patricia Schroeder (D-Colo.), a member of the Armed Services Committee, would have required the President to rescind $8 billion in budget authority from the defense budget by January 15, 1982, through "elimination of waste, fraud, abuse, and mismanagement. . . ."

This was superseded by a substitute offered by Rep. James Courter (R-N. J.) requiring the President to submit by January 15 recommendations to improve efficiency and management at DoD.

Profit Curbs

Congressional debate over limitations on defense contractors' profits is finally reaching resolution. Rep. Samuel Stratton (D-N. Y.), chairman of a House panel reviewing the issue, expects to strike a compromise with the Senate during conference on the defense authorization bill.

The Senate bill calls for outright repeal of the Vinson-Trammell Act, the only remaining statute imposing profit curbs on defense contracts, while the House version merely suspends enforcement of Vinson-Trammell's provisions until July 1982.

The compromise sought by Representative Stratton would allow controls on profits only during times of national emergency or declaration of war; it excludes imposing limits during periods of massive increases in defense spending despite support given this provision by the General Accounting Office (GAO). The compromise language stems from legislation introduced by Rep. Nicholas Mavroules (D-Mass.).

Posse Comitatus Change

The House-passed DoD authorization includes a provision which circumvents the 1878 Posse Comitatus Act. The latter bans the military from civilian law enforcement. The new provision would allow DoD personnel to track, monitor, and communicate the movement of air and sea traffic of various suspects during routine military operations and provide law-enforcement officials with intelligence regarding violations of state and federal law.

Military equipment and facilities may be made available to civilian officials as long as military preparedness is not adversely affected. Further, military personnel may participate directly in drug seizures and arrests *outside* US land areas, *i.e.,* at sea.

Cautions on Lasers

The President's nominee to be his chief science advisor and director of the Office of Science and Technology Policy urged cautious optimism on laser and directed-energy weapon technology. Dr. George Keyworth, former head of the physics division of the Los Alamos Laboratory, told a Senate committee these technologies have great *potential* applications for the future of national defense.

Specifically, Dr. Keyworth told Sen. Howell Heflin (D-Ala.), a strong advocate of laser technology, that these advanced systems represent "the only truly credible antiballistic missile (ABM) alternative in the future."

He warned, however, that the US, as well as the Soviet Union, is years away from deployment of large, high-energy lasers capable of achieving ABM goals, and that any attempts to push experimental-stage ABM technologies to the forefront prematurely is a gross mistake.

Air Defense Concerns

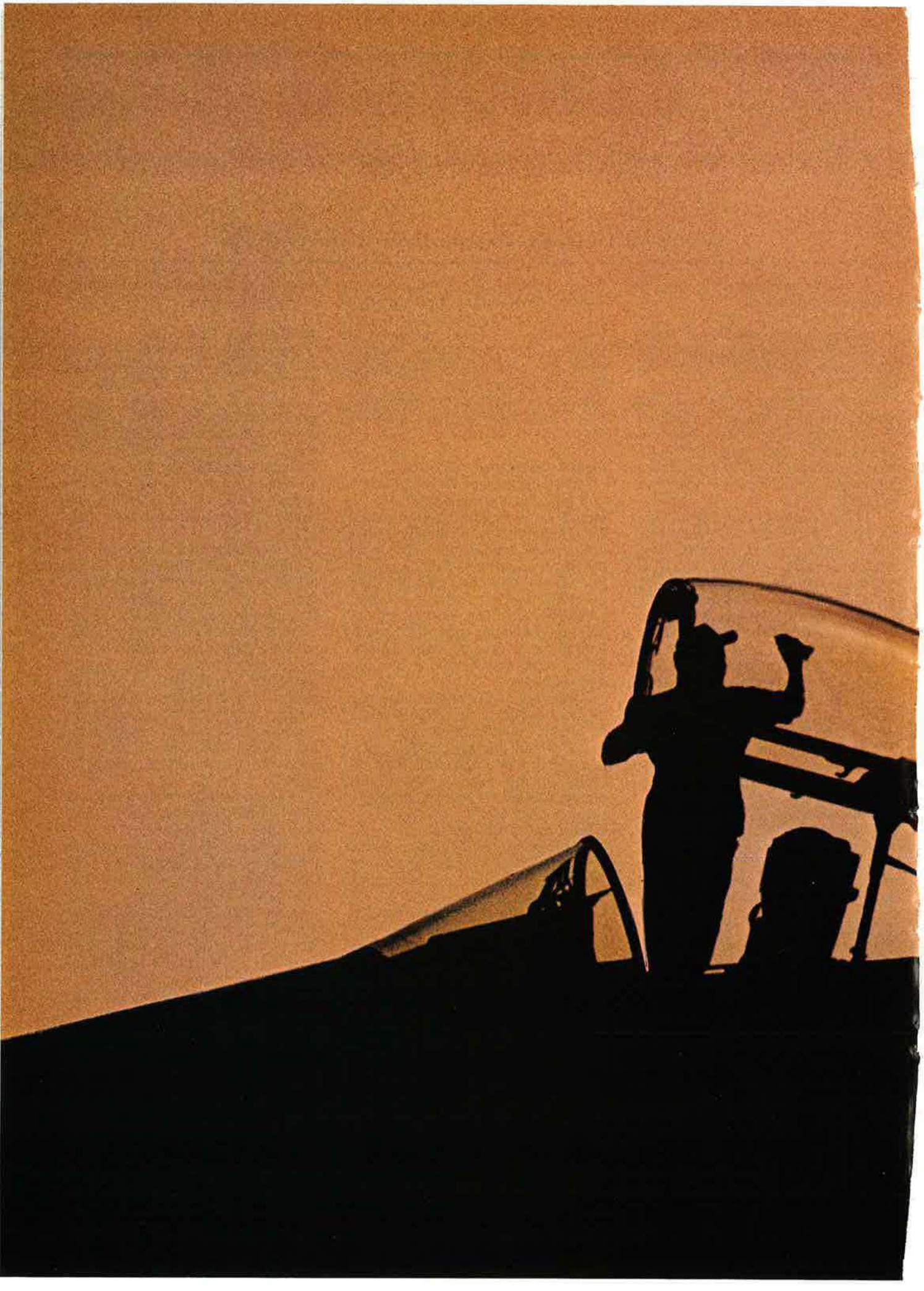
It would take until the mid-1980s to redress the US's woefully inadequate strategic air defense capabilities, according to Lt. Gen. James V. Hartinger, Commander in Chief of the North American Air Defense (NORAD) Command. That statement was linked to eventual adoption and funding of an Air Defense Master Plan requested by Congress and currently in the process of being developed by the Air Force.

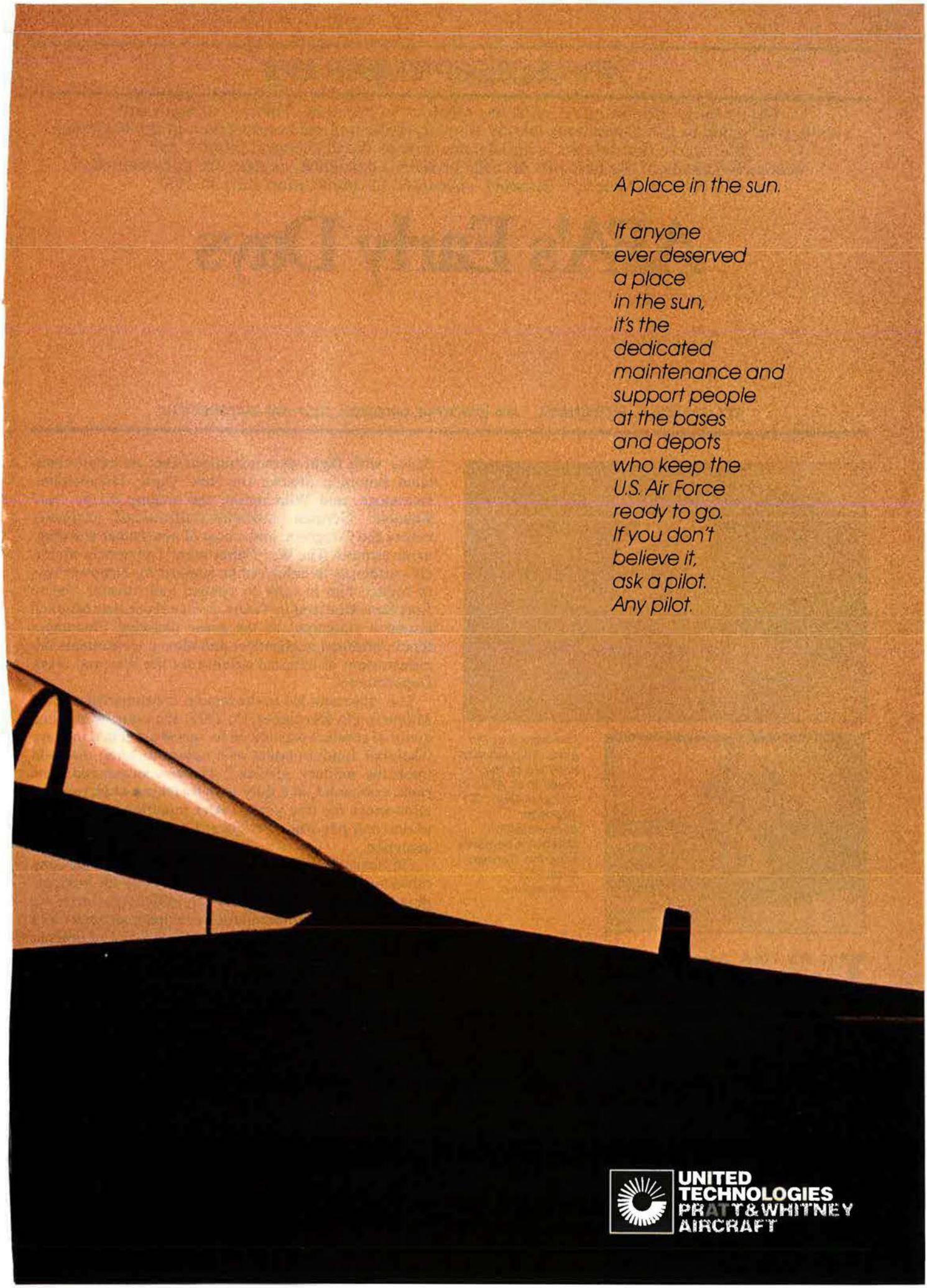
The reason for the current concern is the increase in Soviet bomber and cruise missile capabilities. The program is expected to be submitted to Congress for its approval in October.

The NORAD chief told Congress that we need "atmospheric early warning to complement our missile warning capability in providing a balanced deterrent posture and eliminating that bomber option" accompanying the Soviet Backfire bomber capability and the Soviets' development of a B-1 equivalent capable of carrying cruise missiles.

The plan calls for modernization of early warning systems with an Over-the-Horizon Backscatter (OTH-B) radar system giving an all-altitude bomber detection capability to 2,000 miles. Currently, low-altitude aircraft can penetrate our coastal warning systems. OTH-B radars are planned for deployment on both coasts by FY '86, and a southern-looking OTH-B later. General Hartinger said surveillance of the northern flank will probably be best served in the near term by an "upgraded, gap-filler" radar for the Distant Early Warning (DEW) Line to provide all-altitude coverage.

Further modernization of NORAD's interceptor force through conversion to F-15 squadrons is planned. Current interceptor aircraft, products of 1950s technology, do not have low-altitude coverage and only small search volume. The F-15s with look-down shoot-down radar and extended range represent a key part of effective air defense. ■

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a place
in the sun,
it's the
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at the bases
and depots
who keep the
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On its thirty-fifth birthday, AFA has much to be proud of. Today's strength and vitality owe much to the foundations laid by so many dedicated men and women in the beginning. The article that follows is an advance look at the challenges, pitfalls, and accomplishments of the first two decades of AFA's existence, as they are documented in a book by James H. Straubel, scheduled for publication early in 1982.

AFA's Early Days

BY JAMES H. STRAUBEL, AFA EXECUTIVE DIRECTOR, JULY 1948–OCTOBER 1980

The legacy of the great Billy Mitchell (left) led to the creation of AFA. In this stunning 1921 airpower demonstration, Mitchell's bombers sank the German battleship Ostfriesland.

THE Air Force Association, like many other organizations, has both spiritual and founding fathers. The Association's spiritual father was Billy Mitchell, the outstanding air combat commander of World War I. He foresaw with remarkable clarity the potential of military and commerical aviation and the need for widespread public support if that potential were ever to be realized.

Mitchell came out of the war convinced that America, in the new air age, could rely no longer on geographical isolation for its defense. It needed an air force as an equal partner of the Army and Navy. Thus began the debate over an independent role for aviation in our military structure.

Mitchell pressed his argument for airpower independence with flight demonstrations that included simulated bombing attacks on New York, Philadelphia, Baltimore, and Wilmington; the sinking of the "unsinkable" German battleship *Ostfriesland;* testimony before the Congress; and a host of newspaper and magazine articles. The War Department's answer to Mitchell's attempts to enlist public support for airpower was to reduce him in rank to colonel and transfer him to Fort Sam Houston in Texas. It was there that Mitchell issued a statement to the press charging "incompetency, criminal negligence, and almost treasonable administration of national defense by the War and Navy Departments."

This statement led to the famous court-martial of Billy Mitchell. On December 17, 1925, the court found him guilty of conduct prejudicial to "good order and military discipline [and] conduct of a nature to bring discredit upon the military service." He was suspended from rank, command, and duty with forfeiture of all pay and allowances for five years—later modified to forfeiture of one-half pay when President Coolidge confirmed the sentence.

On February 1, 1926, Billy Mitchell resigned his commission in order to continue his campaign for independent airpower, unfettered by any official position. He believed that the impetus for developing airpower as a deterrent to war and as the nation's first line of defense would have to come from the people. "The people are all right," he said. "Don't worry about them. They're ahead of those supposed to lead them." He saw the need for an organization that could muster grass-roots support for aviation. As a result, he founded, in 1926, an Air Force Association. It was short-lived and was not a direct ancestor of our Association. But its very existence, as a creation of Mitchell, has a message for all of us.

Billy Mitchell didn't live to see his faith in airpower vindicated by World War II, or his dream of an independent Air Force realized in 1947. But his legacy was passed on to AFA through his "boys," as he referred to them, several of whom laid their careers on the line to testify in his behalf at the trial.

One of Mitchell's "boys" was Henry H. "Hap" Arnold, shown here as a lieutenant general, who was to become a five-star general and Commanding General of the World War II Army Air Forces. He was the founding father of AFA.

One of Mitchell's boys, Henry H. "Hap" Arnold, was to become Commanding General of the Army Air Forces during World War II and the founding father of the Air Force Association.

Hap Arnold was a human bulldozer. His memos to commanders across the world and his oral directives to staff members across the desk left man after man shaking his head at the thought of what he had agreed to do for the Chief.

Arnold also was what today is called a communicator. Early in his career he had been Chief of Information of the Air Service. While in the Information seat, he had been editor of the monthly newsletter that was the direct forerunner of the AIR FORCE Magazine of today. As Commander of the AAF, General Arnold decided a new publication—a successor to the old newsletter—was needed to help keep his officers and men abreast of what was going on in their new organization and in the combat theaters.

As Arnold put it, he wanted "a first class, slick-paper magazine—highly readable—the best of its kind—with worldwide circulation. . . ." The basic training centers supplied staffers from *The New Yorker, Saturday Evening Post, Cosmopolitan,* and other leading magazines, and some good writers from Hollywood. AIR FORCE Magazine was created as "The Official Service Journal of the US Army Air Forces."

As the war drew to a close, General Arnold saw that a new Air Force would have to be forged in the face of public apathy, if not public opposition, that is common to anything military in a postwar period. And despite the wartime accomplishments of the AAF, the Navy Department, at least, would continue to oppose a unified land, sea, and air establishment.

Just as in Billy Mitchell's day, the Air Force urgently needed *organized* public support. And now, for the first time, there was an alumni group to call on—some 3,000,000 veterans of the Army Air Forces who would be returning to civilian life.

A united front had to be established among these AAF veterans to prevent formation of a number of small groups, each calling on the Air Force for support, and many seeking self-serving benefits in competition with established veterans organizations.

And restraint was required. This had to be a citizens' organization supporting the Air Force but without any organizational or operational ties to it.

General Arnold directed Maj. Gen. Fred L. Anderson, his Assistant Chief of Staff for Personnel, to explore the problem and propose objectives and guidelines for a new civilian organization. Anderson recommended that a leading AAF veteran be asked to take the initiative in this effort.

The man chosen by Hap Arnold to put the Air Force Association together was Edward P. (Ted) Curtis, a fighter ace in World War I who had served in World War II as Chief of Staff of "Tooey" Spaatz's US Strategic Air Forces in Europe. He was about to hang up his major general's uniform and go back to Eastman Kodak Co. as its executive vice president. Ted asked Medal of Honor winner Lt. Gen. Jimmy Doolittle, who already had returned to civilian life as a vice president of Shell Oil, to serve as AFA's first president.

At AFA's first convention, in Columbus, Ohio, in 1947, the speaker was Gen. Dwight D. Eisenhower, then Army Chief of Staff. Here he is flanked by AFA's first President, Jimmy Doolittle (left), and Edward P. (Ted) Curtis, the man chosen by Hap Arnold to put AFA together.

Curtis began the organization work with a nucleus of twelve civilians who met in New York City on October 12, 1945, to form what was to become the Air Force Association. These gentlemen were known as the "founders" of the organization.

The first order of business was, of course, financing the proposed program. No endowment fund, or "angel," was available, as has been the case in forming nonprofit organizations in the last decade. Virtually all of the founders and other Air Force veterans donated generously to get the Association off the ground. And for a number of years personal donations kept it flying. At one point we asked for "a dollar a member" to do just that.

While requests were going out for contributions to the "Founders Fund," a headquarters office was set up on December 1, 1945, in the basement of a building at 1603 K St., N.W., Washington, D. C., with the only

AFA's Early Days

staff member, Col. Willis Fitch, US Air Corps (Ret.), as the Executive Director, a post he held until his resignation in July 1948 when I filled the position in an "acting" capacity until my appointment by the Board in January 1949. Furniture was inherited from the previous occupant, and a typewriter was obtained on loan. Membership solicitation began in January 1946 with annual dues $3.

On February 4, 1946, the Air Force Association was incorporated in the District of Columbia as a nonprofit organization. And that is how AFA was born—an organization dedicated to attaining Billy Mitchell's goal of a separate Air Force as the dominant element of national security and world peace. In that sense, we were, and still are, Billy Mitchell's boys.

In July 1946, Hap Arnold's AIR FORCE Magazine, the wartime journal of the AAF, was turned over to AFA.

Growth—And Its Pains

Until a national convention could be held to elect a full slate of officers and approve a statement of policy, a governing board, acting in a temporary capacity, established membership criteria and adopted a constitution for the new Air Force Association. The board accepted General Arnold's sage advice that the Association be governed by its civilian members and that it have no organizational or operational ties with the Air Force. Anyone who had ever served with or been attached to the Air Force was eligible for regular membership. Associate, nonvoting membership was open to active-duty Air Force people. Regular membership later was extended to members of the Air Force Reserve and Air National Guard, then still later to any adult US citizen not on active duty with the armed forces. Meanwhile a Cadet membership had been established for members of Air Force ROTC, Civil Air Patrol, and Air Force Academy cadets.

The constitution defined the three basic aims of the Association:

"To preserve and foster the spirit of fellowship among former and present members of the Army Air Forces, and to provide a medium through which AAF traditions may be perpetuated.

"While a strictly nonpolitical organization, to assist in every possible way in obtaining and maintaining proper recognition of the Air Forces so that adequate airpower may at all times be available for the defense of the country.

"To advise its members and educate the public at large in the development of airpower, and disseminate information on new accomplishments in the field of aviation."

Right from the start, then, a major purpose of the Air Force Association has been public education. But why that emphasis in 1946, when this country had just won the biggest war in history? You have to look back to the early postwar period to answer that question. In the "explosive demobilization" that followed V-J Day, the Air Force shrank from more than 2,000,000 men and women to 300,000. Only a few months after the war, Gen. Carl "Tooey" Spaatz, who succeeded Hap Arnold as head of the Air Force, warned that he could not muster a single fully effective squadron. Our Western wartime allies were either in ruins or exhausted. On the other hand, the USSR still had several million men under arms. Their actions in Greece, Iran, Korea, and Eastern Europe made it clear that Russia's wartime cooperation with her allies had ended in 1945. Russia was on the move and only the United States stood between it and widespread penetration of the non-Communist world.

AFA's immediate goal was to develop public support for rebuilding US military strength; the key policy objective was a separate Air Force.

Thanks in large measure to Jimmy Doolittle's tireless efforts, AFA had 126,148 members with 148 operating squadrons (now called chapters) in forty-five states by the time of the first national convention, held in Columbus, Ohio, September 15–16, 1947. Congress already had passed the Armed Forces Unification Act that created a separate Air Force, and two days after the convention, W. Stuart Symington was sworn in as

During AFA's first year of life, some of its members got together to celebrate Air Force Day, August 1, 1946, with a party given in Hollywood by former AAF Lt. Col. Jack Warner (second from left). A special coast-to-coast radio broadcast featured fighter ace Lt. Col. John C. Meyer, former AAF Capt. Ronald Reagan, and former AAF Col. Jimmy Stewart.

Across the street from the AFA headquarters at that first convention, in Columbus, in 1947, this colorful display greeted convention delegates and citizens of the Ohio capital. The Air Force mobile display, on the grounds of the State House, featured V-2 rockets, P-80 jets, captured Zekes, and Japanese kamikaze aircraft.

"Operation Wing Ding" climaxed AFA's 1948 convention, held in New York City. Here, from left, are AFA President Tom Lanphier, singer Jane Froman, USAF Chief of Staff Gen. Hoyt S. Vandenberg, and Joe E. Brown, reading the text of USAF's tribute to the wartime efforts of US show business.

As part of what has been called "the greatest show ever put on in Madison Square Garden," Bob "Killer" Hope went a fast sixty seconds with the Manassa Mauler himself—former heavyweight champion Jack Dempsey. The referee, actor Adolph Menjou, called the match a draw.

the first Secretary of the Air Force. AFA's first policy objective had been achieved, and Jimmy Doolittle told the delegates: "No agency and no one individual was responsible [for passage of the Unification Act] . . . but I will say that no agency that I know of did more than the Air Force Association."

Already, AFA was the largest veterans organization to come out of the war, exceeded in membership only by the American Legion and the Veterans of Foreign Wars. At that first convention, the delegates decided that AFA was to be unique among veterans organizations, dedicated to assuring there would be adequate airpower for national security and world peace. They didn't ask for a single personal benefit; they confined their crusading to airpower issues; they rejected a quasi-military status of uniforms, military ceremony, and parades; and they opposed any merger with other veterans organizations.

I don't want to give the impression that everything was peaches and cream. AFA was suffering from some severe growing pains. President Doolittle reported that the Association had not broken even financially, even though donations of more than $50,000 had been made by members, over and above their dues. The headquarters staff that started with one person had grown to thirty, but still was undermanned. "This overworked group handles about a thousand pieces of mail a day . . . some 5,000 changes of address [with] too few people and too little money," Doolittle said. There were postwar shortages of everything from paper to metal for membership pins to office space. Members were changing addresses frequently as they adjusted to civilian life, and as a result, a number of magazines didn't get delivered.

By September 1949, paid membership had dropped to 57,500. Four years later, with many members and a lot of local leaders recalled to active duty during the Korean War, it plummeted to 35,368. The Association was eight years old before it was on sound financial footing, and in some years only donations and the income from magazine advertising kept our heads above water. At times, it was touch and go whether AFA would survive, and it wouldn't have except for strong and dedicated elected leadership at every level and a hard-working headquarters staff that handled day-to-day administration and organized special events like the annual conventions.

Everything First Class

For sheer pageantry, no AFA national convention is likely to surpass the 1948 gathering in New York City. Its highlight was "Operation Wing Ding," staged in Madison Square Garden on the night of September 25. John Reed Kilpatrick, President of the Madison Square Garden Corp., called it "the greatest show ever put on in Madison Square Garden."

When the show opened, the Garden was jammed beyond its 18,000-seat capacity. Jimmy Stewart stood alone on stage. He checked his watch and voiced concern that several distinguished guests were late.

As Stewart fretted, the sound of an approaching aircraft rose to a crescendo. House lights were down, and searchlights swept the darkened auditorium. Then the sound of a crash, and the searchlights spotted a pile of unfurled parachutes in the middle of the hall.

From the parachutes emerged the tardy guests—Bob Hope, comedian Jerry Colonna, and guitarist Tony Romano, each in flight crew gear, and actress June Lockhart dressed as an airline stewardess.

With nationwide radio coverage, augmented by Armed Forces Radio's worldwide broadcasts, regional television covering most of the East Coast, and widespread press coverage including columns by Walter Winchell and Bob Considine, this was the Air Force Association "going public" in a big way for the first time. The purpose was not just entertainment, or to honor the media people who had covered the air war and the men and women who had entertained the troops here and overseas, or to inaugurate the presentation of AFA's annual awards. It was also to demonstrate that everything the Air Force Association did was going to be first class.

For high spots you could toss a coin. Hope's "parachute drop" into the Garden was a smash hit, and he

AFA's Early Days

and Jimmy Stewart were on stage much of the night. For favorites you could choose among Marlene Dietrich, pleading "See What the Boys in the Back Room Will Have," Lena Horne quivering "Deed I Do," Dinah Shore's "I'll Walk Alone," Jane Froman's "It's a Great Life," Carmen Miranda's "South American Way," Ella Logan's "Tipperary," and Patricia Morrison's "Beguine." Beyond that, the show featured Jinx Falkenberg, the Radio City Music Hall Rockettes, Clark Gable, Herb Shriner, Morton Downey, the Deep River Boys, Margaret O'Brien, Walter Pidgeon, Larry Adler, and Gypsy Markoff. One of the hits was a slapstick boxing match between Bob Hope and the old Manassa Mauler, Jack Dempsey, with Adolph Menjou as the referee. And the act that temporarily blacked out television coverage was Gypsy Rose Lee's famous strip.

But with all that talent, the show's serious moments were its real high spots. The greatest reception of the night was accorded the Medal of Honor men. Present were eight of the thirteen living Air Force recipients of the nation's highest honor.

Operation Wing Ding was five months in the making.

Keeping the gang together is something AFA does well. These two (top photo) ran into each other at the 1951 convention in Los Angeles. Message boards helped, too. This one was at Columbus in 1947. Sometimes Orville would be notified to call Wilbur at the bicycle factory.

It was Tom Lanphier's baby, and it took a lot of guts to stage that show. Lanphier was AFA's first elected president, chosen a year earlier at Columbus when Jimmy Doolittle flatly declined a move to make him permanent president. At thirty-one, Tom headed the largest newspaper in Idaho. During the war, he became an ace in the Pacific and is credited with shooting down the plane that was carrying Admiral Yamamoto to Bougainville.

Tom spent agonizing weeks of letter writing, meetings, and phone calls to coordinate the efforts of the producers, performers, the Air Force, AFA leaders, and others involved. He was strongly supported by radio personality Tex McCrary (an Air Force veteran) who served as associate producer, and without whom the curtain might never have gone up. Producer Joshua Logan, whose "Annie Get Your Gun" and "Mr. Roberts" were then on Broadway, deserves unlimited credit. And from Hollywood came the great help of a convention committee headed by Hal Roach and supported by Jack Warner Merian Cooper, and others.

That second National Convention was not all extravaganza, however. At the business meeting the delegates approved one of the most analytical and statesmanlike policy statements in AFA's history. The statement is too long to quote here. In brief, it analyzed the shortcomings of the National Security Act of 1947 that were becoming apparent, and outlined what needed to be done to make unification more effective. Many of its recommendations were included in the 1949, 1953, and 1958 revisions of the Act.

The Final Term of Reference

At AFA's first convention in 1947, Gen. Tooey Spaatz said: "Public support is as essential to effective airpower as industries, airplanes, and airmen." He recalled the "famine years" of the '20s and '30s when airpower backers could do little except by "individualized efforts" because they were not organized.

From that experience, General Spaatz said, "we learned the value of organization of true believers within a democracy, in which public opinion is the final term of reference. Hence the formation of the Air Force Association."

I can mention here only a few of the ways AFA went about educating public opinion to the importance of airpower—later aerospace power—to national security in its first seventeen years.

A key to our grass-roots approach was the work of the squadrons in their local communities, supported by state organizations and the national headquarters in Washington. An early example was AFA's nationwide campaign for a seventy-group Air Force, based on the report of the President's Air Policy Commission—the Finletter Report—which was reprinted in full in the March 1948 issue of AIR FORCE. A series of airpower rallies, all initiated at the AFA local level, was held in big cities and small. Some 10,000 copies of the magazine were sent by members with personal letters to governors, mayors, community leaders, editors, educators, civic organizations, and members of Congress. The campaign produced airpower resolutions by city councils, chambers of commerce, and various organizations. It didn't persuade the Administration to request financing for seventy Air Force groups, but it did con-

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vince thousands of people from coast to coast that our future security rested on adequate airpower.

Then there were the air shows and exhibits, starting with a National Air Fair in Chicago the following year. It was conceived and arranged by AFA President C. R. Smith, who also was President of American Airlines.

In 1954, at the convention in Omaha, we started the industrial exhibits that have been a part of every AFA convention since and have given hundreds of thousands of people a chance to see what their tax dollars are buying and to learn why that hardware is needed. And in 1959, AFA staged its most ambitious project, the

"The Miracle at Las Vegas"

The World Congress of Flight, conceived and sponsored by the Air Force Association, was held in Las Vegas April 13–19, 1959. It was the largest and most complex aviation event ever held in this country and the first international air show in US history.

The idea for the Congress came out of AFA's Jet Age and Space Age Conferences. Its purpose was to explore the impact of aviation, missiles, and space on international relations, domestic policies, education, and world trade. In relation to the latter, Russia's Premier Khrushchev had recently announced: "We declare war upon you in the peaceful field of trade. We will win over the United States."

The challenge to the US was clear. As leader of the free world, we had to demonstrate that the free-enterprise system could design, develop, and produce superior aerospace products.

AFA committed itself to sponsorship of the Congress at the end of October 1958, just five and a half months before the show was to open—an impossibly short time, according to the experts. We didn't believe them.

An AFA survey team selected Las Vegas as the only place that had a combination of hotel space, convention facilities, airfields, and weather adequate for a massive international event of this kind. It also had people who would go all-out to support us, as we were to learn.

After our long negotiations with the federal government, Secretary of State John Foster Dulles, in late January 1959, sent letters to seventy-seven governments urging them to participate in the Congress. Fifty-one accepted. By the time the event opened, 5,674 people, 465 US and foreign companies, and 442 media representatives had registered. About 1,000 private planes flew into Vegas, including a Navion from Palm Springs, Calif., piloted by seventy-two-year-old Mrs. Zadie Bunker, who had soloed at sixty-five, with her six-year-old great-grandson as a passenger. Virtually every aviation "great" of the free world was on hand, headed by eighty-two-year-old retired Brig. Gen. Frank P. Lahm, the world's No. 1 living aviator.

The Congress was much more than an air show. There were, in fact, six separate flying shows on the schedule—five featuring commercial and private aircraft at Las Vegas's McCarran Field and the old racetrack whose straightaway had been surfaced, and one at the Nellis AFB Gunnery Range—eighty outdoor and 210 indoor displays, and industry briefings by eighty-five companies. But also on the schedule were thirteen major symposiums and twelve forums with ninety-five speakers, and the largest NATO banquet ever held, commemorating NATO's tenth anniversary. The principal banquet speaker was His Royal Highness Prince Bernhard of the Netherlands.

Many of the meetings were run by such Cooperating Agencies as the Air Transport Association, Electronic Industries Association, Flight Safety Foundation, National Aeronautic Association, National Business Aircraft Association, and the Space Education Foundation (now the Aerospace Education Foundation).

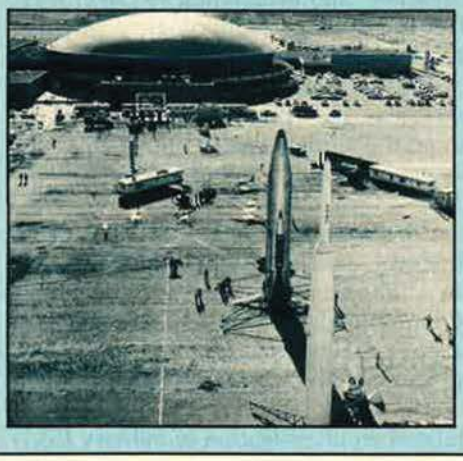
The air and ground events were witnessed by some 94,000 people. NBC-TV ran an hour-long special on the Congress, viewed by an estimated 40,000,000. The April 27, 1959, issue of *Life* Magazine gave it five full pages under the headline "World's Biggest Air-Space Show."

The Firepower Demonstration at Nellis AFB Gunnery Range, forty-seven miles from Vegas, was a high point of the week-long program. It did present one problem—how to get 7,500 people from Vegas to Nellis in time for the 9:30 a.m. show. There weren't enough buses in the state to do it. Benny Goffstein, President of the Riviera Hotel, solved that one. He went on radio and TV to appeal for cars and drivers. His patriotic pitch made you feel you were stepping on the flag if you didn't volunteer. More than enough cars showed up at the major hotels, promptly at 7:00 a.m.

The Nellis demonstration included just about every weapon in the US Air Force inventory plus combat planes of the NATO allies and aerobatic teams from Italy, the Netherlands, and Taiwan in addition to the USAF Thunderbirds and the Navy's Blue Angels. The Portland *Oregonian* reported that "the military air show has been conceded by the foreign press as bigger and better than anything in the free world. . . ."

When it was all over, Donald G. Wallace, Dean of Drake University's College of Education said: "All of us came away with a much better appreciation of airpower concepts and of the very great problems facing us in education in adapting to the new world that airpower has brought about."

The Detroit *News* called the Congress ". . . the most comprehensive international aerospace program ever presented." And George Haddaway, Editor of *Flight* Magazine, wrote: "US aviation owes the Air Force Association a debt of gratitude and a rousing vote of thanks for 'the miracle at Las Vegas.' "



The first international air show in US history was AFA's World Congress of Flight, held in Las Vegas, Nev., in 1959.

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AFA and USAF teamed up in 1957 to celebrate the Air Force's Golden Anniversary. Thousands flocked to an air show at Andrews AFB, Md., featuring everything from "pushers" to the latest jets. Here's a B-57.

World Congress of Flight in Las Vegas *(see box, p. 59)*. An entire chapter of the book is devoted to that massive undertaking.

AFA's first Jet Age Conference was held in Washington in February 1956 with more than 1,500 people attending. It addressed military and commercial requirements in the Jet Age—jet noise problems, flight safety, the impact of jets on airports, and traffic control problems. Subsequently, twenty-five similar conferences were held across the country that year. These conferences were continued in following years, with even larger participation, and broadened to cover missiles and space after the Soviets' technological surprise of Sputnik I in October 1957.

One of the Association's major contributions to national preparedness was its unremitting campaign to keep its members and the public at large informed about the Soviet Union's growing military and scientific/technological strength.

Two months after the Soviets launched *Sputnik*, AFA produced a staff study entitled "Organizing for the Technological War." The study charged that the nation was lacking in dynamic leadership in science and that the President's Science Advisory Committee should be revitalized and supplemented by working groups of young scientists.

This study stimulated an investigation of military R&D by the Executive and Legislative Reorganization Subcommittee of the House Committee on Government Operations. AFA President Pete Schenk, himself an experienced R&D manager, testified before the committee, and the entire text of AFA's study was included in the committee's published report.

AIR FORCE Magazine was an indispensable means of keeping AFA members as well as media people, members of Congress, and key Capitol Hill staffers abreast of Air Force problems and the world balance of military power.

During the Korean War, a November 1953 article exposed North Korean techniques of brainwashing and torture that had extracted confessions of germ warfare from downed Air Force pilots. A digest of the article was published in some 800 newspapers. The November 1954 issue carried an article on Air Force crew members who were still being held prisoner in China more than a year after the war ended. The article, and a telegram from AFA President John Alison to President Eisenhower that was frontpaged by the New York *Times*, sparked reaction in Congress and the United Nations which resulted in release of the airmen.

The March 1958 issue of the magazine was devoted entirely to space weapons—the first publication of its kind. That issue became the basis for a book published by Frederick Praeger of New York. Material from it was used by New York University, by a leading encyclopedia, and the US Information Agency. The House Committee on Astronautics and Space Exploration asked for copies before it began hearings on pertinent legislation "so the members would know what the witnesses are talking about."

Other special issues that contributed significantly to public education were the annual "Air Force Almanac," inaugurated in August 1959, and the "Missile and Space Almanac" that was first published in April 1960.

Of Orators and Oracles

Delegates to the Ninth Annual Conference held in San Francisco August 9–14, 1955, witnessed what will stand for a long time as a histrionic high in convention lore.

One of the resolutions put to a vote concerned Billy Mitchell. After a suitable number of WHEREASes concerning Mitchell's contributions to airpower and to the nation, it concluded:

"NOW, Therefore Be It Resolved: That the Air Force Association in the light of the foregoing take such steps as may be appropriate to have proper application made to the Air Force Board for the Correction of Military Records to void the court-martial proceedings, and to take further corrective action with respect to such records as may be considered appropriate."

There were mixed feelings on the issue among Association leaders, particularly those who were of Mitchell's era. Many of them wondered whether "Old Billy" would really want to be cleared of his martyrdom. Among the dissenters was Gill Robb Wilson, who later was elected AFA president for the coming year.

During World War I, Gill Robb had served as a pilot with the Lafayette Escadrille and then in the US Air Service. Later he had a distinguished career in aviation as Director of the New Jersey Department of Aviation

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and as president of the National Aeronautic Association. He organized the Civil Air Patrol, was a member of the committee that developed the Civilian Pilot Training Program before World War II, and was co-founder of the Aircraft Owners and Pilots Association. He also was a columnist for the New York *Herald Tribune* and in the course of his varied career had been a preacher and a great orator.

When the resolution came up for discussion, Wilson had his say. With his closed eyes raised to the heavens and his square chin uplifted in end-of-the-runway take-off position, he climaxed an impassioned speech in behalf of "my friend Billy" and against the resolution with this admonition:

> Let us not take the cup from Socrates!
> Let us not take Christ from the cross!

But in the end, he testified in behalf of the resolution before the Board for the Correction of Military Records.

Almost three years later, AFA President Peter J. Schenk announced that the Board had voted four to one in favor of exoneration. AFA had won its case, but that left Secretary of the Air Force James Douglas with the unhappy task of making the final decision. Jim Douglas was one of the best friends the Air Force Association ever had, but Douglas also was a representative of the Administration, headed by General of the Army Dwight D. Eisenhower, a strict disciplinarian in military matters.

On March 4, 1958, Secretary Douglas sent a memorandum to the Chief of the Board. After reviewing Mitchell's service to the country and the vindication of his ideas in World War II, Douglas concluded:

"Colonel Mitchell's views have been vindicated. But while on active duty, and subject to the discipline of the military service, he characterized the administration of the War and Navy Departments as incompetent, criminally negligent, and almost treasonable.

"I am confident that his services to his country and his unique foresight as to the place of airpower in the defense of our country are fully recognized by his countrymen. No more convincing or appropriate recognition could be given than was bestowed on Col. Billy Mitchell on August 6, 1946, when the President signed a law posthumously bestowing upon him a Medal of Honor 'in recognition of his outstanding pioneer service and foresight in the field of American aviation.'

"The application is denied."

It was not long after Gill Robb Wilson's oration that the Air Force Association's good friend and staunch supporter, Arthur Godfrey, got us into a literal heap of trouble—but the kind of trouble we like.

The April 1956 issue of AIR FORCE was a special edition devoted to the Strategic Air Command, with fifteen articles by SAC leaders, including Gen. Curtis E. LeMay, SAC's commander in chief.

Most everyone in aviation was familiar with Arthur Godfrey's long love affair with the Strategic Air Command and his high respect for General LeMay. Both were apparent in his April 2 Talent Scouts show over the CBS-TV network. On the show, Godfrey held up the front cover of the April AIR FORCE and called the attention of his millions of viewers to something "very, very important."

"Steal one, borrow one, buy one if you have to," said Godfrey, "but get a copy and read it from cover to cover. Every American must know the things that are in this magazine." Since AIR FORCE was not on newsstands, Godfrey's viewers called his office for copies. We advised his staff that we had several hundred extra copies and would make them available to the first people who contacted us.

That night, Arthur relayed this information to his TV audience, along with our Washington street address. Hardly had he finished when our phones began ringing with calls from people who wanted their copies. Then the telegrams began pouring in, until we had requests for 160,000 copies beyond our regular print order. We condensed the SAC issue into a twenty-four-page reprint and mailed a copy free to each of the 160,000 people who had contacted us.

For Those Who Serve

There is no chapter in AFA's history of which we should be more proud than our work to get more adequate pay, better housing, improved benefits, and greater public recognition for the men and women of the Air Force. That campaign started in 1949 with AFA President C. R. Smith's personal letter to each member of Congress, urging support for pending legislation on military compensation. In his letter, he said:

"The time has passed when the personnel requirements of the Services can be provided by volunteer service of short duration. There is an urgent requirement that a career of military service should be made attractive to men of intelligence.

"There are men willing and able to devote their lives to a military career. They have, however, the same

AFA's Mid-Year Conference in the spring of 1962 brought to Colorado Springs such figures as radio-TV star Arthur Godfrey (left), here greeting Academy Honor Squadron Cadet Wallace, with Prince Bernhard of the Netherlands and USAF Chief of Staff Gen. Curtis E. LeMay.

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requirement for their lives as have other citizens of the country: the ability to live in reasonable comfort, to provide for the education of their children, and to lay up a saving against the time when their youth has passed. In other words, they require the opportunity to earn respect and a decent living while they are engaged in the military service. . . .

"We urge that you give serious consideration to this situation. Assess for yourself the merits of the individual provisions of the legislation, but do the country the good service of providing for the military establishment a standard of compensation in keeping with the reasonable requirements of the time."

From that day forward, AFA's elected presidents, chairmen of the board, and headquarters staff members have appeared frequently before congressional committees to testify in support of legislation beneficial to Air Force people, and we have campaigned for it in conventions, symposiums, and at the grass-roots level.

The Association also has worked to bring good people into Air Force careers. For example, until 1954 the Air Force was faced with a recruiting budget far below minimum requirements and held to joint recruiting with the Army. As a result of that and the recent Korean experience, the reenlistment rate had dropped to twenty-five percent. That year, DoD finally agreed to an independent recruiting program for the Air Force, and Congress increased its recruiting budget. Even so, it would be some time before the Air Force could be geared up for an all-out effort, and the money available was still inadequate.

The Air Force came to AFA for assistance, and the Association in turn called on its Industrial Associates, a group of nonvoting affiliates that started in 1951. Ninety-six of the 170 Associates sent representatives to a day-long AFA recruiting conference at the Pentagon.

Air Force leaders at the conference were headed by Chief of Staff Gen. Nathan F. Twining. AFA representatives included President George Kenney and past presidents Jimmy Doolittle, Harold Stuart, Tom Lanphier, and C. R. Smith, who served as moderator. As a result of the conference, the companies committed themselves to $5 million worth of advertising for Air Force recruiting in newspapers and magazines. They pledged to make available billboard space, to underwrite radio and TV spot announcements, and to sponsor aviation exhibits—all to help the Air Force solve its manpower dilemma.

Brig. Gen. Arno Luehman, Commander of the Air Force Recruiting Service, summed it up a few weeks later: "We are now in business, thanks to the Air Force Association, and I'm already getting a wealth of assistance from the industrial people who met with us in Washington. . . ."

AFA's emphasis on manpower issues at the Tenth Anniversary Convention at New Orleans in 1956 was highlighted by the first annual tribute to the Outstanding Airmen of the Air Force. Nineteen airmen chosen by

At the 1955 convention in San Francisco, AFA filled the sprawling Civic Auditorium's 50,000-square-foot display area with the exhibits of seventy-seven companies, the largest indoor aviation exhibition ever staged in the United States up to that time.

The Battle of the Beams. E-Systems plays to win.

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In electronic warfare innovation and production, E-Systems Garland Division has total answers today. And, we're getting ready for tomorrow with a vigorous, ongoing, multi-million-dollar research and development program to keep us ahead . . . in the "battle of the beams."

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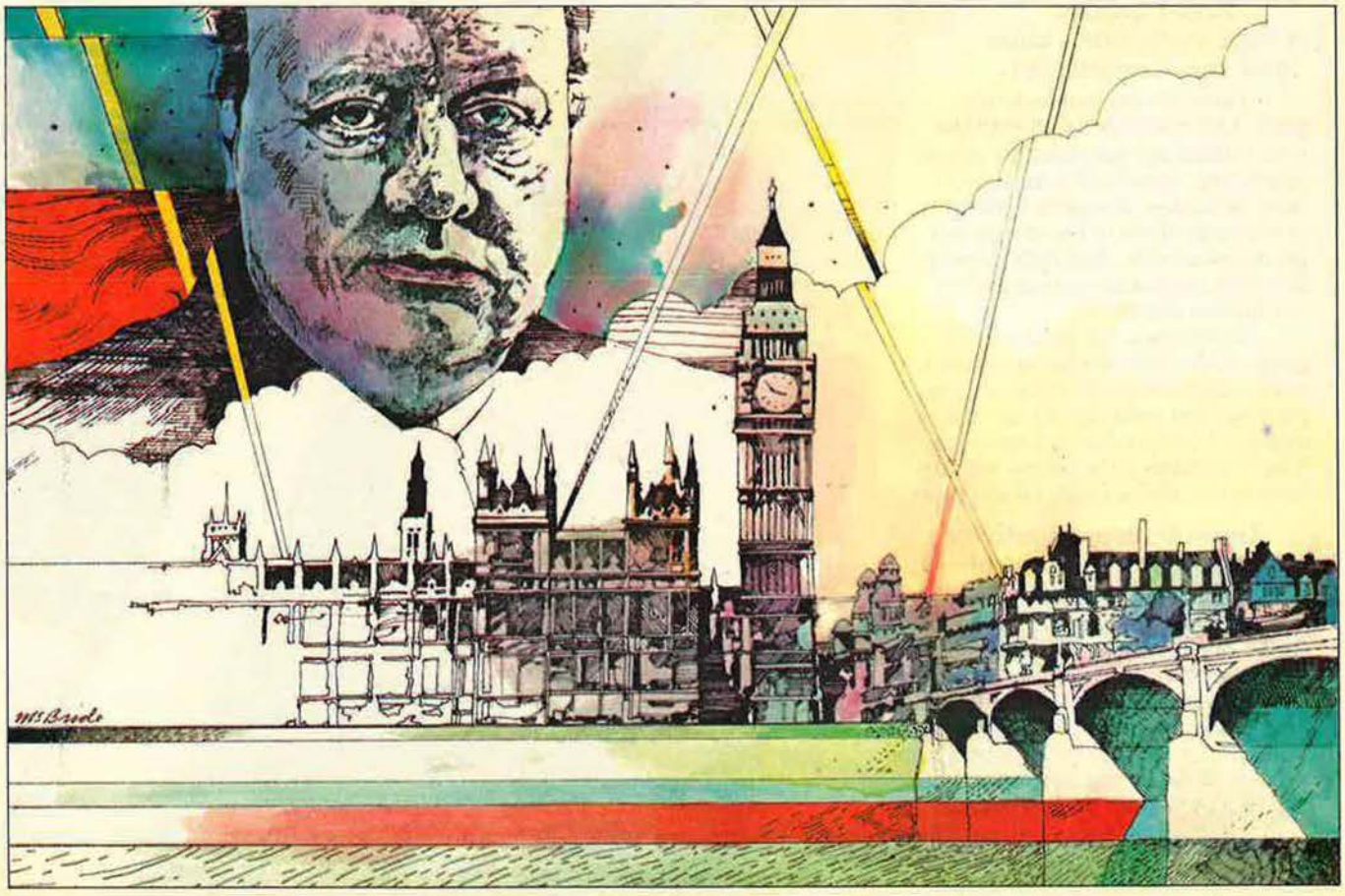

TOP PR

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Three years ago we took a hard look at ourselves. We saw a company whose productivity was good, but still falling behind foreign competition. And we saw an industry whose production techniques were not keeping pace with the rapid advances in defense electronics.

Our conclusion: mere evolutionary changes in our manufacturing process could never do the job. What was needed was a total productivity revolution. And that revolution is going on right now at Westinghouse Defense.

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control of material inventories, eliminating expensive stockpiling and production delaying shortages.

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Couple design engineering with process engineering.

Couple them with WICAPP — Westinghouse Integrated Computer Aided Process Planning. WICAPP creates a direct, automatic interface between the design engineer and manufacturing engineer in the development of new electronic system production. This WICAPP interface gives the designer the information he needs to apply the latest manufacturing techniques to the system while it is still being prototyped. The result is a system that will be produced faster, with greater reliability, and with higher cost-efficiency.

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American workers are excellent workers. They're inquisitive, innovative, creative and success-oriented. They want their talents better utilized. They want work that's more challenging and more important to them and to their company. By simply giving our people these opportunities, Westinghouse Defense benefits with improved productivity.

We're implementing ambitious training programs to give our workers the skills they need to master the developing production technologies. We've created one of the most successful Quality Circles programs in America. And we're giving our people the tools and working environment to improve productivity and gain more satisfaction doing it.

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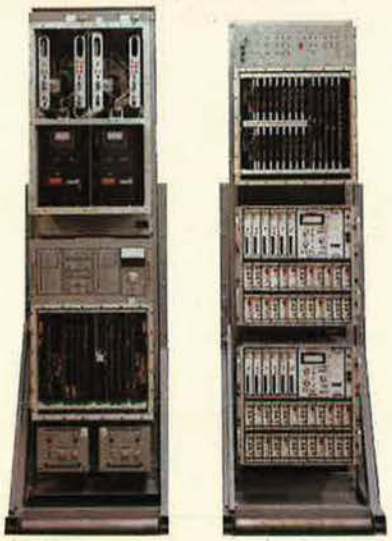
More than 300 of our AN/FCC-98 communications terminals are now serving these critical communications areas with exceptional reliability.

We've also developed a complete line-of-sight transmission system for the Digital European Backbone communications network serving the command structure and forces of NATO throughout Europe.

Map courtesy of Nystrom, Division of Carnation Company.

Installation of our 1st and 2nd level digital multiplexers and the AN/FRC digital radio will begin in 1981.



We are also supplying digital radios and 3rd level multiplexers to the NATO Integrated Communications System which handles NATO's long-haul communications needs.

If you'd like additional information on TRW's digital transmission and switching capabilities, contact: Joe Wellington, TRW DSSG, (213) 535-2258.

DIGITAL COMMUNICATIONS from

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DEFENSE AND SPACE SYSTEMS GROUP

the major commands for outstanding performance were seated at the head table next to the general officers and other VIPs at the Airpower Symposium luncheon for the Chief of Staff. General Twining led a standing ovation for them. Since then the Outstanding Airmen program, a full week in length and financed by AFA's Industrial Associates, has been a major event of AFA conventions, and each of the airmen serves on AFA's Enlisted Council.

All of this support for Air Force people prompted Secretary of the Air Force Jim Douglas to say:

"You of the Air Force Association have helped us understand the deficiencies in Air Force living and have helped point the way toward correcting them."

Exercising the Right of Dissent

The 1963 Convention met in Washington, D. C., September 11–14. It turned out to be the most politically explosive conclave up to that time.

The convention opened with nothing but good news. President John B. Montgomery, a former Air Force major general and commander of SAC's Eighth Air Force, announced that membership had swelled from the Korean low of fewer than 36,000 to 73,831 (still less than half what it is today). AFA was comfortably in the black financially and its programs were on track. Then came the blockbuster.

The convention met at a time when the Senate was debating confirmation of the recently signed Test Ban Treaty between the US and the USSR. In the September issue of AIR FORCE Magazine, Editor Jack Loosbrock had questioned the wisdom of ratifying a treaty that involved great technological and military risks for this country, in view of the Soviet Union's propensity to cheat and the difficulties of enforcing the treaty.

The Association's annual Statement of Policy adopted by the delegates on September 11, said, in part:

"We of the Air Force Association are particularly troubled both by the substance of the proposed Test Ban Treaty and the manner in which it has been thrust upon Congress, our military leadership, and upon the American people. Much of the basic information pertinent to a prudent decision remains in contention.

"We are keenly aware of the military risks which are inherent in this Treaty. The political gains which are supposed to outweigh these risks are not so clear. Whenever a nation limits its freedom of technical initiative in any important field, its security is endangered.

"It is our conviction, therefore, that even if the promised safeguards should materialize, ratification of the proposed Test Ban Treaty would entail unacceptable risks to the security of this nation and of the free world."

President Kennedy, when questioned at a press conference about the Association's position on the Treaty, upheld AFA's right to oppose Administration policy, adding that there should be "no reproofs."

Despite President Kennedy's statement, AFA's position on the Treaty was reported to be opposed violently by Secretary of Defense Robert McNamara, who was never an ardent supporter of the Association. Among other things, AFA had been critical of his management of defense news—particularly during the Cuban missile crisis, his abandonment of a counterforce strategy in favor of minimum deterrence, his belief that the Soviets would respond favorably to unilateral US reduction of strategic forces, and his opposition to the B-70 program.

On the evening of the day the Association adopted its Statement of Policy, the convention agenda listed a reception in honor of the Secretary and Chief of Staff of the Air Force. At mid-afternoon, Secretary Eugene Zuckert called from the Pentagon to discuss the situation with AFA President Montgomery. Secretary Zuckert, a good friend of the Association, explained that he was under extreme pressure (from an unspecified but easily identifiable source) and that, regretfully, he would not be able to attend the reception in his honor that evening.

But the Air Force demonstrated its readiness to meet a social emergency in a Washington ballroom, as well as a nuclear emergency in the Caribbean.

Gen. Curtis LeMay, the Air Force Chief of Staff, stood alone as the only guest of honor in the reception line. Normally he would have stayed in the line about ten minutes. Social events of this kind were not his favorite sport. But this night he was in the line for an hour and a half, greeted some 2,000 guests, and took care of the situation in grand style. The attendance of senior Air Force officers at the reception was at a new high. Several general officers, including Gen. Bernard Schriever of Air Force Systems Command, canceled trips so they could be present.

Despite the pressure on him, Secretary Zuckert later fulfilled his engagements as principal speaker at the convention's annual Secretary's Luncheon and as keynoter for Honors Night, the convention's climax event.

After the convention, newly elected AFA President Dr. Randolph Lovelace, Chief of the Aero Medical Labs at Wright Field, and a cowinner of the Collier Trophy, said:

"The right of dissent, so important to the preservation of our democratic institutions, must be exercised with maturity and judgment. Now that the Treaty has been ratified, we accept it as national policy and pray for its success."

I might add that in the years since 1963, AIR FORCE Magazine has reported frequent Soviet violations of the Treaty, as foreseen by AFA leaders.

* * *

In a relatively short article it has been possible to tell only a little about how the Air Force Association was founded, and to recount only a few highlights of its first seventeen years.

Regrettably, there has been space to recognize the contributions of only a few leaders at national, state, and local levels.

Looking back over those formative years, it should be a source of satisfaction for all of us to note how often AFA was ahead of whatever Administration held office in foreseeing the air- and spacepower needs of national defense and in supporting the people of the Air Force.

We lost a few, like the B-70 and the SST, but we won our share. That was only because of organized, grassroots efforts to educate public opinion, which is, as Billy Mitchell and Hap Arnold knew and as Tooey Spaatz said, "the final term of reference in a democracy." ■

A Message from the Secretary . . .

We Must Meet the Challenges

BY THE HON. VERNE ORR
SECRETARY OF THE AIR FORCE

Mr. Orr became Air Force Secretary earlier this year.

THIS past May, in my first article for AIR FORCE Magazine, I discussed my thoughts and initial impressions of our most valuable and essential resource—the motivated, dedicated people who operate, maintain, support, manage, and lead our Air Force. These people give the Air Force its very personality as well as its varied capabilities.

An important part of our responsibility as a nation to these individuals is ensuring that they are given both the physical and the moral support they require to do the job they have been asked to perform. Among other things, that means providing them with the tools of their trade—the proper weapon systems, support equipment, and training, in the right quantity and of the highest quality. It is those tools that I want to concentrate on in the paragraphs below.

We are at a critical point in our history. We can choose the wide and easy path of curtailed commitment, which leads inevitably to a weakened position in the world. The alternative is the narrower and rougher road of restoring our military capability in consonance with the American spirit to live in freedom and peace ourselves and to help others who share that dream. At this critical juncture, it is particularly important to examine our national goals and objectives as they relate to our common defense. As we all know, capability without direction is meaningless. Any military force, regardless of its size or how well equipped it is, must be tied to a national strategy aimed at widely accepted goals and objectives.

Certainly, one constant and generally accepted objective governing our national strategy has been to deter potential aggressors. To do that, it is essential for us to be able to wage certain types of wars whose probability seems very low. We must do this because the price of losing such conflicts would be unacceptably high, and also because the probability of their happening remains low precisely *because* of our capability to wage them.

How the Soviets View Nuclear War

Outside of that consensus, the national military strategy of our country under a changing and growing threat has been influenced by the differing views of successive Administrations. The elements of that strategy can hardly be described as "graven in stone." Today, for instance, there is a new understanding about future conflicts we may find ourselves confronted with. This new thinking arises in part from a more accurate appraisal of how the Soviets themselves view war, especially strategic nuclear war, for certainly their beliefs must affect how we posture our own forces in defense.

The cornerstone of Soviet military doctrine has been their commitment to prepare themselves to fight and win a strategic nuclear war, should such a war occur. Importantly, they have clearly delineated the various operations deemed essential for victory in such a war, and have relentlessly built up and trained their forces to support such a strategy. The Soviets have developed a concept of total warfare, stressing the supreme value of offensive operations including a strong predisposition to employ preemptive strikes against the enemy's military capabilities, in particular his nuclear delivery systems, as a means to achieve victory while limiting damage to their homeland.

Soviet leaders have stated that they believe a war between the Communists and the "Imperialists," especially a strategic nuclear war, would be short in duration; nonetheless, they acknowledge the possibility that even that kind of war might develop into a protracted conflict and that they must plan accordingly. Most importantly, the Soviets emphasize again and again that—in stark contrast to the broadly accepted American view—nuclear war, should it occur, would not represent the termination but rather the continuation of the political struggle.

Over the past decade, we have witnessed the modification of Soviet military doctrine concerning the possible nature of future conflicts. Throughout most of the 1960s, Soviet military doctrinal writings routinely asserted that in any conflict involving the superpowers, the widespread use of nuclear weapons would be virtually inevitable. Most recently, they have come to recognize the possibility that theater conflicts could remain conventional in scope. This shift has reinforced their belief in the value of maintaining massive conventionally armed forces and provided additional impetus to their drive to acquire improved long-range force projection capabilities.

What, then, does this mean to us? Obviously, in order to deter our main adversary, US forces must have the capability to meet the challenges that this Soviet threat

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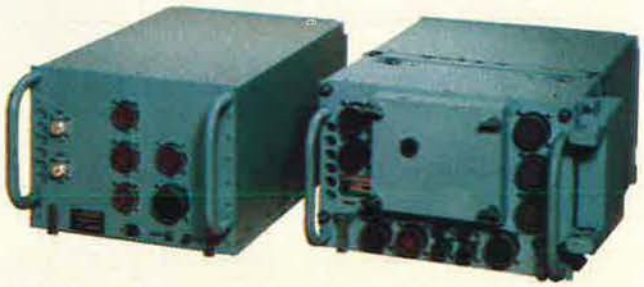
The USAF's JTIDS Class 2 terminals are about to take off at Singer.

The U.S. Air Force has awarded the Singer Kearfott Division and its project partner, Collins Government Avionics Division of Rockwell International, the full-scale development contract for 20 TDMA JTIDS Class 2 terminals.

Singer previously furnished 16 advanced development models of JTIDS Class 2 terminals to the U.S. Air Force and U.S. Navy, and to the United Kingdom Royal Air Force Establishment.

Singer's JTIDS terminals have undergone strenuous flight testing at Eglin Air Force Base and simulation tests by the U.S. Navy and by the RAE, Farnborough.

In addition, Singer is under contract to the U.S. Navy to examine the design concepts for a Distributed Time Division Multiple Access Terminal (DTDMA).



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presents. Consequently, our weapons development efforts must be geared to provide us with the credible war-fighting capabilities that deny the Soviets the prospects of victory at any level of conflict. I'd like to take some time to examine our efforts in three major areas—strategic nuclear forces, theater forces, and mobility forces.

Strategic Nuclear Forces

I have said that the principal reason for the United States to maintain a strategic triad is deterrence, but a deterrent force without war-fighting capability is hollow. The enemy's perception of our capability to wage and win a nuclear war on the strategic level is the real basis for the deterrent effect of those forces. Forces capable only of a massive final act of defiance and destruction are, in fact, *de*stabilizing. Soviet leaders will be unlikely to attack this nation or our allies so long as they know that they cannot destroy us with a first strike, that after such a strike our surviving forces will remain responsive to the National Command Authority and be capable of defeating their aims.

For instance, as the current US bomber force of B-52s and FB-111s gradually loses its ability to penetrate the imposing Soviet air defense system, there is a corresponding decrease in our operational flexibility and in our war-fighting capability. The Long-Range Combat Aircraft will not only update this most flexible portion of our strategic triad, but also will provide a complementary role in lower orders of conflict, which have, in my judgment, a much higher probability of occurring.

Also, at the current state of technology, a survivable land-based missile force is an essential part of that strategic posture. Not only must it be able to "ride out" a preemptive Soviet attack, but it must also remain responsive to the NCA through a hardened communications network, and it must carry warheads with the combination of accuracy and yield to neutralize the growing list of hardened Soviet military and C^3 targets.

Theater and General-Purpose Forces

It is also increasingly clear that the Soviets are acquiring the capability and that they believe in the utility of waging war on what is referred to as the "integrated battlefield." This future clash of armies may simultaneously involve conventional, chemical, biological, and nuclear weapons. This modern battlefield will be a rapidly changing one in which the level and method of warfare will be in constant flux. Modernization of our general-purpose forces must provide our people the capability to fight effectively under all these conditions and to sustain conventional operations for prolonged periods of time.

While the Soviets don't believe that a theater conflict would necessarily have to escalate into a general nuclear war, their initial targets will certainly include allied nuclear stockpiles and delivery systems. Deployment of GLCM, with launcher mobility and the missile range necessary to reach theater targets that are beyond the reach of current tactical systems is, therefore, a must to give the allied powers the beginnings of a flexible capability to counter the nuclear threat posed by the Soviet SS-20 missiles.

Beyond this, all our tactical and general-purpose forces must be responsive, flexible, and capable of operating day or night and in adverse weather conditions. And they must be *ready*. Readiness has three dimensions. Training is the foundation. No matter how good their equipment, our crews and support personnel cannot be effective without realistic experiences to prepare them for battlefield conditions. Also, to keep the nuclear threshold high, spare parts, supplies, and stocks of munitions must be at levels adequate to wage a protracted conventional war.

Finally, we must also address the growing age of our tactical forces by accelerating the replacement of older aircraft. Our tactical forces will be required to gain and maintain air superiority over the battlefield against a foe with the initial numerical advantage. Additionally, we must be able to attack his strength on the ground, particularly his fast-moving armored forces, with effectiveness, in any environment he chooses to create. That capability is also crucial to our deterrent posture.

Mobility Forces

We live in a world increasingly interdependent for essential raw materials, technology, goods, and services. With this interdependence comes increasing vulnerability to disruption of the international system by the Soviet Union. For this reason, US forces must be able to respond quickly to potential trouble spots. Defense Secretary Caspar Weinberger recently said that "we do not use our military power to hold together or expand an empire. Our strategy in this sense is reactive. If an aggressor moves first, we must be able to strike back. We must be able to mobilize our forces quickly and strengthen them in response to warning."

For example, the RDF was created in response to the realization that the Persian Gulf area is an area of vital concern to all industrial nations; however, without adequate airlift our response to future actions requiring our involvement there or anywhere else far from our shores cannot be rapid. The ability of the Air Force to move our forces rapidly is hampered today by a well-documented shortfall in airlift capability. Modifying the C-5 wing structure and stretching and adding air-refueling capability to the C-141 (along with buying the necessary spare parts to increase both aircrafts' wartime utilization rates) are essential steps in increasing our purely military airlift capability at the lowest cost. Those programs must be completed without interruption.

Simultaneously, we must vigorously pursue the Civil Reserve Air Fleet (CRAF) Enhancement Program, whose goal is to retrofit commercial wide-body passenger carriers with cargo capability in order to take the fullest advantage of the resources that exist within the civilian community. This program will be the most efficient way to augment our ability to move bulk and oversize cargo. Finally, we must address the remaining requirement to move more outsized cargo over intercontinental distances.

These are all difficult challenges for the nation and for the Air Force, and to meet them all within inevitable fiscal constraints is more difficult still. But they must be met, because being ready and capable of winning the next war is the key factor in diminishing the probability of ever having to fight that war. ■

A Message from the Chief . . .

Reporting on a Year of Change

BY GEN. LEW ALLEN, JR.
CHIEF OF STAFF, USAF

General Allen has been USAF's Chief of Staff since July 1978.

THIS past year has been a year of major and positive changes for the Air Force. A year ago the country was engaged in a reexamination of national security—a major issue of which was the state of American military preparedness—and the course ahead was far from clear. The American public had begun to evidence a growing awareness of the ominous threat posed by the Soviet Union's burgeoning military might and more aggressive behavior, but this recognition had not yet been translated into the vitally needed increases in defense budgets. We were losing unacceptably large numbers of our experienced aviators, NCOs, and engineers, and there were serious deficiencies in the readiness and staying power of our forces.

Now, a year later, the situation has changed markedly. Our problems have not disappeared—the Soviet threat shows no sign of diminishing, inflation continues to eat away our procurement and O&M dollars, and we are still short of experienced personnel—but the state of the Air Force is much improved and the prospects for the future are far brighter.

Reflecting the popular mandate to revitalize US military capabilities, the Administration and the Congress are taking necessary steps to provide vitally needed improvements in our forces. Partly as a result of the substantial compensation improvements enacted by the Congress last fall and the prospect of further improvements proposed by the Reagan Administration, there has been an encouraging turnaround in retention. We must continue this positive trend. Retention of skilled and experienced people is the essential element of maintaining and improving our military capabilities. This month the Air Force Association will be honoring twelve outstanding airmen who exemplify the talented and dedicated men and women who serve in today's Air Force. We must continue to attract and retain such skilled and experienced people. We must provide a reasonable standard of living to include pay comparability with the civilian sector, more adequate PCS reimbursement, improved medical and dental-care benefits, and increased aviation pay. We can afford to do no less.

However, the improvements we see in recruiting and retention are not only due to improved benefits. These improvements are due, in large measure, to renewed patriotism, increased public awareness, and a greater sense of the value of military service. The Air Force and supporting organizations such as AFA must continue to emphasize the fundamental purposes and worth of service to country.

We are making significant progress in improving combat capability as a result of the emphasis placed on readiness and sustainability of our forces in the FY '81 and '82 budgets. Our crews will fly more frequently and train more effectively, the supply bins are beginning to fill with the needed spare parts, and our operational facilities will be better maintained.

Readiness improvements, of course, are only part of the picture. As well as being ready, we must have sufficient numbers of modern aircraft to meet the increasing Soviet threat. The capability of Soviet theater forces continues to grow as large numbers of night and all-weather-capable fighter-interceptors, equipped with long-range radar and radar missiles, enter the Soviet inventory. The Soviets are also improving the range and payload of their fighter-bombers and intermediate-range bombers.

In their planning for theater war, the Soviets place great emphasis on employing these forces in a massive, "blitzkrieg" air offensive as a means to achieve, among other things, their key objective of gaining and maintaining air superiority. Our fighters must be able to counter such an attack, to establish air superiority over the battle area, and to detect and destroy Warsaw Pact attack aircraft and bombers ingressing at low altitudes in all weather conditions. The F-15—the world's finest air-superiority fighter—in combination with the F-16 is specifically designed to meet these threats. Less-capable systems can no longer counter the advanced weaponry of our potential adversaries.

Since entering the force in the mid-1970s, the F-15 has proven itself to be a highly effective and reliable air-superiority fighter. This flexible and capable aircraft can fulfill a wide range of missions including continental air defense, worldwide air superiority, and, with selected enhancements, will be a highly effective ground attack aircraft. Because of its long range, large volume

The F-16 has already demonstrated its exceptional air-to-air and ground-attack capabilities, and achieved the highest mission capable rate of any fighter in FY '80. Above, an F-16B.

radar, and advanced avionics, the F-15 also enhances our tactical warning capabilities—the F-15 can operate autonomously to detect, track, and engage enemy aircraft at long range, thereby extending our E-3A AWACS warning and control capabilities.

Complementing the F-15 in the air-superiority mission, F-16s now entering the force have already demonstrated their exceptional air-to-air and ground-attack capabilities. In a recent tactical bombing competition in the United Kingdom, an F-16 team from Hill AFB won the meet hands down, attaining near perfect scores in bombing accuracy and in the achievement of all mission tasks. The F-16 has met or exceeded all of our expectations and will be a mainstay of our tactical forces for years to come.

The advanced technology embodied in these aircraft has led not only to improvements in combat capability but also to increased reliability and maintainability. Both the F-15C/D and the F-16 require significantly less maintenance per flying hour than the F-4s they are replacing. The failure rate for the F-15C/D avionics suite is less than half that of the F-4E, and the F-16 achieved the highest mission capable (MC) rate in FY '80 of any fighter in our inventory. Deployment exercises involving F-111s and F-15s have clearly demonstrated that our most capable all-weather tactical aircraft can operate well above planned wartime sortie rates when they are provided appropriate levels of spare parts. In a deployment to Europe last fall, for example, a squadron of F-15 Eagles flew more than 960 sorties in a nineteen-day period, achieving a sortie rate three times higher than the peak sortie rates achieved during either the Korean or Vietnam conflicts. Providing the stocks of parts and munitions to support wartime requirements has been a central focus of Air Force budgeting efforts over the past two years.

Over the past decade the relentless growth of Soviet strategic capabilities has eliminated the lead once held by the US in strategic nuclear capabilities. Moreover, the continued momentum of Soviet efforts clearly threatens to tilt the strategic balance decisively in their favor. We must act quickly to restore an adequate strategic balance and to maintain a credible deterrent and defense capability.

As of this writing, the future course of the Air Force strategic programs is uncertain. Alternative means to modernize our bomber force and to remedy the growing vulnerability of our land-based ICBMs are being carefully reviewed by the Administration. Whatever alternatives are selected, it is important that the strategic systems we field over the next decade and operate into

Sufficient stocks of spare parts and munitions are essential to the ability to generate wartime sortie rates. Above, airmen load munitions on an F-15.

the next century be adequate to the demanding challenges we face. They must be survivable, readily adaptable to changes in the Soviet threat, capable of timely and effective response, and supported by a similarly effective, enduring command and control network. Such capabilities are, of course, the bedrock of a credible US deterrent and defense capability.

In closing, I would like to add a personal thanks to the Air Force Association for its support of Air Force needs. Groups like AFA have played a key part in making the public aware of the growing Soviet threat and the need for military preparedness. The reawakening of public concern over the state of US defenses is due in no small part to your Association's efforts. ■

We found a way to elevate missile technology, yet keep costs down to earth. MQM-107B.

When the MQM-107A was introduced in 1976, it was the most advanced, low-cost, subsonic, recoverable missile target. Since then it's been through a lot of ups and downs—with over 400 units flying at a rate of 20 missions each. It was bound to be a success. Designed for simplicity, production efficiency and utilizing state-of-the-art technology, it's little wonder that the MQM met the target requirements of so many military organizations, so well.

But now there is a new state-of-the-art—the MQM-107B. Like its predecessor, it can be surface launched from a zero-length launcher with rocket booster assistance. It can be operated from remote ground control just like the MQM-107A, and recovered on command with a two-stage parachute system. In fact, the MQM-107B can do everything its predecessor did, but with greatly improved performance characteristics.

The MQM-107B utilizes an increased thrust propulsion system together with more precise digital flight control and improved 3-axis maneuvering autopilot to raise performance characteristics to a new level. Speeds in excess of 535 knots TAS are possible, from sea level to over 40,000 feet. Maneuvers requiring constant g loads up to 6 g's are no problem.

These improvements permit more precise target control and increased mission profile flexibility. For example, low altitude terrain following missions and simultaneous three vehicle flight missions can be flown. And the MQM-107B digital control system has additional computer capacity already built in to accommodate the even more stringent target requirements of the future.

In addition to improved performance, the MQM-107B has an improved payload capability with an internal volume capacity of 4.8 cubic feet. Easy access to augmentation and scoring payload and core electronics are also included in the design. And the new MQM-107B is mobile. Launch, tracking and control units are all self-contained. Relocation of a target operation is a matter of just picking up and moving.

The MQM-107B and all the various elements of its improved design have been thoroughly tested. It more than meets the military's demands for large payload volume and weight, target size, speed, altitude, endurance and precise controllability. All within a down to earth, cost-efficient system. That's technology.

For further details, please write to: Beech Aircraft Corporation, Aerospace Programs, Wichita, Kansas 67201.

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A Message from the CMSAF . . .

'Take Care of Your People . . .'

BY CMSAF ARTHUR L. "BUD" ANDREWS
CHIEF MASTER SERGEANT OF THE AIR FORCE

Arthur L. "Bud" Andrews became CMSAF this summer.

I AM pleased to have this opportunity to share with you my thoughts and feelings so soon after being selected Chief Master Sergeant of the Air Force. As a supervisor, First Sergeant, and Senior Enlisted Advisor, I have lived with the motto "Take care of your people and they will take care of the mission." I do not know who first spoke these words, but I have come to believe in them and think of them almost on a daily basis.

Further, I believe totally that communication is vital and it must flow fluidly "up and down the flagpole." In these complex times, it is important that we communicate well, and at least half of every conversation is listening. We must listen to the people so we can know what is going on and to ensure that we focus on the real issues.

The people also have an obligation to listen to the Air Force leaders and understand that the achievement of a strong Air Force is the sum of its parts, and that we have to channel our efforts and funding many times to equipment, facilities, spares, etc. This does not mean we do not understand or care, but that we are trying to keep the system in balance.

Last September, General Allen wrote an article for this magazine in which he stated, "The nation and its governing bodies are coming to realize that today's complex national security environment requires top-notch, technically competent people. We in the Air Force are especially dependent on the seasoned veterans who are steeped in the lore of our profession."

Effective leadership can only come from a career-long commitment to doing the best job we can, tackling the hard issues head-on, clearly and concisely stating our views, and implementing policy and direction as best as is humanly possible.

The Administration and the Congress are closely assessing the military capabilities in a positive sense. This close look is going to continue even more so in the future than it is today. I hope our blue-suiters and spouses realize this.

We must recognize that the confidence and public trust placed in us must continue to be earned. We are visible and identifiable. It is imperative that we strive each day to earn public trust and increase our credibility. To do this means that we must give more than we receive. For without credibility we have nothing. Being in the military is a unique profession.

There are few jobs in the Air Force that cannot be effectively completed by an enlisted member. The prestige of our senior NCO corps must be enhanced. We must push for the opportunity, ensure our people are properly trained, and, once given the position, demonstrate our ability to function in a nontraditional enlisted environment. We need to create a compelling desire for airmen to want to become a Chief Master Sergeant. I believe we cannot continue to siphon our best talent to commissioning programs. We must have a strong enlisted force if we are truly to be the backbone of the Air Force.

In recent years we have seen a greater blending of the military into the civilian community than ever before. However, being a community, we have community needs that encompass not only the military member, but the family as far as schooling, housing, child care, and health care are concerned. If you don't think your spouse and children play an important role in your future, maybe you won't have the bright future you want. The quality of life for the military member must be continuously enhanced. We must upgrade and improve areas in which our people work, live, or play. No one can do their best when basic needs are not being met.

I want to talk with people! I am willing to go anywhere there is a blue-suiter, whether it's five or 5,000 people in Thule, Anchorage, or Turkey. If a blue-suiter can go there, I want to see for myself what the conditions are. And I like telling it like it is. I will tell you and, of course, my boss, the Chief of Staff, what's out there. I like to see things firsthand. The only way I can do that is to visit as many bases and people as possible. After I have listened and seen it for myself, possibly then I can make some suggestions for changes—for the better.

I am looking for your support and counting on it—especially the strong staff support of the senior noncommissioned officers. You have my sincere promise of hard work and dedication both to people and the mission. ■

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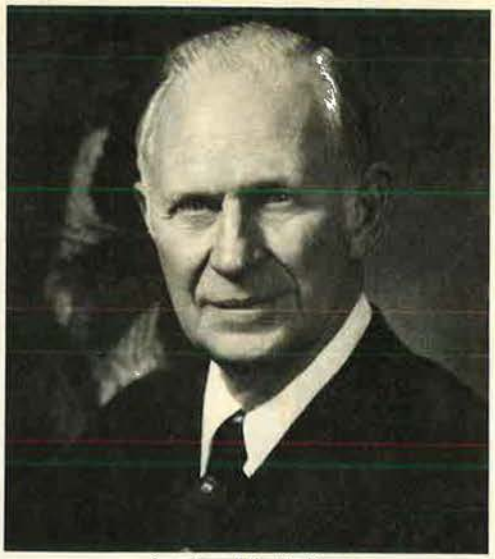
F-16 Fighting Falcon Wins the 1981 RAF/USAF Tactical Bombing Competition

Scoring 7,831 of a possible 8,000 points, F-16 pilots and support personnel of the 388th Tactical Fighter Wing from Hill AFB, Utah, swept a four-day competition in Scotland against RAF Jaguars, Buccaneers and USAF F-111s.

The Fighting Falcon recorded its near-perfect score during long-range, low-level missions against obscure targets protected by surface-to-air missiles and interceptor aircraft.

GENERAL DYNAMICS



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Long before the **Columbia** became a star, and kids everywhere began picturing themselves as part of the Shuttle Program, we put our name on the line. **Rocketdyne.** We designed and built history's first reusable rocket engines—Space Shuttle Main Engines.

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We're helping to put America back on the winning track. We're **Rocketdyne,** a Division of Rockwell International, the company people look up to.

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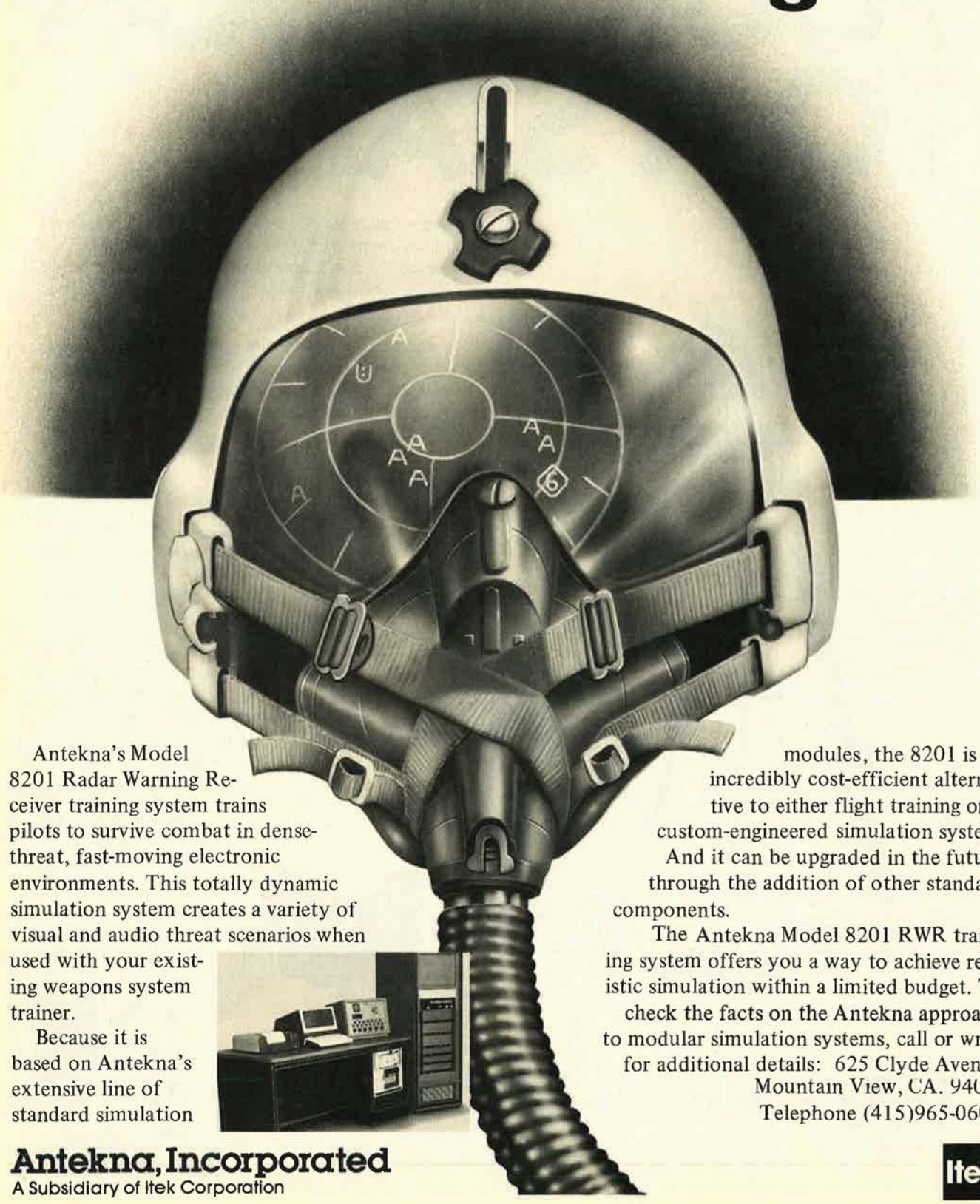
RWR simulation training makes real threats less threatening.



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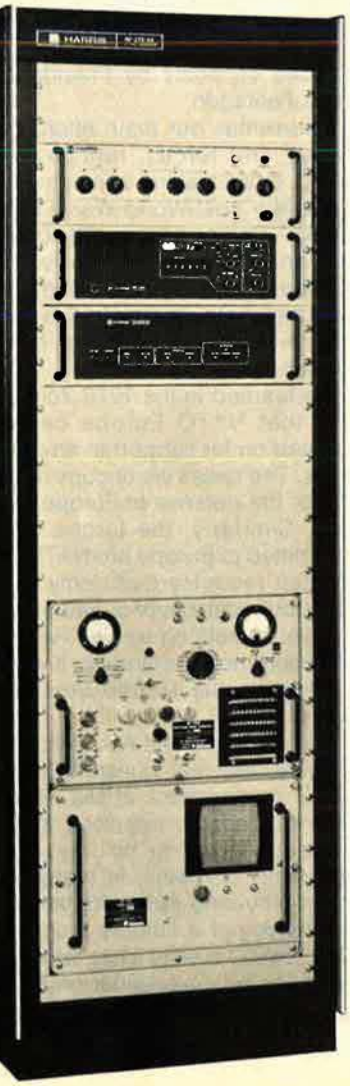

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The time may come when the US must employ its forces stationed in Western Europe to protect vital interests elsewhere. It is appropriate, then, that we begin the process of . . .

Reexamining Our NATO Commitment

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

OUR NATO allies were uneasy, back in the 1960s, when the United States began to show its seamier side. The race riots and antiwar demonstrations, along with an obviously deteriorating military presence in Europe, all contributed to a new and more skeptical view of America as the leader of the Alliance. The earlier view had been of a rich and self-assured nation, a little arrogant, perhaps, and not always easy to be around, but a leader nonetheless. The 1960s altered that image, and the Vietnam debacle, followed by Watergate, almost destroyed it. Four years of the hapless and irresolute Carter regime left the United States on a very shaky pedestal.

Now we have a new administration clearly determined to turn things around. Money is, of course, implicit in that scheme, and President Reagan is making certain there is no shortage there—not, at least, for some very big weapon systems. Whether or not the pay tangle—in which the least deserving are too well paid in comparison to the deserving highly skilled—can be straightened out remains to be seen. Until it is, military rewards will continue to be unattractive to too many of the bright and discerning. As for the All-Volunteer Force, it can only be a matter of time until the folly of that idea is generally acknowledged.

But these are simply problems, however difficult, along the way. Let's assume they are all solved in the reasonably near future, and the United States once more has a disciplined, motivated military backed up by ample reserves of people and supplies. The question that we can then ask in anticipation of that day has to do with our strategy for any situation short of a nuclear exchange with the USSR. Given that ghastly scenario, there is no place for strategy, just reaction. The strategy, such as it is, comes in trying to prevent that kind of war by building Tridents, MXs, and bombers.

Granting a nuclear stalemate, however, there is still an ever-increasing probability of war. The Middle East, or Southwest Asia, to take in the larger area of potential conflict, has become everyone's favorite candidate as the next battlefield, one that seems likely to see American forces involved one way or another. All of which is, of course, obvious enough and the reason behind the Rapid Deployment Force, a casual invention of the Carter years now being pursued seriously by President Reagan's Pentagon.

Meanwhile, our main effort, both in money and forces, remains tied to NATO. It is a historic commitment, one that every post-World War II administration—Democratic or Republican—has endorsed with enthusiasm. The question, given the times and the dangers they hold, is should this continuing inviolate commitment to NATO be reexamined?

We learned in the 1973 Yom Kippur War that NATO Europe cannot be counted on for support in any Mideast crisis. The bases we occupy in Europe are for the defense of Europe, nothing else. Similarly, the forces we have committed to Europe are NATO forces. We can redeploy them only over the strenuous protests of our allies. It is, of course, something we will have to do, objections notwithstanding, if we do get involved in the Middle East or elsewhere.

Putting Southwest Asia aside for the moment, the real question about our NATO commitment arises within the Alliance itself. It has long since become obvious that no ally, possibly excepting Germany, is really serious about providing forces for the agreed-on strategy of a flexible response. Instead, NATO is what it has always been, a thin line of conventional forces, poorly deployed, backed up by tactical nuclear weapons and the United States's strategic arsenal.

While the mechanism for employing tactical nuclear weapons is inevitably complex, NATO being a free and democratic alliance, the nukes have for many years been NATO's equalizer, at least on paper. Now, with the nuclear modernization program becoming a major political issue in Western Europe, there is increasing doubt as to the seriousness behind the flexible response strategy. That is not to say our NATO allies are ready to roll over; it is just a statement of fact.

If the Soviets were to invade, the allies would unquestionably fight, at least with conventional forces, for as long as they could hold out. Keeping in mind the imbalance between NATO and the Warsaw Pact, that phase would not be long. And given the present and growing antinuclear sentiment in Europe, there is good reason to doubt anything beyond conventional resistance.

All of this, however, is conjecture based on the unlikely event of a Soviet invasion of Western Europe, an invasion for which there is little apparent incentive. Meanwhile, the war clouds darken over the Middle East and all of Southwest Asia, and the United States ponders how it can deal militarily with a threat to our interests in the oil-producing world.

Since our interests are not as much affected as our allies' interests, there does appear to be one point worth discussing. Put simply, it would be a proposal to agree that US bases in Europe, along with US forces and supplies in Europe, are available for the support of contingencies elsewhere. It is one way, perhaps the only practical way, to bring the Alliance into touch with the real threat and at the same time make our continuing NATO commitment militarily sensible. ■

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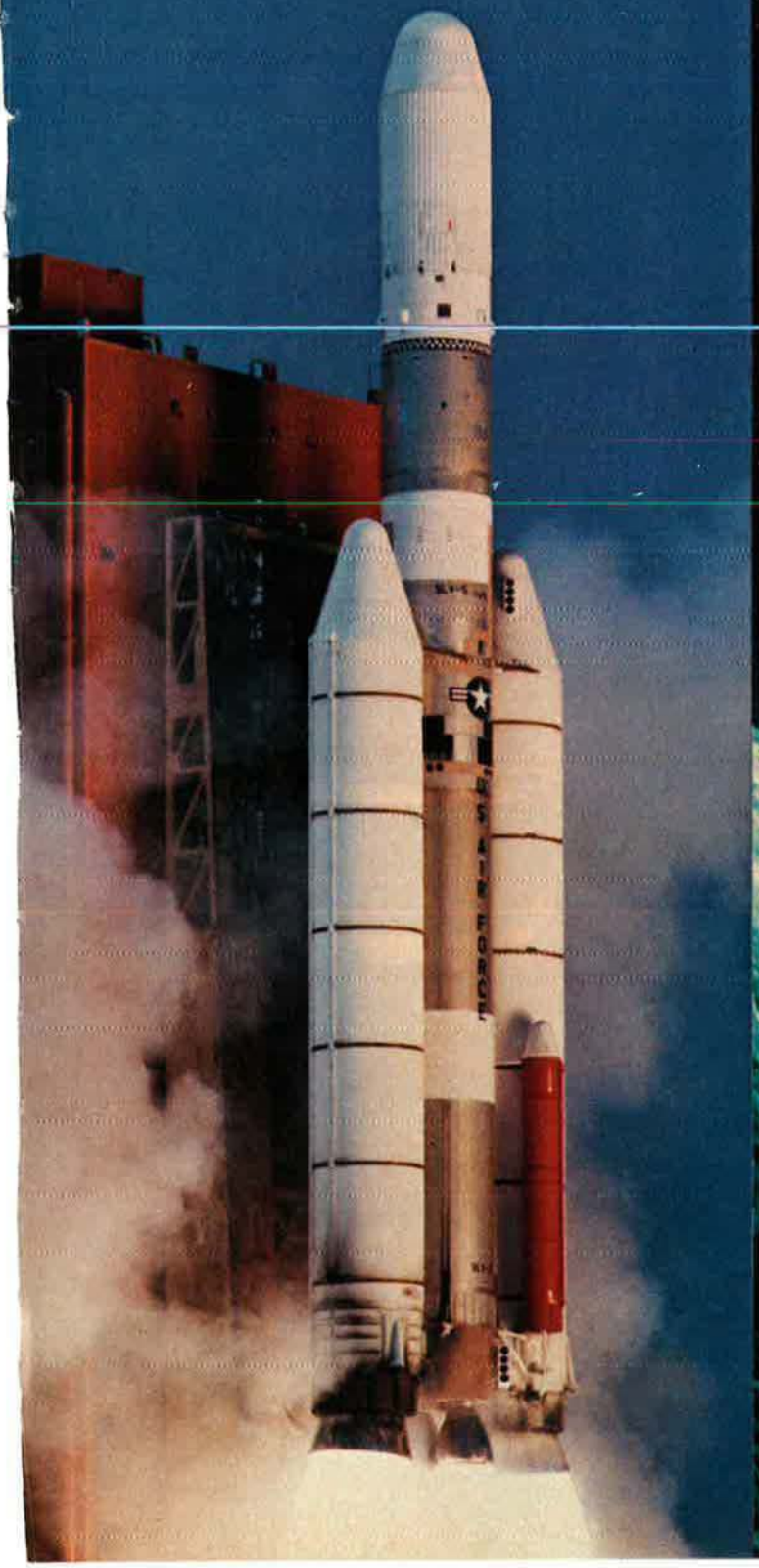

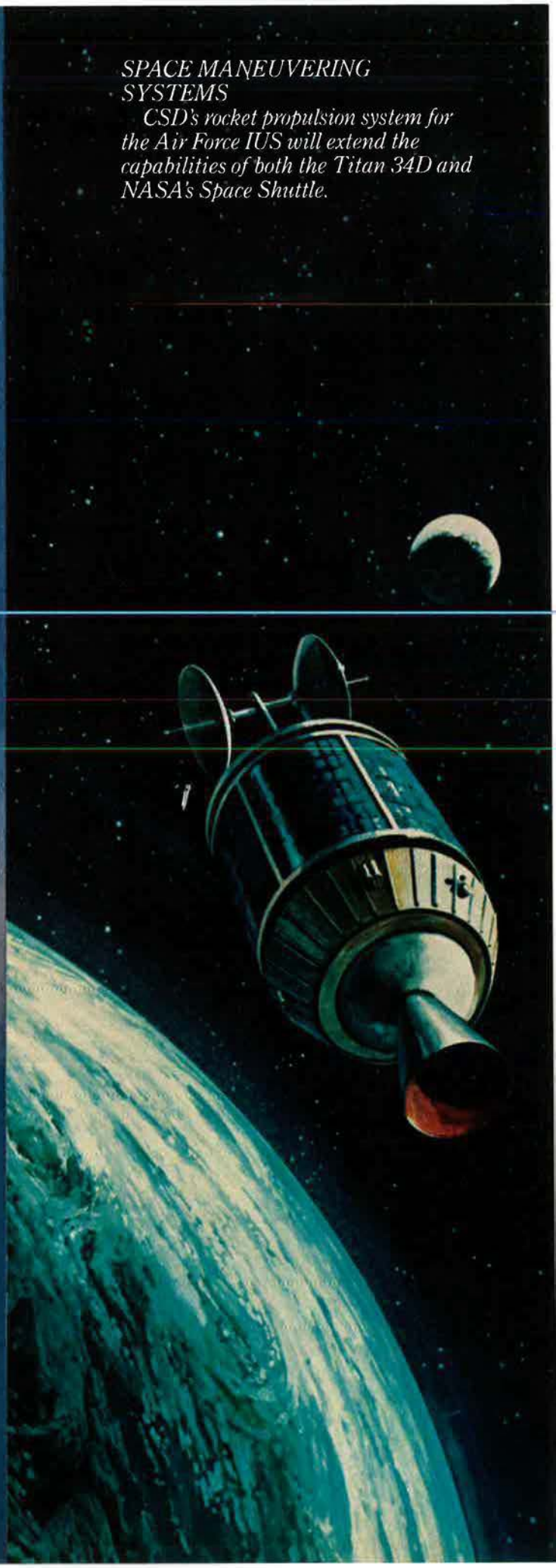

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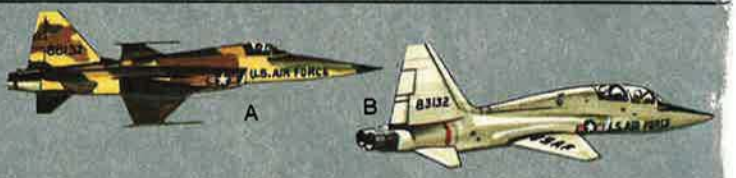

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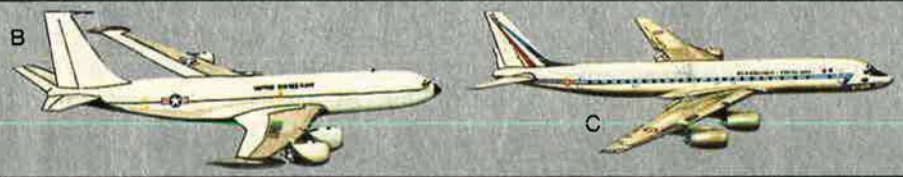
A. McDonnell Douglas F/A-18
B. Northrop F-18L*
C. Northrop F-5G*
D. Grumman FSW*
E. Swedish JAS*

A. Rockwell International B-1*
B. General Dynamics FB-111B/C*

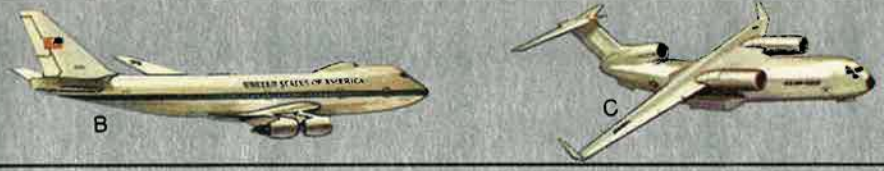
A. Northrop F-5
B. Northrop T-38
C. Cessna A-37B
D. Canadair CL-41
E. Aeritalia G.91Y
F. Rockwell International T-2C
G. Saab-Scania 105

A. General Dynamics F-16/79*
B. McDonnell Douglas F-4
C. Lockheed F-104
D. Israel Aircraft Industries KFIR



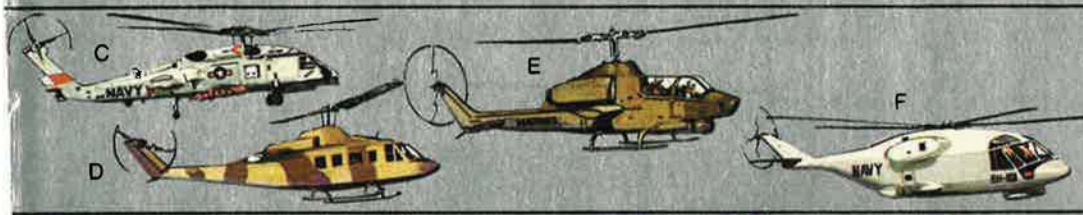
A. Boeing KC-135R*
B. Boeing ECX*
C. McDonnell Douglas DC-8 Series 72

A. Fairchild Republic A-10
B. Lockheed S-3A
C. Lockheed S-3 Derivatives*



A. McDonnell Douglas KC-10A
B. Boeing E-4A/B
C. Boeing CX*

A. Lockheed C-5A



A. Sikorsky UH-60A
B. Hughes AH-64*
C. Sikorsky SH-60B*
D. Bell 214ST*
E. Bell AH-1T+*
F. European Helicopter International EH-101*

A. Sikorsky CH-53E
B. de Havilland DHC-5
C. Aeritalia G.222
D. Kawasaki P-2J
E. Shin Meiwa PS-1

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"I am personally aware of the fact that a B-17 could absorb 3,000 bullets, fly with no rudder, and complete its combat mission on two engines. To me the Flying Fortress was, and will always be, the Queen of the Sky. I owe my life to the Queen. God help us had she not been in being when the war began."

—Lt. Gen. Frank A. Armstrong, Jr., USAF (Ret.)

Developed by visionaries in the Air Corps and industry, it survived a turbulent infancy and adolescence, then came to maturity in time to tip the scales in the strategic bombing campaigns of World War II. "It" was the B-17. During the war years, the Air Forces accepted 12,677 B-17s. In England today, the *Sally B* still flies. Her characteristics are reported by a present-day USAF A-10 pilot.

Flying the B-17 'Sally B'

BY 1ST LT. ROBIN STODDARD, USAF

WE ARE at 3,000 feet above the rolling hills of Northamptonshire, England, heading 130 degrees when I finally take over the controls. I settle into the pilot's seat and "white-knuckle" the yoke with both hands. I have assumed the left seat of the *Sally B*, the last B-17 gracing the skies over England. It is a flight I shall always remember because it is in the plane that, as General Armstrong so aptly put it, "was, and will always be, the Queen of the Sky."

The first thing that gets you—overwhelms you—is not the sensation of motion or of flight, but of sound. As an Air Force pilot, I have flown ever since the squealing days of T-37 "Tweets" in the relative quiet of pressurized cockpits and form-fitted helmets. Not so on this late summer day. Instead, I am engulfed by a deep propeller-driving roar. To a pilot it is the most amazing sound in the world, the steady throb of four Wright Cyclone R-1820-97 radial engines, hammering out 1,000 horsepower each in a measured pace.

I became familiar with the engine instruments in my preflight and knew what to expect in cruise conditions: 1,800 rpm and twenty-eight inches of manifold pressure for 150 mph. But I can't honestly remember monitoring a single engine gauge during the entire flight. My emotions prevented me. This is the last B-17 that will ever fly over the one-time stamping grounds of the Eighth Air Force! It is a moment to savor.

I look over my left shoulder and see the two powerful radials throbbing away. Their sound, their roar, and a quick look through the veil of the spinning props tell me the engines are OK. You can "feel" them . . . the gauges become superfluous.

It takes a moment to break the initial spell. At last, after sitting almost hypnotized, both hands still gripping the yoke, I start to relax and begin to appreciate the flight characteristics of the B-17. I begin to turn the *Sally B:* I am amazed! It's the most stable turn I've ever felt as a pilot. At first, the wings are almost reluctant to dip, and then they slowly respond to the pressures of the ailerons.

As an A-10 pilot flying from RAF Bentwaters, I'm used to nearly fifty feet less of wingspan and to commanding quick, sharp break turns and rollouts for gun passes. But there is an incredible surge associated with

flying this stable 105-foot wingspan. I knew Forts could be maneuvered violently if the need arose to foil an enemy's aiming solution or recover from a screaming dive. But the *Sally B* is treated a little gingerly. As you fly it with smooth graceful inputs, the wings regally condescend to turn.

I start to use a little rudder. Again I am incredulous. I had expected that large rudder inputs would be necessary to control the huge tail at the end of this seventy-foot fuselage. Not so, for with every half inch of rudder movement there is a sweet, exact yaw response. It is a beautiful feeling. With every input I make, I realize how the pilots and crew came to love the Fortress. She flies majestically, well deserving of her royal title, The Queen.

Trim control is completely satisfactory. Using the large elevator trim wheel on the left side of the center console between the pilots, you can easily trim away pitch transients. The same is true for yaw by using the rudder trim wheel located on the floor just aft of the center console. Aileron trim can be accomplished only by the pilot, since it sits on a small box to his left. Combat veterans of the B-17 have told me that by just trimming the plane, they've flown for hours on end with the flight controls shot away—including bomb runs, descents, approaches, and landings.

In the Cockpit

Before we took off from Coventry Airfield, I had a chance to familiarize myself with the cockpit. There is a huge half-moon yoke in front of both pilots. Spars off the yoke at three, six, and nine o'clock connect it to an appendage of the fence-post-like control column that splits your legs. There is an intercom switch on the right side of the pilot's yoke and on the left side of the copilot's.

The rudder pedals are huge, designed to accommodate the fleece-lined leather flying boots used by B-17 aircrews for high-altitude missions. You can see over the rudder pedals into the navigator's and bombardier's stations in the nose. The pedals are used for the hydraulic-powered braking, and the copilot has an additional small plunger parking brake on the panel just to the right of his knees.

The dash has nearly thirty gauges and dials, but seems to be completely uncluttered. At first I started to look for the four tachometers you would expect in a four-engine machine. But there are only two. Each has two needles so that the left tach monitors rpm for both number one and number two engines, and the right tach monitors three and four. The same is true for manifold pressure, oil temperature, oil pressure, the carburetor air temperature, and the cylinder-head temperature gauges. A quick glance, therefore, gives you the status of two engines instead of one—cutting engine cross-check time in half. That's not a bad idea for someone who might use the saved seconds to spot Me 109s and Focke-Wulfs. All the engine performance gauges are on the right side of the dash, staring the copilot in the face.

Directly in front of the pilot is an attitude indicator with a back-up in the middle of the dash. A vertical velocity indicator sits to the left of the pilot's attitude indicator, and a now inoperative flux gate compass is to the right. Below these are the airspeed indicator, in miles per hour, and the turn and slip indicator.

Above your head and between the seats is a center ceiling console that holds vintage radio equipment and a magnetic variation card. This console splits the two perspex windows that give the pilot and copilot a view of . . . dare I say it? . . . Twelve O'clock High.

View to twelve o'clock level is excellent and unlike any other—this is where the Fortress starts to take on a bit of its personality as a fighting ship. The windows

The B-17G Sally B *on the ground at Coventry Airfield, England, on August 17, 1980, before the author's flight.*

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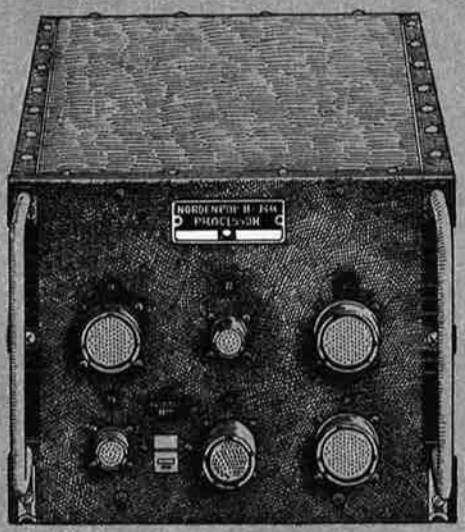

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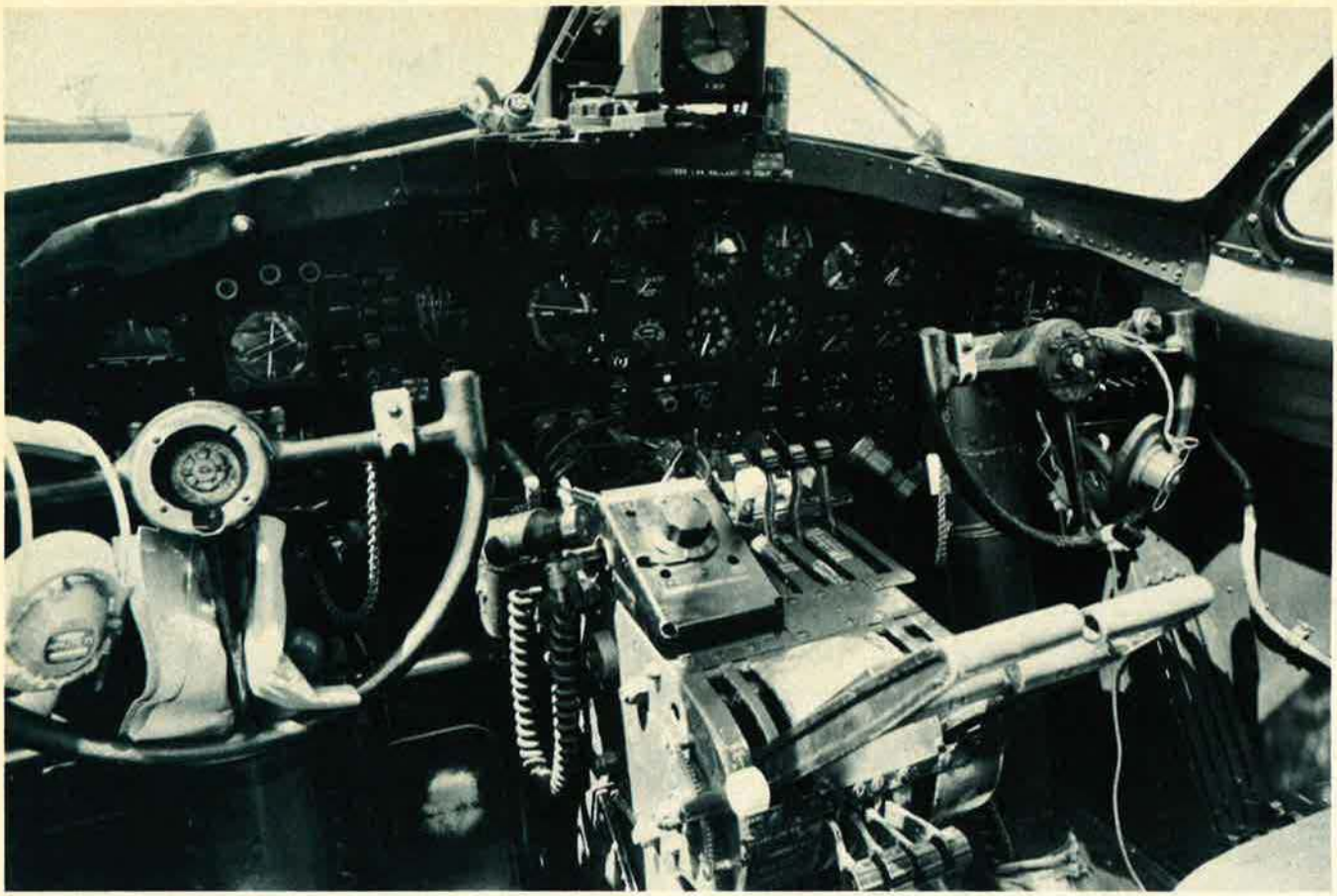

Cockpit of Sally B, *looking over pilot's right shoulder. Panel is relatively uncluttered, with flight instruments concentrated on left side and engine instruments on the right. Prop, mixture, and throttle controls are on the console between pilot and copilot.*

are larger at the outside of the fuselage and taper in a trapezoidal manner until they meet over the center of the dash. This gives a forward visual effect as though the aircraft is squeezing its "eyes" in response to danger. These window "eyes" are bracing for combat, squinting a little tighter in preparation for running a gantlet of flak and fighters.

The engines are controlled from the console between the knees of the pilots. On the upper right are the four mixture controls and the turbo and mixture control lock. Changes in power are usually a shared function, with the pilot controlling the throttles and the copilot adjusting mixture, props, and turbosuperchargers.

When adding power, the copilot first increases the mixture controls by pulling backward on them. Next, he pulls up on the four propeller controls at the base of this center console above the elevator trim wheel. Lastly, the left-seater grips the middle handle of the huge throttle controls (palm upward, suggests the pilot's manual) and progressively walks the throttles forward. It is a step-by-step operation that is lost on the modern jet pilot who is used to "cobbing" the throttles backward and forward.

Only the last step is familiar—similar to walking the throttles in tight fingertip formations. Of course, the final step would be to advance the turbosuperchargers, but the *Sally B* is no longer operated in the thin atmosphere of five miles above the earth, and they've been removed to save weight. To decrease power, the sequence is reversed, reducing throttles, then props, then mixture.

Right above the center console and located on the dash are the controls you've heard so much about in B-17 movies: "Oil pressure's dropping, feather number three!" Oil pressure is critical when it comes to feathering. The feathering controls are buttons clearly labeled 1, 2, 3, 4, which you push to start the feathering operation. The button energizes an electric motor with a cable to the affected engine to open a valve that redirects the oil pressure to the feathering gears. If you have enough remaining oil pressure, the blades of the

Sally B*'s crew on August 17, 1980: From left are Mike Waddingham, copilot; Stewart Evans, Paul Szluha, ground crew; John Littleton, flight engineer; Chris Bevan, pilot; the lone Yank, author Robin Stoddard; and Clive Denny, flight engineer.*

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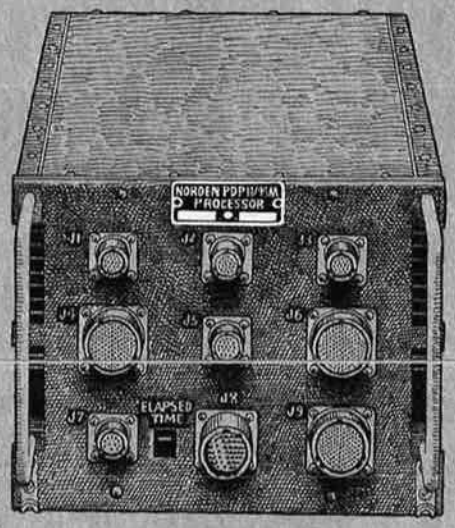

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propeller will turn parallel to the slipstream. If not, the prop will "windmill," creating enormous drag and eventually cause the engine to disintegrate.

Starting the Engines

I had monitored engine start-up in the *Sally B*. It is a task that falls primarily to the copilot. It is quite a bit more involved than the starting procedure for the A-10, which is accomplished simply by lifting a throttle over the idle stop once the auxiliary power unit is operating.

In the B-17, first you ensure that the fuel shutoff switches, the cowl flaps, and the carburetor air cleaners are "open" or "on." Then you check that the mixture controls are in "idle/cutoff." The starting switches are on a small panel on the copilot's right console. Upon receiving the start command, he will "energize" the number one engine by pushing down on the lower left-hand toggle switch of this panel and at the same time expel all the air from the primer, situated to his lower right.

He strokes the primer to obtain a solid fuel charge and then holds it down until he needs it again. After about twelve seconds of energizing, the pilot directs the right seater to "Mesh number one," whereupon the copilot pulls down on the second toggle switch from the left, labeled "MESH," while still holding down on the start switch. He then begins priming the engine with strong, steady strokes.

After the propeller makes one revolution, the pilot turns the ignition switches, located in front of the turbosupercharger controls on the center console, to "BOTH." If the engine fails to fire after the starter has turned it four or five times, the copilot must release the start and MESH switches while the propeller is still turning to prevent damage to the starter. When the engine fires, the pilot pulls the appropriate mixture control back to the "Auto-Rich" position.

The flight engineer or the copilot monitors the engine instruments on starting. Particularly important is the oil pressure, which must start to rise within thirty seconds or you have to abort the start. Minimum oil pressure subsequent to that is fifty psi. B-17s have been flown solo, but the arrangement of the starting switches and primer requires you to fly from the right seat in that situation.

Cleared for Takeoff

Flying the *Sally B* for longer than an hour gave me a chance to inspect the ship from every angle. When the flight began, I was confined to the area between the radio room bulkhead and waist gun positions. A few airline seats have been installed for use by the ground crew and the occasional fighter pilot who steals a ride.

Over the intercom came the call, "B-17 cleared for takeoff." There is no need for a long civilian call sign, since this is the last B-17 flying in England. She is affectionately known to all the air traffic controllers from Lands End to northern Scotland as B-17. My view of takeoff was from the right waist gun position, which is outfitted with a mock .50-caliber machine gun. A little smoke from number three was whipping past the barrel of the fifty as we picked up speed on the takeoff roll. I was waiting for the pilot to push forward to elevate the tailwheel prior to rotation, but that action is unnecessary. Approaching 110–115 mph, you simply apply moderate back pressure, and the airplane flies itself off the ground.

Sally B *is transformed for an English television production into the* Ginger Rogers, *via addition of chin, top, and ball turret mockups. The E784 on left fuselage is unchanged.*

The waist gun positions are about three feet square and covered in perspex. This was true of the wartime "G" models as well, but in the earlier Fortresses these firing ports were open to the slipstream, forcing the gunners to endure the sub-zero howling blast of 25,000 feet and above. On some missions the cold inflicted more casualties than the enemy.

Moving forward to the radio room, one finds a perspex ceiling hatch that could accommodate a single .50-caliber for additional five to seven o'clock high coverage. Leading out of the radio room is the "catwalk" crossing the bomb bay. It is about ten inches wide and stretches some eight feet across the closed bomb bay doors. When bombs hung up, it was the job of the radioman to balance on this thin plank over the slipstream and pry them loose.

Stepping out of the bomb bay, you are in the flight engineer's compartment, just aft of the pilots' seats. From here, the flight engineer would monitor the starting procedure and help in the event of emergencies. Directly above would be the top turret (missing on the *Sally B* when I flew her). Chin, ball and top turrets were added a few months later for an English television production.

On the floor between the pilots is a trap door leading to the nose compartment. You must really hunch over to enter the "goldfish bowl" where the navigator and bombardier made their home. The view is unbelievable.

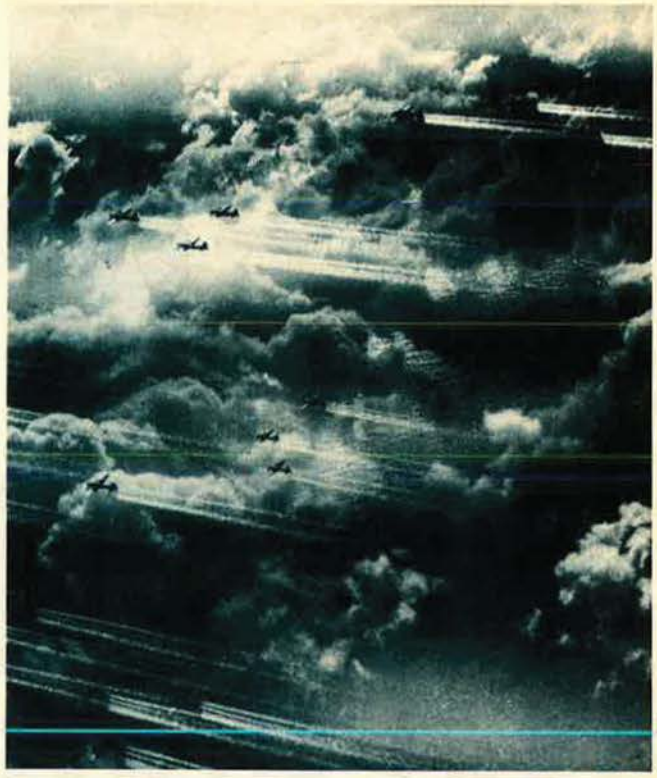
1st Lt. Robin Stoddard was commissioned in USAF via AFROTC after graduation from Colorado State University. He just completed an assignment as an A-10 pilot with the 92d Tactical Fighter Squadron at RAF Bentwaters, UK. Lieutenant Stoddard is now an A-10 instructor pilot with the 355th Tactical Fighter Training Squadron at Davis-Monthan AFB, Ariz.

From the bombardier's small chair you can stare straight down to the patchwork farmland. As an A-10 pilot, protected by a "titanium bathtub," I can't imagine what it felt like for B-17 bombardiers and navigators to face head-on attacks from enemy fighters. There is absolutely no protection.

Of course, with the two cheek guns in the nose section and the power chin turret of the "G" model, you could sure fight back. A B-17G carried thirteen .50-caliber machine guns. They were indeed Flying Fortresses. There is only one way to understand the magnitude of this defensive armament, from the enemy's viewpoint. Cajus Bekker, author of *The Luftwaffe War Diaries*, describes an engagement that occurred on February 4, 1943: "There were four pairs, and they attacked in succession: eight Messerschmitt 110s against sixty Boeing B-17s or sixteen 20-mm cannon and forty 7.9-mm machine guns against *780* heavy 12.7-mm [.50-caliber] machine guns." The defensive firepower was awesome.

Schweinfurt Remembered

I've been flying fifteen minutes and we are passing south of Bedford when I'm directed to turn to 070 degrees. We are heading for Duxford, The World War II home of the 78th Fighter Group's P-47 Thunderbolts.



A World War II photo shows aircraft of the 388th Bomb Group crossing the English Channel on their way to targets inside Germany. The 388th earned four Distinguished Unit Citations in combat.

Duxford now houses the Imperial War Museum, where the *Sally B* is hangared and maintained.

Two minutes later, as the twilight starts to overtake the *Sally B* and this day, August 17, 1980, we are over Bassingbourn. Of course, I didn't realize it until later, but I flew over Bassingbourn, home of the 91st Bomb Group, on the thirty-seventh anniversary of the Schweinfurt raid—when only ten of the group's twenty-four B-17s returned.

As we near Duxford, I realize that I am still experiencing a great deal more emotion than I had for my first solo in pilot training or my first flight in the A-10. If at that time I could have looked ten miles north and almost two score years into the past, to August 17, 1942, I would have seen twelve B-17Es from the 97th Bomb Group returning to their base at Grafton Underwood after carrying the scepter of battle to enemy-occupied Europe for the first time. There were twelve Queens that day in a coronation ceremony aimed at the railroad marshaling yards in Rouen, France.

The lead aircraft of that first Eighth Air Force mission was piloted by then-Col. Frank Armstrong. It was a day of celebration—all the bombers returned unscathed, including *Yankee Doodle*, piloted by Brig. Gen. Ira C. Eaker, Commander of VIII Bomber Command. As the enemy grew stronger and more aggressive and as the Eighth struck deeper into Germany, the losses would mount.

The sentiments of those who did survive were appropriately expressed by General Armstrong when he said, "I owe my life to the Queen. . . . The Flying Fortress was, and will always be, the Queen of the Sky." ■

KEEPING THE *SALLY B* FLYING

The *Sally B* is one of the B-17G Flying Fortresses built by the Vega subsidiary of Lockheed. Rolled off the assembly line as the war was winding down, she never saw combat, but was used as a training aircraft. In 1958 she was demilitarized and flown to France for survey work with the French *Institut Geographique National* as a camera ship for high-altitude photographic surveys.

In 1957, Ted White, a worldwide plane delivery expert, bought the *Sally B* to sell, but he "fell in love with her." He and dozens of volunteers have kept her in flying shape and restored the Eighth Air Force markings of the 749th Bomb Squadron, 457th Bomb Group, based at Glatton, Hunts. (Huntingdonshire).

Ted White formed B-17 Ltd., to preserve the *Sally B* as a flying memorial to the 79,000 US airmen killed over Europe in World War II. The costs involved are staggering. All maintenance, air, and ground crew duties are carried out by unpaid volunteers, but the insurance premiums run nearly $12,000 a year—just for fifty hours of flying. Gas and oil run about $4,000 for each of the twenty-five air shows or flybys that the *Sally B* will grace. The *Sally B* was grounded midway through the 1981 show season due to lack of funds.

The *Sally B* "Supporters' Club" is open to anyone with an interest in preserving her as a flyable aircraft. The annual membership fee is $10, for which you will receive a specially made lapel badge and a membership card.

Inside the radio room of the *Sally B* is a special memorial. A brass and mahogany plaque was dedicated in a ceremony on September 29, 1979, by representatives of USAF's Third Air Force, officials of the British Imperial War Museum, and Roger Freeman, author of *The Mighty Eighth*. Individuals or corporations donating more than $250 have their name or the company's name engraved on the plaque, permanently recognizing their help in keeping this flying tribute to the American airmen of World War II airworthy and flying.

Checks or money orders should be made out to: The B-17 Preservation, and sent to B-17 Ltd., 277 Chiswick High Road, London W4 4PU, England.

Formal bombardier training was nonexistent in the Air Corps until 1941, and bombing accuracy varied widely. By war's end in 1945, more than 45,000 bombardiers had been graduated. With the "secret-weapon" Norden bombsight, these men achieved phenomenal bombing accuracy for their units in combat operations. This article tells about two essential ingredients for a successful bombing campaign . . .

The Bombardier and His Bombsight

BY MICHAEL J. NISOS

In World War II, the crewman with the "best seat in the house" was the bombardier. His station in the "greenhouse," the unprotected Plexiglas nose of the aircraft, gave him an unparalleled opportunity to watch (and fire at) incoming fighters.

The bombardier's job was to keep the aircraft on a constant course and heading during the bomb run to synchronize his Norden bombsight on the target. Since the bomber's nose was a prime target for incoming enemy fighters and flak bursts, bombardiers needed not only technical skills but also a special measure of courage and dedication.

Let's examine the Norden bombsight and how it worked, and then the bombardier . . . the last of a vanishing breed.

The Norden Bombsight

In World War II, the Norden bombsight became famous for making bombing uncannily precise—it could place one of its bombs inside a 100-foot circle from four miles up. Bombardiers who worked with the sight described this remarkable performance more graphically; they said it could put a bomb in a pickle barrel from 20,000 feet. When asked if the sight could *really* hit a pickle barrel from that high, Carl L. Norden, the bombsight's inventor, replied: "Which pickle would you like to hit?"

Ironically, Norden had originally developed a bombsight for the US Navy. However, Navy bombing was done at low levels, which made use of the bombsight impractical. The Army Air Forces, in thousands of high-altitude missions, made it a major factor in winning the war.

Made of black metal, roughly cylindrical in shape and studded with knobs and apertures, the bombsight was nicknamed "The Football" by bombardiers in Europe and was referred to as "The Blue Ox" in the Far East.

By the end of World War II, more than 25,000 bombsights had been built by Norden and thousands more by Sperry and other subcontractors. Each cost the government $10,000. Twenty years later, the price was $25 on the surplus market. Today, it is difficult to find a Norden bombsight for sale at any price.

To solve the bombing problem, the bombsight used the ground speed of the aircraft and a particular bomb's actual time of fall (different bomb configurations resulted in different times of fall), and combined with the autopilot to compensate for the effect of wind or drift. *(See diagram on p. 108.)*

To assure that the bomb hit the target, it was necessary to find the proper point to release the bomb. The Norden bombsight could actually find this point if the proper data had been inserted into it and if the crosshairs were precisely synchronized on the target. This was the bombardier's task.

The bombing problem had two

Far left, one of Ninth AF's top bombardiers, Maj. William E. Smith. Left, Eighth Air Force group donated a plaque to Thetford, patriot Tom Paine's birthplace in UK. Above, the delicate work of loading one of the Norden bombsights aboard aircraft.

parts: the "course" problem and the "range" problem. The course problem was relatively easy. A free-falling bomb falls in the same direction as the aircraft was headed at the moment of release. The problem was solved by placing the aircraft on the correct heading and correcting for the effect of the wind.

The range problem was more complex. When the free-falling bomb was released from the aircraft, it was subject to the actions of gravity, airspeed, air resistance, and wind. These forces determined the path the bomb followed and its point of impact.

Because these forces slowed the free-falling bomb, the bomb would "trail" behind the aircraft after it was dropped. This trail represented the horizontal distance from the intended point of impact to a point directly beneath the aircraft at the instant of impact. Therefore, compensation for trail had to be inserted into the bombsight.

The actual time of fall (ATF) of the bomb depended primarily on the altitude of the aircraft above the target, its true airspeed, and the ballistics of the bomb itself.

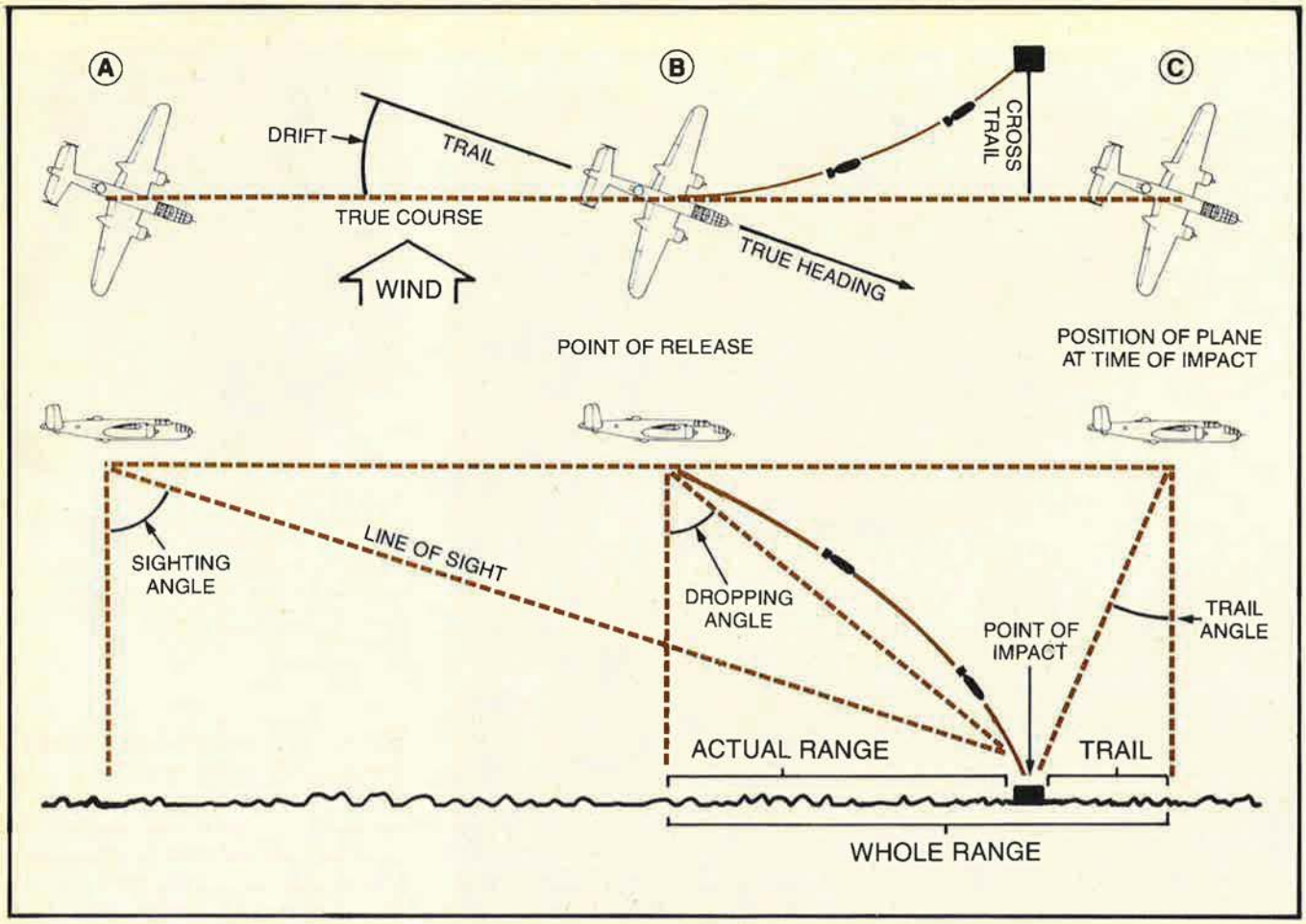
Trail and the bomb's ATF were manually set into the bombsight. Trail was set into the bombsight as a mil value on a scale with an arm on top of the bombsight. The ATF was set into the bombsight as a "disc speed." It was roughly set in using the disc speed drum and refined using a tachometer. Precomputed tables furnished the correct ATF disc speed and trail value for each bombing altitude, true airspeed, and type of bomb.

Once the correct trail and actual time of fall had been set into the bombsight, the bombardier synchronized the vertical and horizontal crosshairs on the target, finitely correcting for course and range. If this was done correctly, the bombsight would find the correct point in space for the bomb release and release the bomb at that point. Synchronization on a target using the bombsight could not be done with precision unless the optics of the bombsight were held in a steady, fixed position relative to the earth.

Capt. W. E. Sticklen in his nose "greenhouse" aboard a B-17 of the 91st Bomb Group, April 20, 1944.

Uncage Your Gyro

Since an aircraft pitches, rolls, and yaws or turns, a gyroscope was needed to hold the bombsight optics in a stable position, regardless of the aircraft movement. This gyro was located on the left side of the



Two views of a bomb run. At Point A, the bombardier adjusts course knobs to turn the aircraft into the wind to compensate for wind drift (top) and sights target for range (bottom). At Point B, the released bomb's descent is affected by wind (top); its trajectory (bottom) is determined by the aircraft's groundspeed and the bomb's ballistics. The aircraft is at Point C at the time of bomb impact, and the bomb should fall on target if wind drift (top) and range (bottom) have been computed accurately.

bombsight. A large silver knob just above it was used to "cage" or lock the gyro until the bombardier started on the bomb run. Once "uncaged," the gyro stabilized the optics against pitch and roll of the aircraft. It then established a vertical reference to the ground, which was necessary to align the course and measure the dropping angle.

There were two "bubbles" on the bombsight, much like those used on a carpenter's level. One was placed parallel to the fore and aft portion of the aircraft and the other laterally. Two silver knobs on the left of the bombsight head were used to center these bubbles. Once the gyro was leveled during the bomb run, it would tend to remain level. Leveling of the bubbles was critical. If an aircraft was flying at 10,000 feet and the top of the gyro was tilted one degree to the rear, the bomb would hit about 214 feet short of the target. This was a "bubble error."

While the Norden bombsight stabilized the optics for the pitch and roll of the aircraft, the "yaw" or lateral movement of the aircraft had to be compensated for also. This was accomplished by the stabilizer, the box-shaped equipment on which the bombsight fit and was connected to. When the bombsight was properly fit and the nemesis of the bombardier—"the dovetail locking pin"—was inserted to complete the connections, a directional gyro stabilized the entire sighthead and gave the bombardier control of the aircraft through the autopilot.

With the bombsight connected to the stabilizer and accurate data set into the bombsight, the bombardier was ready to synchronize on the target. Two sets of larger silver knobs on the lower right of the bombsight were used. These "course knobs" were used to make drift and course corrections. When these corrections were made precisely, the vertical crosshair would remain stationary.

The other set of knobs on the lower right were the rate knobs, which synchronized the lateral crosshair on the target, controlling groundspeed or rate of closure. Groundspeed varies with the heading of the aircraft, since wind causes the differences between true airspeed and groundspeed. Therefore, the aircraft had to be on the correct heading before the closure rate could be accurately synchronized. When this occurred, the lateral crosshair remained stationary.

The Norden bombsight was a precision instrument; likewise, the bombardier had to be precise in his calculations, careful in his insertion of data into the bombsight, and methodical to assure proper synchronization. As much as the Norden bombsight could do, it could only do it if the bombardier was precise.

There were six major causes of errors in synchronous bombing, beyond actual malfunction of the bombsight itself. They were: (1) incorrect vertical of the gyroscope, (2) incorrect actual time of fall of the bomb, (3) incorrect trail, (4) incorrect course alignment and synchronization of fore and aft crosshair on the target, (5) incorrect rate (misalignment and synchronization of lateral crosshair on the target), and (6) incorrect release of the bomb. The bombardier had to be just as precise as the bombsight.

The Bombardier

Although the Norden bombsight provided the key to accurate bombing and made a major contribution to winning the war, it was only as good as the men who made it sing . . . the bombardiers.

Gen. Lew Allen, Jr., the Chief of Staff, US Air Force, in a letter read at the 9th Biennial Convention of the Bombardiers Alumni Association (BAA), which was held in Washington, D. C., August 20–23, 1980, described the bombardiers' contribution to the war effort:

> You are representatives of an elite group that contributed substantially to ending World War II successfully, and with minimum loss of American blood. You lived under enormous pressure, for your comrades depended upon you to put the bombs on target. You flew in exposed positions. And yet, for a mission to succeed, you had to maintain an icy calm even under intense attack. You were calm and you were brave, and you bombed with precision. You set an example for generations of airmen. We thank you.

Who were these incredible individuals who came into the Army Air Forces from across the nation, were trained to use the Norden bombsight and, as General Allen said, " . . . bombed with precision . . . with a special measure of courage and dedication"?

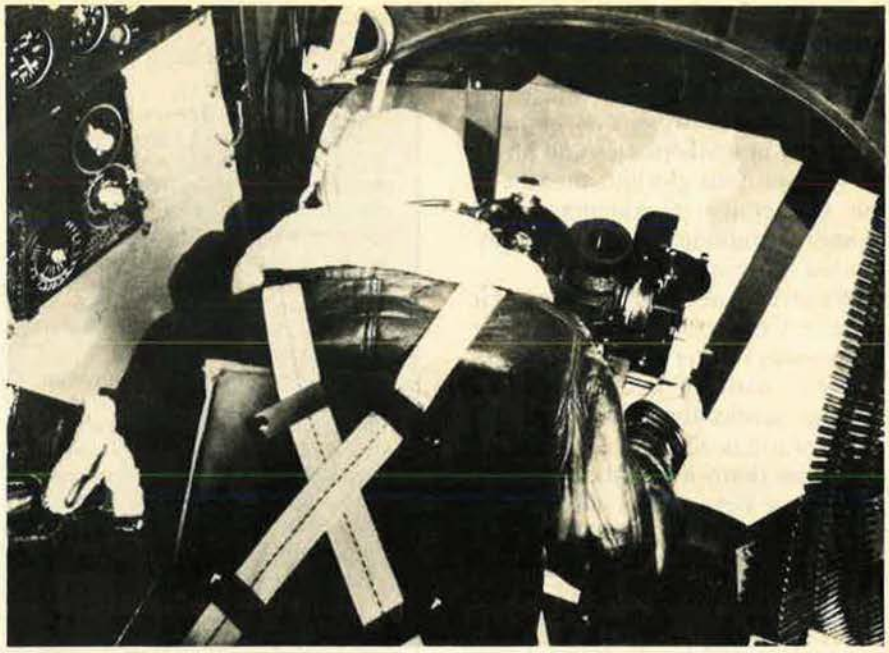
The typical bombardier was usually a happy-go-lucky fellow, unlike the always serious-minded navigator or the unemotional pilot.

In the 1940s, these young men came into the Army Air Forces because they wanted to fly. After basic training and taking those famous "Stanine tests" at one of the Classification Centers, each was classified as a Pilot, Navigator, or Bombardier, or "Qualified for All Three" (QAT). The Stanines consisted of a battery of tests on a variety of equipment to determine if the individual had the aptitude and potential for either or all of these crew positions. These young folks went directly into pilot, navigator, or bombardier training.

I had "qualified for all three," but never got to pilot training because, like so many others, I was "reclassified" in the midst of training in order to meet the needs of the service.

My memory of what happened is quite clear. One day, while assigned to Hondo Army Air Base, Tex., for "on-the-line" training, which allowed the cadets to get used to being around aircraft, we were all assembled in the post theater. A major made the announcement that too many B-17s and B-24s were returning from combat missions with the aircraft noses missing . . . and, of course, the bombardiers and navigators missing. He explained that inasmuch as there was a glut of pilot trainees, our class would be split up, with one-third going to bombardier training, one-third to navigator training, and the last third to pilot training.

Those of us who were "QATs" were incensed and visited the major to express our indignation. His response is also burned into my memory: "Those of you who don't want to go to navigator or bombardier training will be transferred immediately to the infantry!" Talk about extrinsic motivation! We, of course, went to the training as directed.



Interior view of bombardier's station, above. It appears he is about to take control of the aircraft from the pilot and begin his bomb run. Left: synchronizing a bombsight aboard a B-24 Liberator as the aircraft nears its target on Wake Island in the Pacific on April 30, 1944.

Michael J. Nisos is Managing Director of AFA's affiliate, the Aerospace Education Foundation, and a World War II bombardier.

After going through basic training, classification, on-the-line training, four months at a college or university to refresh our abilities primarily in mathematics and physics (I spent four glorious months at the University of Alabama), and gunnery training, we finally attended bombardier training.

We arrived at Childress Army Air Base in Childress, Tex., where the rattlesnakes were on the runways and the "norther" frequently would whistle across the plains, causing all operations to cease. The story goes that there was only a barbed-wire fence between us and Canada to slow down this bone-chilling wind.

None of us will ever forget the hangar bomb trainer; the AT-11 aircraft; the 100-pound "blue devil" concrete-, sand-, or water-filled practice bombs; or the "wobblers"—bombs not quite filled with water or sand, which wobbled all the way to the ground and inevitably landed on one of the local farms. Did the price of that real estate go up automatically!

My class 45-5B was commissioned on March 22, 1945, as Bombardiers with Dead Reckoning Navigation Training—almost two years from the date I came in as an aviation cadet. Following another selection process, half of my class and I went to navigation school for celestial navigation training because General Chennault needed dual rated Bombardier-Navigators for his Fourteenth Air Force in the Far East. Off we went to Hondo (we just couldn't seem to get out of Texas). We became dual rated in June 1945, and we all know of the events from that month to the end of World War II.

Memphis Belle

There were many stories about World War II bombing missions. The story of a B-17, the *Memphis Belle*, is highlighted in an excerpt from the book *25 Missions*, published by the Training Aids Division, Army Air Forces, July 1943:

"In September 1942, a new Flying Fortress was delivered at Bangor, Me., to a crew of ten eager American lads headed by Robert K. Morgan, a lanky twenty-four-year-old Army Air Forces pilot from Asheville, N. C.

"Proudly, those ten boys climbed aboard, flew their ship to Memphis, Tenn., christened her *Memphis Belle* in honor of Morgan's fiancee, Margaret Polk of Memphis, and then headed across the Atlantic to join the Eighth Air Force in England.

"Morgan had told them it was rough where they were going. There would be no room in the *Memphis Belle* for fellows who couldn't take it. The boys said they were ready.

"They took it. Between November 7, 1942, and May 17, 1943, they flew the *Memphis Belle* over Hitler's Europe twenty-five times. Bombardier Vincent B. Evans dropped more than sixty tons of bombs on targets in Germany, France, and Belgium. They blasted the Focke-Wulf plant at Bremen,

World War II Bombardiers Alumni Association

The World War II bombardier is now in his late fifties or in his sixties. Some are grandfathers. Like a lot of people, he is nostalgic. He thinks of his youth and the years he spent in the Army Air Corps or the Army Air Forces. He is thankful that he was one of the survivors but has deep compassion for his buddies who were not as fortunate as he. Yet, he will never forget that supreme experience or the camaraderie that existed. He remembers . . . it is part of his life, and it will always be. He wants to associate with his former fellow bombardiers and reminisce a bit. He does it through the Bombardiers Alumni Association (BAA).

This Association was formed in 1962 by two men, William Burmester and Lee Campion. Burmester is now permanent National President; he and his wife Dotty keep the Association going.

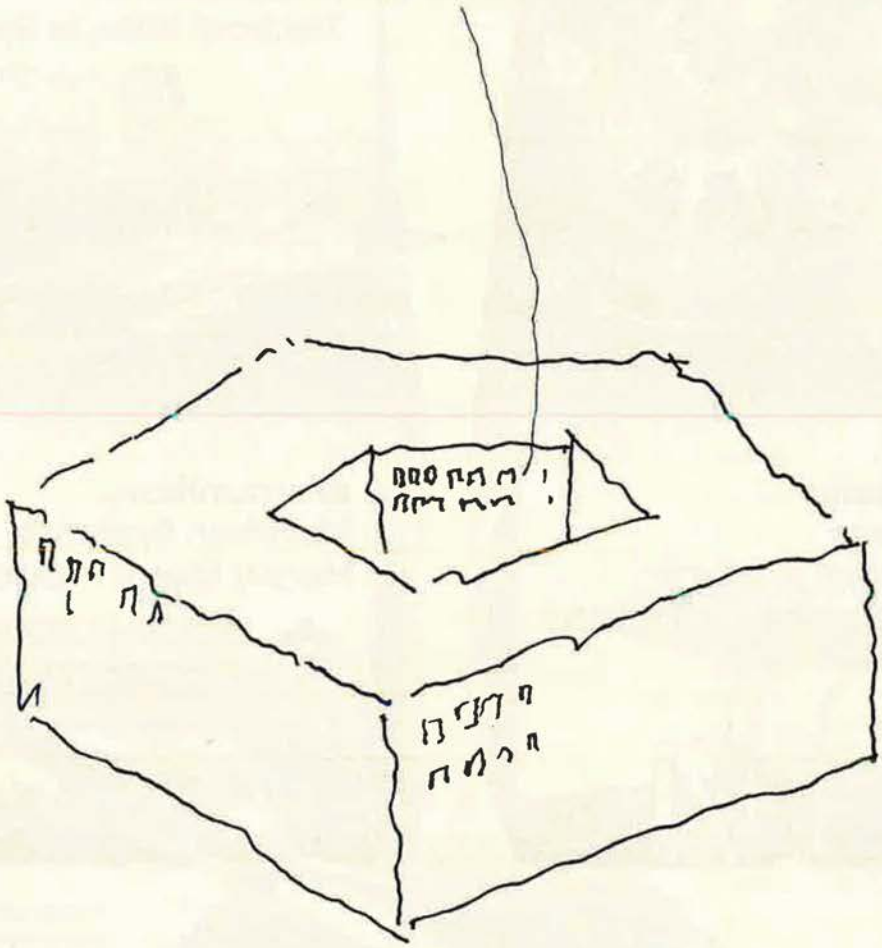
BAA is a nonprofit organization, not affiliated with any other organization or association. Its purpose is to maintain contact with service "buddies" and their families. All original members were in Class 45-5B—Childress AFB, Tex., but because of growing interest, membership has been extended to include all bombardiers who served during World War II.

Reunions are held every two years, and members are encouraged to bring their families and guests. Sightseeing tours and various social and recreational activities are planned by a committee. Reunions to date have been held in New York (1964), Chicago (1966), Washington, D. C. (1968), St. Louis (1970), Detroit (1972), Cleveland (1974), Williamsburg, Va. (1976), Dayton (1978), and Washington, D. C. (1980). The 1982 gathering is scheduled for Ocean City, Md.

For further information, contact Mr. William Burmester, 485 E. Lincoln Ave., Mount Vernon, N. Y. 10552.

Above, left and right, Lt. Jack Mathis and Lt. David R. Kingsley, both bombardiers who were awarded posthumous Medals of Honor for their valor. Mathis was lead bombardier of his squadron that day over Vegesack, Germany, in 1943. He ignored a flak-shattered right arm and a large wound in his side and abdomen, dragged himself back to his bombsight, released his bombs, and died at his post. Kingsley, on a raid over Ploesti, Romania, in 1944, first assisted wounded aircrew and then, when the bailout order was given, unhesitatingly gave his parachute to a wounded man and died in the crash.

King who?



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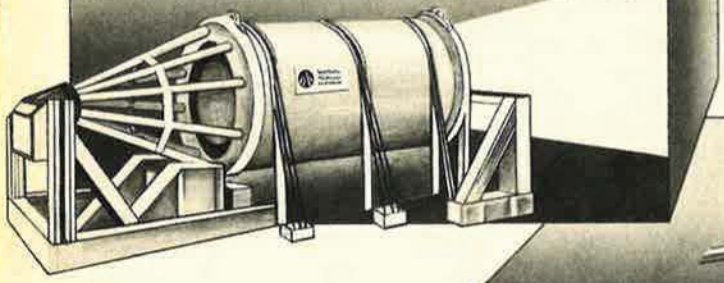

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locks at St. Nazaire and Brest, docks and shipbuilding installations at Wilhelmshaven, railway yards at Rouen, submarine pens and power houses at Lorient, and airplane works at Antwerp. They shot down eight enemy fighters, probably got five others, and damaged at least a dozen.

"The *Memphis Belle* flew through all the flak that Hitler could send up to them. She slugged it out with Goering's Messerschmitts and Focke-Wulfs. She was riddled by machine gun and cannon fire. Once she returned to base with most of her tail shot away. German guns destroyed a wing and five engines. Her fuselage was shot to pieces. But the *Memphis Belle* kept going back.

"The longest period she was out of commission at any one time was five days, when transportation difficulties delayed a wing change. When the tail was destroyed, the Air Service Command had her ready to go again in two days.

"Only one member of the crew received an injury, Staff Sergeant John P. Quinlan.

"The *Memphis Belle* crew had been decorated fifty-one times. Each of the ten received the Distinguished Flying Cross, the Air Medal, and three Oak Leaf Clusters. The fifty-first award was Sergeant Quinlan's Purple Heart."

So goes the *Memphis Belle* story. After World War II, the young bombardiers returned to their chosen professions and carried the bombardier spirit with them.

Dan Devine, once the Notre Dame football coach and a former Army Air Forces bombardier, remembers: " . . . after so long a period of time, my memory is not so good in remembering dates, missions, etc., so I guess the best comment I can make is to say that my service-connected training certainly prepared me for the career I later pursued. In the service, we learned to cope with 'flak' from the enemy, but in my field of endeavor it has certainly helped me to take the 'flak' from all areas in the football world—the alumni, the fans, news media, etc. I guess I could sum it all up by saying I'm glad I was prepared by Uncle Sam."

Tom Landry, head coach of the Dallas Cowboys and former World War II B-17 combat pilot, who brought back a pretty badly shot up bird and landed it safely, says: "I must admit, as an old bomber pilot, that we would not have done much damage without the bombardier's help. The only real gripe that I had with my bombardier was when we were approaching a target over Merseburg, or someplace else and all I could see was flak. I never thought that he got the 'bombs away' quick enough. Our country needs the same type of enthusiasm and strength that all of the bombardiers showed during World War II. We need that for a stronger America."

Sen. Barry Goldwater (R-Ariz.) states, "As a pilot, I know what you bombardiers did in World War II, and your many, many contributions will never be forgotten by this grateful veteran of that war."

This, then, was the bombardier, the man who made the Norden bombsight do what it was designed to do—put iron on the target.

There you have it, the Norden bombsight and the bombardier—a vanishing breed. ■

Above, a stick of bombs hurtles earthward toward strategic targets. Left, "Bombs away!"—the mission payoff by a B-24 Liberator of the Fifteenth Air Force.

Credit is due to the following for their help in preparing this article: Lee Lauren, identified by Beirne Lay, former pilot and author, as "the best bombardier in the Eighth Air Force"; William Burmester, my classmate in bombardier class 45-5B and President, Bombardiers Alumni Association; and personnel of Norden Systems, United Technologies, Inc., for technical help and photographs.

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The addition of the EF-111A's superior, versatile jamming capabilities to the Air Force inventory will boost the survivability and effectiveness of US tactical airpower and help pierce Soviet air defenses. The EF-111A "Electronic Fox" opens a . . .

NEW ERA IN ELECTRONIC WARFARE

BY EDGAR ULSAMER, SENIOR EDITOR (POLICY & TECHNOLOGY)

SOVIET air defenses keep on growing at a prolific rate; their density, numbers, complexity, and reliance on C^3 (command control and communications) are mushrooming. Conversely, the importance of defense suppression to USAF's tactical airpower keeps growing by leaps and bounds. This fall, the Air Force's ability to suppress hostile air defenses—in the form of vastly improved tactical electronic warfare (EW) capabilities—will take a major step forward with the entry of the first EF-111A into the operational inventory. This unique EW system serves to negate Soviet and other hostile early warning, ground control intercept, and acquisition radars.

As Lt. Gen. Lawrence A. Skantze, Commander of the Air Force Systems Command's Aeronautical Systems Division, put it at the rollout of the first production EF-111A at Grumman Aerospace Corp.'s Calverton, N. Y., plant on June 19: "The EF-111A is born of a great necessity—the need to modernize and improve our capabilities in electronic warfare."

EW is as vital as bombs on targets and enemy aircraft killed, yet far less palpable and, thus, less understood and appreciated. Those who understand EW best refer to it as a force multiplier that maximizes the effectiveness of all combat elements by boosting aircraft survival and the ability to get through to the target area to carry out assigned tasks. In the last analysis, it is a cat and mouse game with an enemy who uses his missiles, antiaircraft artillery, and interceptors to decimate the other side's tactical airpower.

As General Skantze put it: "Without the ability to neutralize an enemy's radar system, we lose—we lose costly aircraft and their even more valuable crews. If we are not able to strike our targets, we lose the air battle. If we lose the air battle, we lose the war—it's painfully simple."

The relatively recent emphasis by the Soviets on fielding tactical and strategic air defense systems—surface-to-air missiles (SAMs), antiaircraft artillery (AAA), and airborne interceptors—that exhibit roughly the same degree of mobility as the tactical forces they accompany and protect necessitates that US defense suppression match this trait.

The active components of the Air Force's defense suppression system already incorporate a high degree of mobility in the F-4G Wild Weasel as well as the Highspeed Antiradiation Missile (HARM) and the expendable tactical drone, or Locust, which are under development. The latter is equipped with a seeker-warhead payload and can be ground-launched in large numbers to fly to areas where enemy radars are thought to be operating. Once in the target area, the Locust drone will acquire, home on, and destroy target radars with a fragmentation warhead.

On the EW side of defense suppression, two new systems meet the criterion of mobility. One is the Compass Call system designed to counter the steadily improving Soviet command control and communications (C^3) network. This system, a special EC-130H aircraft, disrupts selected portions of the Soviet force management system through standoff jamming, thus causing loss of control over Soviet tactical airpower. The other is the supersonic EF-111A. This new system results from the integration of two thoroughly battle-tested weapons: the F-111A, a veteran of the Vietnam War, supersonic, maneuverable, and one of the most capable fighter bombers in the Air Force; and the ALQ-99 jamming system of the equally combat-proven Grumman EA-6B Prowler.

There is, General Skantze said at the recent rollout ceremony, "no known equivalent to the EF-111A Tactical Jamming System in terms of electronic warfare sophistication and sheer radiated power. The high-performance EF-111A airframe, coupled with the smartest and most powerful jamming system, makes it the most versatile electronic warfare weapon system anywhere."

What's more, he added, the EF-111A includes a considerable growth potential to meet increasing threats "well into the next century."

One of the early and costly lessons of the Southeast Asian war was that Soviet-built long-range radars de-

tected USAF aircraft almost from the moment of "gear up" and that the obsolete EB-57s and EB-66s were incapable of effectively jamming their radars. The situation in Europe is worse, with the thick curtain of air defense and surveillance radars getting more lethal every year. There the defensive thicket of SAMs keeps growing, with the Soviets adding one new model about every two years.

What's more, the steady addition of new systems—the latest being the SA-12—has not caused the Warsaw Pact forces to retire any of the older ones—except the antiquated SA-1—from active service. The result is a profusion of thousands of ground-to-air weapons providing overlapping coverage in terms of altitude and range, leaving no flight profile safe from attack. These SAM belts operate in concert with a multitude of redundant radars, including early warning ground-controlled intercept and height-finder systems that can pick up and track NATO aircraft on takeoff, SAM control radars that guide Soviet SAMs against these aircraft, and radars that accurately aim AAA against them.

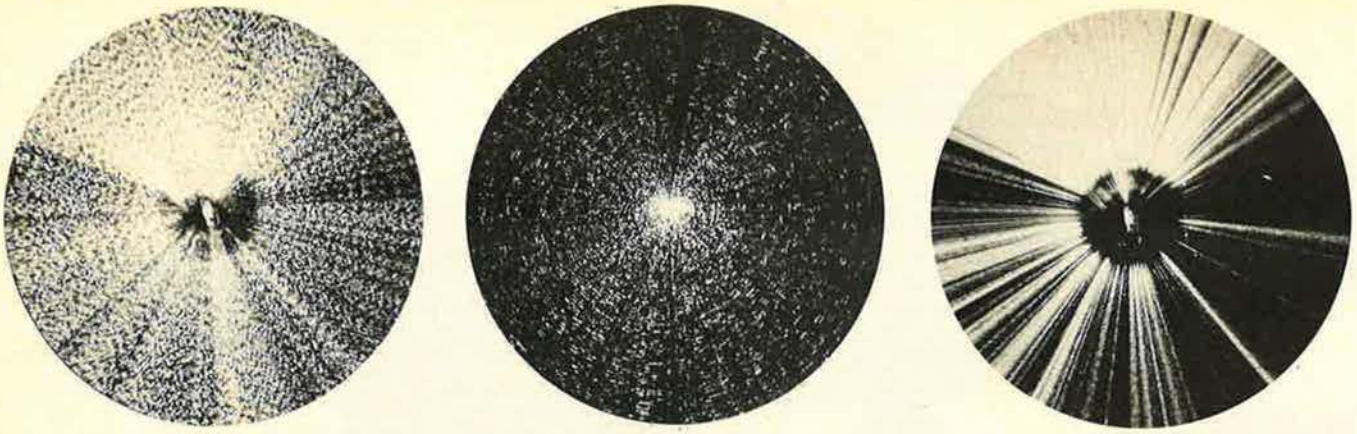
Lt. Gen. Lawrence A. Skantze, Commander of AFSC's Aeronautical Systems Division, asserted that the EF-111A is a crucial force multiplier by enabling the strike force to survive and do its job.

These radars, in turn, feed control centers that decide when and which targets are to be engaged by interceptors, SAMs, and AAA, thus maximizing the effectiveness of this defense system. Capping this lethal curtain is a fleet of Soviet and Warsaw Pact fighters that is being modernized at a rapid rate. Additionally, in the not too distant future, a Soviet version of USAF's AWACS, the SU-AWACS, can be expected to augment the radar network along the Warsaw Pact's western perimeter.

As early as 1971, the Air Force recognized the need for a dedicated airborne tactical jamming system, the primary reason being that strike aircraft no longer can carry enough electronic countermeasures—or the required electrical power—to jam the growing number of sophisticated hostile radars. A range of options was considered by the Air Force, including an "Improved Tactical Electronic Warfare System" (which turned out to be too costly) as well as use of the US Navy's EA-6B Electronic Warfare aircraft (which on closer examination was found wanting in speed and range for the Air Force mission).

Specifications—Grumman EF-111A Tactical Jamming System

General Data	
Crew	2
Power Plant:	
Number	2
Manufacturer	Pratt & Whitney
Type	TF30-P-3 turbofan
Rating	18,500 lb. (8,391 kg)
Dimensions	
Wingspan	63 feet (19.2 meters)
Wingspan (swept)	32 feet (9.75 meters)
Overall length	76 feet (23.16 meters)
Height	20 feet (6.1 meters)
Weights	
Empty weight	55,300 pounds (25,000 kg)
Internal fuel	32,500 pounds (14,700 kg)
Maximum TOGW	89,000 pounds (40,300 kg)
Performance	
Maximum speed	1,196 knots (2,215 km/hr)
Cruise speed	436 knots (800 km/hr)
Takeoff distance (50-ft. obstacle)	5,825 feet (1,775 meters)
Service ceiling	45,000 feet (13,700 meters)
Ferry range	2,022 nautical miles (3,745 km)



Loss of early warning "radar" vision is illustrated by views of three jammer returns. The EF-111A's ALQ-99 jamming system blinds hostile radars to all aircraft movements in virtually all directions out to a range of about 125 nautical miles.

The solution meeting the cost and operational requirements best and with the least risk turned out to be the grafting of the EA-6B's ALQ-99 jamming system on existing F-111A airframes. Following competitive design studies, Grumman Aerospace Corp. was selected late in 1974 by the Air Force as the prime contractor of the EF-111A program, involving, initially, full-scale development of two preproduction systems. During 1977 and 1978 the preproduction aircraft underwent exhaustive Initial Operational Test and Evaluation at Eglin AFB, Fla., and Mountain Home AFB, Idaho, that established their ability to cope with all mission requirements. Included were tests against the E-3A AWACS, the outcome of which was not disclosed for reasons of security beyond the bland assertion that the EF-111A "did well."

In March 1979, the Defense Systems Acquisition Review Council (DSARC) ordered the EF-111A into full production, concurrent with completion of the Operational Test and Evaluation program. The production program provides for the conversion of forty-two aircraft to the EF-111A configuration at a cost—exclusive of the airframes—of about $1.2 billion, or about $21 million per aircraft. While these forty-two aircraft are coming out of the Tactical Air Command's active inventory, the boost in overall tactical air capability produced by the EF-111A is expected to more than offset this reduction.

By the same token, the economic benefit of using airframes that are already paid for is major, especially in light of the relatively low total of flying hours piled up by the F-111As involved. These aircraft, the Air Force believes, are good for at least 10,000 hours of flying time, yet to date have averaged only about 2,000 hours. At presently envisaged usage rates, the EF-111As should thus have a lifespan of twenty to thirty years.

The EF-111A is to achieve IOC (initial operational capability) in November 1983 and full operational capability, with delivery of the forty-second production aircraft, late in 1985. For the time being, there is no indication that the US government plans to make the aircraft available for foreign military sales.

The EF-111A's Intrinsic Pluses

The Air Force chose the F-111A as the air vehicle of the tactical jamming system for a number of reasons. Paramount were the aircraft's availability from the inventory on a "sunk-cost" basis and the fact that it offers fighter performance combined with great endurance on station. The latter two traits make the EF-111A compatible with all airborne elements of the strike force in terms of structural strength, maneuverability, and performance—including the ability to penetrate enemy airspace and escape at supersonic speed.

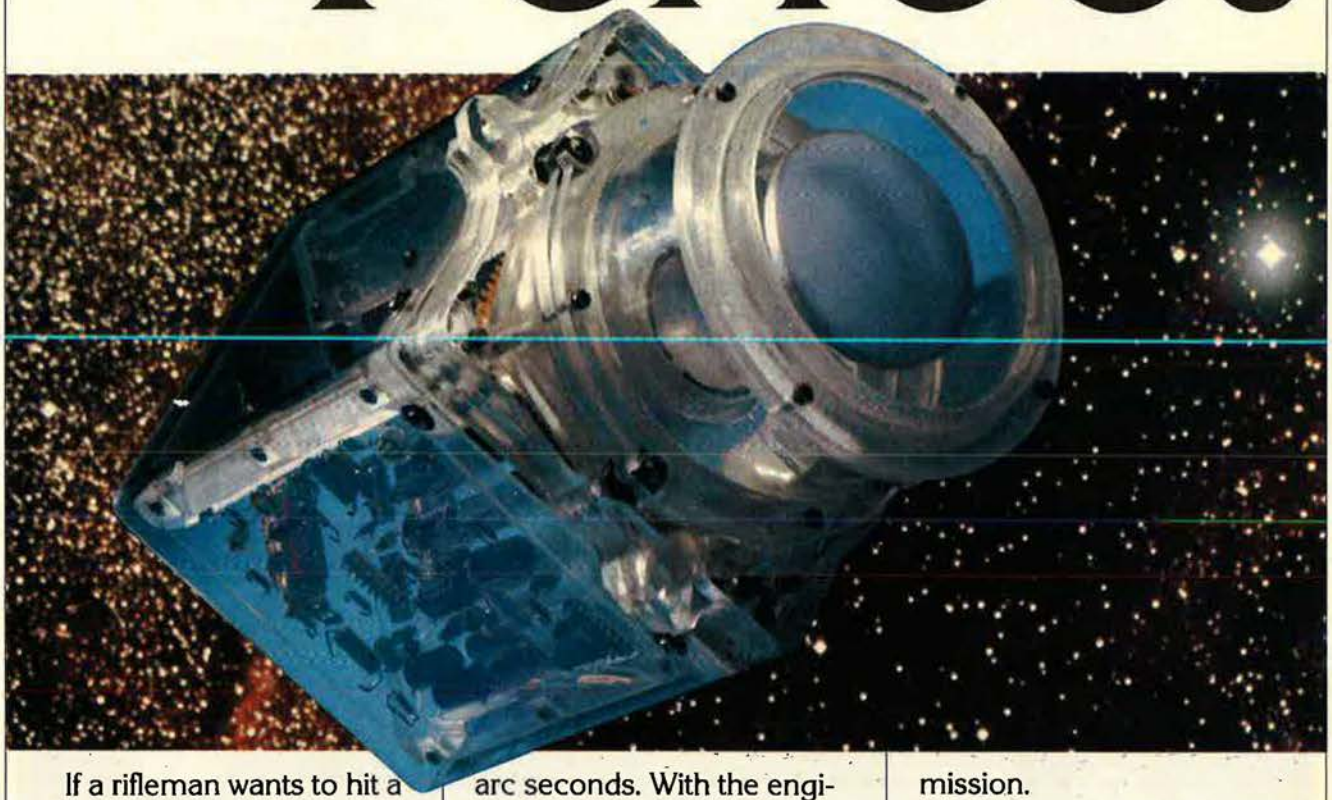
Equally crucial is the EF-111A's ability to loiter for up to four and three quarter hours without refueling—in part a result of its variable sweepwing design. Because of its great endurance and a mission radius of up to 1,000 miles, the EF-111A can provide jamming protection for many strike aircraft sorties on a single mission. The aircraft's operating range extends from speeds in excess of Mach 2.1 at altitudes up to 50,000 feet to the low supersonic regime on the deck. Even though the EF-111A accommodates three tons of sophisticated electronic equipment, including antennas, computers, and display devices, the aircraft retains high maneuverability—including a seven "G" plus turning capability—to assure a high degree of survivability in hostile environments.

Exterior modifications include a narrow, canoe-shaped radome, sixteen feet in length, on the underside of the fuselage, that houses the antennas for the high-powered jamming transmitters; and a pod mounted on the vertical stabilizer for the receiving antennas and ancillary equipment, including a processor to detect hostile radar emissions.

Other significant modifications to the F-111A airframe include the incorporation of a higher capacity air-conditioning system and the addition of a liquid cooling system to handle the heat load of the jamming equipment, the installation of ninety-kw generators (vs. sixty) to provide the jammer electrical power, and numerous areas of structural modification. Also included is the installation of all new electrical wiring, some 25,000 cables, and more than 100 antennas of various types.

The Tactical Jamming System is comprised of three major subsystems. The ALQ-99 jamming subsystem consists of sensitive receivers that detect threat radars at long range, and computers, displays, and controls that locate and identify threat signals and automatically assign exciters and jamming transmitters, which provide optimum modulations amplified to high power lev-

AIMING FOR Perfect



If a rifleman wants to hit a standard, 10″ bullseye at a hundred yards, his aim must be accurate to within about 9 arc minutes (less than 1/6 of a degree).

The best currently available star sensors, which position a spacecraft relative to its targets (which may range from celestial sources of X and gamma-rays to other spacecraft) is accurate to within about 10 arc seconds.

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A third is technical: Laser Communications, an area of vital interest to TRW, also requires pointing as close to perfect as possible.

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American Aerospace Controls
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American Electronic Labs, Inc.
Lansdale, Pa.
- jamming subsystem receiver
- low-band transmitter

Astronautics Corp. of America
Milwaukee, Wis.
- digital display, radarscope

Bendix Corp., Electric Power Div.
Eatontown, N. J.
- generator

Canadair Ltd.
Montreal, Canada
- vertical stabilizer

Dalmo Victor Operations,
Bell Aerospace Textron
Belmont, Calif.
- terminal threat warning system

Eaton Corp., AIL Div.
Deer Park, N. Y.
- jamming subsystem and encoder

Fairchild Weston Systems, Inc.
Syosset, N. Y.
- converter synchronizer

Garrett Corp., AiResearch Mfg. Co.
Torrance, Calif.
- air cycle cooling system

General Dynamics Corp.
Fort Worth, Tex.
- misc. air cycle parts and speed bump

Grimes Mfg. Co.
Urbana, Ohio
- misc. panels

Hartman Electric
Mansfield, Ohio
- main line contactors

Hughes-Treitler Mfg. Corp.
Garden City, N. Y.
- ram air heat exchanger

IBM, Federal Systems Div.
Owego, N. Y.
- System / 4 Pi computer

International Silver Co.
Times Wire and Cable
Wallingford, Conn.
- coaxial cables

Kirkhill Rubber Co.
Brea, Calif.
- seals

Lear Siegler, Romec Div.
Elyria, Ohio
- pump

Lourdes Industries, Inc.
Hauppauge, N. Y.
- relief valve

Metal Bellows Corp.
Chatsworth, Calif.
- accumulator

Microlab / FXR
Livingston, N. J.
- dummy load

Microphase Corp.
Cos Cob, Conn.
- rf distribution network

Microwave Research Corp.
No. Andover, Mass.
- high-band power divider

Navatronics, Inc.
Pompano Beach, Fla.
- interference blanker unit

Plessey Dynamics Corp.
Hillside, N. J.
- actuators

Randtron
Menlo Park, Calif.
- jamming transmitter antennas

Raytheon Co.,
Electromagnetic Systems Div.
Goleta, Calif.
- jamming exciter
- high-band transmitter

Sage Laboratories, Inc.
Natick, Mass.
- coupler

Sanders Associates, Inc.
Nashua, N. H.
- self-protection system

Seaton Wilson Inc.
Burbank, Calif.
- fluid disconnectors

Singer Co.,
Kearfott Div.
Little Falls, N. J.
- synchros

Sundstrand Corp.
Aviation Electric Power Div.
Rockford, Ill.
- integrated drive generator

Transco Products, Inc.
Venice, Calif.
- power dividers and combiners
- antenna couplers
- self-protection system
- high-band antenna

Valcor Engineering Corp.
Kenilworth, N. J.
- shut-off valve

Wadell Equipment Co., Inc.
Edison, N. J.
- jammer pallet

Walter Kidde & Co., Inc.
Fenwal, Inc., Div.
Ashland, Mass.
- sensors

Wavecom
Northridge, Calif.
- power divider

els to destroy the threat radar's detection capability. The Terminal Threat Warning Subsystem, common to the entire F-111 force, detects emissions of selected, weapon-associated threat radars, processes the data, and provides immediate warning information to the crew of impending attack by SAMs, AAA, or interceptors. The active self-protection system automatically provides specialized jamming signals to degrade the accuracy of SAM, AAA, and interceptor target tracking systems.

Improvements of the ALQ-99 multipurpose electronic countermeasure system that tailor it to USAF requirements lead to more rapid detection and identification of enemy transmissions; greater automation and less reliance on human involvement and manual operations; expanded computer functions to provide more

sophisticated and flexible jamming options; and more independent jamming signals over a wider range of frequencies. The Airborne Instruments Laboratory ALQ-99E jammer is a fourth-generation system that appears capable of defeating the vast majority of known Soviet radars.

In selecting the ALQ-99, the Air Force capitalized on some $250 million the US Navy had already invested in this system and, because of its technically mature status, sharply reduced developmental risks. The "E" version of the ALQ-99 shares some seventy percent of all parts with the original design used on the EA-6A and EA-6B aircraft.

The reason the Air Force opted for a new system rather than adapt the Navy's EA-6B is that the latter aircraft was not designed for the high-density ground environment prevalent in Europe and also lacks both the endurance and flexible performance of the F-111A. Further, by designing a high degree of automaticity into the EF-111A, the Air Force aircraft's crew was reduced to two—a pilot and an electronic warfare officer.

The ALQ-99E ECM unit can be "grown" significantly in terms of capacity to meet changes in the threat. Information about new threats, not in the memory of the IBM 4 Pi computer, can be fed into the system either through entries on the electronic warfare officer's keyboard in the cockpit or by changing the computer software. Updating the latter takes only about five minutes. The EW officer can test the information and, if necessary, override it by entering proper commands with the keyboard and display unit in the cockpit.

Preflight insertion into the computer memory of topical intelligence information enables the EW officer to concentrate on unpredicted threats during the flight. Compared to the tactical jamming system of the EA-6B, the EF-111A's system offers greater speed and capacity in locating and identifying uncharted hostile radars and in defeating them. The growth margin in the tactical jamming system's computer is half again the presently used level.

A Variety of Jamming Modes

Exhaustive, USAF-supervised testing established clearly that the EF-111A is capable of meeting the gamut of combat requirements for radar jamming. The new system radiates many hundred kilowatts of radio frequency power in a directional, half-omni, or full-omni mode, and in a way that adapts to prevailing, specific radar threats with the help of on-board computers. Additionally, the system could be modified, if necessary, through the use of higher gain antennas to increase its effectiveness against such "targets" as Soviet AWACS aircraft, but in the process probably would have to shrink its jamming beam width to a degree that might reduce its effectiveness against other essential targets beyond the optimal level. The EF-111A's jamming capability, at this time, appears sufficiently powerful and flexible to cope with electronically agile radar, or EAR, if the Soviets ever deploy such a system.

Barrier/standoff jamming is one of the three missions of the EF-111A Tactical Jamming System. The aircraft performs this task while operating on the friendly side of the FEBA (forward edge of the battle area), out of range of the adversary's ground-based weapons. Several orbiting EF-111As would use their vast jamming power to create an electronic barrier to mask the movement of friendly strike aircraft from hostile radar detectors. By denying the adversary the ability to monitor NATO airspace, the friendly forces can refuel, join up, and begin their strikes—all undetected by the searching eyes of the enemy radar nets.

In the penetration/escort mission, the EF-111A can accompany tactical strike aircraft to targets deep behind enemy lines to augment the force's own ECM, EW drones, and other countermeasure techniques. Because of the EF-111A's high performance and great endurance, it can keep up with or stay ahead of the strike force during penetration to hold up an electronic shield that causes confusion, delays, and loss of effectiveness for the enemy's air defense system.

In the close air support role, the EF-111A will operate along the FEBA to suppress the enemy's antiaircraft artillery and surface-to-air missile (SAM) systems while the strike force delivers its weapons and recovers.

While the Air Force, as yet, has not assigned any reconnaissance tasks to the "Electronic Fox," the system is intrinsically capable of feeding radar threat information into a common network. This will be doubly true when the EF-111A is retrofitted with a JTIDS (Joint Tactical Information Distribution System) terminal *(see p. 58, July '81 issue)*. Eventually the EF-111A will probably be linked with USAF's E-3A AWACS by JTIDS. The Electronic Fox not only can be controlled by and feed information to the E-3A, but is also well suited for protecting the AWACS from hostile interceptors by shielding it through barrier jamming, thus providing the large aircraft with a high degree of electronic "invisibility."

The EF-111As will be operated by the Tactical Air Command's 388th Electronic Combat Squadron at Mountain Home AFB, Idaho.

There is a possibility that heavily modified F-111Es—incorporating a high degree of commonality with some EF-111A technology—might serve as PAVE MOVER aircraft several years from now. PAVE MOVER is scheduled for DSARC II (full program go-ahead) sometime next year. The system combines advanced technologies in the areas of side-looking moving target indicator radars, digital signal and data processing, and weapons guidance capabilities, and integrates these technologies for real-time target acquisition and strike capabilities.

PAVE MOVER, a pivotal element of Assault Breaker (a combination of programs meant to cope with the vast number of armored ground targets associated with the Warsaw Pact in the second echelon), is being developed by AFSC's Electronic Systems Division and the Rome Air Development Center to provide real-time standoff surveillance and cooperative strike capabilities for both Air Force and Army weapon systems.

Grumman, as well as Hughes Aircraft, is involved in this evaluation program, which involves the launching of GBU-8 (HOBO) glide bombs and T-16 and T-22 guided missiles against a variety of moving and stationary targets. The current program phase is an advanced technology effort slated for completion in July 1982. The Air Force, as yet, has made no firm decisions on which aircraft will serve as the PAVE MOVER platform. ■

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SOVIET VULNERABILITIES

Burgeoning Soviet military power has altered the military balance over the past decade, and bids fair to continue until the imbalance can be redressed. At the same time, the Soviet leaders face problems across the board that deserve weighing in any analysis of the great powers.

BY COLIN S. GRAY

"How does the Soviet Union assess its problems and prospects?"

As Soviet authors tell us, the USSR assesses the international situation in terms of the broad concept of "the correlation of forces," not the narrow idea of the strategic balance. Some Western defense and foreign-policy analysts have discerned a "window of [Western] vulnerability"—(all-too) rapidly translated into a "window of [Soviet] opportunity"—which should endure through much of the 1980s. No less an authority on the tide of history than Henry Kissinger has given credence to this view. If he is to be believed, we face five to seven perilous years.

The "window of vulnerability/opportunity" thesis is exclusively Western: No Soviet authority can be cited to support it. The somewhat simpleminded Western view is that the Soviet Union:

- Remains, and *will* remain, superior to NATO in conventional forces in the European theater;
- Achieved superiority in the 1970s in nearly all elements of theater nuclear firepower;
- Is outbuilding (and perhaps outthinking) US/NATO navies; and
- Has achieved what may be characterized as strategic nuclear superiority through its ability (theoretically) to reduce US silo-housed ICBM assets to a near-trivial level in a first strike.

The Soviet View

This view constitutes an easily-defensible Western assessment of the state of the multitier East-West arms competition. However, the important question is: How does the Soviet Union assess its problems and prospects?

Paradoxically, although they are the least "usable" of forces, the "strategic forces" of both sides have an importance in Soviet-American competition that is not generally recognized. On the Western side, central (US-based, strategic nuclear) systems, for more than thirty years, have constituted "the great equalizer" to Soviet local superiority in general-purpose forces around Eurasian rimlands. Looming over every crisis, or latent crisis, was the potential of US central-system intervention. The USSR learned during the Cuban missile crisis (October 1962) what it should have known from theory—that the prospect of escalation in "local" crisis can be dominated by expectations concerning "central-system" use.

Soviet leaders appreciate, indeed may even overappreciate, the political value of military power, but they do not make the mistake, so common in the West, of appreciating that power in a near vacuum—innocent of political, economic, technological, and societal considerations.

In narrow military terms, Mr. Brezhnev has ample cause for pride in accomplishment. By dint of steady, cumulatively prodigious effort since 1964, the Soviet Union has modernized its armed forces across the board. Particularly impressive has been the achievement of "parity plus" at the high-technology end of the com-

"In narrow military terms, Mr. Brezhnev has ample cause for pride in accomplishment."

"[The Soviets] achieved parity, or even parity plus, because the United States chose not to compete vigorously for the better part of fifteen years."

petitive spectrum. In strategic and theater nuclear forces, where the USSR has a grave, inherent, and enduring competitive disadvantage resulting from the relative backwardness of the Soviet electronics industry, the USSR has achieved the most noteworthy of its competitive leads.

Soviet military power, as already attested here, has achieved levels of quality and quantity vis-à-vis potential enemies almost unprecedented in Soviet (or Russian) history. In a plausible characterization of the current situation, William Hyland, senior fellow at the Georgetown University Center for Strategic and International Studies, has offered the thought that:

> " . . . he [Brezhnev] would pass on an inheritance of military power unrivalled in Russian history since the days when the Czar strode into Paris at the end of the long march from Borodino." (*Foreign Affairs*, Fall 1979, p. 61.)

The case for alarm concerning the growth of Soviet military power is clearly a strong one. However, an alternative analysis, framed insofar as possible in Soviet terms, also merits close attention. Far from having reached Winston Churchill's "broad sunlit uplands" of across-the-board military superiority, Soviet leaders and commentators may see a distressingly bleak future for their likely competitive performance.

High Cost of Parity

The Soviet Union knows that it has competed successfully only in the military realm, and that required allocating to defense probably well in excess of fifteen percent of a GNP only fifty-five percent the size of the American GNP. Moreover, Soviet officials know very well that their success in military competition, although well-earned, was also a "gift." They achieved parity, or even parity plus, because the United States chose not to compete vigorously for the better part of fifteen years.

It is plausible to argue that although the USSR would welcome the achievement of a genuine measure of strategic superiority, it has not sought such an achievement and neither does it expect, realistically, such an achievement to be sustainable. In terms of mobilization potential and high-technology accomplishment, the USSR simply cannot compete successfully with the United States (or, really, with Japan or West Germany either), if the United States chooses to flex its defense-industrial muscles.

If this assessment is correct, the Soviet Union knows that the best it can achieve, over the long term, is strategic nuclear parity with the United States. Therefore, a prime, though far from exclusive, function of the SALT process is to discourage the United States from pursuing new strategic technological possibilities to the point where the old condition of Soviet strategic inferiority is reimposed.

Contrary to the thesis of some Western analysts, the Soviet Union is fortunate since it does not need to achieve a condition of strategic superiority to pursue a genuinely forward diplomacy. Although Soviet military science holds, as it must (for reason of its political ideological referents), that wars at any level can be won (or lost!), the basic requirement that Soviet foreign policy places on Soviet strategic nuclear forces is that they operate as a robust "counterdeterrent" to US central systems. Superiority in prospective central-system prowess will be accepted and fits admirably into the precepts of Soviet military science, but it is not necessary.

Indeed, if anything, such superiority is probably counterproductive because, relating as it does to the most sensitive regions of Soviet-American military competition, recognition of Soviet superiority by American politicians, officials, and policy commentators may serve to trigger an across-the-board American defense mobilization policy response that could impact very negatively on the areas of competition "where the action really is."

In the strategic nuclear forces realm—the centerpiece of Western "window of survivability/opportunity" theorizing—the USSR faces an unattractive medium-term future. Although the US silo-housed Minuteman-Titan ICBM force will be (theoretically) vulnerable to a superbly timed mass attack through most of the 1980s, Soviet General Staff analysts have to be disturbed by the possibility of a US "launch under attack" and the threat to their silo-housed strategic assets posed by the coming US MX ICBM program.

Although the MX ICBM is not due to come "on line" (one flight of ten missiles) until July 1986, that missile system alone will pose eventually a near-total first-strike threat to more than seventy percent of the Soviet strategic forces payload. Minuteman and Titan, though critically important for orderly US SIOP execution, constitute only approximately thirty percent of US strategic forces' payload.

Impact of MX

The threat that MX will pose to hard targets affords a competitive leverage that may easily be underappreciated since it is greater than simply the vulnerability

"However, the USSR is obliged by geopolitics to contemplate the world in a rather more complex way."

of the USSR's payloads. US estimates of the economic burden that defense expenditures place on the Soviet Union almost certainly underprice the cost of the highest technology items. The fact that the Soviet Union appears to have spent three times as much on strategic nuclear forces during the 1970s than did the United States attests at least as much to the inefficiency of the Soviet defense industry as it does to the importance attached by the Soviet leadership to the mission. At the time of writing, for example, the Soviet Union is judged, very authoritatively by US defense experts, to be upgrading the blast resistance of some of its ICBM silos to better than 5,000 psi.

The Soviet Union could reply to the 200-strong MX ICBM program simply by increasing dramatically the fractionation of its ICBM payload (if missile accuracy allows), and/or, if SALT limits on launcher deployment do not apply, by augmenting the payload of its ICBM force. However, if the Soviet Union were to increase its ICBM warhead count to the level of 14,000–17,000 by 1990—as projected, in the absence of SALT constraints, by former US Secretary of Defense Harold Brown—those additional warheads, placed on ICBMs in super-hard silos, would offer a very cost-effective target for US MX missiles.

In short, because of the way the two superpowers have chosen to distribute payload among their strategic-force triads, the MX ICBM should pose, eventually, a far more severe problem for Soviet defense planners than Soviet hard-target competence poses for US defense planners. Unfortunately for the putative achievement of what might have been a truly strategically noteworthy SALT II agreement, the vulnerable silo problem is emerging sequentially as between the US and the USSR.

On the basis of the admittedly imperfect evidence available, it is not at all obvious that the Soviet Union has sufficient slack in its high-technology defense industry (or has available civilian high-technology productive resources that could be reoriented to defense production) to "surge" in response to a US program of even limited defense mobilization. Those American commentators (including some in the CIA) who predict a Soviet ICBM warhead count climbing precipitously from, say, the 8,600 anticipated under SALT II rules by late 1985, to 14,000, 20,000, or even 25,000 by 1989–90 choose to ignore the facts that the USSR—in the same period—has to deploy a new air defense system capable of defending against new penetrating bombers and B-52G-carried ALCMs; has to modernize its SLBM force; and has to consummate its modernization of theater nuclear strike systems.

Potential Instability

American defense commentators tend to think of Soviet-American military relations in terms of a bilateral relationship—a preference encouraged by the SALT exercise, of course. However, the USSR is obliged by geopolitics to contemplate the world in a rather more complex way. Soviet leaders must cope with an actually, or potentially, hostile United States, NATO-Europe, and China (with Japan an as yet unmobilized threat of potentially superpower proportions). A Soviet defense planner confronts a not-implausible nightmare future. If asked to brief the Politburo on the situation that could obtain as of, say, the year 2000, he would have to itemize the following possibilities:

- A United States well recovered from its post-Vietnam syndrome and determined to achieve at least parity in the major indices of relative US-Soviet military power.
- A China well on the road to military modernization.
- A Western Europe still internally divided, but providing a quality and quantity of military capabilities that is impressive by any standard.

Notwithstanding its (long-run) optimistic state ideology, and the short-run optimistic military analyses, the Soviet Union in the 1980s faces a set of weaknesses of daunting proportions. First, the Soviet Union essentially stands alone in the major international competition. East German, Polish, and Czech divisions are counted appropriately by NATO analysts in the Warsaw Pact order of battle, but the loyalty of those divisions and their governments to Soviet purposes has to be questionable under many circumstances. The Eastern European imperium of the USSR is essential as a defensive glacis, but it is ever vulnerable to local nationalistic impulses.

Politically, the stability of the Communist Party of the Soviet Union (CPSU) authority is less convincing in prospective practice than peacetime experience might suggest. The Soviet Union is a true empire of nationalities, dominated by Great Russians. Loyalty to Moscow is ensured so long as Moscow is believed to be successful. If the USSR should lose a war, or appear to lose it, then the loyalty of the non-Great Russian peoples would be put to a major test. In short, the Soviet Empire is politically solid in peacetime and even in periods of brief war-waging abroad, but it is unlikely that the Soviet imperial structure could sustain the shock of undeniable military defeat.

Colin S. Gray is Director of National Security Studies at the Hudson Institute, Croton-on-Hudson, N. Y., and a consultant to the Department of State. His most recent book is The MX ICBM and National Security *(New York: Praeger, 1981). Dr. Gray is working at present in the areas of strategic targeting policy, ballistic missile defense options, and strategic culture.*

MAGIC CARPET TO SURVIVAL

During the Second World War, radar-laid flak became a major hazard to attacking bombers, particularly over the more important targets in Germany and Occupied Europe. For their protection, B-17s and B-24s were fitted with the APT-2 Carpet Jammer, developed by Dr. Frederick Terman and his team at the Radio Research Laboratory at Harvard.

This first US airborne jammer to go into mass production could be pre-tuned to any spot frequency in the 430 to 780MHz band. It radiated 3 watts of noise over a bandwidth 6MHz wide. A few aircraft in each Bomb Group carried Carpet with their transmitters spot-tuned to frequencies used by the German Würzburg flak-control radar.

Carpet was first used in October 1943 and, as more became available, there was a progressive reduction in the accuracy and effectiveness of German radar-laid flak. More than 7,000 APT-2 Carpet jammers were built at an average unit cost of $400.

The APT-2 Carpet was the first US airborne jammer to go into mass production. The most modern, now being developed for the Department of Defense, is Sanders-Northrop Airborne Self-Protection Jammer (ASPJ).

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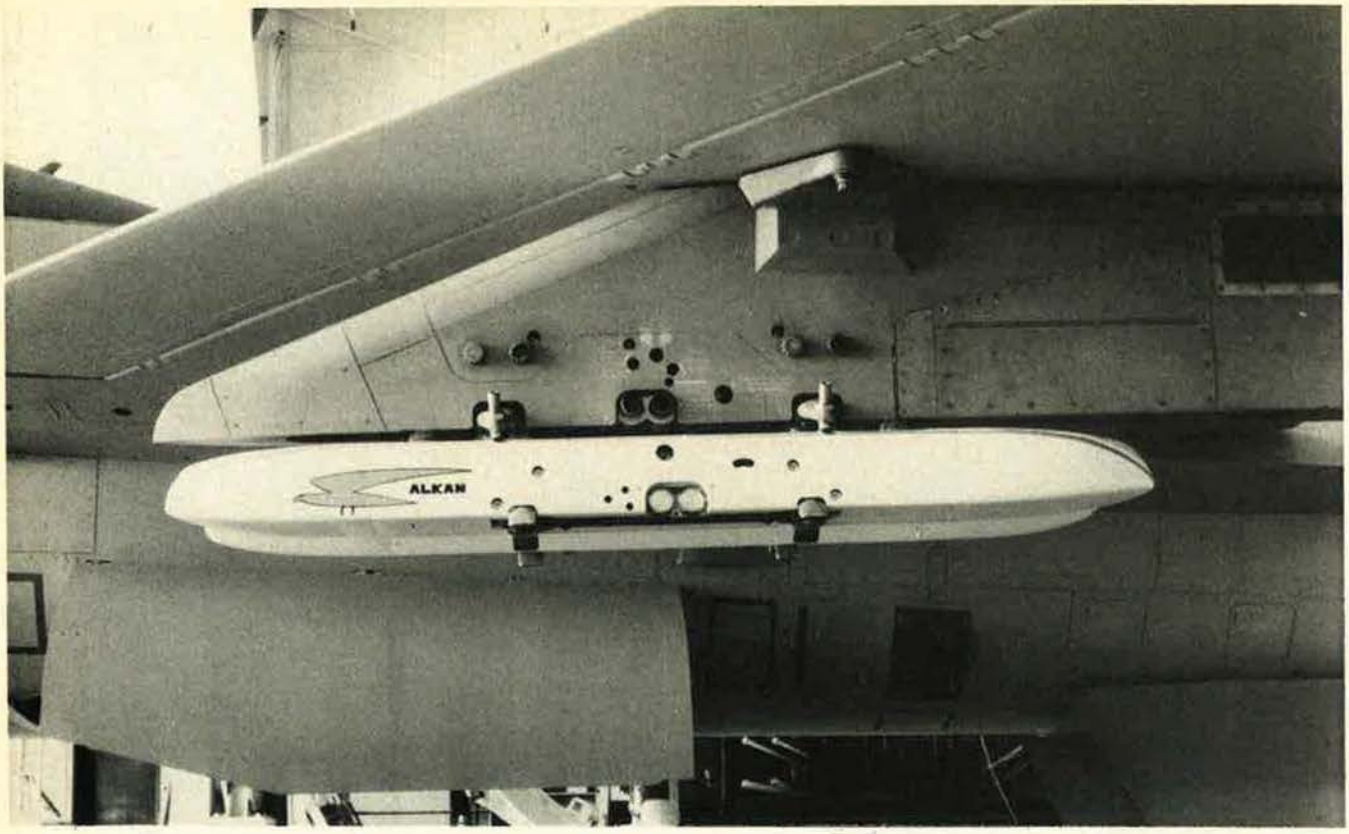
One in a series of Sanders advertisements on the history of electronic warfare. Research and text by Alfred Price, author of "Instruments of Darkness," Charles Scribner's Sons, New York. Illustration by Alfred "Chief" Johnson, Sanders Associates, Inc., Nashua, New Hampshire.



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The publicized American decision in Presidential Directive PD-59 to place greater emphasis than before on the Soviet political control structure as a target set has to promote acute anxiety in Moscow. The Soviet Empire has the strengths and weaknesses of (over-centralized) leadership. Because the authority of the CPSU, by and large, is imposed on Soviet society and looks to Moscow for direction on virtually all issues, that authority has to be vulnerable to "the decapitation [or isolation] strike."

There are several elements of ambiguity, shallow reasoning, and prospective operational uncertainty about the new US threat, but—generically—PD-59 appears to speak to the worst of Soviet fears. Soviet leaders are painfully aware of the costs of the overcentralization of Soviet political-economic life, but they can discern no acceptable alternatives. Similarly, they are all too aware of the costs of holding to their extant imperium in Eastern Europe, but, again, the alternatives look worse. Moscow will always choose centralized control, with its associated major inefficiencies, to a decentralization (*i.e.* loss) of control and the possibility of much greater efficiency.

More to the point perhaps, Soviet leaders must be aware that the Soviet system lacks genuine roots, even in Great Russian soil, and consequently probably has little resilience in the event of an intelligent attack by an enemy. It is not difficult to paint a very depressing picture of Soviet problems and prospects. By way of illustration, the Soviet Union:

- Very likely will fail as an economic system in the 1980s, as less productive non-Great Russians assume a larger share of work duties and as its energy supply becomes more expensive to maintain;
- Is presiding over a domestic ethnic "time bomb" since many nationalities in the Soviet Empire are not truly resigned to Great Russian rule;
- May well have to navigate a protracted period without benefit of an authoritative, legitimate helmsman. A major succession crisis is brewing for the mid-1980s;
- Will have to survive in a world with no genuine friends or allies worthy of note. The actual and potential major centers of power in the world, outside the USSR, are all more or less hostile to the USSR; and

"...the Soviet Union in the 1980s faces a set of weaknesses of daunting proportions."

"The fundamental weakness of the Soviet system is that it thrives on success."

- Can never feel secure and relaxed concerning its authority in Eastern Europe. The current set of Polish problems reflects an enduring instability.

Without denigrating the significance of the quantity and quality of Soviet military power assembled today, it is still difficult to view the world optimistically in Soviet perspective. The correlation of forces moved favorably through the 1970s and permitted a forward diplomacy in Angola, Ethiopia, South Yemen, and Afghanistan, but the fact remains that most centers of industrial power continue to be directed by political leaders hostile to Soviet purposes. American theoreticians may point, with some plausible reason, to a Soviet "window of opportunity" in the early-to-mid-1980s (*i.e.*, a period of military imbalance unlikely to be repeated—a historic opportunity), but probably it would be adventurism, a cardinal Soviet sin, to seek to exploit such a fleeting moment.

The fundamental weakness of the Soviet system is that it thrives only on success, or believed success. Because of its shallow domestic, and purely coercive external (in Eastern Europe) roots, the Soviet system is vulnerable to solid opposition. Military stalemate, in Soviet terms, should be the functional equivalent of defeat. In terms of its own (sole) legitimizing ideology, a Soviet government that is not successful is a Soviet government unworthy of obedience.

The picture that emerges from this analysis is a little different from that conventionally portrayed by professional Soviet-threat assessors in the West. While the apparent fact of a temporary Soviet partial military preponderance is not contested, it is argued here that the Soviet leadership is persuaded to be cautious not only for the usual, transcultural reasons of military analytical uncertainty, but also because they judge the Soviet political system to be inherently fragile and vulnerable to the effects of popular displeasure in the event of a serious military reverse. Soviet assessments of "the correlation of forces" have to take account not only of pusillanimity in the West, but also of indifference or even latent hostility to the regime at home. Soviet military science prefers short, sharp, and victorious military campaigns, but also makes provision for protracted war—and how does the *imposed* Soviet imperium fare in such a war? ■

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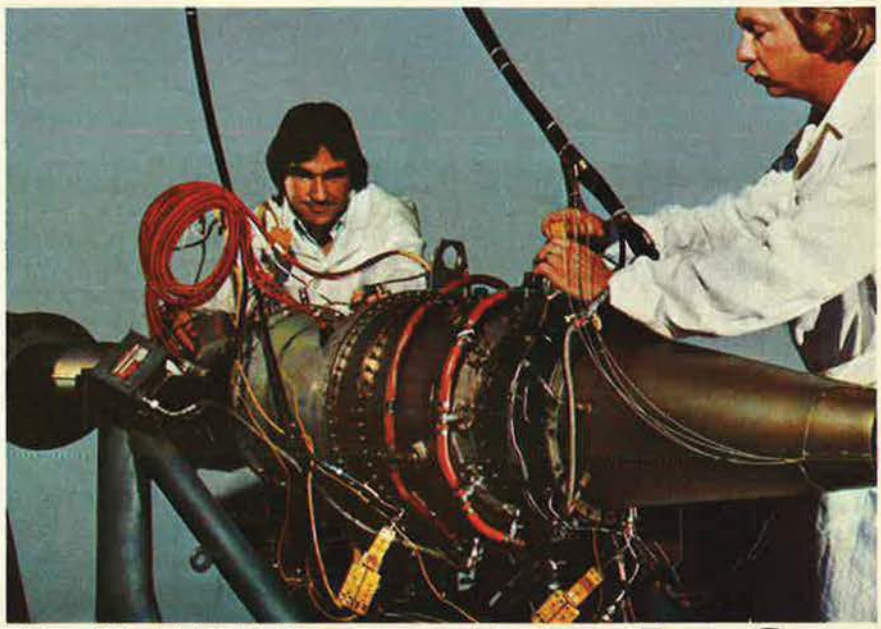

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Garrett's TFE76 Military Turbofan.

An MC-130E in flight with its yoke extended for an aerial retrieval, and, right, on the ground with yoke folded (note fending lines).

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"COMBAT TALON" Is Special

BY MARK BERENT

THE low black clouds scudded furiously over the forest. The stocky man pulled three large canvas bags from a hole at the base of a tall jack pine. Operating mostly by feel, he dragged them to the upwind side of a clearing not much bigger than a tennis court. He swiftly opened two of the bags and took out a variety of equipment.

In minutes he had carefully uncoiled hoses, removed safety keys, and attached snap rings to the bulky object in the third. Over his coarsely made Eastern bloc clothes, he pulled on a garment resembling an Arctic snowsuit, only of much heavier material, sturdy enough to support the built-in parachute-like harness webbing.

He left the furry hood folded back as he hauled out a folded balloon from the remaining bag, attached the nose tie-in to a helium-filled cylinder, and plugged in a hose.

It was nearly 2:00 in the morning. The pick-up was set for quarter past. He looked warily around the clear-

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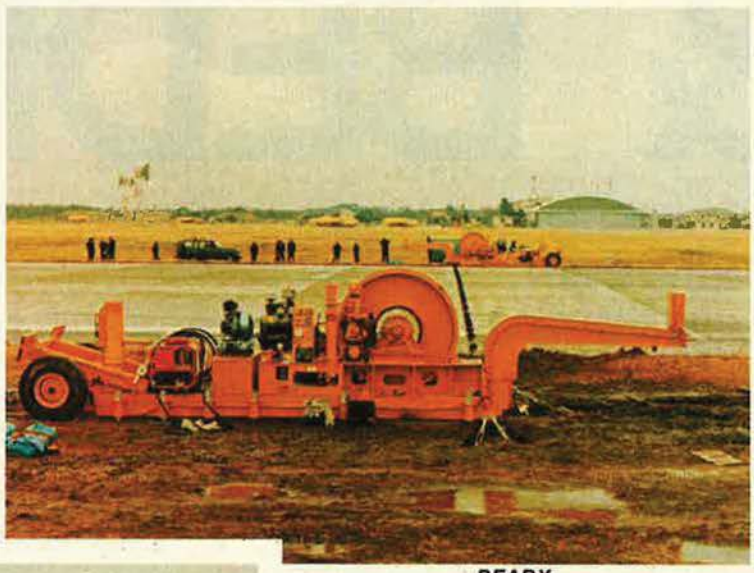

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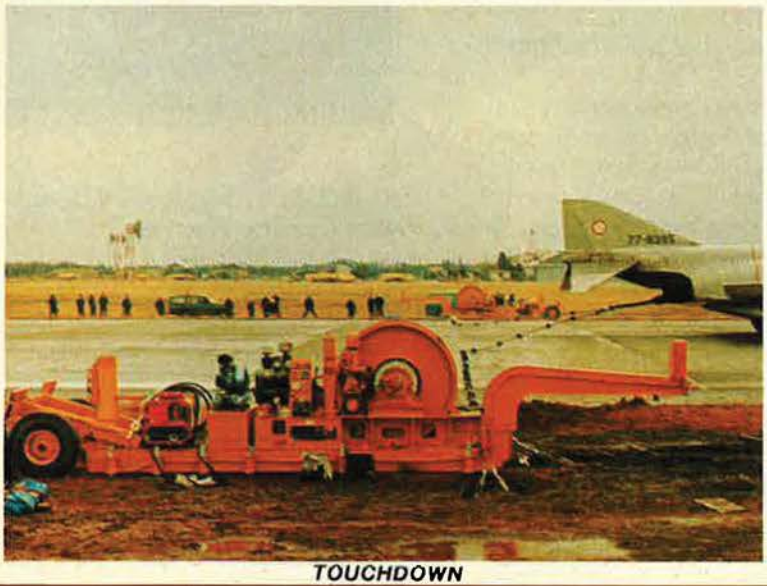

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ing, then up at the low overcast with a thoughtful expression. He was tired but exhilarated after his mission in enemy territory.

He judged the wind from the northwest to be thirty-five or forty knots. It was too dark to estimate cloud base, but he knew it was low, too low, maybe 500 feet. Bad conditions for an extraction, he thought, in a language other than English. With a quick flip, he opened the valve. The sounds of the wind through the forest drowned the hiss of helium inflating the dirigible-shaped balloon.

While it was inflating, he thought of the last nine days he had spent in an Eastern bloc country. He had been born there, thirty-four years ago. The oppressive government that had caused him so much trouble as a twenty-year-old student was the "enemy." He had escaped to the West and joined the US Army.

Special padded and hooded suit with built-in harness, above, was designed specifically for Combat Talon aerial pick-ups. Left, preparing straps attached to harness for a practice STAR (Surface-to-Air Recovery).

Twelve years ago, he'd won his prized green beret at Fort Bragg, and he was now a master sergeant stationed with the 10th Special Forces Group at Bad Tolz, Germany. During his nine days on the other side, he'd made all the contacts he had planned, organized his assets, and left certain instructions to be carried out.

After exhausting the first helium bottle, he hooked up the second. The balloon was already bobbing and tugging at the wrist strap. When the balloon was full, he closed the valve, pulled out the hose, and screwed on the nose cap.

He checked to ensure that the balloon bridle and nylon lift line attached to his harness were not tangled, and then slid his hand from the wrist strap and began paying out line. When the balloon was clear of the jack pines, he let go.

In seconds the 450-foot lift line, with its attached but unlit night lights, was extended. He couldn't see the balloon in the black sky, but could sense its severe layover caused by wind.

With exactly ten minutes remaining, he attached a battery to a small metal box about half the size of a cigarette carton. Etched in a recess at one end were a square, a triangle, a circle, and a plus sign. Beneath each symbol was a toggle switch. He placed the toggles of the GAR-1 transmitter either up or down according to a prearranged pattern.

At five minutes remaining, he flicked the switch that lit the lift line guide lights. With his back to the wind, he sat down, feeling the tug of the balloon lift line on the harness built into his suit. The buffet was heavy in the high wind. Looking up over his head at the line, he saw the lights arc away at the highest angle of layover he'd ever seen.

From a leg pocket he dug out the green beret he'd hidden before he and his bundles had been parachuted in. He clamped it on his head, pulled up the furry hood, and waited. He had done all he could. Now it was up to someone else.

Picking Its Way

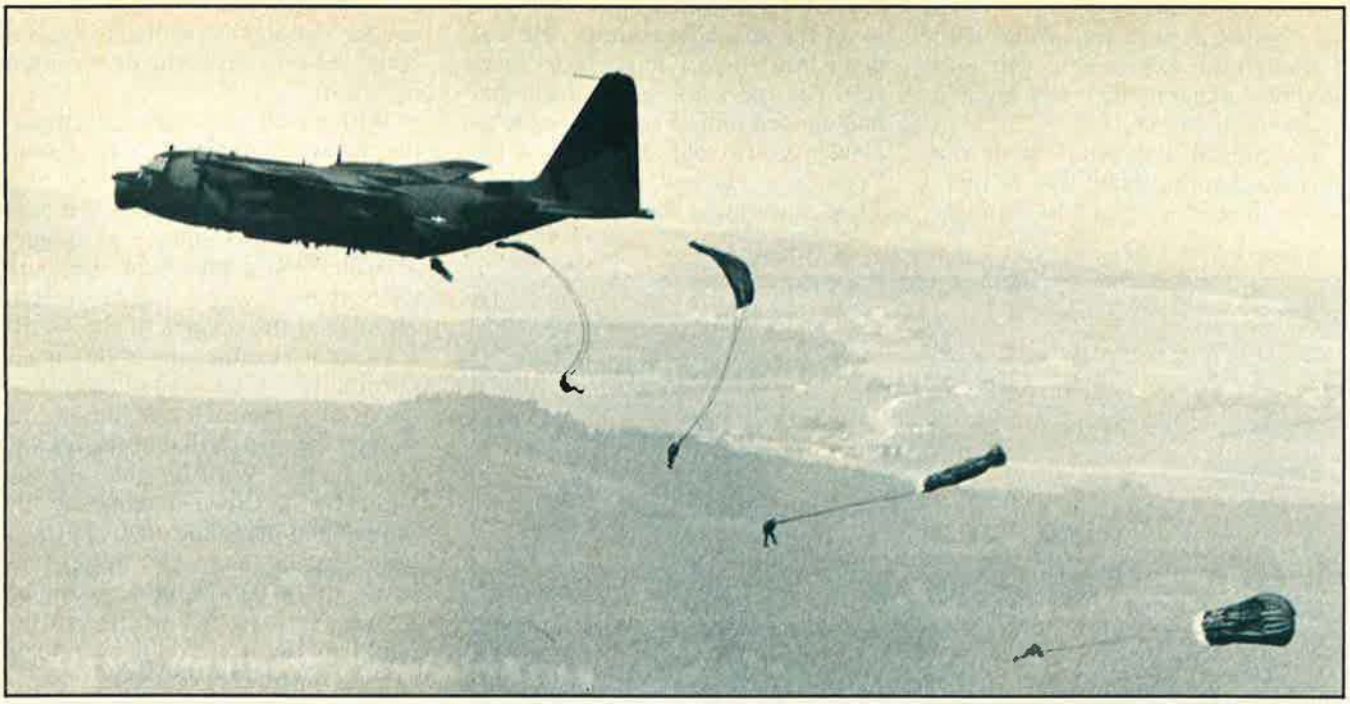
A few minutes to the southwest, a blacked-out four-engine aircraft, at a terrifyingly low altitude for something so large, was picking its electronic way between tall trees and rising mountains. The pilot, copilot, navigator, and sometimes the Electronic Warfare Officer (EWO) spoke tersely over the intercom as they maneuvered the black bird into position.

Using a combination of highly sophisticated radar for ground mapping and terrain following, gyros in an inertial navigation system, and radar altimeters, they were within the target approach area, on time, and flying close enough to the ground that no standard radar could pick them up.

The pilot checked his panel: airspeed 230 knots, radar altitude averaging 100 feet, FLIR pod extended. Certain scopes on his panel gave him terrain-avoidance information. Suddenly his copilot spoke:

"Got the lights!" he said, "Ten o'clock."

The pilot glanced up, fixed the location, and turned the Hercules leftward into position to begin the up-wind run to the lighted lift line



An MC-130E engages in a conventional static-line paradrop by members of the Air Force's 7th Special Operations Squadron at a DZ in West Germany.

that looked like a string of tiny tracers frozen in flight.

Making the Pick-up

The airplane, while not overly heavy, felt that way due to the fending lines stretched from the nose to each wingtip and running forward of the four spinning turboprops. Two men in the rear opened the ramp and re-checked the winch gear.

The EWO called to say they were not being tracked or scanned. The navigator said the wind was from 295 degrees at forty-two knots.

The pilot reduced speed and began his final approach heading 295 degrees. He toggled a switch near his left elbow, causing two large beams folded back along each side of the nose to swing forward, forming a "Y" in front of the aircraft. The distance between their tips was twenty-five feet, and it was into that space the pilot must intercept the lift line.

The copilot stayed on the gauges as the pilot continued the visual approach. Each man had done his work; now it was up to the pilot's knowledge and control skills to fly the aircraft at precisely the right height, the right speed, the right direction, and the right attitude to make the pick-up. The extended yoke buzzed in the wind, sending the familiar vibration through his hands. He wasn't nervous, just apprehensive. If he missed, the line would be cut and the man on the ground might never get home. As the seconds clicked off, the pilot knew he would get him out.

And he did. The 125,000-pound MC-130E made the pick-up, whisking the sergeant straight up for a few feet and then swiftly over the trees into the night air as he was winched aboard through the open rear ramp.

The Work of the 7th SOS

Though this mission wasn't really in hostile territory, that particular live STAR (Surface-to-Air Recovery) was made not too long ago in a joint exercise, called Flintlock, held in Europe.

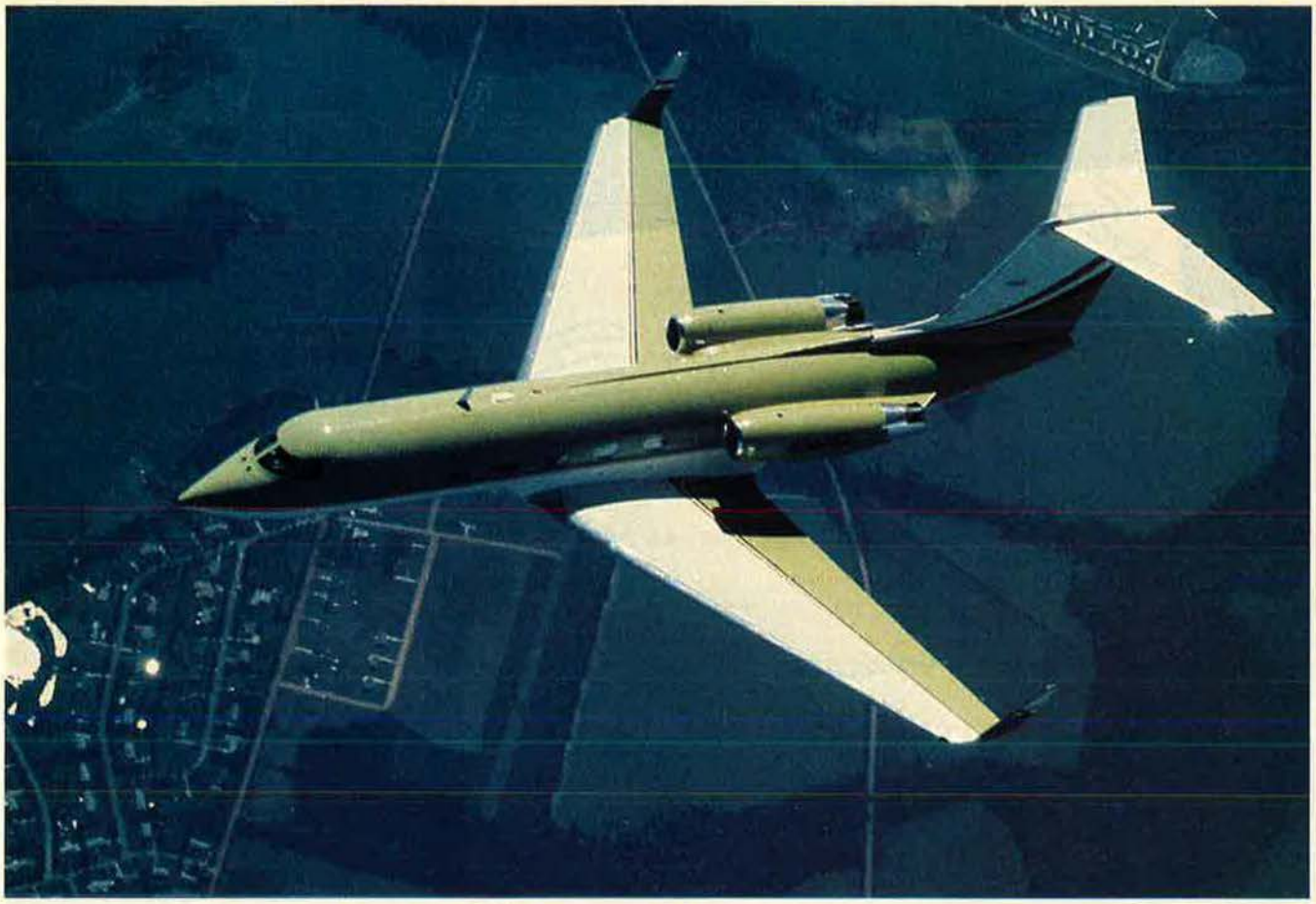
This recovery technique (which movie fans will remember seeing in action a few years ago in the James Bond movie "Thunderball," when an actor was plucked from disaster in one of the film's daring escape scenes) was invented by Robert Fulton, who is the great-great-grandson of the inventor of the steamboat.

According to the Robert Fulton Co., users of the STAR technique have never suffered an injury or mishap since the technique has been in their repertoire. The technique is but one of the many Combat Talon capabilities performed by the 7th Special Operations Squadron (SOS), based at Rhein-Main AB, Germany.

Specifically, the mission of the 7th SOS (and its two sister units, the 1st SOS at Clark Air Base, the Philippines, and the 8th SOS at Hurlburt Field, Fla.) flying Combat Talon MC-130E aircraft is to conduct day/night infiltration and exfiltration, resupply of Special Operations ground forces (which include USAF Combat Control Teams, Navy SEALS, and Army Special Forces), psychological operations, and aerial reconnaissance into hostile or enemy-controlled territory using airland, airdrop, or surface-to-air recovery procedures.

The antenna-studded, air-refuel-

Mark Berent earned his jump wings with the 10th SFG at Bad Tolz, Germany, in 1956. During his career as a fighter pilot he amassed 4,000 hours of flying time, with more than 1,000 hours in jets and props during his four years in Southeast Asia. His last article for this magazine was "Flying the Jaguar," in June. Under the name Berent Sandberg, he has co-authored two novels, Brass Diamonds *and* Honeycomb Bid, *about the international adventures of a retired fighter pilot. A third,* Chinese Spur, *is due out next year.*



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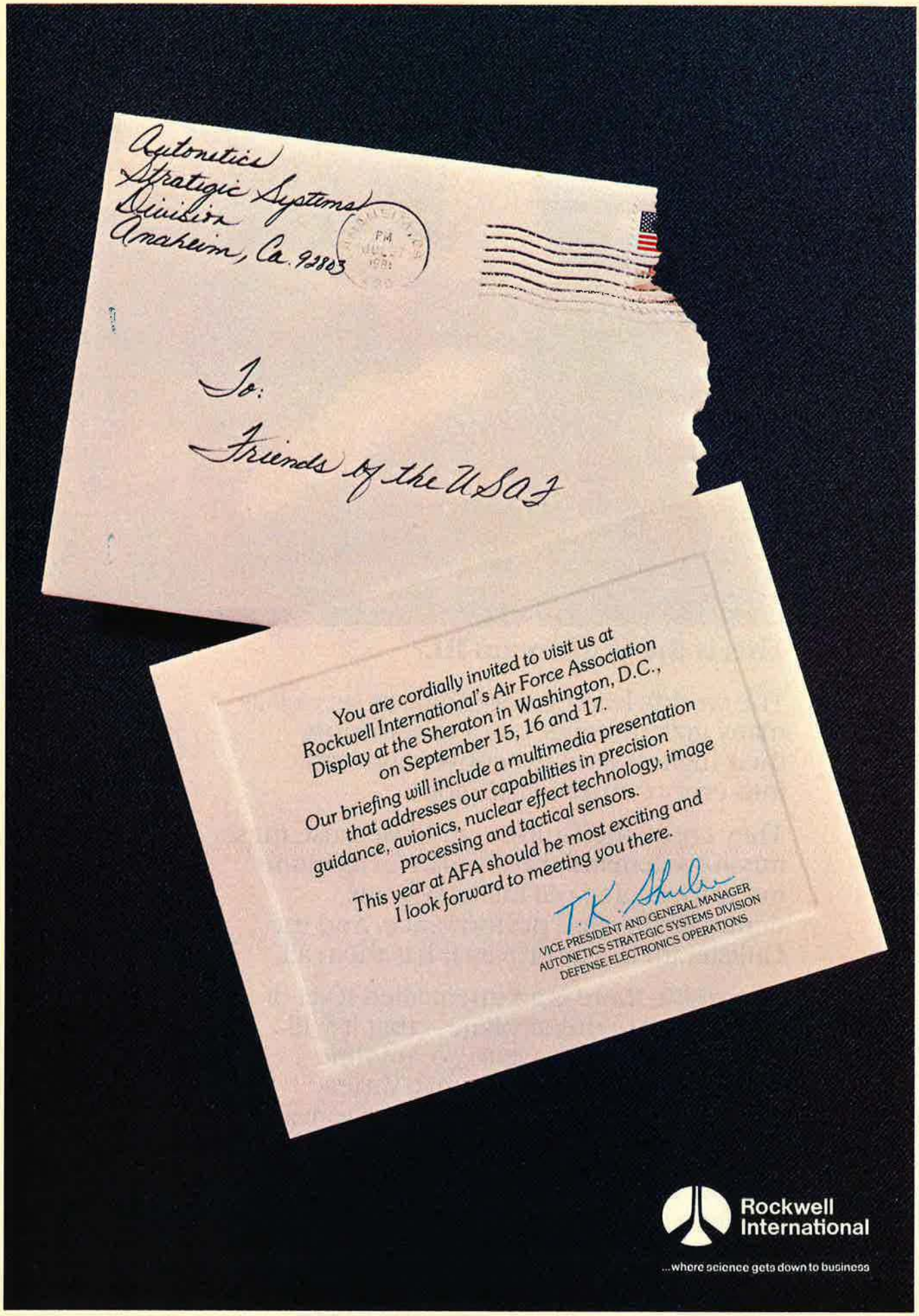
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able MC-130Es carry a host of special navigation and aerial delivery systems to enable Combat Talon crews to fly long distances low and fast, at night, in foul weather, and locate small drop zones:

- Terrain-Following Radar (TFR).
- Precision Ground Mapping (PGM).
- Inertial Navigational System (INS).
- Automatic Computed Air Release Point (AUTO CARP).
- Electronic Countermeasures (ECM).
- High-Speed Low-Level Aerial Delivery System (HSLLADS) and Container Release System (CRS).
- Ground-Acquisition-Receiver/Interrogator (GAR-I).
- Fulton Surface-to-Air Recovery (STAR).
- Secure Voice UHF/VHF/FM Radios.
- Forward-Looking Infrared (FLIR).
- Angle of Attack Probe.

Combat Talon missions are normally flown at night using a hi-lo-hi profile. Modifications to the aircraft, besides the multiple antenna nodes, ECM bathtub under the fuselage, and the yoke installation, include high-speed buffet panels around the rear ramp and door, and strengthened longerons on each side of the ramp.

Nothing about the external portion of the aircraft is particularly classified. It has been photographed hundreds of times by the tail-spotters on Lookout Hill near the No. 5 Autobahn passing Rhein-Main. Tail-spotters are not the only ones who like to take pictures. On June 12 of this year, a Soviet Mi-26 heavy-lift helicopter, en route from the Paris Air Show back to Russia, took off from the civilian side of Frankfurt International followed by its chase helicopter, and made a beeline for the ramp on the USAF side. There it flew low and slow in a curving arc over one of the black birds—obviously filming all the way. Earlier that day, the same pilot who made the live STAR pick-up had taxied his MC-130E by a Bulgarian Tu-154B that had just landed. Maybe the aircrew alerted the Mi-26 for a closer look at the strange beast.

Why MC-130E Is Special

What *is* highly classified about the MC-130E is the EWO (Electronic Warfare Officer) position. Next to the radio operator's position is an odd-shaped container that looks as if someone designed an aluminum packing crate for a lady's dressing table, then secured the openings with padlocks. When opened, it is from here that the EWO controls his ECM gear. Besides controlling, scanning, tracking, and spoofing hostile electromagnetic radiation, the EWO can also have chaff dropped from ports forward of each paratroop door.

Although the 7th SOS claims they are not a rapid response force, they can fly missions deep into heavily defended enemy territory on a forty-eight-hour call-out before TOT (Time Over Target). To do this the squadron depends on its wing-level communication and intelligence sections with a combined personnel force of more than thirty people. Aircraft crew sizes run from nine to eleven, depending on the mission.

In addition to the intelligence and radio sections, the 7th SOS owns a Combat Control Team (CCT). The eight members of this team wear red berets, jump wings, and air traffic controller badges. These versatile men form a force capable of swift appointments in support of unconventional warfare air assets during unilateral and joint operations. CCT missions include but are not limited to:

- Providing operational coordination, training, and interface with USAF, Navy, and Army personnel;
- Positioning navigational aids;
- Developing Terminal Instrument Radar Procedures (TIRPs);
- Providing limited Search and Rescue (SAR) support;
- Positioning target designation equipment;
- Ground controlling of air strikes;
- Surveying, establishing, and controlling Drop Zones (DZs), Landing Zones (LZs), and Recovery Zones (RZs); and
- Weather observations and operations.

To reach their position in hostile territory, the CCT may parachute via static line, free fall, or HALO (High Altitude-Low Opening) methods; be airlanded; or rappel from helicopters. They can also infiltrate on foot, use skis, or use rubber raiding boats. The eight-man team's ranks range from chief master sergeant to staff sergeant.

The versatility of these men is obvious from the thirty items they must maintain proficiency in, listed on their unit training chart *(see box)*.

Proficiency Checklist for 7th SOS Combat Control Team

Air Traffic Control	Combat First Aid	Overland Infiltration
Weather	Weaponry	Ski Infiltration
Drop Zone Ops	Parachute Packing	Amphibious Ops
Landing Zone Ops	Jump Master (Static and HALO)	Helo Rappel/Exfiltration
Recovery Zone Ops		Airland
Communications Equipment	HF Radio	Physiological Training
	Air-to-Ground Ops	Stan-Eval
Navigation Aids	Special Ops Techniques	Physical
Land Navigation	Demolition	GAU-5 AW
Escape and Evasion	Morse Code (CW)	.38 Pistol
Survival	Static and HALO Jumps	

When a newcomer to the 7th SOS shows up at the rather unpretentious two-story squadron building at Rhein-Main, he is led down a hall lined with plaques, trophies, and citations for excellence, to the office of the operations officer.

There, after introductions and coffee, the ops officer, Lt. Col. Bill Hudspeth, points to a large map. He traces a line running west of Iceland, north of Siberia, east of Calcutta, and south of Cape Town. With obvious relish, the tall lieutenant colonel says, "This," his hand waves to the outlined map, "this is the area we are interested in."

That area encompasses about one-third of the world. That's probably why CMSgt. Bob Phillips, who is the NCOIC of the Combat Control Team, says: "This job is tremendously challenging. Every time we go out we do something different, go someplace different. You don't have the problem of boredom in this job." ■

Is a "resource war" for control of strategic minerals under way? What is the extent of US dependence on foreign sources of vital minerals? This account depicts the US's . . .

DANGEROUS DEPENDENCE ON FOREIGN MINERALS

BY JAMES D. HESSMAN

THE General Electric Co. had a better idea.

Rather than extolling the merits of GE products, the company pointed out—in a press release distributed by its Aircraft Engine Group division—that "a total of 356 subcontractors in thirty-two states, Australia, Canada, and England" last year received orders totaling $153.1 million for various parts, components, and subsystems used in production of the division's F404 engine, powerplant for the US Navy's F/A-18 Hornet strike fighter.

The F404 "also has been selected to power Canada's new F-18 strike fighter," the GE release continued, and is "under active consideration" for military aircraft application in Sweden, Spain, Greece, and Turkey, "as well as for Israel's new strike fighter, the Lavi."

The welcome news that the F404 is alive, well, and seemingly assured of a growing share of the world aircraft engine market was without doubt very warmly received by those 356 subcontractors—most of whom, of course, are in the United States.

But it was good news overseas as well. Not only in Australia, Canada, and England, which share some of the subcontracting market—or in Israel and the other countries considering the F404 for their own uses. The fact is that a score or more of countries throughout the world play no immediate part in the engine's production and certainly will never be customers for the F404, but nevertheless have a vital interest in its continued success.

Vital Ingredients

Those countries are the suppliers of a number of important metals and minerals without which neither the F404 nor any other jet engine could be built. They range across the geographic and ideological spectrum from Argentina and Uganda (important producers of beryl) to the Soviet Union and South Africa (which between them control over half the world's production of chromite) to Canada, Bolivia, Thailand, Peru, and South Korea (the world's leading suppliers of tungsten). And their control of the key metals and minerals essential to modern industrialized societies poses major economic, political, and national security problems for the US and its allies.

As with aircraft engines, so it is with electronic components of all types. Consider the following:

- Silver is used in a wide variety of electrical and electronic products ranging from electric batteries to microminiature circuits to electrical and electronic contacts and conductors. The US is the world's biggest silver user and must import about three-fourths of its annual requirements—mostly from Canada and Mexico but significant quantities also from such less-accessible countries as Australia, Namibia (Southwest Africa), Japan, and Peru.
- Antimony, used in the manufacture of semiconductors, is another metal listed in the US stockpile index as "strategic and critical." In 1980, according to the US Bureau of Mines, the United States imported fifty-three percent of the antimony it used. The "by-country" import percentages have not yet been developed, but the Bureau says that, in the years 1976–79, the "major foreign sources" for US antimony imports were: the Republic of South Africa, twenty-nine percent (of imports—not of the total US consumption); Mexico, eighteen percent; Bolivia, twelve percent; and the People's Republic of China, eight percent.
- The United States produces virtually no columbium or tantalum, essential in the production of capacitors, transistor circuits, and superconductive cable. Contingency forecasts for the year 2000 developed by the Navy Department project US demand for columbium at between 15,000,000 and 29,800,000 pounds annually, and tantalum at about 5,300,000 pounds.

The list could go on and on, but one gets the idea. The US is now, and will be for the foreseeable future, as dependent on Third World countries for a number of critical metals and minerals as it already is on OPEC (Organization of Petroleum Exporting Countries) for oil.

The Meaning of Dependence

What that dependence means in economic terms is relatively easy to compute. In 1977, according to the US Commerce Department's Office of Planning and Research, this country imported $12.3 billion worth of metals (and metal products), and exported $6 billion of the same, for a negative balance-of-payments figure in that one commodity of $6.3 billion. By 1979, just two years later, the import total had increased to $17.5 billion, the export total to $7.5 billion, and the balance-of-payments difference to $10 billion. Commerce Department projections indicate the metals import-export deficit will continue to worsen for years to come.

But to US decision-makers that is the smallest part of a complex, pervasive, and multifaceted problem, the larger dimensions of which are military and political. Without oil, the nation's top planners realize, the US would go on short rations. People would walk, virtually all nonessential activities would cease abruptly, and the

Left, a photo looking straight down into the Kennecott Copper mine at Bingham Canyon, Utah. Above, a guard from a Chicago bank hefts a silver bullion bar in the vault of the Board of Trade.

national economy would be dealt a crippling blow. But no one would starve, and the nation would eventually recover—perhaps even stronger and more self-sufficient because of the common sacrifices endured. The reason is that the US could within a few years—and with maximum effort and minimum waste—achieve that long-sought energy independence that has been the frustratingly elusive goal of so many consecutive presidents.

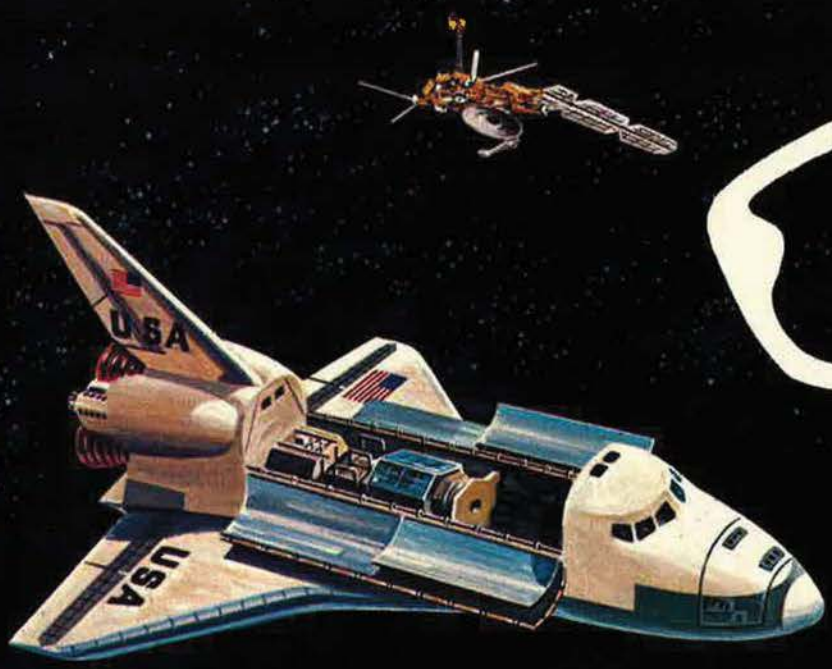
The same is not true of key metals and minerals, without which the US would face certain economic collapse. An article by Daniel James in the March 3, 1981, Washington *Star* makes the point persuasively: "What would be the effect on America of a sudden cutoff of strategic minerals? Take the case of the impact of a single mineral, cobalt, on one industry, aviation. About eighty-three percent of all US commercial aircraft are powered by the JT8D jet engine, which contains 900 pounds of cobalt. Pratt & Whitney, which makes the JT8D, estimates that it could continue supplying its customers with spare parts for one year after a cobalt cutoff. But, calculates the aircraft company, 'At the end of that time the JT8D fleet would start to be grounded at the rate of about twenty-five percent per year.' In five or six years, US civil aviation could be as effectively paralyzed as though struck by a hail of Soviet missiles."

A Legitimate Question

Realists may ask if it is fair, in today's world, even to postulate the possibility of "a cobalt cutoff." It's a legitimate question that has been asked before. Rep. James D. Santini (D-Nev.), Chairman of the House Subcommittee on Mines and Mining, conducted extensive hearings last year on the nation's non-fuel minerals policy (or lack thereof) and used cobalt as a microcosm of some of the larger truths unearthed by his subcommittee. Among the panel's more important findings (supplemented with additional data from the US Bureau of Mines and the 1981 *World Almanac):*

- Zaire is the world's leading producer of cobalt, with 27.7 percent of the world's known reserves. New Caledonia (27.1 percent) ranks a close second. Zambia, Zaire's next-door neighbor to the south, is third with 14.2 percent.
- Last year the United States imported ninety-three percent of all the cobalt it used. The "major foreign sources" (again, according to data published by the Bureau of Mines, which covers the years 1976–79, not 1980) were: Zaire, forty-two percent; Belgium/Luxembourg, sixteen percent; Zambia, thirteen percent; and Finland, six percent. NATO allies Canada, Norway, and the Federal Republic of Germany were among the other leading US suppliers.
- Zaire, formerly known as the Belgian Congo, is—in both military and political terms—one of the least stable countries in a most unstable continent. There have been two invasions in recent years of Zaire's Shaba Province, its principal cobalt-producing region. One invasion, in March 1977, was thwarted by Moroccan troops backed by Saudi financing and French logistic support. French and Belgian paratroops intervened to frustrate the second attempted takeover, in May 1978. (Some reports indicate that the invading forces were trained and equipped by Cuban "advisors" in Angola.)
- Despite the failure of the invading forces, Zaire's cobalt mines were shut down temporarily following the second invasion. The immediate result was a disruption of supplies, which in turn led to a dramatic hike in price from $6.85 per pound to $25 per pound, with the spot market price increasing to an unprecedented $50 per pound.
- Ominously, the USSR, which in comfortable contrast to the US is virtually self-sufficient in most metals and minerals, seems to be trying to corner the world's market in cobalt. (It has cobalt in relative abundance—8.3 percent of the world's reserves.) The USSR in the last three years has arrived at a major agreement with Zambia to trade Soviet arms for cobalt and has

New tricks for the Shuttle era



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James D. Hessman is Editor in Chief of Sea Power *magazine, the official publication of the Navy League of the United States. A 1954 graduate of Holy Cross College, he served on active duty in the Navy for eleven years, and was at* Armed Forces Journal *for six years prior to shifting to* Sea Power *in 1972. This is his second article for* AIR FORCE *Magazine. His first, "US Navy–1977," appeared in the June '77 issue.*

purchased an additional two-year supply from Zaire prior to the 1978 Katangan rebel invasion that shut down production.

The Stockpile Goal

Making the cobalt shortfall more tenuous for the United States is the fact that in 1964 this country sold half the cobalt it had in the strategic stockpile—and has not yet replaced it. The stockpile goal established by the Federal Emergency Management Agency for cobalt is 85,400,000 pounds; as of the first of this year, the agency reported, there was in the strategic stockpile inventory only 40,802,393 pounds—less than half what is considered adequate.

How the shortage of cobalt, and other strategic materials, impacts adversely on the US defense industrial base was spelled out in considerable detail last year in two landmark studies.

The first is a scholarly but eminently readable tour de force (*The Defense Industry*, The MIT Press, Cambridge, Mass., 1980) by Dr. Jacques S. Gansler *(see "Airman's Bookshelf," March '81, p. 132)*. It describes among other things the vicious relationship that has developed in recent years as the escalating demand for raw materials has led to increasingly higher prices and ever longer lead times for critical components of defense hardware.

Between January 1974 and January 1, 1975—a period in which the demand for many raw materials "was actually slackening"—Gansler points out that the price of sheet and plate aluminum increased twenty-five percent, the price of steel and stainless steel thirty percent, and the price of titanium thirty percent.

Compounding and exacerbating the problem was a dramatic and all but simultaneous increase in the lead times needed for obtaining raw materials. In December 1975, the lead time for aluminum sheet and plate was from twelve to sixteen weeks; in August 1979, the lead time climbed from sixty-eight to seventy-three weeks. Similarly, for the procurement of titanium sheet and plate: from twelve to eighteen weeks in December 1975 to seventy-six to seventy-seven weeks in August 1979.

"Over the long period," Dr. Gansler says, ". . . one would have expected additional suppliers to enter . . . and thereby reduce the prohibitive response times. The fact that none did is further proof of the monopoly position of the suppliers."

The Ailing Industrial Base

The second study is a fifty-two-page report supplemented by hundreds of pages of detailed testimony issued on December 31, 1980, by the House Armed Services Committee's Defense Industrial Base Panel chaired by Richard H. Ichord of Missouri, now retired.

With Washington in the throes of transition and the hostage crisis about to end in a crescendo of new-found patriotism, the year-end release of the Ichord report (aptly titled "The Ailing Defense Industrial Base: Unready for Crisis") virtually guaranteed it would be quickly consigned to the file-and-forget folder. But those who did take the time to study it found some alarming reading. Specifically, the Ichord panel discovered, among many other things, that "the general condition" of the nation's defense industrial base "has deteriorated and is in danger of further deterioration in the coming years"; that the Defense Department "has neither an on-going program nor an adequate plan to address the defense industrial base preparedness issue"; and that adding appreciably to the general unpreparedness is "a shortage of critical materials, combined with a resulting dependence on uncertain foreign sources for these materials."

Expanding on the latter point, the panel quoted from the testimony of Gen. Alton D. Slay, USAF, then-Commander, Air Force Systems Command:

"There was a time when we produced more raw materials than we consumed. Since 1950, however, our raw materials situation has deteriorated drastically. We have now become dangerously vulnerable to the OPEC-type mineral cartels. . . .

"The United States is more than fifty percent dependent on foreign sources for over half of the approximately forty minerals which have been described as most essential to our $2.3 trillion economy. . . .

"Our strategic vulnerability is obvious. On one hand, critical materials availability is subject to the political and economic stability of several southern African nations. On the other hand, our chief remaining source is also our major international rival—the Soviet Union."

Recognition that a problem exists is half the solution. Or so it has been said. But, regrettably, despite the eloquent testimony of General Slay and other witnesses, that does not seem to be the case in the present instance. As far back as 1941—sixteen weeks before Pearl Harbor, the Ichord report points out—a *Fortune* magazine article discussing US industrial unpreparedness had also focused on the then "widespread shortages of critical materials."

Not too much has changed in forty years, except that what earlier seemed only a serious problem may now have evolved into a terminal illness.

Chairman Santini, who earlier this year introduced a new National Minerals Security Act designed to "support and stabilize the nation's crumbling mining industry," perhaps summarized the present situation best when he wrote that "Our nation is deeply involved in a silent but critical war over the world's strategic minerals. And we are losing.

"Henry Kissinger was asked recently," Representative Santini continued in an April 27 op-ed column in the Washington *Star*, "if America was engaged in a 'resource war.' The former Secretary of State paused, then responded quietly, 'No, but the Soviet Union is.' " ■

During World War II, some 14,490 P-51 Mustang fighters were produced, making it the second most numerous US fighter plane. Its fighting characteristics and flying abilities endeared the Mustang to the thousands who flew it and the thousands more whom it protected. The aircraft continued in postwar service, and still excites air show crowds. Here, a present-day pilot tells what it is like to fly . . .

The Marvelous Mustang

BY JEFFREY L. ETHELL
Photos by William A. Ford, ART DIRECTOR

An unmistakable sound—the velvety roar of a Merlin engine that powers North American Aviation's most famous product, the P-51 Mustang.

At the time I first talked with Gordon Plaskett in King City, Calif., my mind was flooded with the boyhood memory of how I used to sit on the wing of my Dad's F-51 in Japan.

Gordon owns the only operational dual-control Mustang, a TF-51D, much used in the early 1950s to let USAF pilots check out in the -51 before they were turned loose to solo.

Gordon's Mustang school is very straightforward—start in the Stearman, go to the AT-6D, then to the back seat of the TF-51D, and, finally, if all goes well, the front seat.

Long before I arrived in King City, I had spent many hours with the Mustang pilot's manual, had made up checklists, and had gone through them several times until I was familiar with the cockpit from photos and diagrams. With the back seat of the TF not as complex as the front, I found the visibility magnificent.

Gordon's first approach to the -51 with a student is thorough preflight. He is not satisfied until everything has been checked, particularly in the wheel wells where all kinds of things can happen, the worst being either the gear locking up or getting out of sequence. If one operates the gear handle improperly, the wheels alternate in going up and down—right leg up, left leg down! Wonderful! The tiny rods and actuators that do the work can be found for the most part in the wheel wells and to leave them unchecked is to overlook a safety factor. In flight, the problem can be solved most of the time by pulling the hydraulic pressure dump handle that lets the gear free fall into place. But this has been known to fail if the mechanical locks in turn fail.

During preflight I was in a slight daze—flying this fire-breather, a lifelong dream, was so near at hand that I found my mind wandering out into the sky when there was still something to learn on the ground.

Mustangs at the Valiant Air Command's Airshow, clockwise from top left: Passion Wagon, *George Enhorning's P-51D. A gaggle of Mustangs with various markings. Jimmy Leeward flying cover with a B-25 owned by John Marshall. John Baugh's Mustang taxiing.*

Into the back and a final cockpit check. All strapped in, Gordon did most of the checklist. The Merlin quickly barked to life, and blue smoke poured into the cockpit, the smell and sound vivid. Gordon would make the first takeoff and landing, with an exploration of the aircraft's slow flight and stall characteristics in between.

There is plenty of noise and acceleration. Once things wind up, a fair amount of right rudder is required. But if the throttle is fed in gently, the 6° right rudder trim dialed in, and one keeps his wits, the pull to the left is not that violent.

Heavy Rudder

Off and gear up, we proceed to the practice area. Being neutrally stable as are most fighters, the Mustang is sensitive on the controls. I found pointing it around effortless and very smooth. Then the lesson began with slow flight. Leaving the trim alone, I found that the rudder got very heavy, as did the stick. My right foot was finally pushed to the stop with the nose up and power on, flaps and gear down. My leg began to ache, then tremble. Holding all that horsepower at less than 100 knots took all I had, much like holding a prop-driven, twin-engine aircraft with an engine out.

Down to eighty knots and things were decidedly dicey. Once the stall broke, the -51 wanted to roll over on its back. Quick rudder deflection

can stop that, but altitude loss is rapid. If one tends to recover too fast without enough speed, an honest snap roll jumps out and bites. One sure way to get into trouble is to pour on the power during stall recovery when there is not enough right rudder to stop the roll.

Getting down to just above stall the next time, Gordon shouted for me to put on power and simulate a go-around. This is the chanciest part of flying a Mustang, since it just doesn't want to accelerate. When the throttle is opened, the engine makes an incredible racket but there is no apparent thrust. Gradually the speed builds up, the flaps and gear are brought up on alternate stages, and, thankfully, you are flying again after what seems an eternity. That eleven-foot-two-inch gyroscope churning away out front will roll the fighter inverted at low speed into the ground if the pilot is not on top of things. Besides proper recovery, Gordon's major solution to the problem is *not to go too slow.*

Gordon shot a landing to give me some perspective, let me shoot one, then said, "OK, time to switch seats. You obviously know what you are doing." Back out to the runway, magnetos checked again, harness locked, rudder 6° right trim with elevators and ailerons at 0°, canopy locked, radiators in automatic. There was nothing else left to do. As honest as the airplane had been so far, intimidation was eroding my confidence. In the few seconds I sat there at idle making the final checks, the many years of anticipation to arrive at this moment won out—I was going to *fly* the -51.

Power up on the Merlin, and the engine's rumbling and barking gave way to a banshee's shriek. Stick neutral so that the tail wouldn't come up before the rudder bit into the air. With full right rudder the Mustang can run off the left side of the runway, so the solution is to let very fine tailwheel steering do the work.

At Last—at the Controls

I did not even notice the tail come up, and my feet moved by instinct to catch the lurch to the left. At 100 knots I pulled gently back on the stick and we were airborne.

I hit the gear handle and almost at once was at 157 knots climb speed. If the unthinkable happens and no power is roaring away out front, the only procedure is to land straight ahead with the gear up. Gordon wanted me to go through all the practice maneuvers again from my new seat, and I did not find myself caught up in what I was flying—I was too busy. After the adrenaline tapered off and the practice go-arounds seemed less threatening, I looked out at the Mustang itself. The arc of the prop is impressive, filling up quite a bit of sky, and since the wings are relatively short, this, combined with the snugness of the front seat, made the old adage about wearing the airplane apply.

How about a few rolls just to enjoy the aircraft? Sheer smoothness—the controls are very nicely balanced and harmonized, but the airplane is not that maneuverable. Compared to an AT-6, it is stiff, and the higher the speed the harder the controls become. In particular, the rudder is locked in cement past 250 knots since it is deboosted. The harder you push, the more the rudder resists. World War II Mustangs suffered tail problems as a result of severe maneuvers, particularly snap rolls. To keep pilots from damaging their tail assemblies, the manual thus prohibited snap rolls.

I was beginning to see that the P-51 was a compromise, as of course all aircraft are. To combine such characteristics as range, maneuverability, ruggedness, and armament meant that other factors had to suffer. No doubt the Mustang could be outmaneuvered, but, as many US pilots proved, it was more how they used the aircraft's strong points to exploit an opponent's weaknesses than one aircraft type vs. another.

Back into the pattern with 20° of flap at 160 knots, then drop the gear at 150 knots. The airplane is so clean that to throttle down to flap and gear speed requires considerable preplanning. And once they are down, it takes much power to hold 150 knots and not let the nose come up or the airspeed drop. On final, push the nose down and bleed off power and airspeed so that, with full flaps, 120 knots is locked into the indicator.

With the landing checklist complete and set up, I concentrated on maintaining speed and chose a point on the runway for touchdown. Over the runway at 100 to 110 knots the power was chopped for a tail low wheel landing. The -51 proved very nice to land. Once the mains squeaked down, I pushed the stick forward to get visibility over the nose, let the speed bleed off, then gently let the tail down. Not until speed was down to about twenty knots could I think about the wonder of flying a Mustang. I had been too darn busy. Next—to solo!

Flying the P-51D

A friend and fellow Warbirds of America member, George Enhorning, had previously offered to let me fly his beautifully restored P-51D. So when at the annual air show at Oshkosh, Wis., following the flights with Gordon Plaskett, I spotted George's *Passion Wagon* on the flight line, I felt a surge of excitement. I had helped George duplicate the World War II paint scheme of ace Arval Roberson's *Passion Wagon,* following an interview with Roberson for my book, *Mustang.*

We planned a formation flight of four aircraft, with some military-type flying so that I could get the feel of the P-51 in its element. George indicated I could fly without him in the jumpseat.

The other Mustang pilots and I briefed that I would lead and all four would form up over nearby Lake Winnebago. Ray Stutsman would be No. 2 in his newly restored *Double Trouble,* Bill Clark as No. 3 in *Dolly,* and Bill Harrison as No. 4 in John Baugh's *Miss Coronado.*

The bond that was growing between myself and this fashioned-metal machine was becoming intensely personal, beyond years of yearning to fly the P-51.

The checklist was almost memorized by now: flaps up, carburetor unrammed air, carburetor heat normal, throttle cracked one inch, mix-

---

Jeff Ethell is a certified flight instructor and commercial pilot with instrument and multiengine ratings. He is the son of an Air Force officer and grew up around military aircraft, including the P-51. He has been writing on aviation subjects since 1967. His article on flying the T-6 appeared in the January '81 issue, and his account of the Mustang's development appeared in June '81. He and his family live in Front Royal, Va.

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John Baugh's Miss Coronado *performing during the air show.*

ture idle cut off, prop full increase, brakes set, supercharger auto, fuel shutoff on, fuel main tank left hand, magnetos off, fairing door release in, generator on.

Now to start my bird: battery on, radiators open, starter on and crank, magnetos both in six blades, fuel boost pump on, prime three to four seconds. And when the engine fires, move the mixture to normal. The Packard-built Rolls-Royce Merlin has to be one of the sweetest-starting engines, and its purr at idle is mesmerizing.

The other Mustangs had also come to life, so it was time to taxi. A look in the rear-view mirror showed Ray's prop turning right behind me. Runup was made at 2,300 rpm, then a final before-takeoff check of harness locked, altimeter set, rudder trim 6° right, elevator and aileron trim at 0°, canopy locked, carburetor to ram air, radiators in automatic.

Waiting for the flagman to get us off, I reviewed my checklist and emergency procedures. When we were finally waved on, there was no time to become apprehensive. I smoothly brought the power up, right foot down on the rudder pedal to keep her straight. I was airborne powered by avgas and adrenaline, one being consumed and the other generated in large quantities.

Power back for climbout and a right turn, easily picking up 200 mph (George's bird was not marked in knots). Individual actions began to take on parts of a whole as I moved power and trim as needed. The Mustang's personality was beginning to wax as my inexperience waned.

Flying Formation

Soon all four of us were formed up. After quite a few hours of flying formation in the AT-6, I found the P-51 was on rails by comparison. There was absolutely no trouble in flying any position with plenty of power and solid controls. Flying formation under combat conditions is never easy, but the Mustang must have made it endurable. Looking back on all the Eighth Air Force paint schemes carried by the four of us, I felt transported.

Bill Harrison invited me to play tag. As he rolled, so did I and the *Wagon* simply went where I told her to go. Tactical formation was easy to maintain, and soon my leader was all I saw as earth and sky lost relevance.

Back to the field with me as No. 3 with a request for a 360° overhead approach, flight of four, with two second breaks.

Then the landing checklist: fullest tank, boost pump on, mixture normal, prop 2,700 rpm, radiators auto, gear below 170 mph, full flaps below 165 mph. As I leaned down to shove the gear handle, my safety harness allowed me to move the lever only halfway down. I had locked the harness too soon and apprehension swept over me. Since the handle releases the mechanical uplocks before activating the hydraulic system, there is a definite resistance on the handle about halfway down. If you don't go ahead and shove past this point, the gear can get out of sequence with one up and the other down. With great energy, I pushed myself into the straps and made my arm extend the handle fully. With flooding relief I saw both green lights come on to indicate gear down and locked.

On final at 150 mph. Picking the opposite side of the runway from Ray, I shot over the numbers and chopped the power—crackle, crackle, bark, pop. Mains down with a bit of a bounce, stick forward to see what Nos. 1 and 2 are doing, and find they are turning off the runway onto the grass. Tail down, then a straight rollout.

Off the runway with stick forward to unlock the tailwheel steering for full swivel and maximum turn, then stick back in the stomach to start S-turning to see around the nose. Radiators open, flaps up, trim neutral, prop full increase, boost pump off. Back to the parking area to give a thumbs up and a wave.

Once we are stopped, there is more to do. Throttle 1,500 rpm for a bit to get fresh coolant in the banks and the oil moved, then mixture to idle cutoff. Magnetos off, fuel shutoff off, fairing door release out and down, battery off, carburetor unrammed air.

Silence, and a thirty-year dream has been realized in soloing my first fighter. ■

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In June, hordes of spectators attended the military air show—ranked as the world's most spectacular—at RAF Greenham Common in the UK. Of the more than 200 aircraft on hand, those representing the air arms of eleven nations engaged in a unique competition called "Sea Search" at this year's . . .

INTERNATIONAL AIR TATTOO

BY WILLIAM P. SCHLITZ, SENIOR EDITOR

THE headline in the London *Sun* lamented: "Drivers fume in 17-mile 'road jam of the year.' " The British newspaper was describing the mammoth traffic tie-up caused by aviation enthusiasts driving to an air base in the UK this past June to attend an air show.

In fact, attesting to the popularity of the International Air Tattoo, an estimated quarter of a million spectators attended the two-day event conducted at RAF Greenham Common, near Reading. This despite a somewhat hefty ticket price of the equivalent of $8 per adult and $2 for older children.

What drew them was word of the record number of aircraft scheduled to appear—some 200, representing thirty-five nations. The Tattoo—the sixth in ten years—has become the world's leading military flying spectacular.

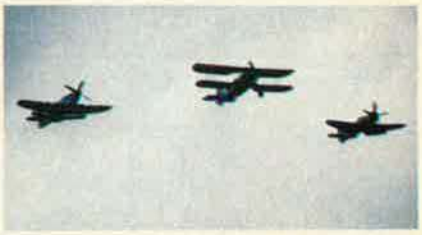
Other than the sixteen hours of flight demonstrations and many aircraft on static display, a humanitarian purpose of the Tattoo is to benefit the Royal Air Force Benevolent Fund. The previous six Tattoos added the equivalent of half a million dollars to the Fund's coffers, and this year's profits are expected to boost it another $200,000.

Established in 1919 by the late Viscount "Boom" Trenchard, the father of the RAF, the Fund dispensed slightly more than £900 that year. By contrast, in 1980 its awards amounted to £2.7 million (about $5.4 million).

The Fund exists for the relief of distress of past and present RAF members and their dependents to include such service auxiliaries as the RAF Reserves and Women's Services. It steps in when the UK's social services are either not forthcoming or are inadequate.

The Fund provides financial help to casualties in peace and war and even underwrites such institutions as a residential and convalescent facility and a preparatory boarding school for the needy children of RAF members of all ranks, with priority to those whose fathers have died or been disabled in RAF service. There are no hard and fast rules about who is to be helped or how much is to be given.

The Fund assumed responsibility for staging the International Air Tattoo in 1976, thereby continuing a tradition of fund-raising events that dates back to the first "Aerial Pageant" of 1920. But despite the Fund's solvency through the years, officials are apprehensive about the future: "It is worth remembering that



Far left, a member of the Royal Family, the Duke of Kent, shakes hands with USAF Capt. Ed Horne in welcoming the 305th ARRS crew to the Tattoo. Left, a fast mover screams off the runway. Top and above, helis and old-timers perform.

more than 1,750,000 men and women served in the Royal Air Force during World War II, and many of those who survived are increasingly in need of a helping hand as age and infirmity overtake them."

Greenham Common and the Tattoo

With the buildup of US airpower in the British Isles during World War II, the RAF air base at Greenham Common was relinquished to the American Ninth Tactical Air Force in 1943. It is best remembered locally as the home of an AAF troop carrier wing and subsequent staging area for paratrooper landings in Normandy.

In the postwar years, the base saw little activity until the 1950s when SAC B-47s began rotating to it from home bases in the US. That ended in 1965. Since then, Greenham Common has been used intermittently for USAF exercises. It is currently the home of USAF's 7273d Air Base Group. In recent times, beginning in 1973, the base has also been used to host the International Air Tattoo. (For the future, it has been announced that USAF elements on the base will play a role in the intended deployment of US cruise missiles in the UK.)

The first Tattoo, undertaken by a small group of military and civilian volunteers, was held at the famous Battle of Britain airfield at North Weald in 1971. The event became truly international in 1972 and, because of mushrooming participation, the following year was moved to the much larger airfield at Greenham Common. The Tattoo is popular with the citizens of the nearby town of Newbury, large numbers of whom assist in running the event.

As one example of the Tattoo's scope, all six of Western Europe's aerial demonstration teams performed this year: the RAF's Red Arrows, of course, in Hawks; the *Patrouille de France* in new Alpha Jets; Italy's *Il Frecce Tricolori* in Fiat G.91s; Austria's *Karo As* in Saab 105s; Switzerland's *Patrouille Suisse* in Hunters; and Belgium's Swallows in SF.260s.

While these and other fast movers provided the Tattoo's zip, it was clear from the open admiration of military and civilian attendees alike that four old-timers from the war years were favorites: Spitfire and Hurricane fighters and a Lancaster bomber of the Battle of Britain Memorial Flight, RAF Coningsby; and a Mosquito bomber/recon aircraft owned by British Aerospace.

Among the other obvious crowd-pleasers was a USAF C-5 Galaxy, its huge visor-like nose door raised to admit long lines of curious spectators.

While no real purpose would be served in cataloging the international collection of aircraft attending the Tattoo, a healthy cross-section of USAF aircraft was on hand. Among them: an A-10 Thunderbolt II, OV-10 Bronco, HH-53, several versions of the C-130, C-9A Nightingale, C-141 StarLifter, F-111E, F-15A Eagle, F-5E Tiger II, and RF-4C Phantom.

Maritime Competition

Each of the past Air Tattoos has had a major theme, and this year's was no exception. Participating in the Tattoo's maritime competition, dubbed international "Sea Search 81," was the largest group of anti-submarine, maritime patrol, and

A healthy cross-section of USAF aircraft was present at the Tattoo. Here, an A-10 is the focus of spectator attention.

search and rescue aircraft ever assembled. Both fixed-wing and helicopter aircraft, they represented the service air arms of eleven nations.

Sea Search 81 kicked off several days before the weekend-long Tattoo. Each of the fixed-wing aircraft passed through an imaginary "gate" near Greenham Common and, flying against the clock in a series of navigation legs, searched four successive areas in the waters off Cornwall and near the Scilly Isles, off Lands End. They were required to find and photograph or broadcast coordinates on such objects as a trawler in simulated distress and a rubber dinghy adrift at sea. It was a test of timing and navigation.

For their part, the participating helicopters flew a similar exercise that included winching and slalom competitions.

This first international maritime competition brought together a full spectrum of search and rescue aircraft ranging from the British Aerospace Nimrod to the Lockheed P-3 Orion to the Fokker F27. Among USAF representatives was an HC-130 of the 305th Aerospace Rescue and Recovery Squadron (AFRES) flown in an eleven-hour flight nonstop from Selfridge ANGB, Mich., to England. An HC-130 from the Suffolk County, N. Y., Air National Guard also took part.

Alas for the Yanks, the British took the top prize. Some consolation was that, after all, the British were playing on their home court.

During the two days of the Tattoo, various members of the Sea Search crews stood by their aircraft on static display to answer visitors' questions and in some cases conduct guided tours of the planes' interiors. A number of aircraft exhibited search-and-rescue equipment. This static display was deemed by officials as "the largest gathering of maritime search and rescue aircraft ever assembled before the public."

The Sea Search crews also attended a day-long symposium, with subject matter ranging from operations in Antarctica to long-range maritime surveillance. Host at this event was Tattoo President and World War II ace Sir Douglas Bader.

A distinguished participant attending the symposium was a pararescueman from the Suffolk County Air National Guard. TSgt. Jay Jinks has been responsible for saving many lives during a number of hazardous missions and this year has been nominated as USAF's most outstanding pararescueman of the year.

Tattoo officials noted that Sea Search 81 and the symposium were made possible through the sponsorship of the "Maritime Industries Team," a consortium of seven European and US aviation and avionics companies including Boeing Co. and Lockheed Corp.

Several historic occasions for Great Britain were also celebrated at the Air Tattoo. One was the seventy-fifth anniversary of the founding of Rolls-Royce, which led eventually to the company's growth into a major developer of aero engines for both military and civil aircraft. This year, too, marked the fortieth anniversary of the initial flight of Britain's first jet engine, invented by Sir Frank Whittle, a revised version of which powered the UK's first jet fighter—the Gloster Meteor. (In a related matter, at about this time Sir Frank was in Washington, D. C., for the opening of the National Air and Space Museum's Jet Aviation Gallery.)

Officials are already planning for International Air Tattoo 83. ■

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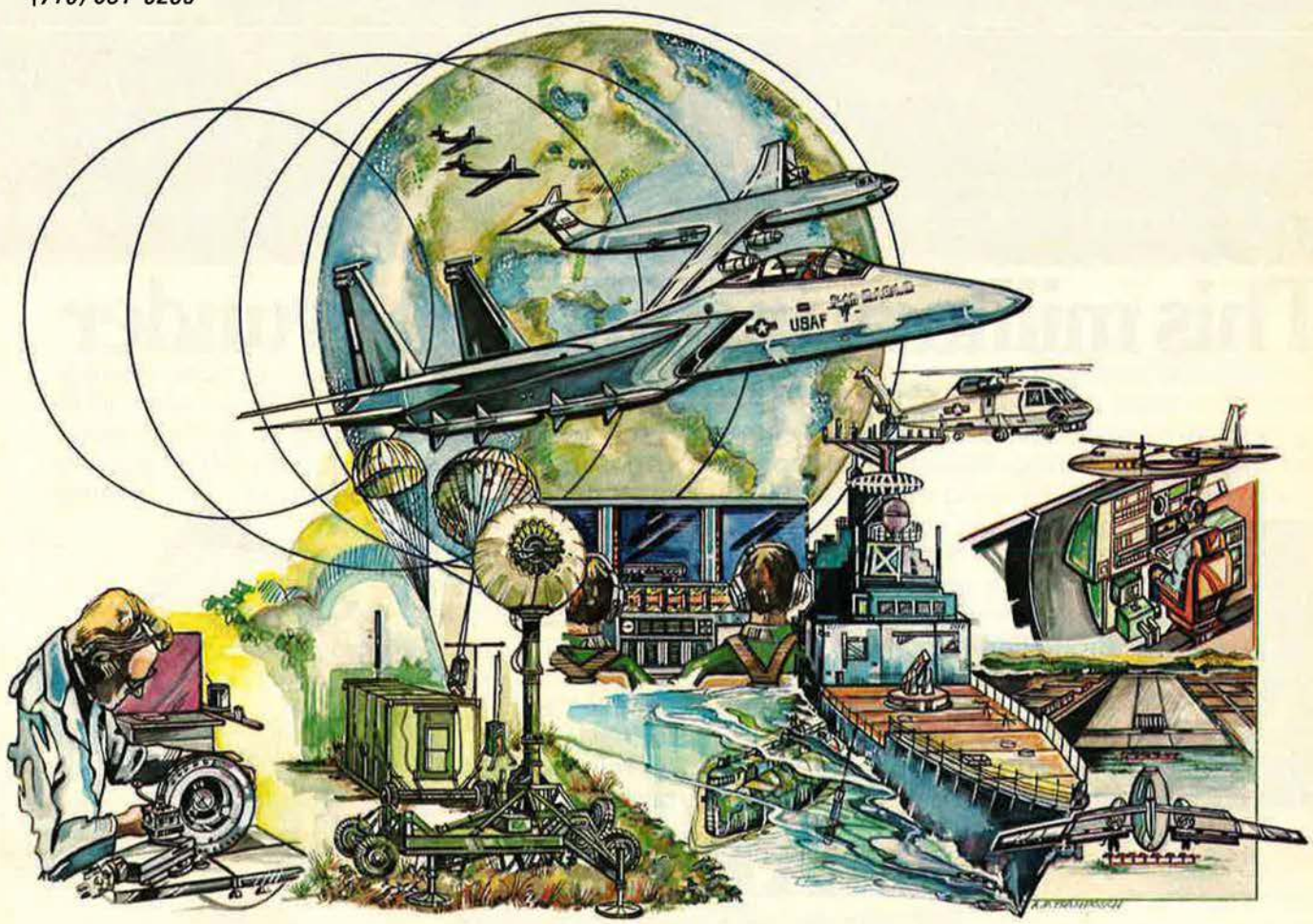

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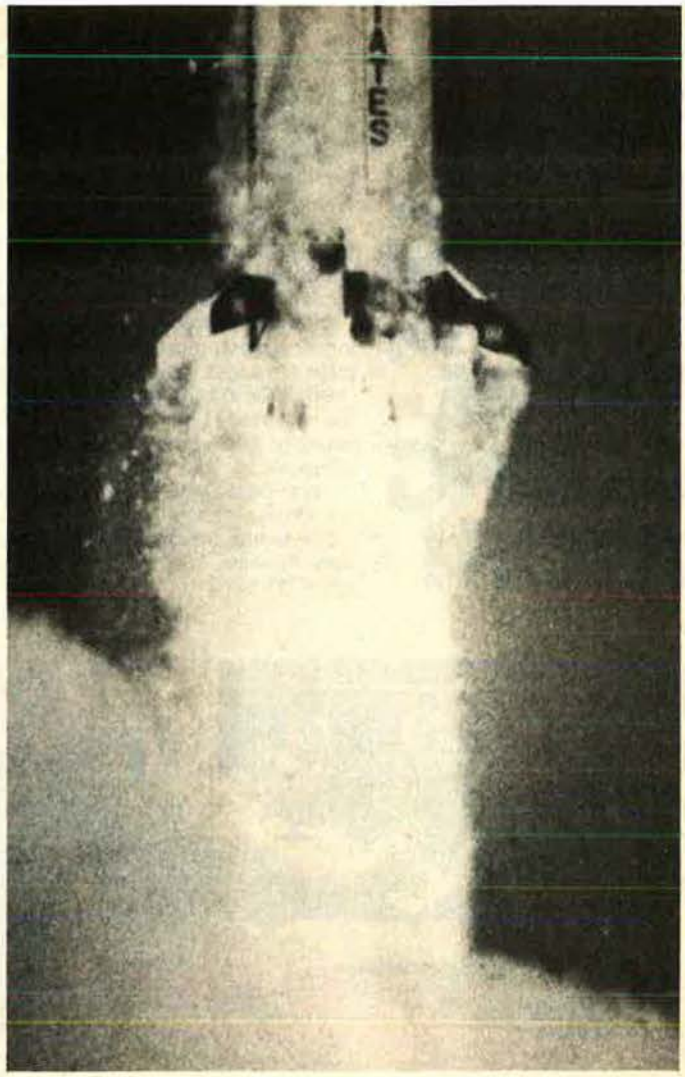

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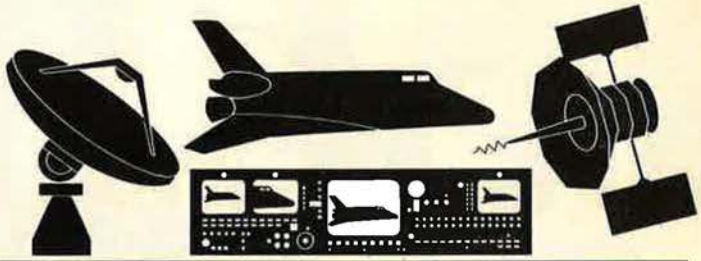

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PERSPECTIVE
Comment & Opinion

By Kenneth Stoehrmann

Taking a Back Seat

On January 21, 1981, I submitted my resignation from the Air Force. That evening, I sat down with my latest issue of AIR FORCE Magazine (January '81) and, as always, began my reading by first turning to Bob Stevens's "There I Was . . . " Coincidentally his cartoon, in humorous fashion, graphically illustrated why I resigned.

After nine very rewarding years as an Air Force navigator, I sat down to take stock of my position, knowing full well that the true competition for promotions, service school appointments, and command-level jobs and responsibilities was truly just beginning. What I saw was frightening—so frightening that I elected to look elsewhere for career possibilities.

Quite simply, it was readily apparent to me that my future progress in the Air Force was inextricably linked to the wings I wore on my chest, and not to my performance. And those wings, proud as I was to wear them, doomed me to third-class status in the Air Force.

Promotions are miserable for navigators. Based on figures from the Manpower and Personnel Center (MPC) for the two most recent (CY '79 and CY '80) colonel, lieutenant colonel, and major temporary promotion boards, primary zone promotions for navigators are below the total Air Force promotion rate, the pilot promotion rate, and, with one exception, the nonrated promotion rate.

In simpler terms (using CY '80 figures), for every 100 pilots in grade as captains, twenty-nine will make colonel in the primary zone. For 100 nonrated captains, eighteen will make colonel. For 100 navigator captains, it is only ten.

Secondary promotions, from which future Air Force leaders are expected to come, are even worse. The most recent (CY '80) secondary zone promotions to colonel are a good example: The total USAF promotion rate was 2.1 percent. Pilots had a 3.5 percent rate; nonrated, a 1.9 percent rate; and navigators, a 0.5 percent rate.

Command-level assignments for navigators continue to show little progress. After the repeal of laws that prevented navigators from holding many command-level billets, there was an initial surge to fill some of these billets with navigators—an action that smacked of tokenism and did nothing to aid the navigators' cause. But now that this initial surge has died down, the cold fact remains that navigators are not in command billets anywhere near the proportion to their overall contributions to the Air Force.

Some commands, specifically TAC and USAFE, attempt to circumvent this glaring injustice by overloading the flight-commander ranks with navigators, and then summarily designating such billets (with the acquiescence of Hq. USAF) as command-level ones.

In my six years in these two commands, my perceptions (which are constantly reinforced by my discussions with other flyers—pilots and navigators) are that flight commanders have little, if any, responsibility, and even less authority. The end result is an attempt to build a case of navigator command-level assignment progress for the very people who know different.

Finally, it must be remembered that the Air Force navigator is a dying breed. As much as MPC argues to the contrary, the fact remains that available cockpits for navigators are decreasing. The three latest aircraft to join the tactical air forces—the F-15, F-16, and A-10—are single-seaters. MAC is slowly drawing down on navigators as C-141 and C-5 aircraft have dual INSs (inertial navigational systems) installed. KC-135s have palletized INSs available now, and the battle continues to rage over whether the new KC-10 will have a navigator as part of the crew.

And when MPC is pressed, as it was at the December 1980 Navigator Symposium at the US Air Force Academy, as to why it forecasts navigator cockpits to rise in the 1980s, it admits grudgingly that its projections are based on a new two-seat fighter-bomber and a new manned bomber on line by 1984. As much as American defense contractors would relish the thought, this scenario will just not be realized.

Thus, today's line navigator is faced with decreasing available cockpits and poor career progression due to poor promotions and command-level assignments. This leads to dismay and an alarming exodus of navigators from the active force. Yet faced with this reality, the Air Force continues to ignore these basic problems and pins the loss of navigators on other, erroneous factors.

The most common is the "grass is greener" argument. While no one is happy with current military pay and benefits, it is not true (contrary to popular belief) that navigators are being "hired away" by the airlines. The simple facts are that navigators cannot fly for the airlines mainly because of a physical impairment (usually poor eyesight) or because airlines would obviously rather hire a resigned Air Force pilot with 2,000 hours of "stick time" than a navigator with 2,000 hours of "ride time."

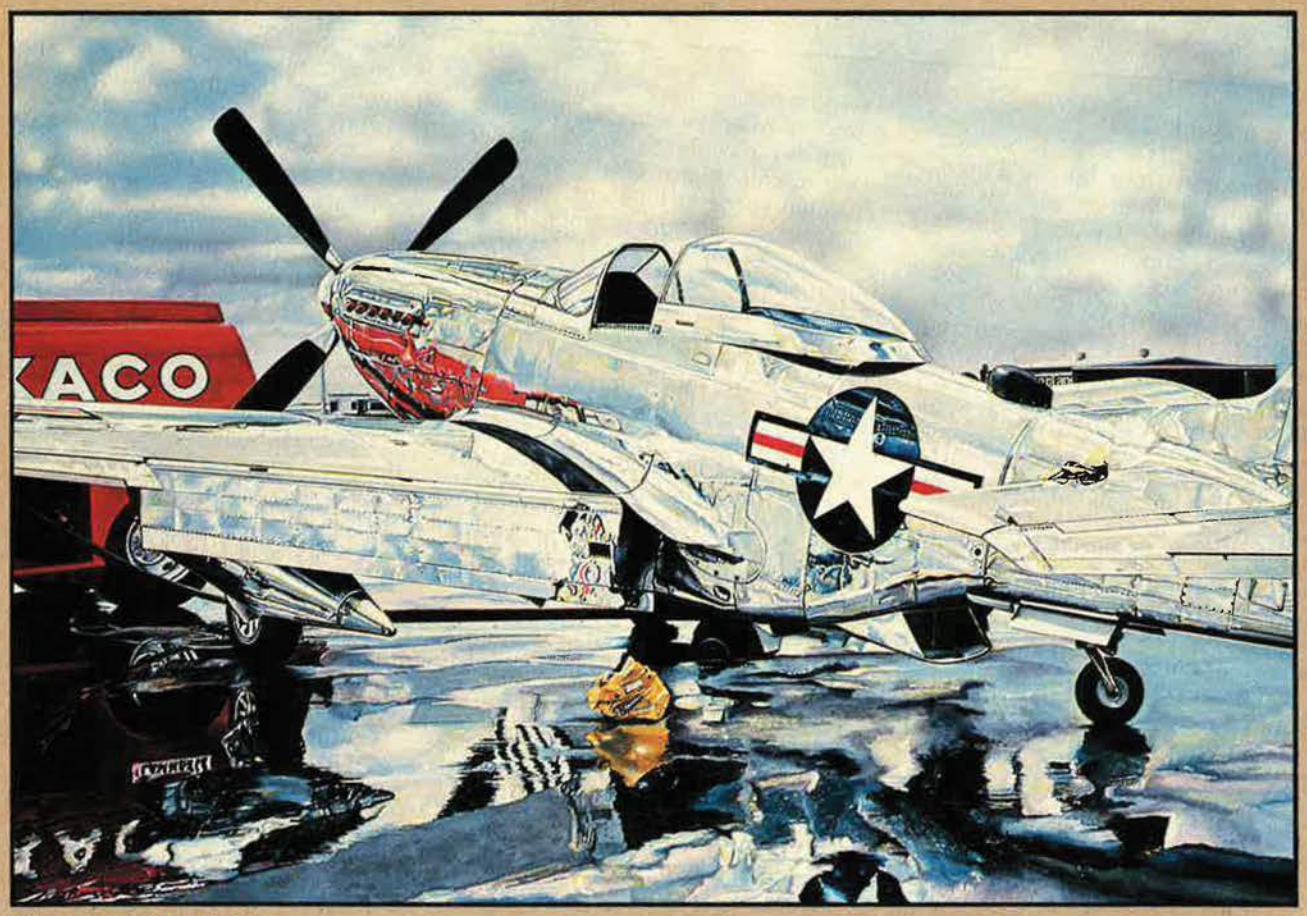
The true reason that navigators are leaving is because they have no future. While they fly just as hard (and in some aircraft harder) than pilots and earn their pay every bit as much as any Air Force officer, navigators do not reap the benefits. If you still doubt the validity of this argument, ask your local base personnel office to provide the results of recent officer exit surveys. Compare pilot, nonrated, and navigator reasons for separating. Then make up your own mind.

It is no secret to anyone who has ever been associated with our Air Force that navigators have always taken a back seat to pilots and, more recently, nonrated officers. It is my fervent hope that senior Air Force and civilian leaders will look beyond Mr. Stevens's humor and see the serious side of the issue.

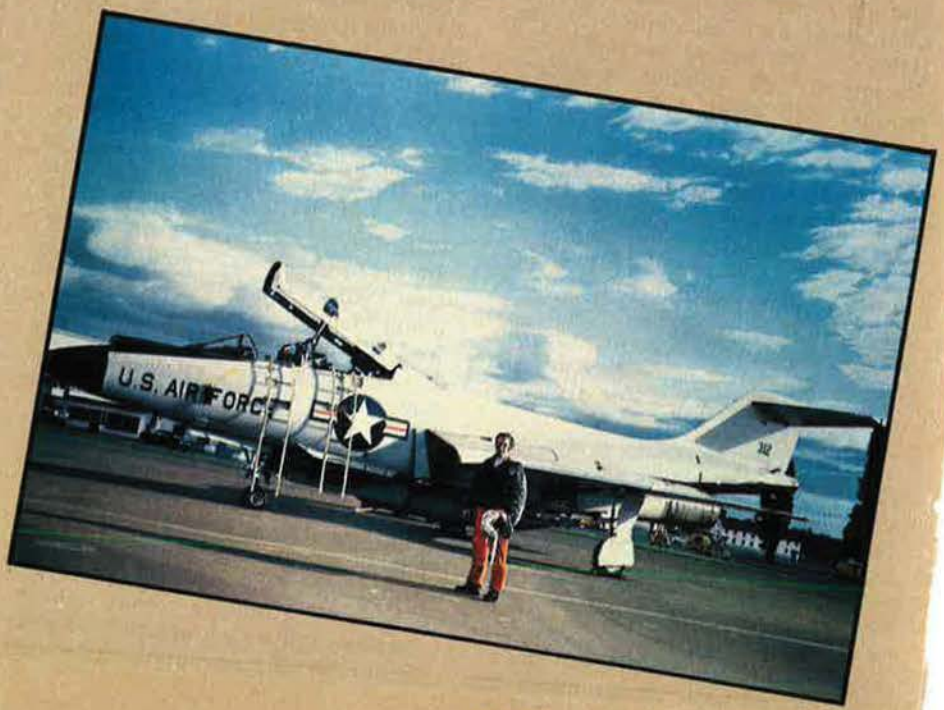
If navigators were asked to rewrite Mr. Stevens's cartoon, they would not ask to receive the boss' handshake upon landing instead of the pilot getting it. Rather, navigators ask only that if the pilot gets a handshake they are afforded the same treatment. ■

A major exhibit at the National Air and Space Museum . . .

PHOTO-REALIST Aviation Art



"Mustang Sally Forth"
Ron Kleeman
Acrylic, 1973



"Bill's F-101"
Paul Staiger
Oil, 1973

The works portrayed on these pages are representative of the aviation art created by members of the "Photo-Realist" school of American painters.

A collection of twenty-two paintings by the Photo-Realists was commissioned in 1973 by New York attorney Stuart M. Speiser, himself a pilot and long-time collector of aviation art.

Mr. Speiser presented the collection to the Smithsonian Institution's National Air and Space Museum in 1978, the most valuable gift of art from a private donor ever received by the Museum. The aviation art is now on display as a major exhibit in the Museum's Gallery of Flight and Arts.

The collection is considered unique because it combines the efforts of artists working in the same style in the same year on a single theme: aviation.

Photo-Realism came into prominence in the late 1960s and early 1970s. Working from photographs as models, the artists are able to give surfaces — especially aircraft surfaces — a dynamic aspect not found in other forms of painting. — WPS

"White Lightning"
Tom Blackwell
Oil, 1973

"Deperdussin and Gee-Bee"
Guy Johnson
Oil, 1973

"Jet Fighter"
Martin Hoffman
Acrylic, 1973

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With skill, dedication, and rare professional expertise, one man has served as Treasurer of the Air Force Association for more than two decades. Now, as he retires, AFA applauds his efforts.

A Salute to Jack Gross

BY ALFRED R. MUSI
AFA ASSISTANT EXECUTIVE DIRECTOR/COMPTROLLER

IF ONE were to assume that each member of AFA owns one share of the Association, the book value per member today would be $30. Using that same formula, the book value per member in 1958 was minus seventy-five cents. These are two revealing statistics that National Treasurer Jack B. Gross reported to the Board of Directors at the Air Force Association's midyear meeting in Colorado Springs.

Jack was trying to impress these two divergent figures on the Board to show how far the Association has come in terms of financial stability. But, at the same time, Jack Gross was warning all of us not to become complacent in matters of cost-effectiveness and expense control and consequently forget where the Association has been. What Jack failed to mention, however, was the extent and quality of his own participation in this transition and the important role he played in bringing it about.

It was not long after 1958 that the reins of the National Treasurer's office were handed to Jack. He has held them firmly for some twenty-one years, constantly making use of his extensive financial knowledge and expertise for the benefit of the Association and guiding it through numerous budget and other fiscal problems. It is no coincidence that during Jack's twenty-one-year watch, the Association has gained control of its complex financial situation and, in the process, has built a net worth that is currently close to $5 million.

With the close of this year's Convention, despite repeated urgings from many AFA leaders for him to seek yet another term as National Treasurer, Jack Gross will retire and surrender his office to someone else.

His frequent presence in and about our headquarters offices in Washington, D. C., will be sorely missed by all on the national AFA staff—but by none more so than this writer. My first association with Jack goes back to 1964 when I joined the AFA staff. Through the years, he and I have worked closely with each other in carrying on the financial function of the Association and in trying to generate optimum operating results for the organization. He has been both my mentor and my friend.

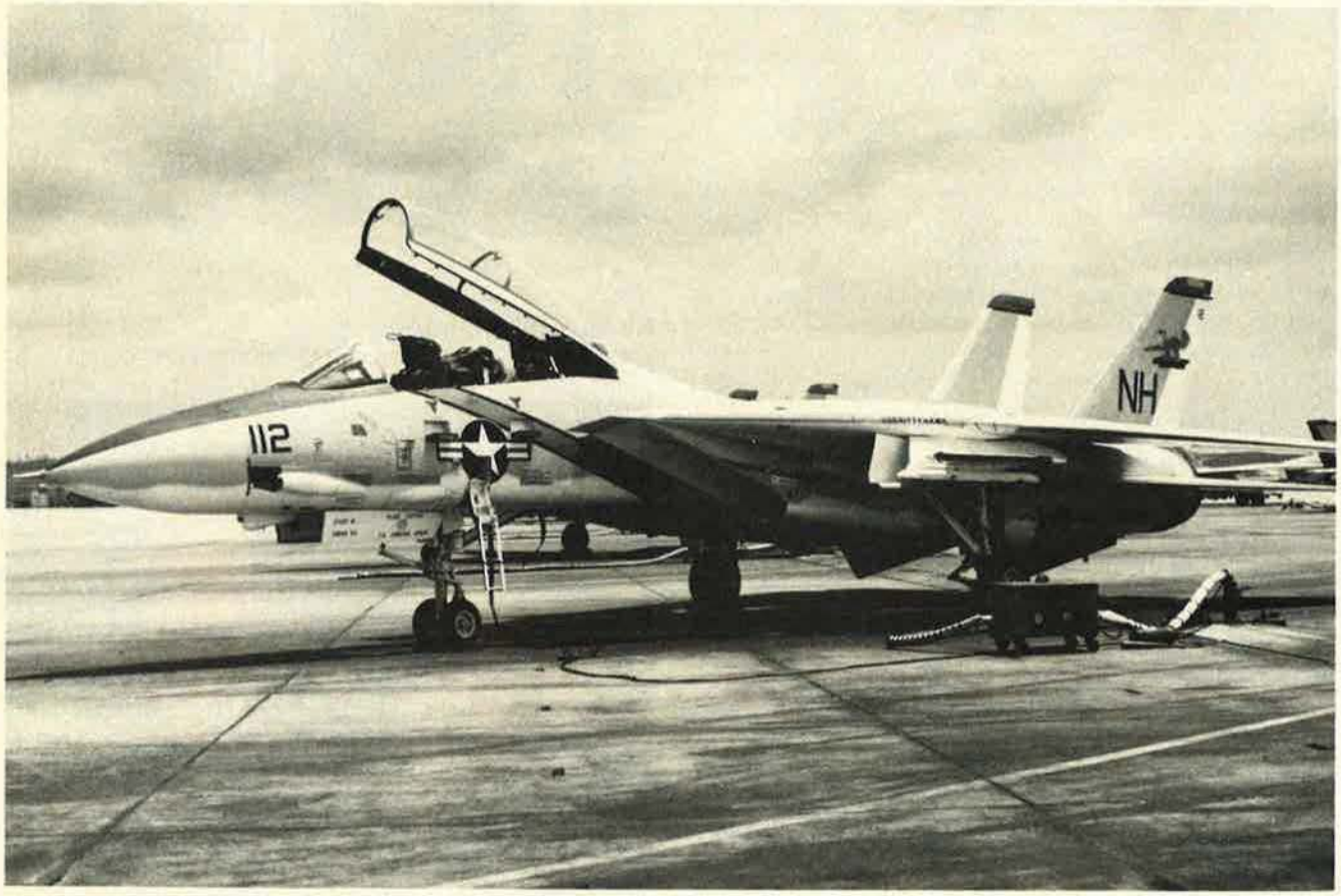
Throughout the national AFA family, Jack is one of the best known and most respected persons in the organization. Largely at his own expense, he has been AFA's ambassador of goodwill around the country for many years. Simultaneously, he has enhanced the national image of his hometown, Hershey, Pa., by "The Candy Man's" predictable and gratuitous circulation of Hershey bars on all occasions. His affability, his unselfishness, his responsibility and dedication to AFA's mission, his knowledge of finances, and his keenness of insight have all left their indelible mark. To know Jack is to love him.

In recognition of and appreciation for the many years of voluntary service rendered by this fine gentleman to the overall betterment of the Air Force Association and the furtherance of its mission, Jack was feted in a testimonial "roast" sponsored by the Pennsylvania State AFA on July 18 in his own town, Hershey. It was a memorable and a fun evening, marking not only Jack's retirement as Treasurer but also his seventieth birthday. The many honors bestowed upon him by his friends, associates, and fellow AFAers were richly deserved.

The Air Force Association owes Jack Gross a lasting debt of gratitude. Although his stewardship will be missed, we will endeavor to follow the course he has charted for us, to maintain the impetus he has established, and to improve on the $30 "book value" figure he so proudly reported to the Board last May. Nothing would make Jack happier. ■

LEFT: AFA's retiring National Treasurer, Jack B. Gross. ABOVE: The author (left) with Jack Gross. AFA's retiring Treasurer has served in that position for twenty-one years. (Staff photos by John O. Gray)

What Could the U.S. Navy Possibly Have in Common With the Air Force?



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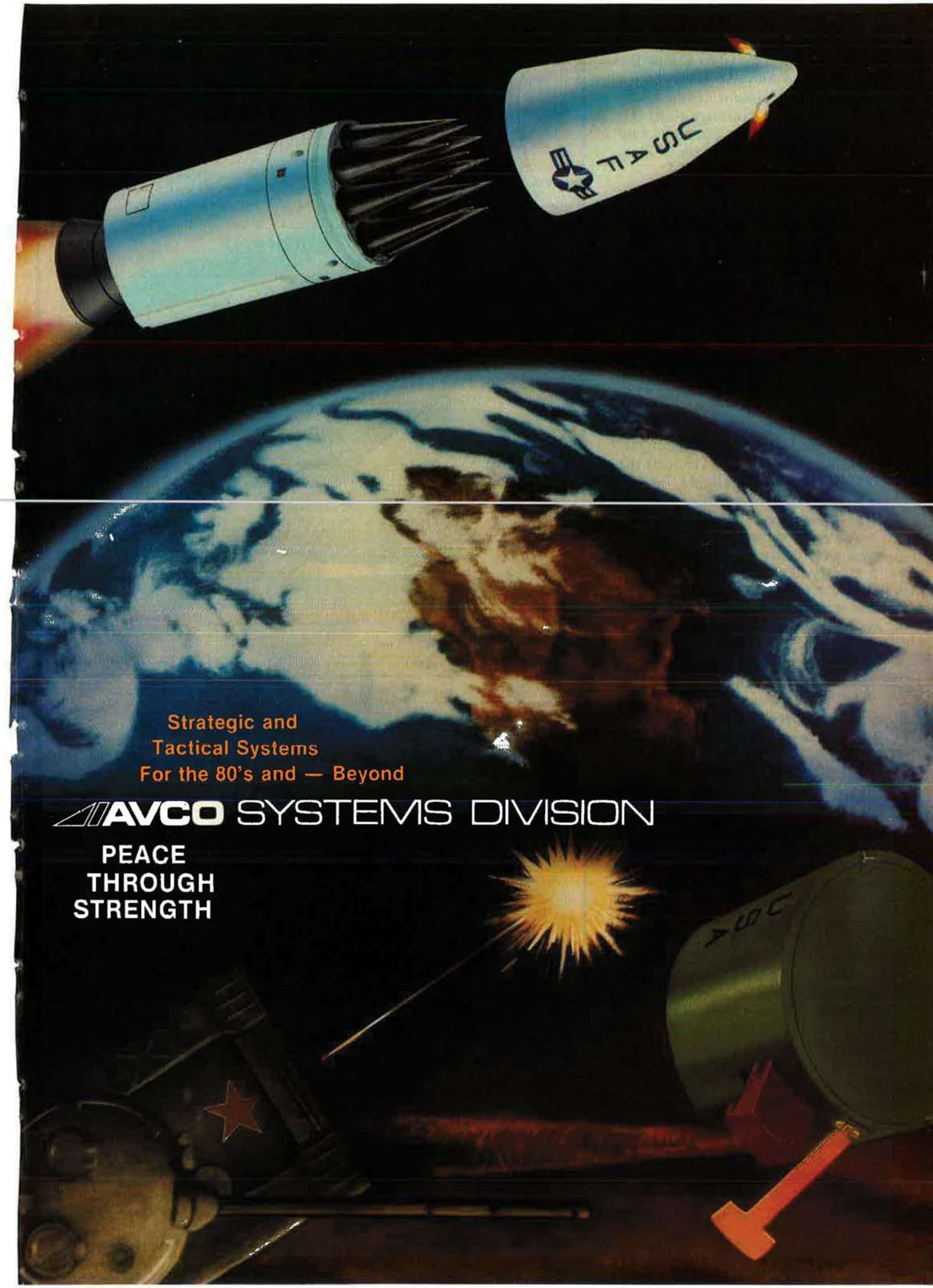
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KELLY'S DURABLE RELIC

Every now and then, a one-of-a-kind airplane comes along, serves its purposes, then disappears. The XC-99, cargo sister of the B-36, is not like that; it won't (or can't) go away.

BY JENNIFER HARPER

THE sun had faded to a glow behind San Antonio. It was one of those mellow summer evenings in Texas. We drove through Kelly Air Force Base and then out by its runway, with all the big planes clustered down at the other end.

I looked again at the fading sunset and then felt a distinct chill.

"My God!" I heard myself saying. "What is *that*?"

Looming at the side of the road was an enormous aircraft.

Something was wrong. It wasn't on the regular taxiway, but in a field behind barbed wire. Its front windows were broken, and the rest of it stretched out behind like a beached sea monster. It was a phantom ship.

One of a Kind

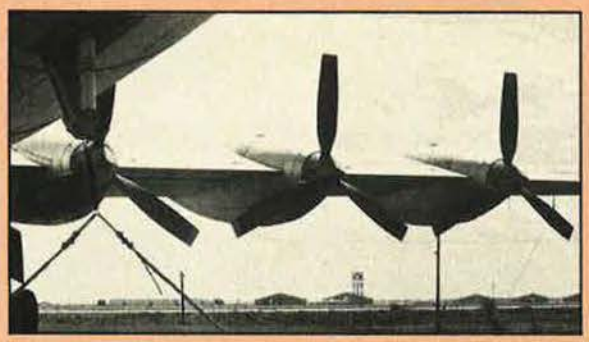
This aircraft, which has been fascinating passersby for years, is the XC-99. It is a remarkable, one-of-a-kind specimen that has rested on private land near the northwest corner of Kelly since 1957, at the mercy of the elements but at the center of a variety of concerns.

The XC-99, built by Convair as the cargo version of the B-36 bomber, made its first flight on November 23, 1947. Designed to carry 400 troops, it has a 230-foot wingspan—seven feet longer than that of the C-5. The wings are so large that crew members could walk into them to observe engine performance during flight.

Its fuselage is 182 feet long, and its tail rises fifty-seven feet—that is, twenty-five feet longer and seventeen feet higher than the B-52's. Once billed as the world's largest land-based airplane and a celebrity while it flew cargo missions out of Kelly AFB from 1950 to 1957, the XC-99 was alternately nicknamed the "Aerial Goliath" and "Queen of the Skies."

Powered by six Pratt & Whitney R-4360-41 Wasp series radial "pusher" engines, delivering 3,500 hp each, the XC-99 cruised at 260 knots. Shortly after arrival at Kelly, it was modified with new landing gear, square tip propellers, and an improved electrical system installed during an overhaul that lasted three months.

The XC-99 had two cargo decks with 16,000 cubic feet of cargo area and could carry a 100,000-pound maximum load. Its 322,000 pounds are distributed over ten tires, which allowed the XC-99 to land on any 5,000-foot runway that could support C-54 aircraft. A crew of eight flew the XC-99, including two pilots, two engineers, a navigator, a radio operator, and two scanners—crew members who would watch the engines because the pilots couldn't see them from the flight deck.



Above, at 230 feet the XC-99's wingspan is seven feet longer than that of the C-5. Left, a view of three of its six "pusher" Pratt & Whitney Wasp engines. (Photos by William A. Ford) Below, on takeoff long ago.

Jennifer Harper, the daughter of a former flight surgeon, has been a free-lance writer for the past six years for a wide variety of publications and in broadcast. She is married to 2d Lt. Eric Harper, USAF, who is scheduled to complete pilot training at Reese AFB, Tex., in October. She also works as a commercial radio and television talent and is currently producing a children's special for NBC affiliate KCBD-TV, which includes a special segment on USAF pilot training. She received her BFA degree from Syracuse University in 1973.

It was, and is, a pretty big airplane, and absolutely the only one like it in the world.

Its immediate predecessors in cargo were the World War II workhorses, the C-46 and C-47, plus such aircraft as the C-54. The monstrous size of the XC-99 in comparison with these planes is noteworthy. Its primary purpose was a practical evaluation of king-sized transports for USAF. The XC-99 set the precedent for the large-size aircraft to come. In fact, in 1953, the XC-99 proved how economical jumbo cargo aircraft could be: It flew 200 cargo missions at an average cost of thirteen cents per ton mile, less than half the ton-mile cost of contemporary military cargo aircraft.

The emphasis on B-36 production and other priorities required postponement of plans to build additional XC-99s during the Korean War. By the mid-1950s, plans to build more XC-99s were scrapped in favor of jet-powered aircraft.

Thousands of Hours

During most of its time in service, the XC-99 flew twice-weekly missions between Kelly and McClellan AFB, Calif. One of its primary missions was resupply of SAC units that flew its sistership, the B-36. In this role, the XC-99 logged thousands of hours around the United States and at SAC bases in the Caribbean.

The XC-99's service record includes several notable events. During the Korean War, the Air Force found itself short of C-54 engines at McChord AFB, Wash.—a critical problem since the C-54s were flying round-the-clock missions to resupply our forces in Korea. The XC-99 was called on to move C-54 engines to McChord quickly. On October 10, 1950, the XC-99 carried forty-two C-54 engines in a single trip—twenty-seven on the lower deck and fifteen on the upper deck—to McChord. The flight ended with Col. T. W. Tucker, chief pilot and project officer for the XC-99 program, taxiing the jumbo down a forty-eight-foot-wide strip, with one foot of clearance on either side of the plane.

Perhaps the most spectacular of the giant's missions was a 12,000-mile flight to Rhein-Main AB, Germany, via the Azores and Bermuda, and back. At every stop along the historic flight, the XC-99 was met by an incredulous press.

Finally, in March 1957, the XC-99 was retired at Kelly AFB. The rising costs of the necessary structural repairs and the phaseout of the XC-99's sistership, the B-36, made continued maintenance impractical.

But what do you do with the biggest airplane in the world when you're finished with it?

The USAF donated the XC-99 to the Texas Disabled American Veterans (DAV) in 1957, primarily due to the efforts of the late Clem Searles, World War I veteran and one-time commander of the Texas DAV. Searles formed XC-99, Inc., in order to set the plane up as a historic tourist attraction, complete with flag and a small court area.

Richard Sarrazin, a retired Air Force technical sergeant and DAV member, recalls, "Clem was the granddaddy of the XC-99, taking people through it himself, keeping historical documents. I remember him out there just three weeks after he had a heart attack. The XC-99 was a total involvement for him."

Another Change

During the 1976 Bicentennial, the behemoth changed hands again, this time going to the San Antonio Memorial Air Museum, a nonprofit group interested in promoting the aviation history aspect of the San Antonio area.

According to Bart Neal, a member of the group, the XC-99 would have provided "a living museum, a hands-on kind of experience, especially for kids." They had hoped to build a hangar over the aircraft, install a flight simulator, and refurbish the aircraft's appearance. Those ideas had a $6 million price tag, and donations lagged far behind aspirations.

Even attempting to move the XC-99 to a more suitable location would cost a small fortune. Neal added, "We thought of the Lackland AFB parade ground as a new home for the XC-99. The estimated cost of moving alone would have been $135,000."

Neal and his group contacted the Air Force Museum at Wright-Patterson AFB, Ohio, in an attempt to deliver the XC-99 from its slow death. Col. Richard Uppstrom, Director of the museum, would like to see it saved, but stated, "It's a grand plane. But we have to be realistic. The cost would be formidable, with a good 25,000 man-hours involved. Then there is distance. It is hard to save something 1,200 miles away."

Meanwhile, other groups have a continuing interest in the XC-99—all of them concerned with the welfare of this aging machine.

The Museum of Aviation Group, Fort Worth, Tex., would like the XC-99 moved there. They maintain a B-36 and would like to see it paired with the XC-99 as a historic exhibit. A Memphis businessman associated with Gulf Air would like to see the XC-99 restored and used as a restaurant.

Besides all of this, the true "owner" of the XC-99 has not quite been determined. The aircraft has been handed down so many times that the question of ownership is no longer clear. It would be safe to assume, however, that it is in the "custody" of the San Antonio Memorial Air Museum.

The XC-99 is no lightweight when judged from a salvage point of view either. Estimates run between $75,000 and $100,000 for its salvage value. Even so, the XC-99 is behind in its rent for the privately owned land on which it rests—alongside the very runway it flew from.

It is a confused and unresolved issue, compounded by the fact that restoration or moving means a lot of money.

Perhaps there is no possible solution and the hulk of the XC-99 may sit in its pasture for another twenty years. It will continue to startle people as it startled me, sitting so ominously alongside the Kelly runway. But the concern of the oversized waif's many well-wishers will be there, and in a sense, that may be enough. ■

AIRMAN'S BOOKSHELF

Lessons of Earlier Military Reforms

America Arms for a New Century: The Making of a Great Military Power, by James L. Abrahamson. The Free Press, New York, N. Y., 1981. 253 pages with index, notes, bibliography, and photos. $17.95.

Colonel Abrahamson, a West Point professor, has produced a solidly researched and well-written history of the late nineteenth century reform movement within the United States Army and Navy. That campaign molded the military that helped win two world wars. This book has significant implications for those in today's armed services who recognize the need for change in the US's military structure.

Abrahamson's reformers were distressed with the weak condition of the US Army and Navy, and set about reshaping the armed forces so that they could adequately safeguard future American interests. They succeeded, and no forty-year period in American military history saw as many profound revisions as did the era between the Grant and Wilson Administrations.

For example, Army manpower grew ninefold and the War Department budget expanded by a factor of thirty as the Army transitioned from horse to tank. The ground forces moved from a constabulary force, suitable only for policing borders and suppressing domestic disturbances, to a fighting force that was to pass the test of combat on the Western Front.

The US Navy evolved also, graduating from wooden hulls, sails, and smooth-bore artillery to armor plate, steam, and rifled cannon. Our Navy was weaker than Chile's when Grant left office, but it rivaled the United Kingdom's when Wilson retired. It advanced from a coastal force of little significance to one that could engage any enemy on any ocean.

Abrahamson demonstrates that this metamorphosis was inspired by soldier and sailor scholars who recognized the dangers of trying to guarantee American security with a constabulary Army and coastal Navy. He sees the reformers as a group within the American "Progressive" movement who stressed efficiency, organization, long-range planning, and corporate expertise. The author plumbed the reformist writings and shows that these military progressives were generally anti-imperialist, usually antagonistic toward big business, and appalled at the often unholy alliances between politicians and industrialists.

The author indicates that the reformers were motivated by concern for national security, were cognizant of the changed nature of warfare brought about by advances in the weaponry of major powers, and aware of America's potential danger in this new era. He explains that these men remained fully aware of the domestic as well as the international dimensions of military policy, and that they carefully estimated future threats without being alarmist.

Abrahamson ends his work by suggesting that the probity, dedication, and scholarship of the late nineteenth and early twentieth century reformers is worth emulating today. His book is a provocative and useful addition to the airman's bookshelf in what may be an era of military transformation.

—Reviewed by Lt. Col. Alan L. Gropman, USAF, a military historian who frequently contributes to "Airman's Bookshelf."

The Men Who Made It Happen

Target Luftwaffe: The Tragedy and the Triumph of the World War II Air Victory, by William Ong. Lowell Press, Kansas City, Mo., 1981. 355 pages with photographs. $19.95.

This book is about some of those who fought and won the air battle in Europe during World War II. The author chronicles the wartime careers of a group of airmen, graduates of Air Corps Aviation Training Class 38-A. Mr. Ong follows several of these men through their cadet days, training, early service in the States, and combat. He does so with minute attention to detail and a sensitivity for the individuals born from his own World War II service as an instructor pilot.

A Reserve captain and early veteran of barnstorming and air races, Mr. Ong's descriptions of Class 38-A are frequently peppered with humorous anecdotes. This factual and fast-paced book presents a history of air combat from the crew member's point of view.

The book is well-written, although Mr. Ong's breezy and euphemistic "Aw shucks" dialogue is distracting. Nonetheless, the cockpit approach to the air war is rich and full of detail—often chilling in its descriptions of the aerial feats of the young men.

The story of Class 38-A begins at Randolph and Kelly Fields in Texas. It centers around airmen who eventually became Air Force leaders. There's Ken Martin, a Kansas farm boy who went on to command the first P-51 Mustang unit to meet Hitler's Luftwaffe, the 354th Fighter Group. Mr. Ong's description of Martin living the fighter pilot's creed, "We never turn away," is a heartening story. As Martin's P-51 smashes headlong into an Me 109, you can almost hear the metal shriek from the crash and can experience the frustration and apprehension of his solitary hospitalization and imprisonment. Martin and a fellow pilot subsequently escaped their German captors, and limped more than ninety miles to Allied lines.

This is also the story of Davy Jones. Mr. Ong pays particular attention to Jones, beginning with his introduction to Randolph Field. Upon arrival, he parked his yellow roadster in a no-parking zone, strolled up to a group of upperclassmen, and said: "Good morning, gentlemen. My name is Davy Jones. Now—where are the airplanes, please?" The humor of Jones and his tremendous strength are detailed in descriptions of Jones flying with Doolittle over Tokyo and then losing a B-26 to German flak over Tunisia.

Other members of the class were equally heroic: Ivan Moody, who

dropped out of the class and returned later as a navigator, and his painful ordeal in German hospitals and prison camps. Though this book focuses on Class 38-A's contribution to victory in Europe, those who served in the Pacific are also mentioned, like Paul Tibbets, destined to usher in the nuclear era with his historic mission over Hiroshima.

Himself a pilot, corporate executive, and writer before his death in 1979, the author spent many hours in interviews and has used his subjects' own words and diaries in several cases. While the brilliance of Jimmy Doolittle and other senior Air Force officers is recounted in these pages, this is the story of the every-day heroes, the men who made it all happen.

—Reviewed by Capt. Phil Lacombe, USAF, Contributing Editor.

New Books in Brief

Deadly Duo: The B-25 and B-26 in WW-II, by Charles A. Mendenhall. Even when parked side by side, one could scarcely guess that the B-25 Mitchell and B-26 Marauder were built to the same Army Air Corps design requirements. The B-25 was a rugged little gunbus, with the H model fitted with fourteen .50-caliber machine guns and a 75-mm cannon. On the other hand, the B-26 looked and behaved more like a sleek hot rod. At first the B-26 gained a reputation as a "widowmaker" because of its difficult handling characteristics. It ended up with the lowest loss rate on operational missions of any combat aircraft in the European Theater. Author Mendenhall provides an evolutionary view of the development of these medium bombers and their adaptation to changing combat conditions, accompanied by many illustrations and a special data directory on each aircraft. With index and bibliography. Specialty Press, Box 426, 729 Prospect Ave., Osceola, Wis. 54020, 1981. 160 pages. $19.95.

Diplomacy of Power, by Stephen S. Kaplan. A publication of the Brookings Institution, this book is a systematic analysis of the use of military force by the Soviet Union in 190 separate incidents since the end of World War II. In the first part of the book, author Kaplan provides a historical perspective, examining the political context of actions taken, forces involved, and Soviet willingness to utilize military forces to further foreign policy goals. Eight guest articles analyze specific case studies of Soviet military diplomacy in the second section, and gauge the effectiveness of the Soviet use of power and its implications for the US. Kaplan concludes that the use of military diplomacy by the Soviets is an uncertain political tool, and suggests ways that the US could deter any further Soviet reliance on military diplomacy. With appendices, tables, and index. The Brookings Institution, Washington, D. C., 1981. 733 pages. Cloth $29.95; paper $14.95.

Jane's Military Communications 1981, edited by R. J. Raggett. This volume is a relatively new member of the *Jane's* family, being only the second edition on this subject. Organized according to category and country, communications and electronic warfare devices are afforded the usual thorough *Jane's* treatment. In his Foreword, editor Raggett sounds a note of warning for the Western allies concerning bureaucratic red tape and unwieldy procurement procedures involving electronic technology. He cautions that the West's reliance on superior electronic technology to offset the Warsaw Pact's numerical advantage is threatened by widespread inefficiency and inflexibility. With photos, appendices, and index. Jane's Publishing, Inc., New York, N. Y., 1981. 629 pages. $125.

Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration, by Desmond Ball. Mr. Ball, a Research Associate at The International Institute for Strategic Studies in London, has written a political and strategic analysis of the missile programs of the Kennedy Administration. With the Soviet launch of Sputnik and political pressures fueling fears of a "missile gap," President Kennedy and Defense Secretary Robert McNamara embarked on deployment of a strategic deterrent that Secretary McNamara said in 1967 was "greater than we had originally planned and in fact more than we require." Mr. Ball attempts to answer the questions of why such a large deployment was made and how the strategic posture and policies of the Kennedy-McNamara defense program were developed. The author concludes by eschewing the notion of "bureaucratic politics" as the driving force behind the buildup in favor of a more complex, sometimes irrational set of forces, circumstances, relationships, and personalities combining to set in train the large missile program. Mr. Ball believes that his study of the Kennedy missile program is relevant to the current decision-making process on strategic force modernization. With select bibliography and index. University of California Press, 2223 Fulton St., Berkeley, Calif. 94720, 1981. 352 pages. $27.50.

To Win a War, by John Terraine. Even before the guns had completely fallen silent on the Western Front in World War I, a "myth" arose that the German Army had been defeated not on the fields of battle, but by traitors and defeatists among the German people. This myth was later seized on and cultivated by the Nazis, and to this day obscures what happened in the summer and fall of 1918. Terraine, a noted World War I historian, has written a "reassessment" of the war during that year, arguing forcefully that the German Army was indeed defeated in battle, particularly by the British armies under Field Marshal Sir Douglas Haig. With photos, appendices, bibliography, and index. Doubleday & Co., New York, N. Y., 1981. 268 pages. $14.95.

Wings of Mystery, by Dale Titler. This book is a revised and updated version of Titler's 1966 edition. Subtitled *True Stories of Aviation History*, it is a collection of interesting and usually bizarre happenings in the world of flight. Mysteries covered range from the unsolved disappearance of aviatrix Amelia Earhart, to the secret threat of the Poll Giant transatlantic bomber that the Germans were to use to bomb New York in 1918, to the strange last journey of Flight 19 over the Bermuda Triangle. This is one book to leave at home when looking for reading material on a long flight on a rainy night! With illustrations and index. Dodd Mead & Co., New York, N. Y., 1981. 301 pages. $10.95.

Zero Fighter, by Robert C. Mikesh, with illustrations by Rikyu Watanabe. Superbly illustrated by Watanabe, with an added bonus of three full-color foldout panels, *Zero Fighter* is an extremely handsome book; but don't be fooled by appearances alone. The authoritative and comprehensive text by author Mikesh, Curator of Aircraft at the National Air and Space Museum, details the history of the Zero and its modifications and variants and reviews its design and construction, flight performance, and combat records. A special section relates the results of evaluation flights against six American planes of a virtually intact Zero found in the Aleutian Islands in 1942. (Watanabe's detailed drawings and cutaway views will be of special interest to serious modelers.) Crown Publishers, Inc., New York, N. Y., 1981. 56 pages with foldouts. $15.95 cloth.

—Reviewed by Hugh Winkler, Associate Editor.

The Fightin' Fourth Makes It Three in a Row

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR
Photos by Renee Smith, ACADEMY STAFF PHOTOGRAPHER

As the curtain rose on the stage of the International Ballroom of the Broadmoor Hotel in Colorado Springs, Colo., it marked the start of a unique occasion.

With the cheers and applause of the more than 700 guests ringing in their ears, the US Air Force Academy cadets of the Fourth Squadron became the first ever to be named as the Outstanding Squadron for three years in a row. High-ranking military and civilian guests, local community leaders, parents and friends of the cadets, AFAers, and AFA Industrial Associate executives gathered to salute the winning efforts of the Fourth Squadron. This was the Twenty-second Annual Outstanding Squadron Dinner, jointly sponsored each year by AFA and its Colorado Springs Chapter.

Frank Merritt, Chapter President, welcomed the dinner guests, the largest number ever in the history of this event. Russ Dougherty, AFA's Executive Director, serving as Toastmaster for this late May black-tie gala, put the Fourth Squadron's achievement in perspective.

"We all know," he said, "that a lot of hard work and dedication is required for a squadron to be named the outstanding squadron. Tonight we are honoring a squadron that has won this recognition for the third year in a row. This is indeed unprecedented."

Dougherty briefly sketched how very thoroughly the Academy, both in initial selection, and in adjustments during the four-year program, tries to balance each of the forty squadrons so that "theoretically, each squadron is a carefully balanced blend of academic talent, athletic skill, and military bearing. How then," he said, "can we explain the difference that allows one group, one squadron, to win the designation as the outstanding squadron not only once or even twice in a row, but *three* times? I think we must credit the intangible spirit of a winner—we must credit extraordinary esprit, high morale, and the extra effort that is spurred on by a winning tradition."

Lt. Gen. Kenneth L. Tallman, Academy Superintendent, also alluded to the unique accomplishments of the Fourth when he addressed the Dinner. "I am proud of all the outstanding cadets at the Air Force Academy," he said. "In particular, I am doubly proud—or triply proud, I should say—of the cadets in Squadron Four . . . for . . . an unprecedented accomplishment in the history of the Academy."

General Tallman also expressed the Academy's appreciation to the Air Force Association and the Colorado Springs AFA Chapter for cohosting this annual salute—pointing out that "it is a splendid example of the continuing impact the Association has on Air Force life."

Capt. Robert R. Dierker also addressed the group. Captain Dierker, an F-16 pilot at Hill AFB (who has been selected for major below-the-zone) was the cadet squadron commander of the 1972 Outstanding Squadron. Noting that he had sat "where you're sitting, not too long ago," he set in perspective for the cadets his Academy experience as it related to his subsequent career.

The featured guest of the evening was actor Charlton Heston. Heston, who served three years with the Eleventh Air Force in the Aleutians during World War II, as a B-25 radio operator, is an avid supporter of the Air Force and has appeared at several AFA West Coast events. He has just completed narrating a new film made especially for the Academy on the cadet honor code. He related a few personal anecdotes, touched on some of the highlights of the Fourth Squadron's accomplishments during the year, and praised the Academy and the cadets' chosen calling as essential to the national purpose. He told

Some of the distinguished guests who came together to honor the Fourth include (left to right): Capt. Robert Dierker; Lt. Gen. James V. Hartinger, CINC NORAD/ADCOM; Lt. Gen. Kenneth L. Tallman, Academy Superintendent; Charlton Heston; Col. Frank Merritt, USAF (Ret.), the former USAFA Director of Athletics and currently President of Colorado Springs AFA Chapter, cosponsor of the event; AFA President Vic Kregel; and AFA Chairman of the Board Maj. Gen. Dan Callahan, USAF (Ret.).

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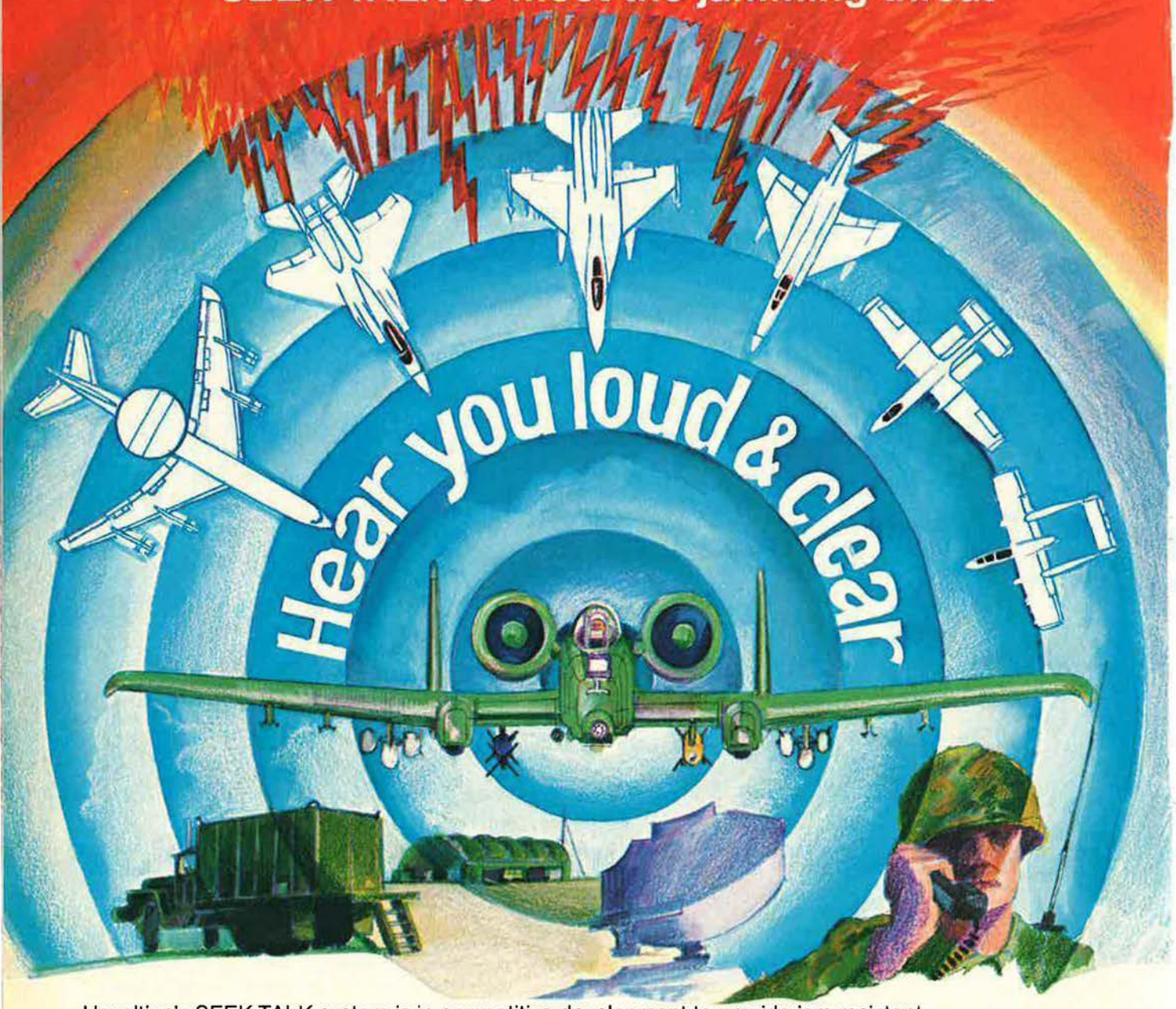

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Hazeltine Answers for the 80's

The Fourth Squadron is introduced to the audience. The Squadron garnered top honors after winning the overall intramural sports trophy in competition against thirty-nine other squadrons in sixteen sporting events; for winning the overall academic award for the highest overall grade point average; and for winning first place in overall military performance based on drill and ceremony, military science grades, and club and activity participation.

The Fourth Squadron proudly takes possession of the coveted trophy. From left to right are Maj. Kenneth E. Roth, Fourth Squadron Air Officer Commanding; Spring Cadet Squadron Commander Dean W. Carlson; Fall Cadet Squadron Commander Marvin N. Fisher; and AFA President Kregel.

Mr. and Mrs. Charlton Heston and AFA President and Mrs. Vic Kregel prepare to meet the Cadets prior to the evening's festivities.

them "I am glad—glad and grateful—that the Academy is here because the cadet corps that the Academy exists to create, year by year, is one of the essential resources of this country."

He concluded his presentation with the reading from the works of Thomas Wolfe that he had performed at the inaugural of President Reagan. It was a magnificent and spellbinding performance that brought the crowd to its feet for a thunderous ovation.

The climax of the evening was provided by AFA President Vic Kregel who individually recognized the two Cadet Squadron Commanders, Fall Squadron Commander Cadet Lt. Col. Marvin N. Fisher, and Spring Squadron Commander Cadet Lt. Col. Dean W. Carlson. President Kregel presented each one a Life Membership in AFA. He then announced that each of the 107 cadets in the Fourth Squadron would receive a memento of the evening—the new AFA mug. At this point he unveiled the AFA Outstanding Squadron Trophy *(see photo)*. This trophy, which President Kregel formally presented at USAFA graduation ceremonies later that week, will remain in the winning squadron dayroom for the following academic year.

Cadet Carlson responded on behalf of the Fourth Squadron. He told the appreciative audience, tongue-in-cheek, that the dinner should be renamed the Fourth Squadron Annual Dinner. Waxing serious, he discussed how the Squadron, after the 1980 Dinner, decided that they would be the first squadron to capture the award three years in a row. He stressed that it truly was a team effort and that "each member of the Fourth Squadron did contribute his best effort, and that is why we are here."

The evening, which also included a sparkling dinner show by the Academy Band and its Moods in Blue singers, under the direction of Maj. John McCord, continued with dancing on into the night. It was, as one graduating senior from the Fightin' Fourth remarked to President Kregel, a "super way to end the Academy experience. AFA does it right." To which President Kregel responded, "So does the Fourth Squadron." ■

THE BULLETIN BOARD

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

National POW/MIA Recognition Day

"Our dedication to the preservation of the individual is nowhere more obvious than our commitment to resolve the issue of those who are still missing as a result of the war. It is our duty to keep faith with them for they did not break their faith with us. My Administration is determined to obtain the fullest possible accounting of these brave Americans. . . . "

This strong and welcome statement of President Ronald Reagan, delivered by Secretary of Defense Caspar W. Weinberger, was enthusiastically received by the throngs attending National POW/MIA Recognition Day Ceremonies at the Pentagon on July 17.

In his proclamation designating this Day, the President urged "all Americans to join in honoring those who made the uncommon sacrifice of being held captive in war, and to honor their loved ones who have also suffered valiantly and patiently."

At the ceremony, on the grassy slope outside the Pentagon's River Entrance, under a bright blue sky, an assemblage of Honor Guards of all services, the Navy Band, and the booming cannon of a nineteen-gun salute all paid tribute to POWs and MIAs of all wars. A "missing-man" formation flyover by F-105s of the D. C. Air National Guard, from Andrews AFB, executed a split-second-timed pass to end the event.

After reading the message from the President, Secretary Weinberger alluded to the plight of the families of those still unaccounted for. The crowd of some 2,000, which included many members of the National League of Families, a group that includes wives of the MIAs, were receptive to his statement that "I can assure you that concern for the individual fighting man remains of the utmost importance to this nation.

"I feel it is absolutely vital that all United States servicemen, wherever they may be—and their families—know that if they are captured or missing in action this government will not rest until each of them is free. . . . I also assure you that this Administration will do no less for the Vietnam servicemen. We will not stop pressing the governments in Indochina for information until we are absolutely certain that we have the fullest possible accounting for those who are still missing. . . . "

DoD has released figures indicating that more than 142,000 Americans were captured in World Wars I and II and the Korean and Vietnam conflicts. Some 17,000 were known to have died in captivity, and about 125,000 were released from prisoner camps. For all wars, some 92,000 are listed as "missing and unaccounted for," the bulk of these (more than 78,000) in World War II.

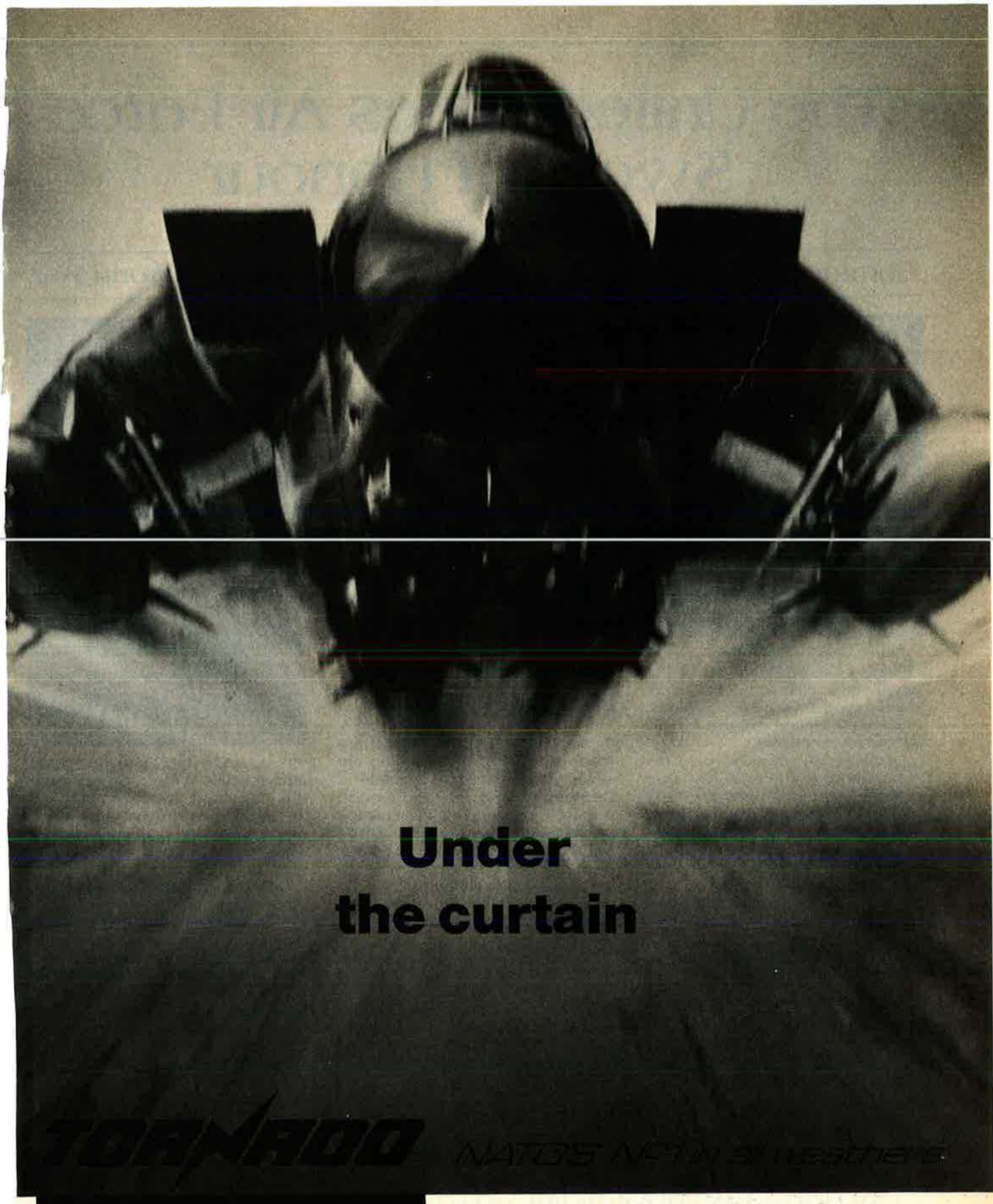
A DoD spokesman has said that as a result of "service department status review board changes" concerning the 1,350 American servicemen carried as either MIA or POW at the conclusion of the Vietnam conflict, "twelve servicemen are still officially listed as missing as of July 12, 1981."

As to whether it believes these men are alive or dead, DoD is noncommittal. However, Air Force Lt. Gen. Eugene F. Tighe, Jr., Director of the Defense Intelligence Agency, has testified before Congress "... we continue vigorously to pursue our investigation of all reports from or of the Southeast Asian area whether they pertain to the missing or the dead. We are determined to retrieve any US military man—whether alive or dead. We remain as we must, dedicated to the view that at least one US serviceman is alive still, in Southeast Asia against his will."

He noted that DIA has obtained credible evidence from a former Vietnamese mortician of the existence of remains of more than 400 US military personnel still in SEA, but that this information has not been independently verified.

The National MIA/POW Recognition Day, and activity leading up to it, was observed in many ways throughout the US. AFA members were ac-

After a recent White House policy briefing on foreign policy, conducted by Vice President George Bush, AFA President Vic Kregel had an opportunity to meet with President Reagan. Mr. Kregel expressed appreciation to the President for maintaining a long-time membership in AFA. Mr. Reagan served in the Army Air Forces in World War II. For another picture of him in another AFA context, see p. 54. (White House photo)



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This sword is 33 inches in length, the cross piece and pommel are made from surgical steel and are silver plated. The grip is made of Rosewood and is hand french polished. On the shell guard is the official United States Air Force Badge which is also silver plated. Please be advised that there is no accompanying scabbard.

Of course, collector value does tend to relate directly to the edition limit, and it is in those cases where this has been severely restricted (perhaps to as few as a thousand swords) that the astute investor is likely to see the most satisfying return.

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tive in this regard. For example, in the East, the New Jersey AFA State Convention urged registrants, while signing in at the Convention, also to sign a petition calling upon the Administration to continue to pursue its efforts to obtain an MIA accounting.

In the West, in Vacaville, Calif., AFA people, along with other veterans groups, banded together to urge the city to honor the Day. The Mayor of Vacaville responded with a proclamation for the city and also sparked a city-sponsored recognition program for the Day.

Major Reorganization of OSD

Secretary of Defense Caspar W. Weinberger has moved to streamline functions under the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics, Dr. Lawrence J. Korb.

Initial moves will reduce the number of Deputy Assistant Secretaries from nine to seven; produce a staff reduction of about ten percent; and provide an estimated savings of approximately $1 million a year. The restructuring is expected to be completed this year.

Secretary Weinberger said that "this streamlining of management functions will increase the ability of Dr. Korb's staff to be more effective and responsive in addressing issues concerning the nation's military capabilities." The reorganization is intended to bring MRA&L in concert with Secretary Weinberger's philosophy of shifting a large portion of operating responsibilities to the military departments.

THE BULLETIN BOARD

The restructuring will result in seven functional clusters that reflect the primary responsibilities of the Assistant Secretary of Defense for MRA&L. The seven are: Military Manpower; Civilian Manpower; Reserve Affairs; Materiel Management; Facilities Management; Equal Opportunity and Safety Programs; and Program Integration. Additional restructuring within the Office of the Secretary of Defense is expected.

DOPMA Takes Effect—Finally

On the fifteenth of this month, the provisions of the long-awaited Defense Officer Personnel Management Act (DOPMA) take effect. This landmark legislation, which updates outmoded aspects of existing laws, has been a long time in coming. *(See "Speaking of People," December '80.)*

While its provisions are many and varied, and individual officers should carefully trace out its applicability to their own specific circumstances, the basic provisions are:

- Permanent grade tables, obviating USAF's need to get temporary authorization from each Congress;
- A single promotion system for all officers on active duty, both Regular and Reserve;
- Permanent promotions in all cases;
- Promotion opportunity and phase points essentially as now exist under the "temporary" promotion system;
- Continuation on active-duty of certain passed-over officers;
- The opportunity for Reservists selected for major, lieutenant colonel, or colonel to be offered a Regular commission (the Air Force emphasizes that acceptance will not be required); and
- "Grandfathering" the right of Reserve officers holding a Reserve grade higher than the "temporary" one in which they're serving to retire in that grade.

In the main, it supersedes provisions of both the Officer Personnel Act of 1974 and the Officer Grade Limitation Act of 1954. In that sense, it may fairly be said to trace its beginnings to the ill-starred "Bolté Report" of 1964, which recommended, at that time, modifications to the existing laws. Those recommendations were shelved. (Interestingly enough, many, if not most, of the acknowledged experts on DOPMA within the Pentagon personnel hierarchy weren't even in the service when General Bolté first brought forth his commission's findings.) The precursor of today's DOPMA legislation was first introduced in the 1974 Congress.

Was it worth the long haul? A senior Air Force personnel official told AIR FORCE Magazine, "No question! It provides, for the first time, a basis for attractive and predictable career opportunities for officers here today and those we're going to take in, in the future."

AFA BELIEVES...

The Military Deserves a Pay Raise

As dramatically outlined in last month's issue of AIR FORCE Magazine, there are a wealth of initiatives that need to be taken to enhance the status of the military member. They range the gamut of those things that enlightened civilian employers already recognize as necessary to attract and retain good people.

However, let's not overlook that the basic entitlement in any employment situation is salary. This is not to say that our people in uniform are only interested in making a living. This would unfairly cast them in the role of mercenaries—which they are decidedly not. What we are saying is that the military member, as a matter of equity, deserves his or her fair share of the bounty of the country that they are pledged to defend.

A special Air Force study on retention summed up its findings: "The most important factor relating to retention decisions among married men and women is spouse support for an Air Force career." And, rightly or wrongly, pay is one of the most significant elements influencing this "spouse support."

Further, six out of every ten blue-suiters are married.

For these and other reasons, AFA fully supports an across-the-board pay raise for the military, to enable them to catch up with the inflationary spiral that has left them behind. We know that President Reagan has expressed his support for a pay increase. Congress and the services have done likewise.

On their own, AFA members across the country are joining this supportive effort by making their personal views known to those who are in a position to take corrective action. They are urging other AFA members to do the same.

—JAMES A. McDONNELL, JR.

The ramifications of DOPMA are many, and the Air Force has gone all out to provide local CBPOs with detailed decision-logic tables to help clarify the effects of DOPMA on individual officers, along with fact sheets and other information. Additionally, a DOPMA transition office has been set up at AFMPC to field too-tough questions.

Meanwhile, Personnel toilers are gearing up to tackle the updating of the myriad of laws governing Reservists not on active duty. Next act—ROPMA.

The Citadel Turning Air Force Blue

More students will be commissioned from The Citadel this year in the US Air Force than from any other college or university except the Air Force Academy. Eighty-nine cadets will don Air Force blue in 1981.

An Hq. AFROTC spokesman attributes this, in large measure, to the influence of Air Force Col. Floyd W. Brown, Jr., who serves as commandant of cadets at the largest of America's classic nonfederal military colleges.

The colonel is credited with influencing increasing numbers of the 2,000-man South Carolina Corps of Cadets to pursue the Air Force ROTC program.

Of the thirty-two officers who have served as commandant of cadets since The Citadel's founding in 1842, only four, including Brown, have been Air Force colonels. Like Brown, a 1955 Citadel graduate, the others were alumni of the college. However, Brown brought to the position a qualification the others did not have—four years as a Citadel tactical officer, from 1960 through 1964. He gained that experience concurrently with a tour of duty as assistant professor of aerospace studies at the military college.

The Air Force sent Brown back to The Citadel in 1978 to serve as professor of aerospace studies, and he then assumed additional duty as deputy commandant of cadets. On December 1, 1980, he was named commandant, and, at the request of The Citadel, his Air Force assignment has been extended through 1982.

New VA Administrator Takes Charge

Robert P. Nimmo, a California legislator and rancher, was sworn in as the eleventh Administrator of Veterans Affairs on July 15, ending an unusually long vacancy in VA's top job. AFA was represented at the ceremony by President Vic Kregel, Chairman of the Board Dan Callahan, and Executive Director Russell Dougherty *(see photo)*.

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The fifty-nine-year-old former World War II bomber pilot indicated that he is ready to move firmly on the problems facing veterans. Speaking of Vietnam-era veterans, he said, "while the vast majority of those veterans have successfully integrated themselves back into our working society, there remains a substantial number suffering from real or perceived illnesses for which we are still struggling to find effective diagnostic and treatment techniques.

"That struggle must continue on an expedited basis until every veteran can feel confident that his country has met its commitment to him; that his or her illness or disability has been accurately diagnosed and properly treated."

He said, "The President and this Administration regard as a solemn obligation the proper delivery of first-class medical care and other authorized benefits to every eligible veteran."

But, he added, "Unless spiraling inflation and escalating costs are brought under control, the VA budget will obviously exceed $50 billion before 1990." It currently stands at just over $24 billion.

AFA President Testifies on GI Bill

In late July, AFA President Vic Kregel was invited to testify before the Senate Committee on Veterans Affairs concerning educational assistance for veterans and active-duty people.

Taking a strong stand for "a properly designed new GI Bill," Mr. Kregel emphasized the belief of the Air Force Association that "any new educational incentive program must enhance retention as well as help recruiting."

He called for a program that not only would provide incentives "up front" but would have retention incentives—such as transferability—likely to encourage retention of highly trained officers and enlisted people.

He outlined these points, which AFA considers essential to any new GI Bill:

- Applicability to both officers and enlisted;
- Noncontributory;
- Provide both recruiting and retention incentive. One way to do this

AFA President Victor R. Kregel pins new VA Administrator Robert P. Nimmo with an AFA pin denoting his new status as an AFA life member, following Mr. Nimmo's swearing-in ceremony recently in Washington. Witnesses of the ceremony include (back row, left to right): AFA Executive Director Russ Dougherty; Sen. Alan K. Simpson (R-Wyo.), Chairman of the Senate Veterans Affairs Committee; and Deputy Secretary of State William P. Clark (partly hidden), who administered the oath of office to Mr. Nimmo.

SPEAKING OF PEOPLE

Giving Uncle Sam His Money's Worth

By Ed Gates, CONTRIBUTING EDITOR

Just about every training program in the Air Force carries with it a service commitment, running from as little as a few months to as much as several years. Most of the commitments are of short duration and don't amount to much. Some are served concurrently with early commitments.

But with training costs continuing to soar—to as high as $1.1 million to produce certain new fully qualified fighter pilots—questions are rightfully raised about the length of various agreements to serve. Do they give Uncle Sam a reasonable return for the money spent on special training?

Some eyebrows are raised, for example, over the fact that while the government spends about $125,000 to send a cadet through one of the academies, academy graduates serve only a basic five-year commitment. (Air Force Academy grads who enter undergraduate pilot training agree to six years of service following graduation from Undergraduate Pilot Training [UPT], in effect meaning that they must serve nearly seven years altogether.)

Interestingly, in USAF the production cost per AFROTC graduate who also serves a five-year mandatory tour is $17,600.

Of concern in some quarters is the service commitment associated with flight training. The Air Force informed AIR FORCE Magazine that FY '80 outlays to put an officer through UPT (including student pay and travel, instructor staff expense, and allocation of base operating and major command headquarters costs) averaged $223,600. For that—the finest flight training in the world—the UPT grad agrees to serve six years, at which time he becomes a prime target for airline employment.

Actually, various advanced flying training programs are even more expensive. For example, the tab is $461,600 for producing a fully qualified B-52G pilot; a fully qualified F-15 pilot factors out at $1,104,600!

The navigator training cost-commitment picture is somewhat similar. USAF in FY '80 spent an average of $67,000 providing basic skills to each navigator trainee, and advanced training costs ran the bill much higher. Indeed, a new F-4C nav cost a total of $619,000, a B-52G nav $293,000.

Technical training is another expensive item, mainly because so many persons participate in it. The average cost per graduate per tech training course for the same period was $8,500. Training averaged about eleven weeks in duration.

Meanwhile, educational outlays continue to mount. The Air Force reports that it spends an average of $49,000 to put an officer through a master's degree program. Its outlay for a doctorate is $63,000.

Considering the enormous cost of Academy schooling and basic and advanced flying training, some feel the five- and six-year commitments are unrealistic, that Uncle Sam is getting shortchanged and should demand a greater return on his investment. That would mean longer contracts, perhaps of ten to even twelve years. Proponents of this course disagree with official service fears that this approach would discourage qualified youths from joining the service. Rather, they see this as a possible answer to the pilot manning problems.

The Air Force responds to longer tour suggestions for Academy graduates by noting that when the matter was discussed in Congress nearly twenty years ago, "it was felt increasing the time would be asking a seventeen- or eighteen-year-old to make too great a commitment too early in his life." Furthermore, USAF officials said that because Academy candidates are sought after by other schools—with numerous scholarship offers—"many more would probably not opt for the Air Force Academy if a commitment involved something more than five years. . . ."

But is there any evidence that this is so? Academy applicants might well be queried on this point as part of the application procedure. Of course, the service could hardly impose a commitment truly commensurate with the full cost of producing such expensive birds as F-15 pilots; that would require a full career—twenty to thirty years—commitment.

Another USAF argument against longer commitments involves a recent experiment by the British RAF. Seems the Brits went for broke and laid on a sixteen-year pilot commitment. But it didn't work out, partly because of a general declining interest in RAF flying careers. So the RAF is now offering an alternative: eight years of active duty followed by four years in the Reserve. USAF states that the RAF's recruitment has improved under this system.

Still, USAF is saddled with what apparently is a never-ending pilot shortage, a deficit expected to rise to 1,700 in two years. And the only plan on the books to erase the shortage is to increase UPT recruiting. It's the same vicious train/release/replace cycle that afflicts many technical training programs, except that it is much more costly. ■

would be to double the benefits for those going on to another period of obligated service;

- Allow transferability of the benefits to spouse or child after approximately ten years of service;
- Include Reservists and Guardsmen in any Bill, on the basis of two months of Reserve service equaling one month of active-duty service; and
- Allow in-service use of the benefits after two years of active-duty.

Mr. Kregel emphasized that AFA believes the program must be available to all ranks and not be limited to critical skills. Further, he noted that an indexing or COLA adjustment would be essential. His testimony also included support for extension of the December 31, 1984, deadline for eligibility for the Vietnam Era GI Bill.

These hearings by the Senate were part of a larger discussion currently raging in Washington on GI Bill benefits. The services, DoD, and especially the Congress are engaging in almost daily dialogue on this issue. Dr. Lawrence J. Korb, Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics), stating the Administration's position, has told Congress that no action should be taken this year, pending results of the current test program now going on *(see June '81 "Bulletin Board").*

At press time, more than ten separate congressional bills had been introduced to institute some version of educational benefits. Nonetheless, knowledgeable observers still believe that no new GI Bill, in any form, will be forthcoming until at least 1982.

400 Slots for FY '82 AECP

Reflecting the scramble the Air Force is making to fill officer engineering slots, the FY '82 Airmen Education and Commissioning Program is targeted almost exclusively towards engineer applicants.

Approximately 400 airmen will be selected to attend civilian colleges and universities and pursue an engineering or technical degree under the program during Fiscal Year 1982. The number of openings is contingent on congressional authorization and funding for the program, according to Air Force Manpower and Personnel Center officials.

Those selected will attend school to complete a bachelor's degree and then enter Officer Training School (OTS). Upon completion of OTS, individuals will receive commissions and assignments in either engineering or computer science career fields.

AECP for FY '82 includes openings for 240 airmen in electrical engineering (190 in specialty code 28XX, twenty in 55XX, and thirty in 305X), fifty in computer science (51XX), thirty-five in astronautical engineering (28XX), thirty in aeronautical engineering (28XX), fifteen in civil engineering (55XX), ten in mechanical engineering (six in 28XX, four in 55XX), ten in industrial engineering (55XX), and ten in nuclear engineering (26XX).

Individuals already having degrees in other fields may apply for AECP, but they will have to meet eligibility requirements and attend school to earn a lateral degree in engineering or computer science.

Airmen interested in AECP should contact their base education office for applications, requirements, and further information.

THE BULLETIN BOARD

Arcari: Top Personnel Manager

Col. Paul W. Arcari, Chief of the Entitlements Division in the Pentagon Air Force Personnel shop, has been named the Outstanding USAF Personnel Manager of the Year by the Air Force. He will be honored by the Air Force Association at its Annual Convention this month.

Arcari's selection for this signal honor was noted with approbation by those in the Washington area who work in the "people business," including Capitol Hill and Administration staffers. He is generally acknowledged to be the foremost authority in the highly complex field of military compensation and is a good symbol of those many behind-the-scenes professionals whose work keeps the Pentagon afloat.

Arcari was first tapped for a Washington assignment in 1968. At that time he was a Standardization/Evaluation Navigator on EC-130Bs at Clark AB in the Philippines. He was brought in to serve as an Air Force representative on the DoD Hubbell Pay Study Group. He never made it back to the cockpit, and has found it difficult to stay out of the Pentagon since.

A key Air Force Personnel planner calls Arcari the man "personally responsible for shepherding landmark pay legislation through the Congress" and achieving for all military people, in the past few years, "the greatest compensation improvements in more than a decade." Good show!

SENIOR STAFF CHANGES

PROMOTIONS: To be **Major General:** Neil L. **Eddins.**

To be **Brigadier General:** Chris O. **Divich;** Browning C. **Wharton,** Jr.

RETIREMENTS: M/G David B. **Easson;** Gen. Richard H. **Ellis;** B/G Horace W. **Miller.**

CHANGES: M/G William P. Acker, from Cmdr., USAF Mil. Trng. Ctr., ATC, Lackland AFB, Tex., to Vice Cmdr., Hq. ATC, Randolph AFB, Tex. . . . **M/G Spence M. Armstrong,** from DCS/Tech. Trng., Hq. ATC, Randolph AFB, Tex., to Cmdr., USAF Mil. Trng. Ctr., ATC, Lackland AFB, Tex., replacing M/G William P. Acker . . . **M/G James I. Baginski,** from DCS/Ops., Hq. MAC, Scott AFB, Ill., to Dir. of Deployment, JDA, MacDill AFB, Fla. . . . **B/G Stanford E. Brown,** from Ass't DCS/Plans, Office of Plans & Policy, Hq. SAC, Offutt AFB, Neb., to Cmdr., Field Command, DNA, Kirtland AFB, N. M.

B/G A. Paul Bruno, from Vice Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, to Cmdr., Int'l Log. Ctr., Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G Graham W. Rider . . . **B/G Duane H. Cassidy,** from Ass't DCS/Ops., Hq. MAC, Scott AFB, Ill., to DCS/Ops., Hq. MAC, Scott AFB, Ill., replacing M/G James I. Baginski . . . **M/G Edgar A. Chavarrie,** from Dir. of Plans & Policy, J-5, Hq. USEUCOM, Vaihingen, Germany, to Ass't DCS/Prgms. & Resources, Hq. USAF, Washington, D. C. . . . **Gen. Bennie L. Davis,** from Cmdr., Hq. ATC, Randolph AFB, Tex., to CINC, Hq. SAC, Offutt AFB, Neb., replacing retired Gen. Richard H. Ellis.

Col. (B/G selectee) Chris O. Divich, from Cmdr., 47th FTW, ATC, Laughlin AFB, Tex., to Cmdt., AFROTC, ATC, Maxwell AFB, Ala., replacing retired M/G David B. Easson . . . **B/G (M/G selectee) Neil L. Eddins,** from Cmdr., 552d AWACW, TAC, Tinker AFB, Okla., to Chief, US Mil. Trng. Mission, Dhahran, Saudi Arabia, replacing M/G Charles L. Donnelly, Jr. . . . **M/G Lawrence D. Garrison,** from Dir., Maintenance & Supply, DCS/L&E, Hq. USAF, Washington, D. C., to Air Deputy, Allied Forces Northern Europe, Kolsaas, Norway, replacing M/G Walter H. Baxter III . . . **B/G Thomas J. Hickey,** from Dep. Dir., Personnel Prgms., DCS/M&P, Hq. USAF, Washington, D. C., to DCS/Tech. Trng., Hq. ATC, Randolph AFB, Tex., replacing M/G Spence M. Armstrong.

B/G Harley A. Hughes, from Dep. Dir. for Doctrine, Strategy & Plans Integration, DCS/Plans & Ops., Hq. USAF, Washington, D. C., to Dep. Dir. of Plans, DCS/Plans & Ops., Hq. USAF, Washington, D. C., replacing B/G David L. Nichols . . . **B/G Gordon P. Masterson,** from Vice Cmdr., Oklahoma City ALC, AFLC, Tinker AFB, Okla., to DCS/Maintenance & Supply, DCS/L&E, Hq. USAF, Washington, D. C. . . . **B/G Richard L. Meyer,** from Cmdr., 831st AD, TAC, George AFB, Calif., to Vice Cmdr., 12th AF, TAC, Bergstrom AFB, Tex., replacing B/G Edward L. Tixier . . . **B/G David L. Patton,** from Cmdr., 4th AD, SAC, F. E. Warren AFB, Wyo., to Cmdr., CAP, USAF & Exec. Dir., CAP, Inc., ATC, Maxwell AFB, Ala., replacing retired B/G Horace W. Miller.

B/G Eugene M. Poe, Jr., from Dep. Ass't to Sec. of Defense (Leg. Affairs for Plans & Prgms.), OSD, Washington, D. C., to DCS/Contracting & Manufacturing, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **B/G Walter H. Poore,** from Ass't DCS/Log., Hq. SAC, Offutt AFB, Neb., to Vice Cmdr., Oklahoma City ALC, AFLC, Tinker AFB, Okla., replacing B/G Gordon P. Masterson . . . **M/G Graham W. Rider,** from Cmdr., Int'l Log. Ctr., Hq. AFLC, Wright-Patterson AFB, Ohio, to Co-Director, US/Spanish Combined Military Coordination & Planning Staff, Madrid, Spain.

M/G Davis C. Rohr, from Chief, Office of Mil. Cooperation, Egypt, to Dir. of Plans & Policy, J-5, Hq. USEUCOM, Vaihingen, Germany, replacing M/G Edgar A. Chavarrie . . . **B/G Edward L. Tixier,** from Vice Cmdr., 12th AF, TAC, Bergstrom AFB, Tex., to Chief, Office of Mil. Cooperation, Egypt, replacing M/G Davis C. Rohr . . . **Col. (B/G selectee) Browning C. Wharton, Jr.,** from Cmdr., 834th Airlift Div., MAC, Hickam AFB, Hawaii, to Ass't DCS/Ops., Hq. MAC, Scott AFB, Ill., replacing B/G Duane H. Cassidy.

SENIOR ENLISTED ADVISOR CHANGES: CMSgt. David Goodman, to SEA, Hq. AFOSI, Bolling AFB, D. C., replacing CMSgt. Joel M. Hamilton . . . **CMSgt. James J. Hudson,** from 366th TFW, Mountain Home AFB, Idaho, to SEA, Hq. PACAF, Hickam AFB, Hawaii, replacing CMSgt. James C. Binnicker . . . **CMSgt. Jerry S. Keaton,** from Base SEA, Iraklion AS, Crete, Greece, to SEA, Hq. ESC, San Antonio, Tex., replacing CMSgt. William C. Chapman . . . **CMSgt. Jimmie B. Lavender,** to SEA, Hq. AAC, Elmendorf AFB, Alaska, replacing CMSgt. Jeffrie D. Evans. ■

Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics Lawrence J. Korb fields one of the many questions posed to him during a question-and-answer session after his address to the JOAC/Enlisted Council.

stressed that artificial numerical goals will not be imposed on the services. Rather, he said, "We want to assign people on the basis of physical and mental standards. We want the best people to do the job, and if that means taking in more women, fine." On the other hand, he noted, in reference to the Army's current freeze on female enlistments, if it means taking in fewer women, "we won't change standards to meet an arbitrary goal."

The Secretary surprised many in the audience by a statement that any new GI Bill should not be offered to officers, "since they already have a degree before commissioning." There is no indication, at this writing, that this will be official DoD policy.

He closed by reminding his listeners that the existence of an increased defense budget carries with it the obligation "to be above reproach" in using the funds. He indicated that DoD would do a more intensive job of monitoring expenditure of funds.

JOAC/Enlisted Council Meet

AFA's Junior Officer Advisory Council (Executive Committee) and Enlisted Council held their two-day mid-summer meeting in Washington, D. C., in July. The Councils advise AFA on matters of interest to their peers, and also work on Air Force-directed projects. The July meeting was aimed at readying agendas for their meeting held in conjunction with AFA's Convention, this month, where their yearly projects are wrapped up.

At an AFA-sponsored luncheon honoring the Councils during their Washington stay, both groups, along with a gathering of Washington dignitaries, heard the Hon. Lawrence J. Korb, Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics, lay out directions he envisions OSD personnel planners will be taking. Secretary Korb *(see photo)* stressed that it is the intention of the Reagan Administration to return to treating military people like first-class citizens. He said that this Administration intends to:

- Provide competitive pay;
- Allow people to perform in skills in which they're trained;
- Decentralize decision-making so that commanders can command and leaders can lead; and
- Restore pride in service.

Secretary Korb also noted that this Administration wants to make the All-Volunteer Force work and does not want to return to the draft, because, as he put it, "you cannot draft for a career."

Concerning the role of women, he

Short Bursts

The Secretary of Defense has recently designated two new groups as "having served on active duty," a determination that allows them to qualify for applicable veterans benefits. Those named are **Quartermaster Corps Female Clerical Employees** who served with the American Expeditionary Forces in World War I, and civilian employees who actively participated in the **defense of Wake Island during World War II.**

The **Air Force Assistance Fund** drive achieved outstanding success this year. Almost $4 million was raised (against a goal of some $3.2 million). This was an increase of some $750,000 over last year and represented participation by more than fifty-four percent of the active-duty force, up from forty-eight percent last year.

Delegate Antonio Won Pat (D-Guam) has introduced legislation to authorize the citizens of the **Northern Mariana Islands** to be appointed as officers in the US armed forces. Currently, a quirk in the law bars ROTC graduates of these islands from commissioning.

The **Air Force Recruiting Service** estimates that meeting FY '82 goals will require recruiters to enlist one nonprior-service recruit every six minutes and thirty seconds, around the clock.

Sen. Barry M. Goldwater (R-Ariz.), noting that he was one of the first members to speak out against the draft, told his fellow Senators recently that he now recognizes that the "All-Volunteer Force is **not meeting** US defense needs." ■

Mark your calendar now...
November 12-13, 1981, Hyatt House Hotel
Los Angeles Airport, Calif.
for

AFA's 1981 Symposium

THE NEW IMPERATIVES OF US AEROSPACE POWER

A comprehensive, searching analysis by senior Defense and Air Force leaders of America's critical Defense needs and how to fill them.

AFA

THIS IS AFA

The Air Force Association is an independent, nonprofit, aerospace organization serving no personal, political, or commercial interests; established January 26, 1946; incorporated February 4, 1946.

OBJECTIVES

The Association provides an organization through which free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principle of freedom and equal rights for all mankind.

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Chairman, Enlisted Council
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VICE PRESIDENTS

Information regarding AFA activity within a particular state may be obtained from the Vice President of the Region in which the state is located.

Thomas O. Bigger
1002 Bragg Circle
Tullahoma, Tenn. 37388
(615) 455-2440
South Central Region
Tennessee, Arkansas, Louisiana, Mississippi, Alabama

Ernest J. Collette, Jr.
Box 345
Grand Forks, N. D. 58201
(701) 775-3944
North Central Region
Minnesota, North Dakota, South Dakota

John H. deRussy
529 Andros Lane
Indian Harbour Beach, Fla. 32937
(305) 773-2339
Southeast Region
North Carolina, South Carolina, Georgia, Florida, Puerto Rico

Jon R. Donnelly
8539 Sutherland Rd.
Richmond, Va. 23235
(804) 649-6425
Central East Region
Maryland, Delaware, District of Columbia, Virginia, West Virginia, Kentucky

Joseph R. Falcone
14 High Ridge Rd.
Rockville, Conn. 06066
(203) 875-1068
New England Region
Maine, New Hampshire, Massachusetts, Vermont, Connecticut, Rhode Island

Francis L. Jones
4302 Briar Cliff Dr.
Wichita Falls, Tex. 76309
(817) 692-5480
Southwest Region
Oklahoma, Texas, New Mexico

Edward J. Monaghan
2401 Telequana Dr.
Anchorage, Alaska 99503
(907) 243-6132
Northwest Region
Montana, Idaho, Washington, Oregon, Alaska

Robert J. Puglisi
1854 State Route 181
Crestline, Ohio 44827
(419) 683-2283
Great Lakes Region
Michigan, Wisconsin, Illinois, Ohio, Indiana

Lyle O. Remde
4911 S. 25th St.
Omaha, Neb. 68107
(402) 731-4747
Midwest Region
Nebraska, Iowa, Missouri, Kansas

J. Deane Sterrett
20 S. Old Oak Dr.
Beaver Falls, Pa. 15010
(412) 843-4589
Northeast Region
New York, New Jersey, Pennsylvania

James H. Taylor
629 N. 1st E.
Farmington, Utah 84025
(801) 451-2566
Rocky Mountain Region
Colorado, Wyoming, Utah

Liston T. Taylor
4173 Oakwood Rd.
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(805) 733-2723
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AFA CHAMPLUS ... New, Strong Protecti

When a Single Accident or Illness Could Cost *You* Thousands of Dollars, You Need AFA CHAMPLUS . . . for *Strong* Protection against Costs CHAMPUS Doesn't Cover!

For military retirees and their dependents . . . and dependents of active duty personnel . . . more and more medical care is being provided through the government CHAMPUS program.

And, of course CHAMPUS pays 75% of allowable charges.

But today's soaring hospital costs—*up to $500 a day* in some major metropolitan medical centers—can run up a $20,000 bill for even a moderately serious accident or illness.

Your 25% of $20,000 is no joke!

AFA CHAMPLUS protects you against that kind of financial catastrophe *and* covers most of your share of routine medical expenses as well.

HOW AFA CHAMPLUS WORKS FOR YOU!

WHO IS ELIGIBLE?

1) All AFA members under 65 years of age who are currently receiving military retired pay and are eligible for benefits under Public Law 89-614 (CHAMPUS), their spouses under age 65 and their unmarried dependent children under age 21 (or age 23 if in college).
2) All eligible dependents of AFA members on active duty. Eligible dependents are spouses under age 65 and unmarried dependent children under age 21 (or age 23 if in college).

EXCEPTIONAL BENEFIT PLAN

(See chart at right)

FOUR YEAR BASIC BENEFIT. Benefits for most injuries or illnesses may be paid for up to a four-year period.

PLUS THESE SPECIAL BENEFITS . . .

1) Up to 45 consecutive days of in-hospital care for mental, nervous, or emotional disorders. Outpatient care may include up to 20 visits of a physician or $500 per insured person each year.
2) Up to 30 days care per insured per year in a Skilled Nursing Facility.
3) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Residential Treatment Center.
4) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Special Treatment Facility.
5) Up to 5 visits per insured per year to Marriage and Family Counselors under conditions defined by CHAMPUS.

YOUR INSURANCE IS NON-CANCELLABLE

As long as you are a member of the Air Force Association, pay your premiums on time, and the master contract remains in force, your insurance cannot be cancelled.

ADMINISTERED BY YOUR ASSOCIATION . . . UNDERWRITTEN BY MUTUAL OF OMAHA

AFA CHAMPLUS insurance is administered by trained insurance professionals on your Association staff. You get prompt, reliable, courteous service from people who know your needs and know every detail of your coverage. Your insurance is underwritten by Mutual of Omaha, the largest individual and family health insurance company in the world.

AFA OFFERS YOU HOSPITAL BENEFITS AFTER AGE 65

Once you reach Age 65 and are covered under Medicare, AFA offers you protection against hospital expenses not covered by Medicare through the *Senior Age Benefit Plan* of AFA Hospital Indemnity Insurance. Members enrolled in AFA CHAMPLUS will automatically receive full information about AFA's Medicare supplement program upon attainment of Age 65 so there will be no lapse in coverage.

AFA CHAMPLUS BENEFIT SCHEDULE

Care	*CHAMPUS Pays*	*AFA CHAMPLUS Pays*
	For Military Retirees Under Age 65 and Their Dependents	
Inpatient civilian hospital care	CHAMPUS pays 75% of allowable charges	CHAMPLUS pays the 25% of allowable charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $5.00 per day subsistence fee, not covered by CHAMPUS.	CHAMPLUS pays the $5.00 per day subsistence fee.
Outpatient care	CHAMPUS COVERS 75% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied	CHAMPLUS pays the 25% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.
	For Dependents of Active Duty Military Personnel	
Inpatient civilian hospital care	CHAMPUS pays all covered services and supplies furnished by a hospital less $25 or $5.00 per day, whichever is greater.	CHAMPLUS pays the greater of $5 per day or $25 of the reasonable hospital charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $5.00 per day fee, not covered by CHAMPUS.	CHAMPLUS pays the $5.00 per day subsistence fee.
Outpatient care	CHAMPUS covers 80% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS pays the 20% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.

NOTE: Outpatient benefits cover emergency room treatment, doctor bills, pharmaceuticals, and other professional services.

There are some reasonable limitations and exclusions for both inpatient and outpatient coverage. Please note these elsewhere in the plan description.

Against Costs CHAMPUS Doesn't Cover

APPLY TODAY!

JUST FOLLOW THESE STEPS

Choose either AFA CHAMPLUS In-patient coverage or combined In-patient and Out-patient coverage for yourself. Determine the coverage you want for dependent members of your family. Complete the enclosed application form in full. Total the premium for the coverage you select from the premium tables on this page. Mail the application with your check or money order for your initial premium payment, payable to AFA.

Get AFA's new

CHAMPLUS

QUARTERLY PREMIUM SCHEDULE

Plan 1—For military retirees and dependents

In-Patient Benefits

Member's Attained Age	*Member*	*Spouse*	*Each Child*
Under 50	$19.03	$23.30	$11.00
50-54	$23.78	$29.10	$11.00
55-59	$30.13	$36.90	$11.00
60-64	$39.65	$48.55	$11.00
In-Patient and Out-Patient Benefits			
Under 50	$26.80	$31.05	$27.50
50-54	$33.48	$38.80	$27.50
55-59	$42.43	$49.18	$27.50
60-64	$55.83	$64.73	$27.50

Plan 2—For dependents of active duty personnel.

In-Patient Only	None	$ 8.80	$ 4.40
In-Patient and Out-Patient	None	$35.20	$22.00

Note: Plan II premiums are listed on an annual basis. Because of the very low cost, persons requesting this coverage are asked to make annual payments.

LIMITATIONS

Coverage will not be provided for conditions for which treatment has been received during the 12-month period prior to the effective date of insurance until the expiration of 12 consecutive months of insurance coverage without further treatment. *After coverage has been in force for 24 consecutive months, pre-existing* conditions will be covered regardless of prior treatment.

EXCLUSIONS

This plan does not cover and no payment shall be made for:

a) routine physical examinations or immunizations

b) domiciliary or custodial care

c) dental care (except as required as a necessary adjunct to medical or surgical treatment)

d) routine care of the newborn or well-baby care

e) injuries or sickness resulting from declared or undeclared war or any act thereof

f) injuries or sickness due to acts of intentional self-destruction or attempted suicide, while sane or insane

g) treatment for prevention or cure of alcoholism or drug addiction

h) eye refraction examinations

i) Prosthetic devices (other than artificial limbs and artificial eyes), hearing aids, orthopedic footwear, eyeglasses and contact lenses

j) expenses for which benefits are or may be payable under Public Law 89-614 (CHAMPUS)

APPLICATION FOR
AFA CHAMPUS SUPPLEMENT INSURANCE

Group Policy GMG-FC70
Mutual of Omaha Insurance Company
Home Office: Omaha, Nebraska

Full name of Member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

DATE OF Birth _____ Current Age ____ Height ____ Weight ____ Soc. Sec. No. _____
Month/Day/Year

This insurance coverage may only be issued to AFA members. Please check the appropriate box below:

☐ I am currently an AFA Member.

☐ I enclose $13 for annual AFA membership dues (includes subscription ($9) to AIR FORCE Magazine).

☐ I am over 65 years of age. Please send information on AFA's Medicare Supplement.

PLAN & TYPE OF COVERAGE REQUESTED

Plan Requested (Check One)	☐ AFA CHAMPLUS PLAN I (for military retirees & dependents)	
	☐ AFA CHAMPLUS PLAN II (for dependents of active duty personnel)	
Coverage Requested (Check One)	☐ Inpatient Benefits Only	
	☐ Inpatient and Outpatient Benefits	
Person(s) to be Insured (Check One)	☐ Member Only	☐ Member & Children
	☐ Spouse Only	☐ Spouse & Children
	☐ Member & Spouse	☐ Member, Spouse & Children

PREMIUM CALCULATION

All premiums are based on the attained age of the AFA member applying for this coverage. Premium payments are normally paid on a quarterly basis (see table for rate table). Upon request, however, they may be made on either a semi-annual or annual basis.

Quarterly premium for member (age ____) $ _____

Quarterly premium for spouse $ _____

Quarterly premium for ____ children @ $ ____ $ _____

Requests for active duty dependent coverage under Plan 2 should include annual premiums.

Total premium enclosed $ _____

If this application requests coverage for your spouse and/or eligible children, please complete the following information for each person for whom you are requesting coverage.

Names of Dependents to be Insured	Relationship to Member	Date of Birth (Month/Day/Year)

(To list additional dependents, please use a separate sheet.)

In applying for this coverage, I understand and agree that (a) coverage shall become effective on the last day of the calendar month during which my application together with the proper amount is mailed to AFA, (b) only hospital confinements (both inpatient and outpatient) or other CHAMPUS-approved services commencing after the effective date of insurance are covered and (c) any conditions for which I or my eligible dependents received medical treatment or advice or have taken prescribed drugs or medicine within 12 months prior to the effective date of this insurance coverage will not be covered until the expiration of 12 consecutive months of insurance coverage without medical treatment or advice or having taken prescribed drugs or medicine for such conditions. I also understand and agree that all such pre-existing conditions will be covered after this insurance has been in effect for 24 consecutive months.

Date _____, 19 ____ _____
Member's Signature

9/81

NOTE: Application must be accompanied by check or money order.
Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Ave., NW, Washington, D.C. 20006.

Form 6173GH App.

AFA NEWS

Chapter and State Photo Gallery

By Dave C. Noerr, AFA AFFAIRS EDITOR

AFA's Eglin, Fla., Chapter recently held its annual awards night. One of the featured awards was the James H. "Jimmy" Doolittle award, presented to the outstanding senior JROTC cadet from area high schools. In the photo, Cadet Maj. Francisco Zermeno (left) receives congratulations on being a finalist for the Doolittle award from Arthur L. Stevens, Jr., State AFA Awards Chairman. Cadet Col. Jeff Macrander, second from left, watches as Cadet Col. Thomas W. Hair, the Doolittle winner, and Lt. Gen. Stanley M. Umstead, Air University Commander and keynote speaker for the event, observe the ceremonies.

Delegates and guests of the Washington State AFA Convention, held in Spokane in late May, were greeted by (from left) Ken Humphreys, Spokane Chapter Treasurer; Bert Shaber, State Treasurer; Liz Humphreys, State Secretary; Harry Goldsworthy, State President; and Walt Lepski, Spokane Chapter President.

Pictured at ceremonies held recently by the Staten Island-Empire Chapter of Staten Island, N. Y., are the chapter's newly elected officers. From left to right are the new Chapter President, William Pritchard; Henry Meyenberg, Treasurer; George Grace, Vice President; and Charles Jacob, Secretary.

During a recent visit to Langley AFB, Va., for the annual open house, the support team for USAF's Thunderbirds were treated to a steak picnic sponsored by AFA's Langley Chapter. "Chefs" for the event were (from left) Brig. Gen. William G. Gorton, DCS Plans, Hq. TAC; Brig. Gen W. Troy Tolbert, Commander, 1st Tac Fighter Wing; CMSgt. Larry Shellhammer, Senior Enlisted Advisor, 1st TFW; and CMSgt. Paul Killion, Chief Enlisted Manager for 1st TFW Maintenance.

AFA's Phoenix, Ariz., Sky Harbor Chapter held its Sixth Annual Military Ball last May. A sellout weeks before the event, guests included (from left) Sen. Barry Goldwater (R-Ariz.); Lt. Gen. James H. Doolittle, USAF (Ret.); Mrs. Robert W. Waltz, wife of the Sky Harbor Chapter President, Bob Waltz; Mrs. Doolittle, Honorary Ball Chairman; and Mrs. Barry Goldwater. Jimmy Doolittle was the guest of honor. Proceeds from the ball went to the Enlisted Men's Widows and Dependents Home Foundation and the USO.

AFA's Spirit of St. Louis Chapter recently held its Fifth Annual Outstanding Airmen's Award dinner. Keynote speaker for the event was former Mayor of St. Louis, the Hon. John H. Poelker (left), now Senior Vice President of the Regional Commerce and Growth Association. Awardees included (from left) SSgt. John E. Marsh, Sr.; SSgt. James H. Bushart; TSgt. Donald J. Mitchell; and SMSgt. Curtis W. Davis. At far right is Chapter President Richard A. Gerber.

The John C. Stennis Chapter recently honored retired Maj. Gen. Eugene Eubank at its annual Spring Dining-Out. Pictured at the event are (from left) Bryan Shotts, Chapter President; AFA's Executive Director Russ Dougherty, guest speaker; General Eubank; and Maj. Gen. Don H. Payne, Commander of Keesler AFB, Miss., Technical Training Center. General Eubank, honored for his pioneering contributions to US airpower, is now Board Chairman of Gulf National Bank in Gulfport, Miss.

AFA's Chattanooga, Tenn., Chapter has received considerable visibility in its area lately—and a positive public image—through sponsorship of a Chapter AFA Queen contest. Candidates were selected by a vote of area AFJROTC units, and were then interviewed by a panel of AFA judges. Above, from left, are Dr. Wayne Shearer; Dr. Art MacFadden, Tennessee State AFA President-elect; Ms. Janet Sherwood, AFA Queen for 1981; Lt. Col. and Mrs. Jim Sherwood, Janet's parents; and Bill Edwards, Hixson, Tenn., High School Principal.

AFA NEWS PHOTO GALLERY

Pictured at the first major event, a dinner meeting, sponsored by AFA's newly revitalized Baltimore Chapter are (from left) Dr. Tom Tuttle, Director, Center for Productivity and Quality of Working Life, University of Maryland; Gen. Alton G. Slay, USAF (Ret.), keynote speaker; Rick Gibbs, Chapter President; and Wilbur Van Sant, Chapter Treasurer.

CALENDAR OF EVENTS

September 12–17, **AFA National Convention,** Washington, D. C. . . . October 2–4, **Arkansas State AFA Convention,** Fayetteville . . . October 9–11, **Georgia State AFA Convention,** Jekyll Island.

AFA's Executive Director, Russell E. Dougherty, was the keynote speaker at a June dinner meeting of the South Bend Chapter, Ind. The event was the culmination of a full day of Air Force-oriented activities. Pictured with Russ Dougherty are (from left) Maj. John Adams, USAF (Ret.); Judge Allen Sharp, US District Court, South Bend; F. Jay Nimtz, former US congressman; and John R. Kagel, Chapter President.

Clarence B. Santos, Jr. (right) receives a copy of AFA's AIR FORCE *Magazine May Almanac issue from Jack Dougherty. Both men are part of the Aerospace Guidance and Metrology Center (AFLC), Newark AFS, Ohio. The presentation was a result of a personal appeal by Mr. Santos, who requested several copies for members of a Consolidated Review Team studying possible consolidation of calibration facilities worldwide. He termed the favorable response as "a fine example of cooperation between USAF and AFA." (Photo by Chuck Skidmore)*

At an inaugural dinner held in late spring in Phoenix, Ariz., a charter was presented by AFA National Vice President for the Far West Region, Liston T. "Zack" Taylor (center), to Fred Lustig (right), President of AFA's new Frank Luke Chapter. At left is State President John P. Byrne, looking on.

The week of June 15, 1981, was officially proclaimed "Aerospace Power Week" in Massachusetts. Shown on the occasion of the signing of the proclamation are (standing, from left) Zaven Kaprielian, State President; Richard Stone, Vice President; Eugene MacMurray, Vice President, Laurence G. Hanscom Chapter; John White, President, Laurence G. Hanscom Chapter; and Robert Pace, Chapter Communications Director. Seated at his desk is Edward J. King, Governor of the Commonwealth of Massachusetts.

New York State AFA presented a Vietnam Veteran's Award at its thirty-fourth annual state convention in Niagara Falls. Pictured chatting at the reception prior to the presentation are Col. L. L. "Scooter" Burke, USAF (Ret.), Vice President of the Congressional Medal of Honor Society, who presented an engraved silver platter to Martin T. Prast (right) of Grand Island, N. Y., a former Green Beret lieutenant who was awarded the Bronze Star for heroism in action in Vietnam in January 1970. (Photo by Joseph Rocco)

Robert A. Fuhrman, President, Lockheed Missiles & Space Co., receives the Tennessee Ernie Ford Chapter's Speaker's Award from Col. Richard H. Hansen, Professor of Aerospace Studies and Commander, Air Force ROTC, San Jose State University. Mr. Fuhrman was the featured speaker at the Chapter's recent dinner meeting in Santa Clara, Calif., on the topic "Industrial Readiness." Colonel Hansen was master of ceremonies. Both are members of the Tennessee Ernie Ford Chapter.

20% Dividend paid for 1979 calendar year

SEE NEW BENEFITS FOR FAMILY COVERAGE!

NOW AVAILABLE TO

CURRENT BENEFIT TABLES

Insured's Attained Age	STANDARD PREMIUM: $10 per month Basic Benefit*	HIGH OPTION PREMIUM: $15 per month Basic Benefit*	HIGH OPTION PLUS PREMIUM: $20 per month Basic Benefit*
20-29	$85,000	$127,500	$170,000
30-34	65,000	97,500	130,000
35-39	50,000	75,000	100,000
40-44	35,000	52,500	70,000
45-49	20,000	30,000	40,000
50-54	12,500	18,750	25,000
55-59	10,000	15,000	20,000
60-64	7,500	11,250	15,000
65-69	4,000	6,000	8,000
70-74	2,500	3,750	5,000
Aviation Death Benefit*			
Non-war related	$25,000	$37,500	$50,000
War related	$15,000	$22,500	$30,000
Extra Accidental Death Benefit*	$12,500*	$15,000*	$17,500*

*The Extra Accidental Death Benefit is payable in addition to the basic benefit in the event an accidental death occurs within 13 weeks of the accident, except as noted under AVIATION DEATH BENEFIT (below).

*AVIATION DEATH BENEFIT: The coverage provided under the Aviation Death Benefit is paid for death which is caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage. Furthermore the non-war related benefit will be paid in all cases where the death does not result from war or an act of war, whether declared or undeclared.

OTHER IMPORTANT BENEFITS

COVERAGE YOU CAN KEEP. Provided you apply for coverage under age 60 (see "ELIGIBILITY") your insurance may be retained at the same low group rates to age 75.

FULL TIME, WORLD WIDE PROTECTION. The policy contains no war clause, hazardous duty restriction, combat zone waiting period or geographical limitation.

DISABILITY WAIVER OF PREMIUM. If you become totally disabled at any time prior to age 60 for at least a 9-month period, your coverage will be continued in force without further payment of premiums as long as you remain disabled.

FULL CHOICE OF SETTLEMENT OPTIONS. All standard forms of settlement options, as well as special options agreed to by the insured and United of Omaha, are available to insured members.

CONVENIENT PAYMENT PLANS. Premium payments may be made by monthly government allotment (payable to Air Force Association), or direct to AFA in quarterly, annual or semi-annual installments.

DIVIDEND POLICY. AFA's primary policy is to provide maximum coverage at the lowest possible cost. Consistent with this policy, AFA has provided year-end dividends in all but three years (during the Vietnam War) since the program was initiated in 1961, and basic coverage has been increased on six separate occasions.

ADDITIONAL INFORMATION

Effective Date of Your Coverage. All certificates are dated and take effect on the last day of the month in which your application for coverage is approved, and coverage runs concurrently with AFA membership. AFA Group Life Insurance is written in conformity with the insurance regulations of the State of Minnesota. The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minnesota as trustees of the Air Force Association Group Insurance Trust.

EXCEPTIONS: There are a few logical exceptions to this coverage. They are:

Group Life Insurance: Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane will not be effective until your coverage has been in force for 12 months.

The Accidental Death Benefit and Aviation Death Benefit shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or (4) During any period a member's coverage is being continued under the waiver of premium provision, or (5) From an aviation accident, either military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

ELIGIBILITY

All members of the Air Force Association are eligible to apply for this coverage provided they are under age 60 at the time application for coverage is made.

*Because of certain restrictions on the issuance of group insurance coverage, applications for coverage under the group program cannot be accepted from non-active duty personnel residing in either New York or Ohio. Non-active duty members residing in Ohio, however, may request special application forms from AFA for individual policies which provide coverage quite similar to the group program.

OPTIONAL FAMILY COVERAGE
(new benefit schedule effective 6/30/80)
PREMIUM: $2.50 per month

Insured's Attained Age	Life Insurance Coverage for Spouse	Life Insurance Coverage for each Child*
20-39	$20,000.00	$4.000.00
40-44	15,000.00	4,000.00
45-49	10,000.00	4,000.00
50-54	7,000.00	4,000.00
55-59	5,000.00	4,000.00
60-64	3,000.00	4,000.00
65-69	2,000.00	4,000.00
70-75	1,000.00	4,000.00

*Children under six months are provided with $250 coverage once they are 15 days old and discharged from the hospital.

Upon attaining age 21, and upon submission of satisfactory evidence of insurability, insured dependent children may replace this $4,000 group coverage (in most states) with a $10,000 permanent individual life insurance policy with guaranteed purchase options.

Please Retain This Medical Bureau Prenotification For Your Records

Information regarding your insurability will be treated as confidential. United Benefit Life Insurance Company may, however, make a brief report thereon to the Medical Information Bureau, a nonprofit membership organization of life insurance companies, which operates an information exchange on behalf of its members. If you apply to another bureau member company for life or health insurance coverage, or a claim for benefits is submitted to such a company, the Bureau, upon request, will supply such company with the information in its file.

Upon receipt of a request from you, the Bureau will arrange disclosure of any information it may have in your file. (Medical information will be disclosed only to your attending physician.) If you question the accuracy of information in the Bureau's file, you may contact the Bureau and seek a correction in accordance with the procedures set forth in the federal Fair Credit Reporting Act. The address of the Bureau's information office is P.O. Box 105, Essex Station, Boston, Mass. 02112. Phone (617)426-3660.

United Benefit Life Insurance Company may also release information in its file to other life insurance companies to whom you may apply for life or health insurance, or to whom a claim for benefits may be submitted.

ALL AFA MEMBERS (under age 60)

APPLICATION FOR
AFA GROUP LIFE INSURANCE

United of Omaha

Group Policy GLG-2625
United Benefit Life Insurance Company
Home Office Omaha Nebraska

Full name of member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

Date of birth (Mo. / Day / Yr.)	Height	Weight	Social Security Number

This insurance is available only to AFA members

☐ I enclose $13 for annual AFA membership dues (includes subscription ($9) to AIR FORCE Magazine). Please send membership application.

☐ I am an AFA member.

Name and relationship of primary beneficiary

Name and relationship of contingent beneficiary

Please indicate below the Mode of Payment and the Plan you elect.

Mode of Payment	Plan of Insurance: Standard Plan		High Option Plan		High Option PLUS Plan	
	Member Only	Member And Dependents	Member Only	Member And Dependents	Member Only	Member And Dependents
Monthly government allotment (only for military personnel). I enclose 2 month's premium to cover the necessary period for my allotment (payable to Air Force Association) to be established.	☐ $ 10.00	☐ $ 12.50	☐ $ 15.00	☐ $ 17.50	☐ $ 20.00	☐ $ 22.50
Quarterly. I enclose amount checked.	☐ $ 30.00	☐ $ 37.50	☐ $ 45.00	☐ $ 52.50	☐ $ 60.00	☐ $ 67.50
Semi-Annually. I enclose amount checked.	☐ $ 60.00	☐ $ 75.00	☐ $ 90.00	☐ $105.00	☐ $120.00	☐ $135.00
Annually. I enclose amount checked.	☐ $120.00	☐ $150.00	☐ $180.00	☐ $210.00	☐ $240.00	☐ $270.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth Mo. Day Yr.	Height	Weight

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanatorium, asylum or similar institution in the past 5 years? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes ☐ No ☐

If YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid.

I hereby authorize any licensed physician, medical practitioner, hospital, clinic or other medical or medically related facility, insurance company, the Medical Information Bureau or other organization, institution or person, that has any records or knowledge of me or my health, to give to the United Benefit Life Insurance Company any such information. A photographic copy of this authorization shall be as valid as the original. I hereby acknowledge that I have a copy of the Medical Information Bureau's prenotification information.

Date _____, 19 ____ _____
Member's Signature

FORM 3676GL App. REV. 10-79

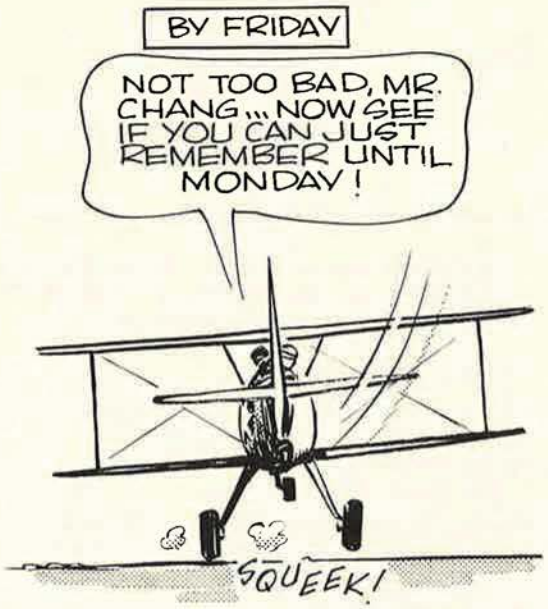
Application must be accompanied by a check or money order. Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Avenue, NW, Washington, D.C. 20006

9/81

Bob Stevens'

"There I was..."

BACK IN "THE BIG ONE", THE U.S. ARMY AIR FORCES, *née* AIR CORPS, TRAINED A LOT OF CHINESE CADETS (THEN THERE WAS JUST ***ONE*** CHINA). TO SAY THERE WAS A COMMUNICATIONS GAP WOULD BE THE UNDERSTATEMENT OF THE AGE!



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because someone asked Sperry.

Up to now, this Navy EA-6B flight team could hardly operate in four oceans in one day. But today, a Sperry simulation system enables them to practice ECM missions in a variety of realistic worldwide scenarios... without ever leaving the ground.

Considered to be the U.S. Navy's most technically advanced simulator, Sperry's EA-6B Weapon System Trainer provides a practical supplement to onboard flight exercises. Risks to crews and aircraft are minimized. Fuel is saved. Prime equipment is spared wear and tear.

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The EA-6B trainer is one example of Sperry aircraft trainer technology. Our flight simulator for the Navy/Marine Corps' newest fighter—the F/A-18 Hornet—will have the features necessary to qualify pilots in normal and emergency operations of the aircraft.

Our A-6E trainer realistically portrays night carrier launch and recovery functions. Our A-4 attack aircraft simulators cover the entire range of aviator training.

Sperry math modeling techniques are being incorporated in our design of the operational flight trainers for the CH-53 helicopter. Our conversion of U.S. Air Force B-52 trainers to the latest digital systems is a cost-efficient alternative to the design and construction of new trainers.

And we've developed a wide range of simulators for other applications—from improving the firepower accuracy of infantry and armor to assuring the combat readiness of shipboard crews; from enhancing the skills of commercial ship pilots to researching the behavior of deck officers.

This technology is making training more practical and less expensive—often at one-tenth the cost of actual exercises.

For more information on what we're up to in simulation, just ask us...we understand how important it is to listen.

Write to: Sperry Division Headquarters, Systems Management Marketing, Great Neck, NY 11020. Or call (516) 574-1543.

SPERRY

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Eyes on the olive branch, but arrows at the ready.

The American Eagle's stance on the Great Seal of the United States symbolizes what our country's great leaders have taught for two centuries: Seek peace from a position of strength.

President George Washington captured its meaning in his first message to Congress in 1789. "To be prepared for war is one of the most effectual means of preserving peace."

Today, the United States Air Force F-15 Eagle is a manifestation of the Great Seal's symbology. Strong enough to win, awesome enough to deter. By its very presence it is an expression of national will.

F-15 Eagle

MCDONNELL DOUGLAS