AUGUST 1977/$1

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

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AIR FORCE MAGAZINE
PUBLISHED BY THE AIR FORCE ASSOCIATION

This Month

OUT THE COVER

Vietnam and the Yom Kippur War clearly demonstrated that electronic warfare capabilities decisively affect the outcome of air warfare. With the arrival of the EF-111A, USAF's future in tactical electronic jamming never looked brighter. See story on p. 54.

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AN EDITORIAL

B-1 Aftermath

By John F. Loosbrock, EDITOR

IT IS a great temptation, in the wake of President Jimmy Carter's momentous decision to abandon production of the B-1 strategic bomber, to put forward once again all of the arguments that militate against the wisdom of the Presidential decision. There are many, and they have been often repeated in this publication. There is no denying that a shock wave of unprecedented proportions swept through the Pentagon, through the boardrooms of companies involved in the multibillion dollar project, and through the family budgets of the tens of thousands of aerospace workers who are being idled as a result.

The political timing and techniques put to shame the canniest efforts of wily political leaders of the past. Congress was caught up short on its way out of town for the Fourth of July recess. A well-orchestrated series of ambiguous meetings had encouraged supporters of the B-1 and infuriated its opponents. Above all, to veteran entrail-examiners in Leaksville-on-the-Potomac—including this observer—the secrecy surrounding the announcement of the decision was impeccable to the point of incredulity.

Be all that as it may, the decision is not going to be reversed, in our judgment. For every congressional proponent of the B-1 who is still willing to fight on, there are at least two marginal supporters who breathed mighty sighs of relief at having gotten off *that* hook. What remains, then, is the need to assess coolly, constructively, and objectively the aftermath—the future course of national strategy in a world that has become even more dangerous than it was before June 30, 1977. A hole in our strategic force structure has been created. The problem is how best to fill it, a view that was taken in the initial response of the Air Force Association to the decision (*see below*).

A number of additional points perturb us. The decisio has been widely interpreted as an either/or case—the B- or the cruise missile—whereas the cruise-missile-carryin capability of the B-1 has long been a foremost considera tion in justifying the program. The critical and overridin need to penetrate Soviet defenses has yet to be addresse definitively. Launch vehicles standing off miles from th Soviet perimeter, even though armed with the best c cruise missiles, yet to be perfected, cannot fill this long term need.

There is, in addition, the perplexing paradox of a Administration wedded to decreasing the threat of nuclea war, yet placing so much reliance on the cruise missile— uncountable and therefore defying SALT verification, an thereby bound to be a destabilizing element in any futur arms-control negotiations. And there is the distressin movement away from the last best hope of flexibility i strategic planning and the locking in of the nation to a preplanned, prerouted, pretargeted kind of responsive ness. It is an approach that makes a mockery of genuine strategy and points inescapably to a reduction of option and the eventual narrowing of choice to the "humiliatio or holocaust" alternative once decried as unthinkable b another Democratic President. The stage clearly is set fo a Procrustean revision of defense priorities to fit the be of politico/fiscal predilections. It's happened before, c course. But one day, time is going to run out.

We intend to do no crying into our B-1 beer in th pages of this magazine. But we do intend to examine i detail and without mercy any and all palliatives that a proposed to compensate for the B-1's absence from th strategic scene.

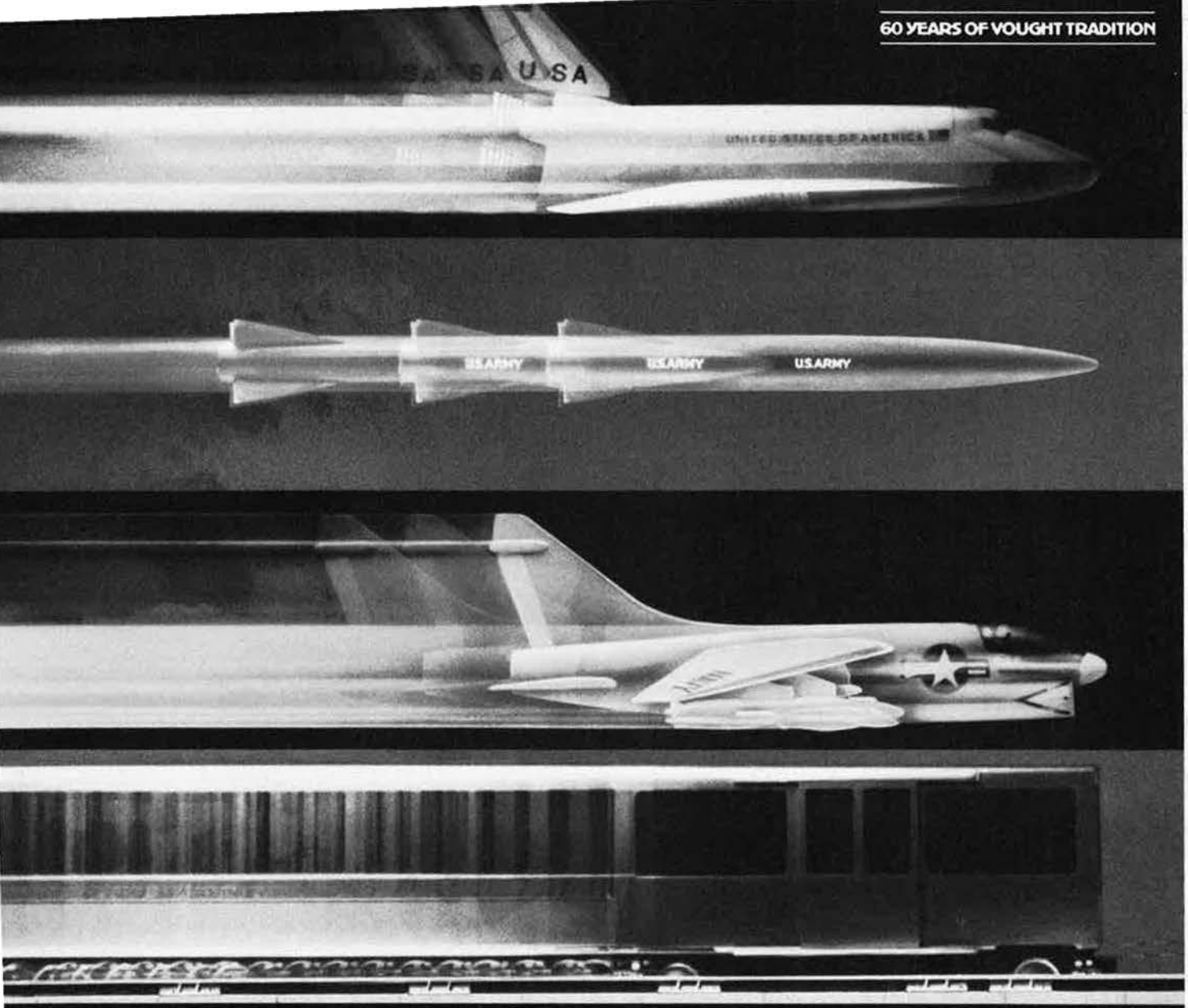
AFA's Wire to President Carter, Dated July 1, 1977

The Air Force Association has been—and continues to be—a firm supporter of the B-1 advanced strategic bomber as an essential element of the US strategic triad. In the view of the 160,000 members of this Association, the need for a manned strategic system capable of penetrating hostile airspace remains crucial.

We regret the decision to cancel production of the B-1, but welcome continuation of research and development on this weapon as well as on alternate systems.

We also believe strongly that cancellation of the B-1 could lead to intolerable erosion of US strategic deterrent capabilities. We urge, therefore:

- That the US negotiating posture at SALT be adjusted to the more restricted range of options that exists as a result of the B-1's termination;
- That full consideration be given to the importance of the MX follow-on ICBM to compensate in part for the widening lead in Soviet nuclear throw-weight capability;
- That an energetic, broad program be initiated and funded as soon as possible to modify and modernize the B-52 fleet to meet the stringent requirements of the 1980s and beyond, including the retrofit of advanced technology engines as well as improvements of avionics, structures, and aerodynamics;
- That the cruise missile program, now clearly the mainstay of air-launched deterrence, be placed under Air Force management to secure the best possible linkage of the launching platforms and the actual weapon;
- That follow-on cruise missile technology be developed expeditiously to assure that improved weapons of this type become available as the sophistication of hostile systems increases; and
- That a vigorous program to explore and develop follow-on launch vehicles—in addition to the cruise missile carrier, such as modified FB-111s—both for the standoff and penetration missions be initiated rapidly to augment or replace the B-52s in the 1980s.



OUR ADVANCED TECHNOLOGY. IT KEEPS THINGS MOVING ON A LOT OF DIFFERENT LEVELS.

After 60 years of business, our technological expertise is still solving a lot of different problems. On a lot of different levels.

Take NASA's Space Shuttle. We build its reusable, heat-resistant leading edge, plus its unique space radiator system. They represent a major subcontract capability which embraces our building of aft fuselages for 747's. And substantial portions of the B-1 bomber.

Take our Lance missile. It's become a defense workhorse for the U.S. and many NATO countries.

The A-7 tactical support aircraft? It's the latest in our line of military planes that stretches back to the rugged Corsairs of the early 20th century.

And Airtrans. Built for D/FW Airport, our sophisticated ground transportation system is being modified and tested for use in tomorrow's city central business districts.

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Lockheed Hercules

Lockheed-Georgia Company

Airmail

WW II's Smart Bombs

n re your comments on my com-nents on the Eaker-Speer interview "Airmail," June issue]:

Re your definition of "true smart ombs": If one used the 40:1 effec-iveness over free-fall ratio an-nounced in 1972, then one must onsider that in WW II they were ated as 25:1 over free-fall.

In any case, the smart bombs in he US arsenal by the end of WW II ncluded TV and radar-controlled nodels.

The use of azon, tarzon, and azon bombs was far beyond the experimental" stage in WW II lone. Interestingly, they were udged in advance of their use as nworthy in Europe and there were laim denials and the like; *e.g.*, ome commanders in the Mediter-anean would not allow separate uns by azon bombs! In the ETO, ,000 were used; in the Far East, here they received acclaim, they O'd twenty-seven bridges in Burma hat had defied free-fall strikes; in orea, the tarzon was knocking out ridges in one sortie. Experimental?

The Germans did heavy damage t Salerno, even to the point of neu-ralizing naval gunfire support, and ater in the Bay of Biscay, leading ne Office of Scientific Research nd Development to major programs.

In re power generation, there is n apples-oranges problem with ermany vs. Vietnam. In the former, ams could be hit without political onstraints. In any event, the bulk German power output came from al generating plants—relatively mpact and conspicuous targets.

Inasmuch as smart weapons by ur definition were evident in e arsenal before Vietnam, one ght ask why these systems were elved or held back, leading to an penditure of pilot bravery in lieu technological advantage?

Roger A. Beaumont
Associate Professor
Department of History
Texas A&M University
College Station, Tex.

u quite correctly observe that nart bombs with electro-optical or laser guidance were not available until the latter years of the Vietnam War"; however, this situation was not due to either their nondevelopment or lack of success during WW II. On the American side the GB-1, GB-4, GB-6, Pelican, and Bat bombs were developed using either mechanical preset, radio, TV, or radar guidance. The most successful bomb apparently was the VB-1 or azon glide bomb, used with noteworthy success by the 7th Bombardment Group in Burma against such difficult targets as bridges.

If smart-bomb development on the American side generally suffered because of the success of the manned bomber in the European Theater, this same situation provided just the opposite impetus to the Germans. The German Fritz-X and Hs-293A were both three-point guidance or line-of-sight radio-controlled systems that were employed with anything but "indifferent" success. The Fritz-X's notable achievement was the sinking of the Italian battleship *Roma* in September 1943, and the Hs-293 was credited with 400,000 tons of Allied shipping sunk mainly in the Bay of Biscay. The Hs-293B was wire guided, and the D and H models, neither of which saw any combat, were TV guided.

German employment of smart bombs suffered primarily because of the general decline of the Luftwaffe as a creditable fighting force after 1943. US employment and development, always an on-again, off-again affair, suffered, as Dr. Beaumont correctly stated, primarily because success was measured in terms of tonnage—but to give credit to General Eaker and all the brave airmen of the fighting Eighth—this tonnage brought the enemy to his knees. Therefore, the precision of the smart bomb was not required. Additionally, the Allied bomber offensive of WW II had not only as its aim to destroy the enemies' capacity and will to wage war but (own opinion) the secondary and no less important aim to punish. It achieved both without question.

Vietnam taught us the limits of "tonnage" and the gravity bomb, and gave us the needed appreciation for precision delivery systems and weapons. The smart bomb of WW II was reborn—better than its predecessors without doubt, but not something new. The smart bomb has been available to us for a long time, but we weren't quite ready for it until after Thud Ridge.

I thoroughly enjoy reading your professional and stimulating articles and make this contribution only for the sake of historical accuracy.

Lt. Col. W. W. Samuel
Wright-Patterson AFB, Ohio

The article serves to reiterate in an effective manner, confirmed by an erstwhile enemy, how the combined British and United States Air Forces played the dominant role in the destruction of German industry, the Luftwaffe, and the will of the German populace to continue the conflict. It thereby helps to satisfy the renewed interest in the employment of airpower in World War II.

In most respects, the article is a corollary of my article, "Metamorphosis of the Fighter," in the October 1975 AIR FORCE Magazine. The two articles should be read in conjunction.

However, General Eaker does disclose, by inference, who was responsible for the lack of long-range fighters in the initial stage of the combined bomber offensive of 1943 that was shortly delayed due to intolerable losses of bombers and crews as a result of the absence of long-range fighters in the operation.

From the standpoint of a fighter pilot and commander, it is felt that the effect of the deficiency in fighters and the stellar role the long-range fighter played by preventing the devastating casualties once it entered the offensive should have been more emphasized. The long-range fighter, procured by crash programs, was essential to the resumption of the offensive.

Brig. Gen. Ross G. Hoyt,
USAF (Ret.)
Washington, D. C.

Rapid Rise to Marshal

Your 1977 edition of the Soviet Aerospace Almanac is excellent, as always.

Concerning Harriet Fast Scott's articles, "The Soviet High Command" and the "Organization of Soviet Aerospace Forces," the

Airmail

reader should be aware of recent developments vis-à-vis the relative positions of Marshal N. V. Ogarkov, Chief of the General Staff of the Armed Forces, and Marshal V. G. Kulikov, Commander in Chief of Warsaw Pact Forces. There is a growing perception here, reinforced by personal observations, that practical and personal factors may be taking precedence over organizational and traditional considerations to make Marshal Ogarkov the first among equals among the first deputy ministers of defense.

An early indication of Marshal Ogarkov's relative stature was his promotion to Marshal of the Soviet Union—accurately predicted in advance by this office—within six days after assuming his new position and simultaneous with the promotion of Kulikov to the same rank. Thus, Ogarkov became a Marshal after less than a week as Chief of the General Staff, whereas Kulikov had occupied the position for over five years without receiving that promotion.

Some other indications of Ogarkov's primacy vis-à-vis Kulikov include the emergence of a new standard protocol listing which has without fail since January listed Ogarkov before Kulikov in obituaries and in newspaper accounts of ceremonial occasions such as airport send-offs for visiting dignitaries, and Ogarkov's position ahead of Kulikov in the lineup of the Military High Command atop Lenin's tomb during the recent May Day parade.

In all these cases, Kulikov's predecessor as CINC of the Warsaw Pact, Marshal I. I. Yakubovskiy, had previously been accorded precedence over the Chief of the General Staff, then General of the Army Kulikov. Moreover, Yakubovskiy had enjoyed similar primacy vis-à-vis Kulikov's predecessor, Marshal M. V. Zakharov. Marshal Ogarkov's rise may well reflect his having close personal ties with Defense Minister Marshal D. F. Ustinov, which may have been forged during their mutual involvement in SALT matters since the late 1960s.

Lest anyone misread these comments as a substantial downgrading of Marshal Kulikov, I would hasten to add "not so." The Warsaw Pact Forces are now blessed with a relatively young (by Soviet standards), energetic, dynamic commander who can be expected to bring about further enhancement of those forces' readiness posture.

All and all, the Soviet political leaders can look forward to effective leadership and continuity in these two key posts for several years into the future, with the luxury also of having at least two strong, experienced officers to consider as prime candidates eventually to succeed MSU Ustinov as Minister of Defense.

Brig. Gen. James W. Wold, USAF
Defense and Air Attaché
Embassy of the United States of America
Moscow, USSR

• *The developments outlined by General Wold took place after Harriet Scott had prepared her article. We appreciate General Wold's making them known to* AIR FORCE *Magazine.*—THE EDITORS

MX Deterrent

Your April article, "Safeguarding Space," by Edgar Ulsamer, reported former Air Force Secretary Reed's view that "MX will enhance the Triad's ability to deter by holding at risk the Soviets' residual ICBM force after a first strike against the US." Let's see how that would work, assuming both sides have not gone mobile. (If they have, obviously this strategy won't work at all.)

First, the Soviets ding our ICBM fields, destroying some silos but leaving some intact. We then launch our surviving force against their reserve ICBMs. Seeing our MXs on the way, and aware of the very high countersilo lethality of MX, the Soviets will know they have less than half an hour in which to choose to use their reserve ICBMs or lose them. Unless they are saints or fools, they will choose to use them. Thus, an MX countersilo second strike will eliminate the Soviet reserve ICBM force by bringing it down on our population and industry.

Clever.

Robert Sherman
Military Affairs Assistant to Rep. Bob Carr
Washington, D. C.

• *Mr. Sherman's reasoning typifies the thinking of those who favo a minimum assured destruction pos ture. His case is predicated on tw assumptions that are less than credi ble and one cardinal oversigh First, he assumes that Soviet re strike policy is confined to "cit busting," which it is not. Second, h presupposes Soviet willingness t forego reserve forces capable o dealing with remaining high-valu targets in the US. And, third, h makes no allowance for the remain ing US deterrence capability resid ing in the SLBM and strategic bomb er forces. Mr. Sherman's projecte force drawdown—by default—ce ments the case for MX: its presenc will deter the Soviets from attackin in the first place.*—The EDITORS

Commander of 1924 Flight

I noted in the April issue ["Aero space World," p. 24] the presenta tion to Mrs. Lowell Smith of a scro honoring her late husband, th commander of the 1924 Round-the World Flight.

Lowell was my squadron com mander, 19th Pursuit Squadron, i Hawaii in 1927–28. He succeede Claire Chennault, who returned t the mainland in late 1926.

You err slightly as to his tour a Davis-Monthan. I succeeded him a base commander in November 194 when he was transferred to th Caribbean Command. He was o leave in Tucson in 1945 from dut in Panama, and met his death whil riding horseback in the desert wit some friends.

I am very pleased to note th additional recognition to a gre airman!

Brig. Gen. Clyde K. Ric USAF (Ret.)
APO New York

Countering News Bias

In the March issue "Airmail" c umn, a letter from Ralph Wats discussed a film produced by t American Security Council Edu tion Foundation entitled "The Pri of Peace and Freedom." This f is available free for showing individual TV stations, and is s to present an authoritative a

We suggest that readers keep their letter a maximum of 500 words. The Editors re the right to excerpt or condense as require the interests of space or good taste. N will be withheld on request, but unsi letters are not acceptable.

Five Ways to Outwit Budget Cutters in Airport Communications.

First, let's talk about cutting budgets for transmitters, receivers, transceivers, amplifiers, and direction finder systems. We'll concede, our illustrator's solution isn't the answer, but Motorola's VHF/UHF communications equipment can stretch tight budgets five ways.

1 - Reduces spares. Motorola's high module commonality throughout the entire VHF/UHF line means fewer spares are required. And that means you save money.

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3 - Cuts maintenance. Every piece of equipment has built-in self-monitoring and self-test available so a technician who can understand a manual and set a dial can check out this equipment in about ten minutes, or isolate a fault and get a unit back on the air in less than 15 minutes. There goes the need for in-depth backup, particularly with a minimum MTBF on the whole radio line of 8600 hours. And, the need for a big hunk of the budget.

4 - Saves space. Sometimes the biggest part of the problem is understanding the problem. We know how tight airport communications quarters can be and we have designed our equipment with low height profiles so more of it can be put in limited spaces. And, you won't have to worry about operating problems caused by the proximity of many antennas due to our excellent collocation characteristics.

5 - Lowers life-cycle costs. What all this adds up to is incredibly low life-cycle costs. And during the extended life cycle of Motorola equipment you will have enjoyed the outstanding performance of low noise high dynamic range receivers and the ability to punch your message through even under adverse conditions. And, all the radios are compatible with secure voice modems.

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So if you're worried about how to make ends meet, write to Jim Prebe at Motorola's Government Electronics Division, P.O. Box 2606, Scottsdale, AZ 85252, or call 602/949-3274. Outside the U.S.A. write Motorola, P.O. Box 8, Geneva, Switzerland.

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sys·tem (sĭs'təm) *n.* **1.** A group of interacting, interrelated, or interdependent elements forming or regarded as forming a collective entity. **2.** A functionally related group of elements, as: **a.** The human body regarded as a functional physiological unit. **b.** A group of physiologically complementary organs or parts. **c.** A group of interacting mechanical or electrical components. **d.** A network of structures and channels, as for communications, travel, or distribution. **3.** A structurally or anatomically related group of elements or parts. **4.** A set of interrelated

the dictionary defines it...
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- **Defensive Avionics System for the B-1 Strategic Bomber**—Counters missile control radar and negates enemy air defense systems.
- **Airborne Radar**—The AN/APS-503 surveillance radar system installed in the CH-124 helicopter and the F-27 aircraft for maritime patrol and search and rescue.
- **Missile Warning Systems**—The AN/ALQ-154, a tail warning radar system now under development for the B-52 and F-15 aircraft.
- **Electronic Reconnaissance Systems**—SIGINT systems for the U.S. Air Force and the U.S. Navy.
- **Microwave Landing Systems**—The Microwave Scanning Beam Landing System (MSBLS) for NASA s Space Shuttle and C-SCAN (AN/SPN-41 and AN/ARA-63)—an operational microwave scanning beam landing system used on Navy carriers.
- **Air Traffic Control**—Secondary Surveillance Radar (SSR) Processing and Display systems have been developed for military and civilian use. Over 400 have been delivered to eight countries.

For our definition of Electronic Systems, contact J.W. Kearney, Vice President, Plans and Business Development. Telephone 516-595-3250.

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Airmail

realistic view of the nature of the Soviet military threat today, a view somehow carefully avoided by TV networks.

We who are concerned and frustrated by the bias of TV networks can probably best counter that bias by working closely with local stations, making our views known as well as providing support where appropriate. Most of them, I believe, would be happy to obtain and schedule a film such as the above if they knew of its existence and our interest. For example, the first local station I contacted (Huntsville's WHNT-TV Channel 19) graciously scheduled a showing in prime time during the evening.

I would urge readers of AIR FORCE Magazine everywhere to contact their local TV stations to arrange procurement and showing of "The Price of Peace and Freedom." If one station does not cooperate, try another. Then, when the film is scheduled, use every means to spread the word in the listening area.

Lt. Col. James Brewer, USAF (Ret.)
Grant, Ala.

First AAF Casualty

Please refer to your item on Whiteman AFB, Mo., appearing on page 54 of the May 1977 AIR FORCE Magazine, which refers to 2d Lt. George A. Whiteman as "the first AAF casualty" of WW II. He was probably the first "shot down" in WW II, but Capt. Robert M. Losey, AAF, as air attaché to Norway, was the first fatality, struck by bomb fragments in April 1940 while observing German dive-bomber attacks on Norway. Losey was escorting the family of the US ambassador to Finland during evacuation to the US via Sweden and Norway, the more direct routes having earlier been cut off by German offensives.

Clarification could be made in many number of ways. Both events were during WW II; both before the US declaration of war; both men were rated pilots on active duty. Captain Losey, however, has the big edge on being "first casualty."

Maj. Gen. Howard G. Bunker, USAF (Ret.)
Bradenton, Fla.

Insignia Placement

Your 1977 Air Force Almanac has once again proved to be a valuable reference on today's outlook of the United States Air Force and its ever-changing facade.

But as a junior officer who has been corrected several times on the dress code outlined in AFR 35–10, I must bring to your attention that a number of Commanders and Senior Enlisted Advisors of the various major commands and separate operating agencies have overlooked the section of that regulation concerning proper placement of the US insignia on the uniform lapel. As I recall, the insignia should be centered and touching—but not overlapping—the lapel crease. Picayune people may notice over a dozen errors in the photos, some of which may be illusionary but others are quite blatant.

Perhaps prior to stressing AFR 35–10 to their subordinates, the leaders should take heed themselves.

Capt. William R. Revett
Bergstrom AFB, Tex.

UNIT REUNIONS

FACs

The 6th annual FAC Association reunion will be held in San Antonio, Tex., September 9–11. All FACs, past and present, and anyone associated with FACs, are invited. Contact

Capt. Pat McCullough
129 High Oak
Universal City, Tex. 78148
or
Capt. Dave Himes
8338 Athenian Way
Universal City, Tex. 78148

Flying Sergeants

The Flying Sergeants, Class 42-G, are holding their 35th reunion at Frontier Hotel, Las Vegas, Nev., August 5–7. Contact

Russ Shaw
6094 Moon Place
Mira Loma, Calif. 91752

Nam POWs

The ex-POWs from Vietnam are having their 2d reunion at the Hilton Palacio del Rio, San Antonio, Tex., August 12–14. Contact

Maj. Lee Ellis
Box 3046
Randolph AFB, Tex. 78140
Phone: (512) 656-4606
Autovon 487-3119

4th Fighter Squadron

Due to a transposition of figures in the May issue announcement of the 4th Fighter Squadron's August 6 reunion in Milwaukee, Wis., the contact's address was in error. The correct address is

Toni Kalenic
3606 N. 84th St.
Milwaukee, Wis. 53222
Phone: (414) 461-5285

47-C "Guinea Pigs"

The annual reunion of the USAF's first pilot class, 47-C, will be held in Guatemala October 6–11. All "Guinea Pigs" are to contact

Bob Campion
Box 88
Richardson, Tex. 75080

Class 68-B

The 10-year reunion of Pilot Training Class 68-B from Webb AFB, Tex., will be held at the Air Force Academy, Colo., September 23–25. Information from

Capt. Ed Petersen
Qtrs. 4406A
USAF Academy, Colo. 80840
Phone: (303) 472-1520
Autovon 259-2776

314th Troop Carrier Group

The 314th Troop Carrier Group, 61st Squadron, will be held September 16–18, at the Biltmore Towers Hotel, 210 N. Main St., Dayton, Ohio. Contact

George C. Merz
4035 Silver Oak St.
Dayton, Ohio 45424
Phone: (I-513) 236-1678

452d Air Refueling Wing

A reunion of the 452d Air Refueling Wing (AFRES) and preceding units, including the 452d Tac Recon, Tac Bomb, and Troop Carrier (M) Wings, Long Beach, Calif., Municipal AP; the 452d Military Airlift Wing, March AFB, Calif.; and 452d Tac Airlift Wing, Hamilton AFB, Calif., will be held at March AFB, September 10–11. Contact

Maj. Al Dietrich
or
David J. Heffernan
452d Air Refueling Wing (AFRES)
March AFB, Calif. 92518
Phone: (714) 655-4520 (Dietrich)
655-2190 (Heffernan)

494th Bomb Group

A reunion of the 494th Bomb Group, 7th Air Force, known as "Kelly's Cobras," will be held at the Antlers Plaza Hotel, Colorado Springs, Colo., September 9–11. Get in touch with

Richard W. Graham
90 Purdue
Pueblo, Colo. 81005
Phone: (303) 561-4400

507th Fighter Group

The 10th reunion of the 507th Fighter Group (WW II) will be held at Fort Worth Hilton Inn, Fort Worth, Tex., September 2–5. Contact

Clyde J. Whaley
3729 Wren Ave.
Fort Worth, Tex. 76133

Airpower in the News

By Claude Witze, SENIOR EDITOR

Technology Comes Out First

Washington, D. C., July 5

On national defense issues, there is no better informed man in the US Congress than Rep. George Mahon, Chairman of the Committee on Appropriations and Chairman of its Subcommittee on Defense. The Texan has been appropriations chairman since 1964, and no one can recollect when his information, if not always his opinion, was at fault. Not long after noon on June 28, Mr. Mahon launched the House of Representatives on a long debate over the Pentagon's appropriation bill for Fiscal 1978. One of the first things he told the House was that the bill included $1.9 billion for further work on the USAF B-1 bomber and procurement of five airplanes. Rep. Clifford R. Allen of Tennessee interrupted, and the *Congressional Record* reports the following exchange on the floor:

MR. ALLEN: Mr. Chairman, will the gentleman yield for a brief question?

MR. MAHON: I yield to the gentleman from Tennessee for a question.

MR. ALLEN: Can the chairman advise me as to whether or not the President and his military advisors advocate this appropriation for the construction of five B-1 bombers?

MR. MAHON: The Joint Chiefs of Staff and former Presidents have recommended the B-1 bomber. President Ford recommended that we go forward with a program for eight B-1 bombers. President Carter recommended, with reservations, that we go forward with five. President Carter indicated that at some time this month he would make a decision as to his further recommendation with respect to whether or not the program should be altered. I personally believe that President Carter will favor a continuation of the B-1 program. In what context and to what degree and under what circumstances, I do not know. Therefore, I am not prepared to speak for him. However, certainly, in the very near future, he will give his own views as to whether or not the program should be changed. I do not know what the decision of the President will be, but under the Constitution it is the responsibility of the Congress to provide for the national defense, for the armed forces; and I think that we should exercise our own views with respect to that matter, and I hope the President wil be cooperative in that regard. Have I answered the gentleman's question?

MR. ALLEN: Yes.

Mr. Mahon, for all his prestige and seniority in a Democratic Congress, may not have been prepared to speak for the President, but a number of other persons had given an opinion. President Carter halted production plans for the B-1 only hours after Mr. Mahon's reply to Mr. Allen. Earlier, Sen. Barry Goldwater had emerged from a White House meeting to announce that Mr. Carter "is becoming convinced we can't live without the B-1." Two liberal Democrats were given the same impression. Rep. Robert F. Drinan spent forty minutes with the President and concluded, "I think the President is leaning very definitely toward building [the B-1]." Congressman Ronald V. Dellums, who accompanied Mr. Drinan, agreed with the prospect. The day before the decision was announced, Sen. Jennings Randolph, a veteran Democratic legislator, emerged from breakfast with Mr. Carter and voiced the impression that the B-1 would be produced and in larger numbers than generally anticipated.

On the morning the decision was announced, the Washington *Post* declared on page one that there was increasing speculation that the President would "reverse a campaign promise and approve at least limited production of the controversial and costly aircraft." This appeared to be based on an interview with Charles Kirbo, a confidante of Mr. Carter's in Atlanta. Mr. Kirbo said opposition to the project expressed by Candidate Carter would not control the decision by President Carter. He told the *Post* he thought he knew what the decision would be, and "defense policy is one area where it is possible to make adjustments from campaign promises." The newspaper also detected hints from Defense Secretary Harold Brown and anti-B-1 White House aides. The *Post* called Mr. Brown a known advocate of the B-1 the day before the Secretary said he had recommended no production. The White House people were quoted as "feeling something bad is coming."

Any observer who subscribes to conspiracy theories or suspects Mr. Carter of Machiavellianism co

Does cancellation of the B-1, with attendant loss of future strategic flexibility, signal the start of a basic shift in US strategic doctrine?

reasonably deduce that the White House had deliberately misled a large number of people. Yet, the stunned public, Congress, military, industry, and press contingents made no such suggestion when the President said he was opposed to B-1 production, citing the high cost of the system and the high promise of cruise missile technology at this point. Just hours after the announcement, the House approved a $110.1 billion defense appropriation bill, with $1.9 billion earmarked for the B-1. The vote was 333 to 54. Even foes of the B-1 in the House were displeased with the President's timing. Happy with the deci-

The Wayward Press

For this hot month, there are a couple of items in our file of unfinished business that call for attention.

Back in June, we reported, with some alarm, that Rep. Mo Udall, the liberal Arizona Democrat, was upset by the growing concentration of American newspapers into the hands of about twenty-five chain owners. Mr. Udall was so upset, in fact, that he introduced a bill in Congress that called newspapering a basic industry and beseeched the federal government to examine its performance. The newspapers that might be involved responded in horror, denying that they could be tempted by the possible abuses of monopoly position and inviting the congressman to examine the tax laws closely if he wanted to know what force is molding the pattern of publishing today.

Now comes Kevin Phillips, a lawyer, columnist, and student of the media, to argue that "the mushrooming economic growth of mass media corporations creates a new legal context in which they should be—and are beginning to be—considered as possible antitrust targets." He puts up a persuasive case for this approach in an article titled "Busting the Media Trusts" in the July issue of *Harper's*. It is recommended reading.

This may be what Mr. Udall had in mind, although we can find no record that he ever said so. His professed interest in the "efficiency, innovation, social impact, price, and profit" of newspapers sounds more like another effort to strain government controls and meddle in another area of consumer affairs than it does like a legitimate plea to subdue a monster loose in our society. Mr. Phillips, on the other hand, says flatly that "the media" is not a moral and intellectual enterprise, but a rich and powerful industry. He cites John Connally's view that the major press conglomerates are "massive business empires built by entrepreneurs under the shelter of our free-enterprise system." His dire warning:

"In today's context, we can postulate that if the communications business threatens to engulf the values, culture, and careers of voters and politicians, it will force the state to engulf the communications business. That messy prospect is not going to occur next year, but the angry questions already have begun to be asked."

Mr. Phillips can point to the first steps that already have been taken by such institutions as the courts and the Securities and Exchange Commission.

If his essay can be faulted at all, and it is a powerful one, it would be because he fails to more vehemently chastise the press moguls for not keeping their house in order. There is a footnote to the effect that "most big media conglomerates have little interest in self-policing or self-limitation," but no scolding. The Phillips article also ignores the role of our tax laws in creating this situation, and the pressures created by modern newspaper technology.

His conclusion is worth quoting:

"Media spokesmen who pooh-pooh the growing demand for increased competition and structural changes might do well to consider the more troublesome alternatives that could involve if the concerns of citizens and political officeholders go unmet. For all their power, the major media are a bit like a long, smug wagon train passing through Indian territory."

When the Indians attack, the First Amendment may not suffice to defend the pioneers.

Another assault on the mores of the US press has been launched in Washington by Rep. David R. Obey, a Democrat from Wisconsin. He is chairman of the House Commission on Administrative Review and is credited with authorship of the new House code of ethics. Mr. Obey was irked late last year when a television commentator—identified by the Washington *Star* as Roger Mudd of CBS—was critical of some of the freebies enjoyed by members of Congress.

"Members have their own dining rooms," Mr. Mudd pontificated, "which operate at a deficit because prices are low . . . members have their own beauty and barber shops . . . each member gets five [free] parking spaces. . . ."

Mr. Obey thinks it would have been fair for Mr. Mudd to have told his TV audience that he, also, is allowed to eat at special dining rooms on Capitol Hill, have his hair cut at the Capitol barber shops—if they could do it to the satisfaction of coiffure-conscious news-show stars—and that he, also, has a free parking space. Mr. Mudd did not mention these things. Mr. Obey responded that the House restaurants and cafeterias make money and do not lose it, that a haircut costs a reasonable $3, and that it costs the US taxpayers about a million dollars a year to provide freebies for the press, which includes Mr. Mudd. The bills include:

- $592,517 for twenty-four employees to service the press galleries.
- $23,000 for 180 free telephones, installed for the press.
- Reserved parking spaces in choice locations for 181 press corps autos. Downtown they would cost $130,000.
- Desks, chairs, typewriters, and office equipment worth $40,000.
- Exclusive press tables in the dining rooms.
- Free stationery with the congressional letterhead.

In addition, a Capitol Hill press card gives the reporter or TV commentator access to the congressional office-supply stores, where typewriters, cameras, and other expensive items can be purchased at cut rates.

The typewriters, of course, can be used to write stories about the benefits granted to Congress, or even to point with horror at the military system of establishing PX stores at major bases around the world.

After objecting to cheap-shot journalism and the exercise of a double standard, Mr. Obey said his commission is about to review this outlay. He has not decided whether to seek the establishment of a fee system that would make the press pay its own way. He is trying to find a legal way to force reporters and news organizations to file financial disclosure statements, showing any outside interests that might conflict with impartial reporting.

"Doesn't the public have a right to know if a science writer has large holdings in drug company stocks?" he asks.

There is talk in newspaper trade publications about the press imposing its own code of ethics, but there is resistance to one with teeth in it and the abuses continue. The same TV networks that are aghast if a government contractor takes a procurement official to a ball game have just spent $225,000 entertaining television reporters from newspapers and magazines in a thirteen-day bash on the West Coast. It sounds far more lavish than the outlay of goodies for the press at a superbowl game.

Physician, heal thyself.

—CLAUDE WITZE

Airpower in the News

sion, they still felt it should have been known earlier, before the June 28 vote on an effort to strike funding for B-1 production from the defense budget. There was a heated debate on the House floor, barely forty-eight hours before the stunning word from the White House, and the B-1 opponents lost the test, 243 to 178.

It remained for Secretary Brown, the "known advocate" of the B-1, to detail the reasoning involved in the negative decision. At a Pentagon press conference, he affirmed his confidence in manned bombers but put stress, for the first time, on the complex problem that will be created for Russian defense by perfection of the cruise missile. It was reminiscent, to veteran reporters, of the reply given years ago by Gen. Thomas D. White, when he was USAF Chief of Staff, to the congressman who asked him why he favored development of the short-lived B-70 bomber. "Because," the General said, "it will cost the Russians four times what it costs us."

The key Brown statement was:

"I concluded that on the basis of new design features resulting from progress in cruise missile technology and in the light of proven test results, the assurance of successful operation of the cruise missile against future Soviet defenses is now very high. I further concluded that on balance, although either the B-1 or the combination of cruise missiles with B-52s or other aircraft would be effective, the cruise missile options offer more certainty of high effectiveness.

"Each aircraft can launch many missiles, with great accuracy, at different targets in the Soviet Union, from a distance of many hundreds of miles. Each produces many small targets for Soviet air defenses to contend with. To the extent B-1s would have provided additional warhead-carrying capacity to the force, that can come instead from new cruise missile launchers in addition to the B-52s.

"The decision thus was not simply to do without a single weapon system. Rather, it was a choice between two modern weapon systems, and a decision to proceed with the more effective one. Moreover, the cruise missile option is less expensive . . . [and] will provide more certainty for our defense."

Under questioning, Mr. Brown indicated that the B-1 might have survived if it had been thirty percent less expensive. Even so, the cruise missile, he said, would have given it a close race on the basis of its revolutionary technology. He said it can fly "very low"—following the contour of the earth at treetop level—and find its way to the target with great accuracy. The Secretary said the basic question came down to, "Why spend $100 million on a launch vehicle?" and "The situation was much more governed by the characteristics of the weapon than it was by the characteristics of the weapon launcher."

Mr. Brown was pressed, of course, on the cruise missile as a subject for negotiation in the SALT talks with Russia. He was firm. No US position taken in the SALT talks can be allowed to interfere with our decision to incorporate cruise missiles in the strategic arsenal.

There is more fascinating debate ahead. Some military experts will contend that the shift of emphasis to cruise missiles will weaken the bomber leg of the Triad. ICBMs, whether land- or sea-launched, lack the flexibility of a manned system. Bombers, armed with standoff weapons, appear to many as a complement to the ballistic missile, not an equal part of the concept prevailing for the past fifteen years. It will be argued that the Carter decision marks a basic shift in strategic doctrine.

An interesting, possibly ironic, sidelight to the situation came out of Mr. Mahon's House Appropriations Committee. The amendment proposing to delete all funds for the B-1, which lost on the House Floor, was proposed by Rep. Joseph P. Addabbo of New York. He is a member of Mr. Mahon's committee and filed separate and dissenting views when the report was compiled for the House. In his essay, Mr. Addabbo also demanded that funding for the ALCM be dropped, arguing that it duplicates the Navy's Tomahawk effort. The committee as a whole did not agree. It supports a cruise missile for USAF as well as the Navy, but cut the requested funding in half from $40.6 million to $20.3 million.

Out of all this, there should be a lesson for some hypersensitive people who see a lobbyist under every desk. When the Addabbo amendment was defeated, Rep. Robert Carr of Michigan appeared at once on the television tubes chanting about the evil pressures brought to bear by the military-industrial complex, which did not prevail. So far as the anti-B-1 lobby is concerned, it can rejoice in a decision that was not influenced one whit, by its performance either. On June 20, there was a picket line in front of the White House, and Terry Provance of the National Campaign to Stop the B-1 Bomber was happy to see some of his followers hauled off to jail for conducting a sitdown in one of the driveways. The show was virtually ignored by the press, and the White House would not admit that President Carter even knew it took place. Secretary Brown emphasized that lobbying and demonstrations were not considerations in making a security decision.

From the standpoint of influence, probably the most important effort from outside the White House, if any outside effort was important, was a four-page letter sent to President Carter on June 23 by Sen. Robert C. Byrd of West Virginia, the majority leader. Mr. Byrd said he was alarmed "about the danger of putting so many eggs in one basket." He pleaded for more money for the Navy and in support of NATO. His conclusion was:

"With the B-1 we are being asked to gamble a massive amount of public funds—tens of billions of dollars—on the B-1's being effective (and invulnerable) through the 1990s. The investment is simply too great to take that gamble."

Nevertheless, a few days later, the Senate Committee on Appropriations, chaired by John L. McClellan, recommended a Fiscal 1978 defense budget of $111.1 billion, including $1.4 billion for the B-1.

Before the dust had settled from the White House B-1 surprise, Congress plunged into a second wrangle upon discovery that the Fiscal 1978 budget includes funding for development of an enhanced radiation bomb. It is another dispute that should center on technological issues, not emotional ones.

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Aerospace World News, Views & Comments

By William P. Schlitz, ASSISTANT MANAGING EDITOR

Washington, D. C., July 6

★ To align the Department of the Air Force with the previously reported changes in the upper echelon of the Defense Department, Air Force Secretary John Stetson in mid-May announced that he would not fill the vacant post of Assistant Secretary of the Air Force for Installations and Logistics, pending a determination by the Secretary of Defense "on possible legislation to reduce the statutory authorization for Assistant Secretaries." (*See also "The Bulletin Board," p. 68.*)

Further to this end, the functions of the abolished post have been reassigned, with the responsibilities for Programs, Acquisitions, and Logistics being delegated to the newly designated Assistant Secretary of the Air Force for Research, Development, and Logistics (previously Research and Development).

Matters relating to installations and environmental quality have been reassigned to another combined entity, the Assistant Secretary of the Air Force for Manpower, Reserve Affairs, and Installations (previously Manpower and Reserve Affairs).

★ USAF and NASA are embarked on a joint undertaking that has potential for an enormous saving in aviation fuel.

Under direction of the Air Force Flight Dynamics Lab, Wright-Patterson AFB, Ohio, the program calls for the design, fabrication, installation, and flight test of a pair of "winglets" aboard a KC-135.

According to officials, the winglets, which will be attached to the wingtips of the KC-135, can reduce aircraft drag during cruise by about eight percent. This translates into annual fuel savings for the KC-135 fleet of about 45,000,000 gallons (based on 1975 use).

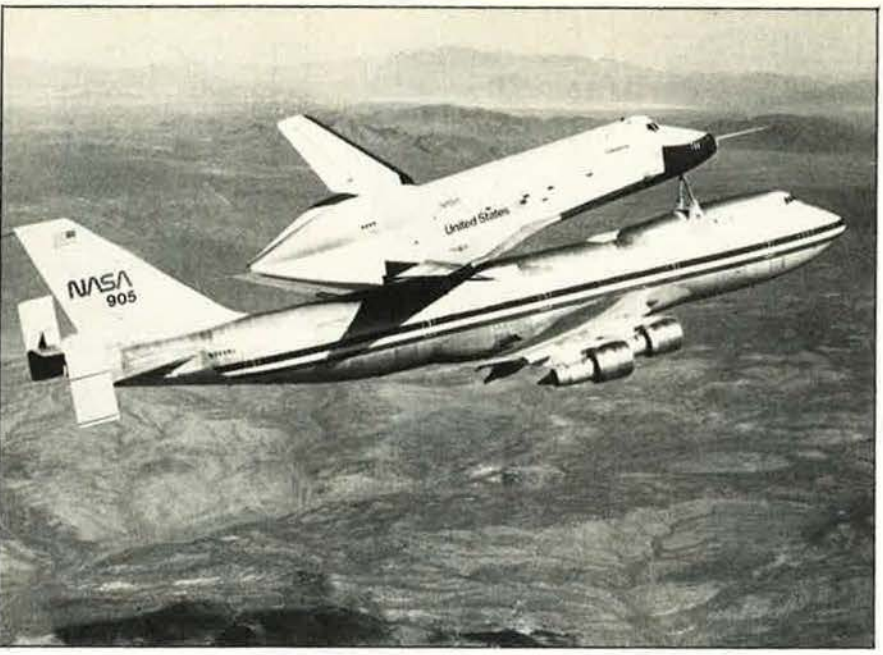
"Unlike end plates, which have been suggested for a number of years, winglets are designed with the same careful attention to airfoil shape and local flow conditions as would be utilized in the design of the wing itself," USAF said.

The winglets will be fully instrumented, as will the aircraft, and will be capable of changing both incidence angle (around the vertical axis) and cant angle (from the vertical plane) so that a data base will be built up for possible use by other transport-type aircraft.

Wind-tunnel tests have shown that the winglets also improve climb, range, and offload performance and make possible a higher average cruise altitude.

Flight testing of the retrofitted KC-135 is to begin in the autumn of 1978 and conclude early the following year. According to studies, modification of a KC-135 should pay for itself within two years of operation.

An artist's rendition of a "winglet"-equipped KC-135 tanker. An aircraft thus modified is scheduled for test flights in 1978.



A captive flight of Space Shuttle "Enterprise" aboard a NASA 747 over the Mojave Desert in Southern California. A series of manned Orbiter flights begun in June is to be followed by release and glide-to-landing tests as the next phase in preparing for the first orbital mission in 1979.

★ The 49th Tactical Fighter Wing, Holloman AFB, N. M., will begin replacing its F-4D Phantoms with F-15 Eagles in October.

Thus, the 49th will become the third operational unit to be F-15-equipped—following the lead of the 1st Tactical Fighter Wing, Langley AFB, Va., and the 36th TFW, Bitburg AB, Germany, which recently transitioned to the F-15. (Pilots from the 49th are to begin F-15 training this summer at Luke AFB, Ariz., where a training wing is located.)

According to officials, the 49th's Phantoms will be reassigned to other TAC units and to the Reserve forces.

The first of several F-15s has already arrived at Holloman, to be used in training maintenance technicians, TAC said.

· Alarming word has cropped up on both sides of the Atlantic concerning the high rate of accidents involving the Harrier V/STOL aircraft.

According to the *Manchester Guardian Weekly*, at least twenty of the vertical takeoff planes owned by the RAF have crashed since the aircraft went operational. The British purchased 109 of the Hawker Siddeley-built aircraft, with initial deliveries in 1969.

Of the US Marine Corps's force of 110 Harriers (USMC designation AV-8A), twenty-two have crashed for a total loss of sixteen and at a cost of seven lives.

What is most disturbing, however, is the accelerating rate of accidents. In the US case, four crashes have occurred since February and sixteen since 1975. This is counter to the usual experience with new high-performance aircraft, where the accident rate tapers off as pilots become more proficient in it. About half the accidents—both American and British—happened while the aircraft were hovering during takeoff or landing, a time when the aircraft is most vulnerable to pilot errors.

Despite the mishaps, USMC is proceeding with a prototype program aimed at developing a "B" version of the Harrier that would be equipped with a supercritical wing, carry a greater payload, and have greater range (the current AV-8A has a range of only about 360 miles [579 km]—a drawback).

As of now, DoD is expected to make a production decision on the AV-8B early in 1979 concerning the purchase of perhaps as many as 350. The aircraft would be built in the US by McDonnell Douglas under a licensing agreement.

The AV-8A is powered by the Rolls-Royce Pegasus engine, which is being upgraded for the AV-8B. First flight of the AV-8B is scheduled for late in 1978.

Also in development is the Royal Navy's Sea Harrier, set to enter service in 1979.

★ "Dawn Patrol 77," a unique exercise in that it pitted aircraft against ships, was conducted this past spring in the central Mediterranean.

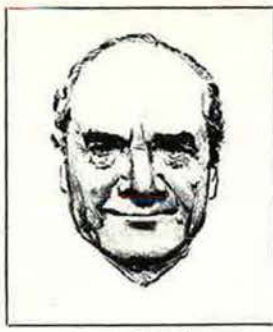
Participating USAFE aircraft included F-4s of the 81st Tactical Fighter Wing, RAF Bentwaters, UK; Phantoms of the 52d TFW, Spangdahlem AB, Germany; RF-4s of the 26th Tactical Reconnaissance Wing,

A "cross-servicing" exercise this past spring witnessed USAF load crew members arming a German F-4F at Ramstein AB, Germany. Their counterparts at GAF's Neuberg AB likewise familiarized themselves with the arming of a USAFE F-4E.

Aerospace World


Beech


Bell


McDonnell


Rogers


Shepard

This year's inductees into the Aviation Hall of Fame. Tribute was to be paid to the five aerospace pioneers during July ceremonies in Dayton, Ohio. See capsule biographies below. Drawings are by Milton Caniff.

Zweibrücken AB, Germany; and F-111s of the 20th TFW, RAF Upper Heyford, UK.

Beside the US units, also represented were Italy, Great Britain, Belgium, Germany, the Netherlands, and Turkey.

According to USAFE officials, "The basic idea of the exercise was to give both navy and air forces realistic training in maritime operations."

A key element of the exercise was a concept dubbed TASMO—for Tactical Air Support of Maritime Operations. TASMO called for the use of land-based forces "for defense of a convoy in a combat environment."

USAFE aircrews took to Dawn Patrol eagerly because they don't get much opportunity to practice missions against surface ships and because simulated combat over large bodies of water is such unusual training.

Attacking modern combat vessels from the air is no piece of cake; they are likely to be armed with very sophisticated radar tracking weapon systems that would make it suicide just to bore in, a la World War II. Attacks, therefore, have to be planned, using various combinations of aircraft and weaponry.

During the exercise, 238 sorties were flown, 169 by F-4s, thirty-four by RF-4s, and thirty-five by F-111s.

★ The Aviation Hall of Fame, Dayton, Ohio, plans enshrinement ceremonies for five aerospace notables on July 23. The tribute schedule will also include participation in the Greater Dayton Air Fair and special ceremonies at the Air Force Museum at nearby Wright-Patterson AFB.

The aviation pioneers to be honored:

• **Walter H. Beech,** 1891–1950, founder of Beech Aircraft Corp., "for his outstanding contribution to aviation by the creation of innovative aircraft of design excellence that served private and business flying in peace, and the nation in war."

• **Lawrence D. Bell,** 1894–1956, an early aviation mechanic who went on to devote his life to the development of military aircraft, helicopters, and special weapons. He is cited for his "contribution to aviation through the development of innovative and unique aircraft that opened new frontiers of flight."

• **James S. McDonnell,** founder of McDonnell Aircraft Corp., which built many WW II aircraft. In 1967, McDonnell Douglas Corp. was formed with Mr. McDonnell as head. The firm produced the DC-9 and DC-10 jetliners and several advanced military jets. Mr. McDonnell is honored for "the advancement of military aircraft design, pioneering work in space technology, and development of commercial aircraft serving human needs around the world."

• **William P. Rogers,** 1879–1935. Following his first flight in 1915, the humorist promoted aviation until his death in the crash of Wiley Post's plane near Point Barrow, Alaska. Will Rogers was cited for his public support of aviation for defense and transportation and his personal example in its use.

• **Rear Adm. Alan B. Shepard, Jr.,** USN (Ret.), is honored "as the first US astronaut to be launched into space [suborbital Freedom-7 in 1961] and, as Apollo-14 Commander, the fifth man to walk on the moon."

★ NASA's recently published "Space Settlements: A Design Study" is billed as "the most comprehensive engineering study of the subject undertaken to date."

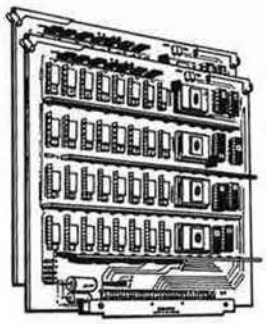
The 185-page volume details construction and operation of permanent settlements in space where up to 10,000 people could work, raise families, and live out their lives.

Published by the space agency's Scientific and Technical Information Office, the futuristic and comprehensive work is based on a ten-week session conducted during the summer of 1975 at which thirty-one engineers, scientists, and students from throughout the country contributed their knowledge and ideas.

The book's eight chapters include such subjects as the physical properties of space, human needs, habitat designs, space manufacturing, agriculture, and settlement locations.

The book's conclusion is that large communities can exist off earth and that the obstacles to them are not technical but rather philosophical, political, and social.

Edited by Richard D. Johnson, Chief of the Biosystems Division, Ames Center, and Professor Charles Holbrow, Department of Physics and Astronomy, Colgate University, the book is for sale by the Superintendent of Documents, US Gove



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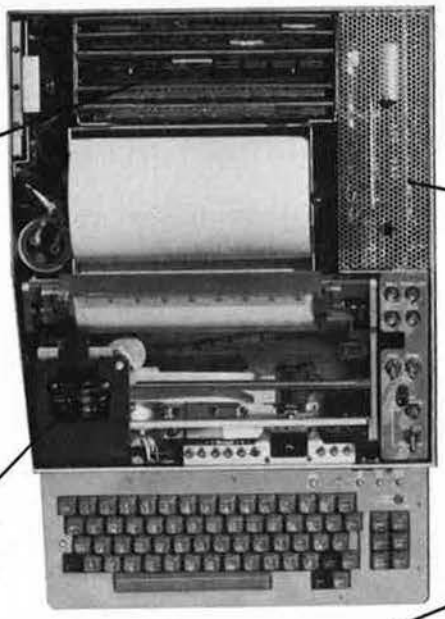

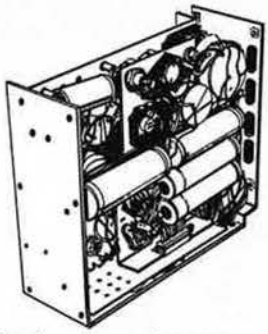

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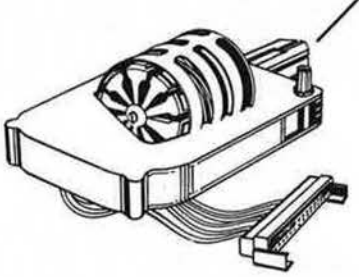

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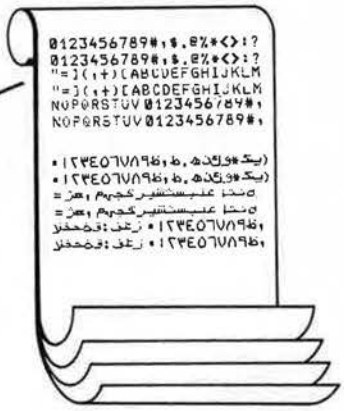

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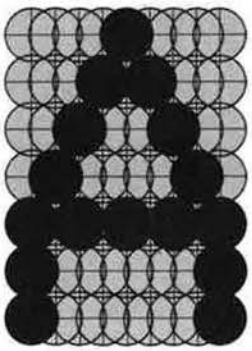

Plot demonstrates how individual pin impacts are used to form the letter "A".

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Aerospace World

Capable of communicating over vast distances is this AN/PSC-1 manpack radio, the subject of recent testing. See item below.

ment Printing Office, Washington, D. C. 20402, for $5. Stock number 033-000-00669-1.

★ A USAF C-5 transport was given an interesting mission in mid-June: airlift a magnet to the Soviet Union. No mean feat, considering that the magnet, the most powerful ever built, and its special transporter weighed in at sixty tons—one of the heaviest loads ever transported by air. The C-5 made the nonstop flight from Chicago in twelve hours.

The magnet, the product of the Energy Research and Development Administration's Argonne National Lab near Chicago, is to be used in a test of the magnetohydrodynamic (MHD) process, a field in which both nations are experimenting.

MHD generators have potential for producing electricity at greater efficiencies than conventional power plants and the Soviet facility on the outskirts of Moscow is the largest in existence.

"Between us," said Dr. William D. Jackson, head of ERDA's MHD program, "we hope to develop a workable MHD system that will be useful to both nations as well as the rest of the world. The improved efficiency of MHD systems could result in substantial savings of fuel . . . and increase the use of our vast reserves of coal."

★ Two new milestones in the ever-improving state of military communications were announced this past spring.

Demonstrated recently during a joint services operational effectiveness test at Shaw AFB, S. C., was a new message processing center developed by AFSC's Electronic Systems Division.

The equipment, part of a joint service program dubbed TACS/TADS (for Tactical Air Control Systems/Tactical Air Defense Systems Interface) will permit the different tactical data systems used by USAF, Navy, Marine Corps, and Army to "talk" directly to each other. "By tying these systems together . . . surveillance information can be immediately exchanged among the military services," a spokesman said.

Also successfully tested was the AN/PSC-1, a twenty-five-pound (11 kg), manpack radio that communicates with others of its kind via satellite or line of sight. "For the first time, highly reliable, interference-free, ultrahigh frequency satellite communications were achieved by militarized manpack radios," an official said of the test.

Battery operated, and designed and built by Cincinnati Electronics Corp. under aegis of the US Army Satellite Communications Agency, the AN/PSC-1 can operate over vast distances. For example, the company said, a soldier in the field in Europe could communicate with the Pentagon, ships, aircraft, ground-receiving stations, or vehicles.

The radio can transmit both digitized voice and digital data bursts (the latter using a hand-held digital message entry device).

★ In late spring, Italy, West Germany, and the United Kingdom ordered a second production batch of the European-developed Tornado fighter. (*See also p. 51.*)

Counting the forty Tornadoes contracted for in June of 1976, firm orders have now been placed for 150 of the aircraft, visualized as "the backbone of NATO's air arm in the 1980s, and a major step forward in NATO standardization."

As of now, the countries involved in the Tornado project (also called the MRCA—Multi-Role Combat Aircraft) plan a total buy of 805 of the aircraft over the next several years.

★ Several upper-echelon changes have taken place at Air Force Systems Command Laboratories at Wright-Patterson AFB, Ohio:

- **George Peterson,** former Director of Air Force Materials Lab (AFML), has been named Deputy Director of Air Force Aeronautical Labs.

Wernher von Braun

A victim of cancer, aerospace giant Dr. Wernher von Braun died in Washington, D. C., on June 16. He was sixty-five. In tribute, NASA officials cited the scientist's enormous contribution to spaceflight. In his name, the National Space Institute has established a fund to promote space activities.

Aerospace World

• **Dr. Frank N. Kelley,** previously AFML Chief Scientist, has been appointed AFML Director.

• **Col. James D. Everett,** former Chief of System Avionics Division, Air Force Avionics Lab (AFAL), has been reassigned as AFAL Director/Commander.

• **Col. George F. Cudahy** has replaced retiring **Col. Albert E. Preyss** as Director/Commander, Air Force Flight Dynamics Lab.

Other important personnel changes also occurred at the Aeronautical Systems Division at Wright-Patterson:

• Replacing retiring **Col. John Paulisick** as ASD Chief of Staff is **Col. James E. Foster,** previously Deputy Program Manager for the Advanced Tanker/Cargo Aircraft.

• Replacing retiring **Col. Virgil W. Munsey** as Deputy System Program Director in the B-1 SPO is **Col. Harold Pluenneke,** formerly Director of Systems Engineering.

• Replacing **Col. James L. McKenna** as Director of the EF-111 SPO is **Col. Elbert E. Harbour,** previously Deputy Director of the Fighter/Attack SPO. Colonel McKenna became Plant Representative at Autonetics in Los Angeles. (*For a rundown on Air Force plans for the EF-111, see p. 54.*)

★ **NEWS NOTES—Maj. Robert O. Heavner,** an Associate Professor at the Air Force Academy, was one of fourteen recently appointed as 1977–78 **White House Fellows.** The fortunate fourteen were chosen from 1,334 applicants.

Gerald D. Griffin, formerly Deputy Director of NASA's Dryden Flight Research Center, Edwards AFB, Calif., has been named **Deputy Director** of the **Kennedy Space Center,** Fla., replacing Miles Ross, who resigned in May.

Hangar 4, the Air Force Museum's restoration and storage facility, Wright-Patterson AFB, Ohio, is now open each Friday for **public tours.** Reservations will be accepted starting at 10:00 a.m. on the Saturday prior to the tour. Call (513) 255-3284.

Frank E. Sorenson
1903–1977

A pioneer in Aerospace Education, Dr. Frank Sorenson died of cancer in Lincoln, Neb., in May. He was seventy-four. Dr. Sorenson was the recipient of twenty aerospace-age education national awards that included the Frank G. Brewer Trophy in 1946, AFA's Hoyt S. Vandenberg Trophy in 1959, the Arnold Air Society Citation of Honor in 1960, and National Aerospace Education Association Hall of Honor 1976. He also was cited for meritorious service to air-age education by former Air Force Chief of Staff Gen. Curtis E. LeMay in 1961, and by the Civil Air Patrol in which he held the rank of colonel.

During 1957–62, Dr. Sorenson served as Chairman of the AFA's Aerospace Education Council. He was a member of the Air Training Command Advisory Board from 1955–61 and NASA Aerospace Education Committee from 1963–68. A professor at the University of Nebraska at Lincoln, Dr. Sorenson actively promoted aerospace education programs. The programs that were cosponsored by the Arnold Air Society and Angel Flight at Lincoln established new educational standards for space seminars. Dr. Sorenson was a charter member of the Link Foundation, established by Edwin Link, inventor of flight simulation. At the time of his death, he was a trustee of the Foundation and Director of Program Development for funded air and space education projects.

Died: the legendary **Sir John Masterman,** Oxford historian who was credited with taking over the **entire German spy network** in Great Britain during World War II and was said to have been the inspiration for "M," James Bond's boss, in London. It is widely believed that Sir John's counterspy efforts duped Hitler into the belief that the Allies' main thrust would come at Calais instead of Normandy. He died on June 6, the thirty-third anniversary of the D-Day landings. He was eighty-six.

Died: Maj. Gen. Lovic P. Hodnette, Jr., recently reassigned from Air Deputy, AF North, Oslo, Norway, to ACS/Ops., SHAPE, Casteau, Belgium, of heart trouble on June 30 at Ramstein AB, Germany. He was fifty.

Died: Dr. Wernher von Braun (*See photo on preceding page*). ■

Index to Advertisers

With more than 600 companies participating and the best pilots and planes in the world displaying their virtuosity, there is something very special about . . .

The Paris Air Show

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

THIS year's Paris Air Show at Le Bourget was the biggest ever. Since this year marked the fiftieth anniversary of Lindbergh's arrival at Le Bourget, his flight was the nominal theme of the event. To that end, there was a replica of the *Spirit of St. Louis* hoisted somewhat forlornly atop a metal pole, and one could see films of Lindbergh's takeoff at Roosevelt Field and his landing at Le Bourget. There was even a French-speaking mannequin Lindbergh, uncharacteristically voluble for that laconic man.

However, the real theme this year was, as always, the showing of aerospace wares. There were more than 600 companies represented, and 125 of them were from the United States, a number exceeded only by the French figure of 225. The British, Germans, Italians, and, surprisingly, the Canadians followed in that order. Canada, as a prospective buyer of 130 or so new fighters, is being romanced by every company with a fighter to sell. The large Canadian exhibit in the British Commonwealth building served, aside from the usual purposes, as a powerful reminder of both Canada's intention and capability to share, and share heavily, in the production of whatever new fighter is chosen.

Most of the Western world's companies with airplanes to sell were there: General Dynamics, Lockheed, Boeing, Rockwell, Northrop, Dornier, Dassault, of course, to name a few. Grumman was very much in evidence, this time with the E-2C instead of the F-14 as its star attraction. The E-2C, a carrier-based early warning aircraft, is Grumman's proposed alternative to the Boeing E-3A AWACS for the NATO market. The E-3A was also on hand in Paris in an impressive display. One of the problems with AWACS has been its $80 million price tag, a formidable sum in any European defense budget. The E-2C, while clearly much less capable overall than the Boeing AWACS, is also clearly less expensive, a fact not concealed in the Grumman sales pitch. The NATO airborne warning and control program, already upset by the British decision to buy their own Nimrod, may be in for even more diversification, or if you will, nonstandardization, a move strongly resisted by USAF and the US government.

The flying program of the Paris Air Show is the real drawing card for both the man in the street and the true aviation buff. Regardless of how long one has been around airplanes or how many times he has seen demonstration flights, there is something very special about the Paris performances. Things got off to a bad start with the fatal crash of the A-10 at the very beginning of the show. The French have been understandably nervous about accidents and their effect on Le Bourget as the location for the Air Show since the Russian Tu-144 supersonic transport crashed four years ago. This year, the Tu-144, called by the French press the "Concordsky," was on static display only.

The rules governing demonstration flights were both stricter and more strictly enforced than ever before, especially after the A-10 accident. Nevertheless, some interesting airplanes went through their routines in a most impressive way, even allowing for light fuel loads and superbly competent pilots. The Northrop YF-17 and General Dynamics F-16, the former flying US Navy colors, put on great exhibitions, both clearly superior, at least to my prejudiced eye, to either the Mirage or the Swedish Viggen. Of course, they should be superior since they are a generation newer. However, the F-15 seemed, to me at least, the performing star of the fighter demonstrations. Dassault did have on exhibit a mockup of its new Mirage 2000, which is to be the first-line fighter of the French Air Force. This 2000, with its Coke-bottle fuselage and delta wing, has a distinct resemblance to the F-106.

The new assault transports, the McDonnell Douglas YC-15, a four-engine bird, and the Boeing YC-14, two engines blowing over the upper wing surface, showed incredible slow speed maneuverability and landing rolls. If we need a new airplane to do heavy duty assault airlift, instead of continuing to rely on the C-130, then one of these prototypes would seem to be the answer.

The MRCA, or Tornado, made its first flying appearance at Paris this year. It is clearly a very good airplane but no air combat match for the F-15, F-16, or the F-18 when it comes along. It is not intended to be. The multiroles envisaged for this swingwing bird do not include dogfighting. The air-to-air capability of the Tornado rests on its ability as an interceptor, not an air combat fighter. Either out of conviction, or because the Tornado is a long term and irrevocable commitment, the British and the Germans think they have in it the right answer on a NATO airplane. With our F-15 and F-16 emphasizing air combat superiority, we, along with Belgium, the Netherlands, Norway, and Denmark, have a different approach. Canada has yet to decide.

You pay your money and take your choice in this alliance of free nations. Whatever your choice, Paris was once again a most reassuring display of the continuing value of competition and innovative thinking. It is very hard not to believe that the best airplanes in the world were flying there this year in spite of the absence of MiGs. ■

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A combination of actions, events, and personalities going back more than two decades has led to the ascendancy of Pentagon program managers over strategists, contributed to a shift in the strategic balance, and played into the hands of US defense critics.

The Decline of US Strategic Thought

BY LT. GEN. DANIEL O. GRAHAM, USA (RET.)

TODAY, in and out of government, a critical debate over US foreign and defense policies is under way. The outcome will have profound effects on the future of the United States and of the free world in general. This historic debate concerns a broad spectrum of policy—political, economic, and military—but its prime focus is on defense policy.

The military services and the Department of Defense are badly oriented to make their critical contributions to this debate. Further, much in the DoD approach to national security matters tends to reinforce the position of the antimilitary or "dovish" side of the debate. The root cause of this paradoxical situation is the domination of programs over purpose in the Pentagon—the domination of program managers over strategists.

The Great Debate over foreign policy and national security was sparked by the dismissal of James R. Schlesinger as Secretary of Defense. It was fueled by the testimony of Alexander Solzhenitsyn, and broadened to a national scale during the presidential election process. The effects of the debate are dramatically evident in the Carter Administration, the Congress, the news media, academia, and the public at large.

The new Administration was saddled from the start with a foreign policy/national security "cluster" of more-or-less McGovernish stripe. Congress, on the other hand, has been feeling a new pro-defense set of pressures from its constituents. One McGovernite, Ted Sorensen, was rejected as the Carter appointee to be Director of CIA; another, Paul Warnke, was confirmed as Chief Negotiator for SALT only with a stern reminder in Senate votes that McGovern-like agreements with the Soviet Union would not be tolerated.

Defense budgets of late have had remarkably easy going in Congress. In the news media, the nigh-automatic suspicion of pro-defense arguments has been largely replaced by sober consideration of all sides of national security issues. Academicians who have questioned the wisdom of détente and arms-control policies have found a greater acceptance among their colleagues. The once-fashionable view that US military power constitutes a greater threat to Americans than that of the Soviet Union is in sharp decline.

President Carter appears to be well aware of the need to revamp overall national defense and foreign policies. His defense of human rights in the Communist camp reflects understanding of the basic factor in all East-West relationships—systemic struggle. For the past eight to ten years, US foreign policy has essentially submerged this basic factor in favor of assumed US-Soviet mutual interests. Carter's original disarmament proposals also reflected a straightforward challenge to previous questionable assumptions underlying US-Soviet relationships. Those proposals reflected a determination that the SALT road should *lead* somewhere—that there must be some tangible strategic goal for the United States beyond the cosmetic effects of merely achieving agreements.

With these two initiatives, President Carter has responded to the Great Debate and has accentuated the fundamental requirement for the reordering of US foreign affairs and national security policies—a sound national strategy. His actions in US-Soviet affairs have infuriated the dovish factions. We have yet to see whether the President sticks to his guns. If he does, he will have opened a new chapter in US national strategy.

Shifting Grounds of Debate

There is a strange aspect of the ongoing debate about national security issues that is not readily apparent unless one steps back and listens to the arguments of contending sides—hawks and doves, if you will. It is the dovish faction that today argues in the fashion of the program manager—that is, in terms of weapon systems cost and efficiency, technical advances, and numerical balances. The arguments of the hawks, on the other hand, are trending away from the numbers game and toward the broader aspects of strategy. This is no doubt due in some part to the fact that the basic figures of the arms balance between ourselves and the Soviets speak eloquently enough for the hawkish position. Arms control and détente enthusiasts, no longer able to deny the Soviet surge in relative

military capability, have taken to manipulating the figures and positing scenarios for war in an attempt to prove that the basic figures are meaningless. It is the dovish faction that now chooses to neglect the linkage between military power and political effects and to couch their arguments in terms of actual warfare after deterrence fails.

The fundamental reason for this curious penchant among doves to resort to the numbers game (which they have in the past abominated as an anti-intellectual refuge of Pentagon spokesmen) is that the broad strategic trends in the balance of power between the United States and Soviet Union are starkly supportive of the hard-liners. For about a decade, it had been possible to shrug off warnings about the deterioration of the West's strategic position with scornful attacks on the motives of those who voiced concern and with comforting predictions of Soviet reasonableness in the era of détente and arms control.

It is no longer possible to describe the motives of men voicing concern about the growing Soviet threat to the free world as the self-service of the "military-industrial complex"; this accusation of base motivation simply cannot be credibly applied to the broad spectrum of American opinion now involved in the debate on the side of new and tougher defense and foreign policy. Conservatives and military professionals have been joined by an impressive array of middle-of-the-road and liberal statesmen, politicians, and academicians in deploring the ominous drift in the world's strategic balance in favor of totalitarianism of Marxist stripe.

Conservatives, for basic ideological reasons, and military men, for basic professional reasons, have all along harbored grave reservations about the wisdom of substituting formal and tacit cooperation with the USSR for Western strength as a means of avoiding major conflicts and preserving free institutions.

The array of names forming the Committee on the Present Danger defies any attempt at categorization by party, basic politics, or profession. This distinguished group of Americans is deliberately apolitical and will not even accept financial support from firms that can be labeled as part of the military-industrial complex. The committee, formed to help alert the US body politic to the dangerous decline of US military power, has by its very existence shaken the confidence of the doves in their basic assumptions about US-Soviet relations and in their claim to a decisive moral superiority for their position vis-à-vis the hard-liners. There has been a deplorable number of empty *ad hominem* attacks on the committee and others of similar persuasion by doves who wish to restore a black–white moral standard on national security issues. Thus, they feel an irresistible urge to assault the honesty and impugn the motives of all who disagree with them.

The more reasonable spokesmen for the dovish point of view are now concerned about ominous trends in the US-Soviet military equation. They eschew assaults on the integrity of the hard-liners and instead try to make the case that the Soviet buildup has been overstated, its effects are not important, and that US arms programs will not help the situation in any case. To make their points, these doves find themselves more and more dependent upon the numbers game and cost-effectiveness analyses, shying away from strategic considerations.

Many of those who now warn against the trends in the world's strategic balance would undoubtedly be uncomfortable under the appelation "hard-liner" with its pejorative connotations. However, in the interest of brevity, I shall use it as a shorthand description of those who consider the Soviets more attentive to relative power than to humanitarian considerations, still determined to impose their totalitarian system on others if given the chance, and still operating in international affairs on a set of assumptions that, despite nuclear weapons, includes a Clausewitzian view of war as an extension of politics.

The "Hard-Line": A Decade of Decline

This so-called "hard-line" position was eroded badly by a general euphoria in the mid-sixties. The Soviets had suffered a humiliating defeat in the Cuban Missile Crisis, the

"There has been no formulation of basic US national strategy since the waning years of the Truman Administration. . . ."

Sino-Soviet rift had deepened, the Western economies were booming while the East's economies stagnated. Unrest boiled under the surface throughout Eastern Europe, while in the West the trend was toward greater economic, political, and military unity. Early leads by the Soviets in the fields of space and intercontinental missiles had been swiftly reversed by the United States. An equitable treaty banning nuclear testing in the atmosphere had been concluded with the USSR. The status of the systemic struggle seemed so promising that much Western opinion concluded that the Marxist tide was in permanent ebb. US analysts, in and out of government, declared ideology in the Soviet Union to be dead, at least as far as the global aspirations of communism were concerned. The foundations of the new cooperative US policies toward the Kremlin, treating the USSR as a *status quo* rather than an expansionist state, were laid in this era of euphoric self-confidence.

The bitter harvest of Vietnam grew from these same overoptimistic roots. Seduced by their success in checking the Communist military adventure in Cuba, the Kennedy Administration's New Frontiersmen made the arrogant and fatal assumption that the Communist drive for Southeast Asia could be checked and model democracy installed in Saigon at one and the same time by the application of moderate US military power and their own new mastery of world political affairs. The political and military blunders that marked the Vietnam intervention served to stoke the fires of pacifism, antimilitarism, and radical left politics in the US and in the West generally.

The passions of the Vietnam episode and their impact on US domestic politics served to mute the voices of the hard-liners. Conservatives and military men, again for reasons of ideology and professional commitment, were placed in the difficult and ironic position of defending US efforts in Vietnam—difficult because of the passions aroused and the distaste of Americans for protracted struggle; ironic because from the late 1960s onward, hard-liners found themselves with no practical options other than support of Administrations looking more and more to Moscow and Peking for assistance in effecting an honorable US disengagement.

After the ignominious collapse of the US position in Southeast Asia, the Watergate trauma, and US self-flagellation over alleged CIA misdeeds, the hawk-dove passions borne of the Vietnam episode finally subsided enough to permit reasonable debate over the strategic situation facing the US and the free world (what was left of it). When moderate and liberal US opinion-makers could once again express concern over the strategic balance without automatic and massive abuse for siding with Nixon, the CIA, or the "military-industrial complex," a consensus of the seriously concerned moved in the direction of the conservatives on national security issues, in particular those regarding policy toward the Soviet Union.

Lt. Gen. Daniel O. Graham, USA (Ret.), graduated from the US Military Academy in 1946. Much of his career was spent in intelligence work, including assignments as Chief of Current Intelligence in Vietnam, Deputy to the Director of the Central Intelligence Agency, and as Deputy Director and Director of the Defense Intelligence Agency. He requested retirement from the last named position in November 1975 in protest to the firing of Defense Secretary James Schlesinger and CIA Director William Colby. General Graham is now affiliated with the University of Miami's Center for Advanced International Studies in Washington.

Toward Revised Perceptions

The movement of liberals and moderates toward the harder line was not the result of persuasive conservative rhetoric; it sprang from an assessment of the facts and trends of the past several years in the global balance of power, occluded until recently by the politics of passion.

Among the facts and trends that have treated the growing harder line (if not hard-line) consensus are these:

- Détente and arms-control policies, born of high Western confidence and optimism, came to be defended in Spenglerian decline-of-the-Wes terms;
- Soviet arms programs acceler ated rather than abated as the Wes pursued détente and arms control;
- Soviet international behavio

"The dominance of program management over strategy in the Pentagon plays into the hands of the antimilitary school of thought. . . ."

and Soviet statements of purpose belie the old comforting assumptions that the USSR has become *status quo* oriented and has given up world hegemonial goals;

• Trends in the relative military power of the Soviet empire and that of the US and its allies will soon provide Moscow with meaningful across-the-board superiority if in fact such an imbalance does not already exist.

The dovish faction does not contest these facts so much as it tries to ignore them. The doves stress instead the "unthinkableness" of nuclear war and express a deep conviction that the Kremlin essentially shares their view. There are some basic points on which the doves agree with the bulk of the hard-liners, however. One is that the Soviet Union does not equal the United States in the fundamentals of power —economic and technical strength —and that in the broader perspective of the West vs. the East, the imbalance is even greater in favor of the US and its allies. A second point of agreement is that the Soviets are not building up military power with a view to launching an unprovoked attack on the West. Another issue where the views of thoughtful doves and hard-liners coincide is that Red China constitutes a greater politico-military problem for the Soviets than for the United States.

Inherent in these areas of agreement is a clarion call for revised US national strategy. If, indeed, the US and the West are basically stronger than the Soviet empire, how can the Kremlin possibly extend its reach throughout the globe except by military means? Since economic and technical strength are the bases of military power, is there any way the Soviets can achieve the balance of power necessary to pursue their goals except through the acquiescence of the United States? If the Soviets do not intend unprovoked attack, doesn't their pursuit of overall superiority portend a vigorous strategy of political, economic, and small-war action backed by an intimidating military establishment? Would not the solution of the Kremlin's China problem be fairly easy if the United States were neutralized militarily?

Objective answers to such questions lead to a critical conclusion: Successful pursuit of the Kremlin's global goals lies in the formulation of a superior Soviet *strategy*. In this the Soviets have been successful, and it has resulted in a shift in the world balance of power ("correlation of forces" in Marxist terms) strongly toward the USSR.

Eclipse of US Strategic Thought

The success of Soviet strategy has not been due so much to the brilliance of their strategists as to an eclipse of strategic thinking *per se* in the United States. There has been no formulation of basic US national strategy since the waning years of the Truman Administration when the strategy of containment was promulgated in a National Security Council memorandum. This imperfect but effective strategy formed a reasonably well understood basis for US foreign policy and national security decisions into the mid-sixties.

Beginning with the McNamara domination of Defense affairs (and to a large extent of foreign policy), strategists were gradually replaced by program managers and systems analysts. In the Pentagon, the broad, complex discipline of strategy was replaced by the techniques of the accountant. Military issues came to be settled on the basis of one weapon's effectiveness against real or imagined counterweapons. Ever less attention was given to the problems of one US force against a similar force, let alone to a confrontation of the entire spectrum of US and Soviet military capabilities.

During the McNamara era, cost-effectiveness became the ultimate yardstick for defense decisions. This led to the situation in which the entire military establishment was characterized by fierce competition among various individual hardware programs. Success came to those uniformed officers or civil servants who could shepherd a weapons program through the Defense bureaucracy, get it into the budget, and defend it before the Bureau of the Budget and the Congress. Fending off the claims of other program managers, particularly those from another service, required great skill in applying cost-effectiveness and systems analysis techniques. Arguments about strategy were subsidiary, if voiced at all.

The emphasis on cost-effectiveness and the concomitant neglect of strategy denigrated the weight of military

"... the US can survive ... without any one of the hotly debated ... weapon systems. ... But the US is in grave danger without a viable national strategy."

experience in decision-making and disgruntled senior military officers. One crusty general is reported to have described the ideal war of the McNamara "Whiz Kids" along these lines: "If the war ends with the last American soldier killing the last Russian with his last bullet, after which his rifle falls apart in his hands and his uniform falls off his back, that's true cost-effectiveness." But the displeasure of the senior military men was not to prevail. Rather, the military profession became one in which successful program managering was the best road to high position, and strategic thought a dead end.

It would be unfair to lay all the blame for the demise of strategic thinking at the feet of McNamara and Co. Considerations of overall strategy had been eroded since the National Security Act of 1947. A brand-new service was created—the Air Force. It was a force created primarily to perform the mission of strategic bombardment, a mission of dramatic new dimensions in light of the advent of nuclear weapons. This new force held very simplistic views of strategy for the first decades of its existence. The Air Force was almost exclusively concerned with the offense and tended to denigrate all strategic defenses as a threat to the "ultimate-ness" of the nuclear-armed bomber as a weapon system. Early Air Force arguments for defense dollars were forerunners of the cost-effectiveness plague of the 1960s. "More bang for the buck" was a catchy phrase of Air Force origin during the Eisenhower Administration. Further, Air Force spokesmen tended to equate the word "strategic" with their military function alone. What in reality constituted the tactics of bomber attacks on the USSR became strategy in much of Air Force thinking.

Impact of the JCS/Joint Staff

The National Security Act of 1947 dealt another serious blow to strategic thinking in the US military establishment. Unable to overcome the combination of general philosophical opposition to a US general staff (mostly based on the fact that the Germans had one) and the resistance of the services (especially Navy) to surrendering prerogatives, no effective military entity was created to deal with issues affecting the services severally. Instead, a sharply circumscribed Joint Staff was created to serve the Joint Chiefs of Staff and its Chairman.

The JCS and Joint Staff arrangement can at best amalgamate the views of the separate services. The primary urge in this arrangement is to arrive at decisions unanimously and to avoid "split" papers, where one or more of the service chiefs disagrees. The officers of the Joint Staff look to their parent services for career advancement. It takes real moral courage for an officer to proffer advice that runs counter to his parent service's perceived interests. (Remarkably enough, such action by officers on the Joint Staff is not rare despite the professional risks involved, but it should not be required.)

The JCS system can operate only if the large questions of overall strategy, roles and missions, and competition between hardware programs are avoided like the plague. Thus, the national leadership is denied professional military advice on broad strategic questions. In its place, the Executive and Legislative branches get advocacy arguments for individual service programs, almost universally backed by the JCS.

An example of the kind of issue that should be addressed by a truly independent general staff is that of the new technology of cruise missiles. These new weapons promise highly accurate delivery of nuclear or conventional warheads to variable distances from land, sea, undersea, or airborne launching platforms. Further, by the standards of modern weaponry they are surprisingly cheap. Surely there are trade-offs between cruise-missile systems and other programs that should be thoroughly examined by military professionals. But this is exactly why the JCS is unlikely to address the problem effectively. Cruise missiles obviously could reduce the need for the vastly more expensive B-1 bombers and Trident submarines. The Navy and Air Force have been apprehensive about the cruise missile's impact on these programs. Army is also apprehensive because, in a more roundabout way, the cruise missiles could adversely affect the helicopter program. The JCS is almost incapable of addressing such trade-offs. It will be the service program managers, not strategists, who decide the fate of the cruise missiles.

If the significant US advantage i

"The continued viability of the National Security Act of 1947 is being seriously questioned."

cruise-missile technology is traded away to the Soviets in SALT, the Pentagon's own program managers will have had a lot to do with it. They had a lot to do with the utterly lopsided ABM Treaty in which a huge technological lead over the Soviets was nullified for little more than cosmetic and domestic political gain. The high cost of the Army's ABM system was the reason for congressional chariness, but this same cost put the ABM in competition with other weapons programs. Much of the ammunition used by the doves to shoot down the ABM came from Pentagon program managers whose own projects might be imperiled. The incredibly intense Soviet offensive "threat," which was used to prove that the ABM system was vulnerable to saturation and thus could be rendered ineffective, was not concocted by arms-control enthusiasts or doves, but by the Pentagon itself.

Restoring Logic to Security Affairs

The dominance of program management over strategy in the Pentagon plays into the hands of the antimilitary school of thought in other ways. By focusing so heavily on hardware programs, the Pentagon helps to drive the national debate away from the basic issues of national security toward the cost-effectiveness of individual weapon systems. While men outside the Pentagon strive to get the nation to focus on the ominous strategic situation as a whole, the military establishment appears content to join the doves in narrowing the debate to one about specific hardware programs—*e.g.*, the B-1 bomber, the MX missile, or the Trident submarine.

This narrow focus is comfortable for the antimilitary faction. An attack on the need for a single costly weapon system is much easier to sustain than an attack on the defense establishment as a whole. Telling arguments can be made about the number of hospital beds represented by the cost of a single weapon. The debate becomes one between the Pentagon program manager and a congressional staff man or private individual in the role of an *anti*-program manager. One can only pity the poor legislator who is offered no strategic framework within which to judge the need for military programs, but must instead rely on masses of costing figures, technical data, and systems analyses.

The cold fact is that the United States can survive and prosper in this world with or without any one of the hotly debated individual weapon systems. But the United States is in grave danger without a viable national strategy. Costs of individual weapon systems or of the entire defense establishment is of less importance than military adequacy. Every dollar spent on an *in*adequate defense establishment is a waste. Adequacy cannot be measured without a much clearer idea of what functions US military forces are expected to perform, and that clearer idea can only come from strategists, not from program managers.

There are hopeful signs in the Congress and the new Administration that new national strategy is in the making. The continued viability of the National Security Act of 1947 is being seriously questioned. The All-Volunteer system is under close scrutiny. Reorganization of intelligence agencies is under way. The next year or so will see great ferment on national security and foreign policy issues. US military professionals must find a way to contribute sound military advice to this process, advice grounded in considerations of strategy.

Mr. Zbigniew Brzezinski has said, in an interview with *U.S. News and World Report* (May 30, 1977), "It is our view that we are now at a stage in history in which the United States again has to undertake a creative process of building a new world system." These words cover a wide range of actions, but one action clearly indicated is the formulation of US national strategy. Within the US governmental system, strategy is a function of top civilian leadership, with military strategy a vital subset of the whole. Military hardware programs, personnel programs, and budgets should be determined on the basis of their relationship to military strategy. Thus, military programs are not primary or even secondary considerations in national security issues; they are tertiary.

As Mr. Brzezinski indicates, the United States is in the process of restoring this fundamental logic to national security affairs, and military professionals should applaud and assist. For too long the tertiary considerations have dominated decision-making in Defense. ■

"US military professionals must find a way to contribute sound military advice [on security and foreign policy issues], advice grounded in considerations of strategy."

The effectiveness of US deterrent forces stands or falls with a potential adversary's view of whether or not these forces can and will be used in a case of last resort. Changes in weapons technology and in the balance of power between the US and the USSR appear to erode the credibility of a minimum assured destruction post

'CHEAP DETER COULD FATAL

IF THE Soviets "were to attack our forces and we had a capability to attack their forces, then doing so . . . would restore the *status quo ante* and it would be no gain, perhaps a loss to them, except both sides would have lost 10,000,000 citizens and we would be at an equivalent stalemate. If we are going to an equivalent stalemate, it would be much better to do it with 10,000,000 dead than with 100,000,000 dead; so it is better to have an attack on their forces than an attack on their society followed by one on ours."

This view was offered—albeit with reservation because of its Strangelovian overtones—by one of the nation's foremost strategic analysts, John B. Walsh, Deputy Director, Strategic and Space Systems, Defense Research and Engineering. The Pentagon official's statement before a congressional subcommittee gets to the core of the most fundamental question of nuclear deterrence and of why the USSR seemingly treats as "thinkable" alternatives considered "unthinkable" by the US. The issue is acute at a time when the Pentagon and the National Security Council are reexamining and weighing the merits of flexible, controlled counterforce deterrence as opposed to finite deterrence, meaning minimum assured destruction capabilities centered on countervalue (largely urban) targets.

The framework of US nuclear strategy is shaped by the political process, perceptions of the threat, and economic considerations. Its formulation obviously is not immune to subjective, emotional, or even irrational influences or fluctuations. This condition is exacerbated by real and assumed uncertainties about the consequences of nuclear war and the understandable tendency to assume that the enormity of its horror makes it unthinkable.

Two mutually reinforcing factors—occasionally challenged but seemingly indomitable—are at the root of much of this nation's strategic thinking. The convenient perception of nuclear war as unthinkable melds handily with an economic fact of life, that mutual deterrence based on the ability of each side to wreak unacceptable damage on the other's economic and social structures can be attained at lower cost and with smaller forces than a combined capability of controlled counterforce and assured destruction. Frequently this reasoning is taken a step further to suggest that capabilities beyond those needed for minimum assured destruction—defined originally as the ability to deliver a total of 300 megatons on Soviet cities—represent overkill and will "provoke" the USSR into accelerating the arms race. Unfortunately, good moralizing usually makes for poor strategy.

The Rise and Decline of MAD

The road to mutual assured destruction starts with the massive retaliation policy of the Eisenhower era, keystone of the "New Look," which enunciated dependence "primarily upon a great capacity to retaliate, instantly by means and at places of our choosing." Massive retaliation, coupled to the declared willingness to consider using nuclear weapons in a first strike, given sufficiently severe provocation, remained a credible policy for as long as the USSR lacked the ability to reciprocate in kind.

The Kennedy Administration used the threat of massive retaliation to resolve the Cuban missile crisis in 1962, but also advocated a "flexible response" capability on grounds that "any all-or-nothing posture . . . would leave no choice but inglorious retreat or unlimited retaliation." This commitment to at least a limited counterforce capability remained in force even in the early years of the stewardship of former Defense Secretary Robert S. McNamara, who asserted that "it is possible that the Soviets' initial strike might be directed solely at our military installations, leaving our cities as hostages for later negotiations. In that event, we might find it to our advantage to direct our immediate retaliatory blow against their military installa-

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BY EDGAR ULSAMER, SENIOR EDITOR

tions, and to withhold our attack on their cities, keeping the force required to destroy their urban-industrial complex in a protected reserve for some period of time.

"Accordingly, we should plan . . . a force that could: 1. Strike back decisively at the entire Soviet target system simultaneously; or 2. Strike back, first, at the Soviet bomber bases, missile sites, and other military installations associated with their long-range nuclear forces to reduce the power of any follow-on attack, and then, if necessary, strike back at the Soviet urban and industrial complex in a controlled and deliberate way."

A year later, in his FY '64 Posture Statement, McNamara focused on the underlying economics in a comment that is probably even more valid today than it was then: "Considering what is at stake, we believe it is worth the additional effort on our part to have this [flexible capability/counterforce] option." Precisely because of the higher cost associated with attaining assured destruction *plus* controlled counterforce (then included in "damage-limiting") capabilities, the former Defense Secretary subsequently reversed himself and practiced a policy of massive assured destruction, informally referred to as MAD.

He justified the about-face on economic grounds and by concluding, as he told Congress in 1968, that in order to be effective counterforce must be free of significant collateral damage but that "we now have no way of accomplishing this." Why counterforce was considered feasible in the early 1960s but labeled infeasible at the end of the decade when command and control as well as delivery systems technology clearly had advanced was never explained to the satisfaction of many military strategists. In the ensuing period, the commitment to MAD and renunciation of counterforce reached such levels that military commanders were not permitted to state publicly that more accurate ICBMs were militarily useful. Even the word "counterforce" was proscribed.

After several years in limbo, the tenet of counterforce deterrence was reactivated formally in 1974 by Defense Secretary James R. Schlesinger on grounds that the Soviet Union's proliferating, modern ballistic missile force was able to attack selectively targets "other than cities." The need, therefore, Dr. Schlesinger reasoned, is to limit the chances of uncontrolled escalation through a "visible" US capability to "hit meaningful targets and with a sufficient yield/accuracy combination to destroy only the intended targets and to avoid widespread collateral damage. If a nuclear clash should

New types of very accurate, low-yield weapons can be developed to reduce collateral damage. This is a chemical high-explosive test at the Lawrence Radiation Laboratory test site at Livermore, Calif.

occur—and we fervently believe that it will not—in order to protect American cities and the cities of our allies, we shall rely into the wartime period upon reserving our 'assured destruction' force and persuading, through intrawar deterrence, any potential foe not to attack cities. It is through these means that we hope to prevent massive destruction even in the cataclysmic circumstances of nuclear war." The wisdom and efficacy of this policy, whose translation into hardware capability is still in a nascent state, are now undergoing a critical review.

"Nyet" to Mutual Deterrence

The paramount flaw—and it is easy to detect others—in relying on *only* minimum assured destruction capabilities for mutual deterrence is that the adversary who is to be deterred has to not only subscribe to that philosophy but also must restrain his force structure accordingly. Breaching either or both of these preconditions reduces MAD to a level of effectiveness comparable to that of the World War II Maginot Line.

The Soviet Union's rejection of the mutual deterrence philosophy is a matter of record in a wide range of officially sanctioned military/political literature. Its commitment to a "war-fighting" counterforce strategy is evidenced by the nature and scope of its offensive strategic forces and the "hardening" of its infrastructure. The hypothesis that the Soviet Union is seeking at least the perception of a *first strike* counterforce capability, although not conclusively provable, becomes tenable because of the otherwise inexplicable buildup of hard-target kill capability. The prestigious nonpartisan Committee on the Present Danger, among whose members are former Deputy Secretary of Defense Paul Nitze, former Secretary of State Dean Rusk, and the former Chief of Naval Operations Adm. Elmo R. Zumwalt, Jr., recently reaffirmed that "by its continuing strategic nuclear buildup, the Soviet Union demonstrates that it does not subscribe to American notions of sufficiency and mutually assured deterrence. . . ."

It may not be possible always to differentiate between what is bombast, meant for home consumption, and the *substance* of statements made by the Soviet leadership concerning the ideological, political, and military confrontation with the capitalist world. Doctrinaire pronouncements by General Secretary Leonid Brezhnev and others at Communist Party Congresses about the "inevitability of the victory of communism over capitalism" probably are less significant and ominous than the cold, recurring fury with which Russian military leaders reject Western contentions that nuclear war is unthinkable and unwinnable.

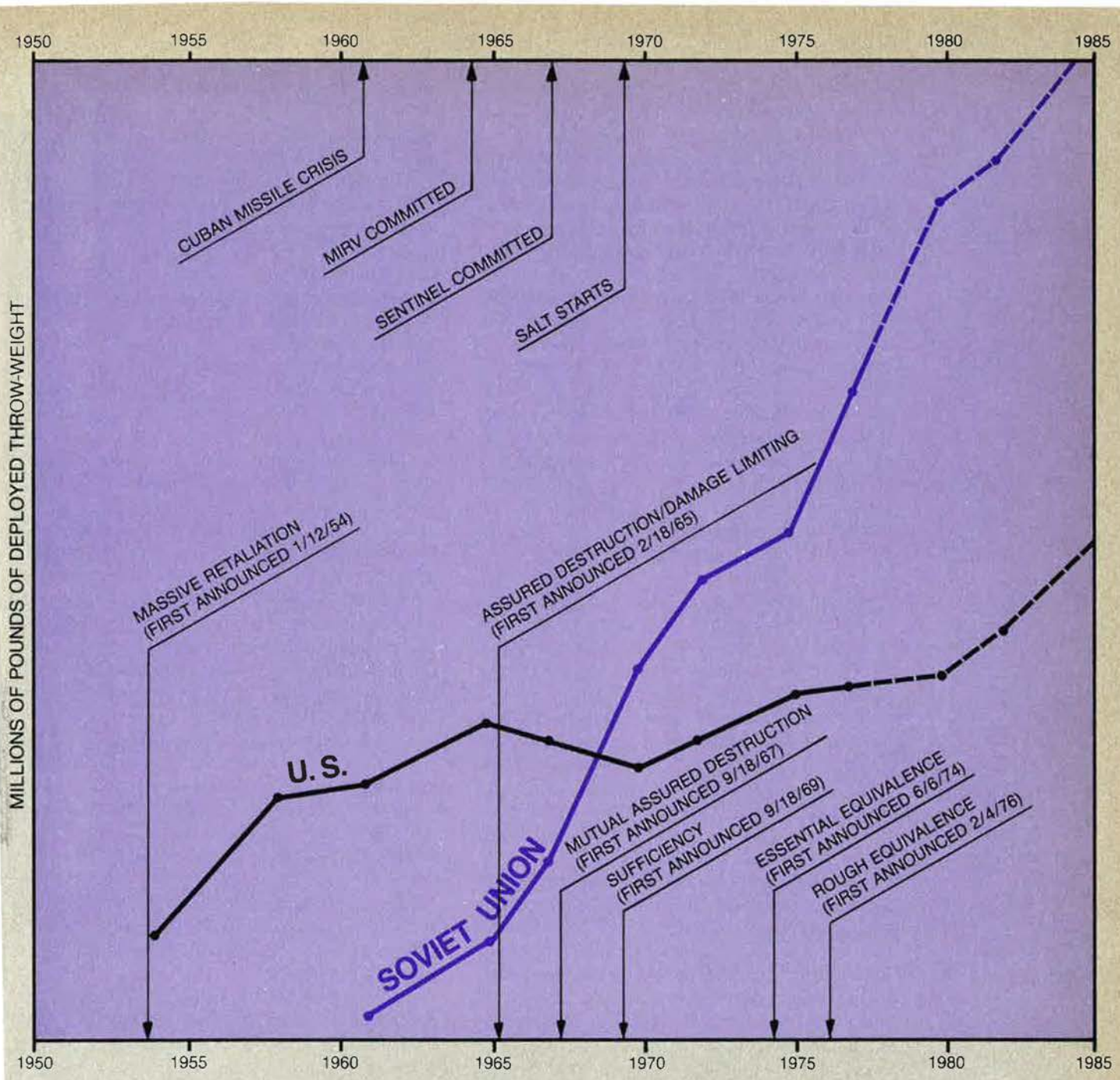
At the core of Soviet nuclear policy is the canon that "no strategy [mutual assured destruction] that is in any way reasonable can set as its objective the crushing of an opponent at the cost of one's own destruction." Soviet doctrine, described guilelessly and consistently, is to go after US strategic forces in "preemptive" (read surprise) fashion if nuclear war is imminent, in order to forestall an attack on the Soviet Union. As former Defense Secretary Schlesinger pointed out, "The Soviets are plowing ahead toward the acquisition of major counterforce capabilities and if you study Soviet doctrine, there is no inhibition whatsoever in going after US strategic capabilities." Once they attain this goal—and if there is no equivalent US capability—this country's mutual deterrence concept is backed into a one-way, dead-end street.

This is not to say, however, that the Soviet Union treats the consequences of global nuclear war casually. General Secretary Brezhnev seemed to be at odds with Soviet dogma when he said in 1974 that "such a mass of weapons has been accumulated which makes possible the destruction of life on earth several times over." He was, however, talking for Western consumption, seemingly to promote US concessions at SALT. There is no evidence that Soviet leaders have ever acknowledged publicly and specifically that Russia herself could be destroyed totally as a result of nuclear war.

The Imponderables of Nuclear War

While Soviet strategic doctrine sets "victory" as the categoric goal of nuclear war, little is known about how that term is defined by the Kremlin. It is probable although not certain that Soviet leaders look at victory in purely relativistic terms, meaning that to receive less damage than the adversary, to suffer fewer casualties, and to be able to recover more quickly are the criteria by which the winner of a nuclear war is established. A report on "Industrial Defense and Nuclear Attack," just released by the congressional Joint Committee on Defense Production, contests the validity of the "relative damage" criterion and asserts that the standard "must go beyond mere body-counts and estimates of surviving productive features to address qualitative features of national existence, such as underlying social and political values." This definition probably is correct in terms of the US perception; it seems quite risky and highly speculative to impute the same standard to the Soviets. Not surprisingly, there was a dissenting view by members of the committee, asserting that the Russian perception of unacceptable damage is "the most uncertain of all considerations as we cannot know what is in the minds of Soviet leaders in calculating these risks. . . ."

Defense Secretary Harold Brown has dealt trenchantly with the issue when he said last year that "one cannot be precise in advance as to



Shown above are plots of US and Soviet strategic throw-weights projected to 1985. The steady growth of Soviet throw-weight has been unaffected by the SALT negotiations or by changes in US deterrent strategy, which have held US strategic throw-weight relatively constant over the past twelve years.

how much destruction and what assurance of destruction is needed to deter. To some degree it depends on how unattractive the political decision-maker considers the alternatives to nuclear war. Indeed, deterrence is not without its risks as a doctrine because there may be some who are not rational enough to be deterred by the prospect of 'assured destruction.' "

Those who believe, without reservation, in the eschatalogical quality of nuclear war usually do so out of the conviction that *any* nuclear exchange creates enough mad momentum to escalate to the limit, and because of the assumption that the long-term effects of global nuclear war may be worse than those manifest immediately. There is considerable evidence to persuade Soviet planners that neither condition need obtain. A number of studies of this fateful question have been conducted.

In a report to the Joint Committee's chairman, Sen. William Proxmire, earlier this year, Gen. George S. Brown, Chairman of the Joint Chiefs of Staff, concluded that "under optimum conditions which include a period of warning prior to an unrestrained US attack and successful evacuation and other preparations, Soviet civil defense measures could probably: (1) assure survival of a large percentage of the leader-

ship needed to maintain control, (2) reduce prompt casualties among the urban population to a small percentage, and (3) give the Soviets a good chance of being able to distribute at least a subsistence level of supplies to the surviving population, although the economy as a whole would experience serious difficulties."

DDR&E Deputy Walsh, during congressional cross-examination, testified this spring on the prospect of the USSR recovering from a nuclear exchange and regaining the status of a twentieth century military and industrial power more rapidly than the US: "The fact is [that] some . . . time after a nuclear exchange, not only would most of the immediate effects be gone, but some kind of a civilization or society could be restored. . . . It is all extrapolation based primarily on judgments, but in order to try and quantify it, we have even specified possible levels of economic activity and standard of living" such as that of the less opulent but still viable level of the 1930s. Other studies, he testified, have examined "how long it takes to reach eighty percent or some other percentage of the economic level of prewar activity. It is somewhat surprising to see how fast recovery could take place if you have an . . . intact base. . . .

"For example, if the Soviets drew on Eastern Europe, and we have not damaged the economic [but only the military] structure of Eastern Europe on the theory that they were innocents caught in the crossfire, the Soviets might indeed . . . draw on this economic structure" just as they did after World War II.

The Pentagon official answered congressional questions about why the US joint strategic target list included "military targets which would only be used in a conventional war," by pointing at historic precedent to suggest that "after our knocking out Soviet industry their army would march across Europe, or attempt to march across Europe, to capture European industry. That is just what happened after World War II. . . . They moved factories wholesale to Russia."

Variables of Nuclear Effects

One of the most detailed studies of the "variables" of nuclear war effects was a 1975 Defense Department study mandated by Congress *(see January '76 issue, "Nuclear War: The Life-and-Death Issues").* The focus of these analyses was on US casualties. These findings have only limited relevance to projecting likely Soviet casualty figures because almost all counterforce strategic targets in the USSR, such as all ICBM silos, are located in sparsely populated areas along the Trans-Siberian Railroad, downwind from major population centers. The DoD study concluded that an attack on the 200 ICBM silos of the Malmstrom AFB, Mont., complex (about a fifth of the US ICBM total) would result in between 120,000 and 310,000 casualties. An attack on all US ICBMs with one-megaton warheads would cause about 800,000 casualties. In the case of a comprehensive attack on all of SAC's ICBMs and bombers as well as the Navy's Fleet Ballistic Missile bases, casualties would range from 3,200,000 to 16,300,000, with 6,700,000 the most probable toll.

The wide range of estimated casualties stems mainly from varying assumptions about the size of warheads used, whether they are set for ground- or airburst, and the degree to which the civilian population downwind from the targets uses available shelter. All scenarios of the study assumed some fallout. This was done because airbursts at so-called optimum (in terms of destructive energy directed at the target) altitude cause the fireball to touch the ground. It is the fireball's contact with the ground that induces almost all nuclear fallout. There is at least the theoretical possibility that a counterforce attack might be tailored to minimize civilian casualties, with burst heights set so that military targets would be destroyed without the fireball reaching the ground. Admittedly, such a scenario is far-fetched *if* there is no basis to believe that a nuclear exchange can be terminated at the controlled counterforce level.

It can be hypothesized also that new types of highly accurate, relatively low-yield weapons could be built to maximize controlled counterforce capabilities and to reduce collateral damage. There is no evidence that "the Soviets are knocking themselves out to develop this class of weapons," according to Mr. Walsh. The USSR has, however, tested warheads down to 0.2 kiloton yield and, like the US, has perfected enhanced radiation neutron weapons for ballistic missile defense.

In assessing Soviet willingness to think the unthinkable, a statistic of World War II can be cited in defense of the proposition that conventional war can be as bloody as limited nuclear war. About 80,000 people died in the March 9, 1945, fire-bombing raid on Tokyo, as compared to 74,000—the highest estimate of casualties—in the atomic bombing of Nagasaki.

Yet another US study, sponsored by the Joint Chiefs of Staff in 1973 and known as PONAST II, probed the US and Soviet ability to survive a first strike, to continue the conflict, and to recover. While that early analysis obviously did not allow for the vast increase in Soviet offensive might that ensued, its findings probably remain valid so far as the USSR is concerned: ". . . although damage was awesome, both sides are calculated to have survived and to be capable of recovery."

Long-Term Effects

Two years ago, the US Arms Control and Disarmament Agency (ACDA) commissioned

the National Academy of Sciences to do a comprehensive interdisciplinary study of "Long-Term Worldwide Effects of Multiple Nuclear Weapons Detonations." Although predicated on massive exchanges—involving 500 to 1,000 weapons with a ten- to twenty-megaton yield each and 4,000 to 5,000 others with an individual yield between one and two megatons for a combined total of 10,000 megatons—the answer to the principal question, "Would the biosphere and the species, homo sapiens, survive?", was, "Yes."

"Reasoning from available information and understanding," the study concluded that "a decade or so after the event, in areas distant from the detonations, surviving humans and ecosystems would be subject to relatively minimal stress attributable to the exchange." The report admits to a "paucity of knowledge" regarding some specialized effects, such as mutations in viruses and microorganisms and the injection into the stratosphere of a large pulse of oxides of nitrogen. There is, however, the conclusion that "if all relevant factors have indeed been considered adequately, when these interim effects subside, much of the planet will appear to have recovered."

A factor brought out by the report that might give the Soviet Union pause insofar as a wholesale rather than a controlled counterforce attack on the United States is concerned is the unique role of the United States and Canada as the world's breadbasket: "There is reason to believe that the dependence of other nations on grains grown in North America to feed their growing populations will become increasingly severe for many decades. Patently, were the United States and Canada involved [in a nuclear attack], these crops would be unavailable for an indefinite period after a nuclear exchange of the magnitude contemplated by this report—and the death toll due to starvation in the dependent regions must then rise accordingly."

Among the National Academy study's other conclusions were these:

- The stratospheric "spreading" of radionuclides (long-lived fission products) would "not generate a hemispheric or global hazard" while nuclear debris in the troposphere would, as a rule, not be scattered over wide areas. There is considerable likelihood of "hot spots" of high radioactivity where, unpredictably, debris would be deposited far from the detonation sites.
- About two-thirds of the total fallout over the northern hemisphere would occur within one year following the exchange. The temperate latitudes of the southern hemisphere would receive about one-third as much fallout as the comparable northern zone, but be delayed by about six months.
- Significant changes in the ozone layer—reductions by between thirty and seventy percent in the northern and by between twenty and forty percent in the southern hemispheres—would occur because of a sharp rise of nitric oxides in the stratosphere. But "within two to four years, it is expected that about sixty percent of this reduction will have been restored as a result of natural atmospheric processes." The incidence of skin cancer and melanoma (tumors) would increase by between three and thirty percent—with a geometric mean of about ten percent for forty years—as a result. The incidence of severe sunburn and snow blindness would increase sharply because of higher exposure to ultraviolet radiation that normally is deflected by the ozone layer. This radiation could prove injurious also to certain crops, such as onions and peas, and to some domesticated animals.
- The amount of dust deposited in the stratosphere as a result of the assumed massive nuclear exchange would equal that of the Krakatoa volcanic eruption in 1883, which apparently reduced average surface temperatures by a few tenths of a degree centrigrade.
- While there are many imponderables and uncertainties, it can nevertheless be expected that "because of the resiliency of natural ecosystems, recovery during the subsequent twenty-five years could be . . . fairly complete."

The National Academy of Sciences report passionately warns against equating its conclusion about the survival of homo sapiens as a species with the survival of "his civilization." But neither does it provide evidence that over the long term "the living will envy the dead," as predicted by the late Soviet General Secretary Khrushchev.

None of the hypotheses about the "survivability" of nuclear war alters what Mr. Walsh told Congress is a strategic asymmetry: The fact that the Soviet Union, unlike the US, treats nuclear war as a "thinkable" eventuality.

Logic and prudence seemingly mandate that the US maintain rough equivalence with the Soviet Union in counterforce capability because, as the Pentagon official testified, while the chances of containing a nuclear exchange to counterforce levels are slim, "I would like to have that slim chance rather than kill everybody in both countries." This argument gains further validity if the US continues development of USAF's MX ICBM follow-on system that he said would make a counterforce strike on the US an "unprofitable venture. . . . The net exchange [involving an attack on MX] would leave them with negligible ICBMs, us with some, and with our bomber and submarine forces intact. . . . Starting a round like this offers them not a gain but a loss in forces." This might make nuclear war unthinkable even in the Kremlin. ■

The laboratories that have designed and tested our nuclear weapons are a little known keystone of US strategic and tactical deterrence. The author, a nuclear weapons expert, believes that their continued ability to assure US superiority in nuclear weapons technology is being compromised to the detriment of national security.

The Nuclear Weapon An Endangered Spec

A hydraulic centrifuge used to test acceleration stress on nuclear weapons components at one of the Sandia Labs.

SHORTLY after his inauguration, President Jimmy Carter announced that he would like to proceed quickly with a Comprehensive Test Ban Treaty. "I am in favor of eliminating the testing of all nuclear devices instantly and completely," he said.

During the 1976 presidential campaign, Mr. Carter proposed a five-year ban on all nuclear testing. He has now moved to carry out that campaign promise. The ill-fated strategic arms limitation proposals made by Secretary of State Cyrus Vance in his March 1977 visit to Moscow included a provision for halting nuclear testing.

The follow-on SALT discussions and negotiations between the United States and the Soviet Union have dealt with the subject of extending the existing nuclear test bans into a Comprehensive Test Ban Treaty barring all nuclear tests in *all* environments. Negotiations on such a treaty are now under way.

The 1963 Limited Test Ban Treaty prohibited nuclear testing in all environments except underground. The 1975 Threshold Test Ban Treaty then prohibited all underground nuclear weapons testing in yields greater than 150 kilotons. The 1976 Peaceful Nuclear Explosives Treaty placed similar, but at the insistence of the Russians, less restrictive controls over peaceful nuclear explosions. These latter two treaties have not been ratified by the US Senate, although hearings are scheduled for this summer. However, both nations are abiding by the treaties as if ratification were completed.

The purpose of this article is not to discuss the issue of a Comprehensive Test Ban Treaty. This has been covered adequately by others, especially by Edgar Ulsamer in the May '77 issue of this magazine. Rather, it is to note that a Comprehensive Test Ban Treaty would have an extremely adverse impact upon the American nuclear weapons design laboratories and, consequently, upon our long-term national security. These laboratories, relatively unknown and unheralded, are a prime foundation of our national security posture. US governmental actions in the recent past have weakened these national assets. The proposed Comprehensive Test Ban Treaty might well give the *coup de grâce* to the laboratories. The United States then would be placed at a severe scientific and technological disadvantage in the building (or rebuilding) of our security posture for the future—at a time when our scientific capability has become even more vital.

The Weapon Design Laboratories

The nuclear weapon design laboratories include the two major nuclear laboratories operated by the University of California: Los Alamos Scientific Laboratory in Los Alamos, N. M., directed by Dr. Harold M. Agnew; and the Lawrence Livermore Laboratory in Livermore, Calif., directed by Dr. Roger E. Batzel. They also include the Sandia Laboratories operated by the Western Electric Co. at Albuquerque, N. M., and at Livermore to give fully dedicated engineering support to the nuclear laboratories. All of these laboratories are under contract to and under the direction of the US Energy Research and Development Administration (ERDA), which assumed nuclear weapons responsibilities from the US Atomic Energy Commission (AEC) in January 1975. These responsibilities will, in turn, be incorporated within the functions of the new Department of Energy. An integral part of ERDA's nuclear weapons research and development complex is the Nevada Test Site, northwest of Las Vegas, where each of the laboratories conducts those experiments that require nuclear explosions.

According to data published by ERDA in a congressionally directed study of their nuclear weapon capabilities (*Funding and Management Alternatives for ERDA Military Application and Restricted Data Functions,* January 1976, ERDA-97), the weapon

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BY BRIG. GEN. ALBION W. KNIGHT, USA (RET.)

laboratories employed, in Fiscal Year 1975, more than 17,000 people with nearly 11,000 working on the nuclear weapons program. The remaining 6,000 were engaged in other important scientific work, mainly in seeking solutions to some of our critical energy problems. Since then, the laboratories have grown to more than 19,000 employees with the predominant increase being scientists and technicians working on energy programs.

A number of people in both ERDA and the Department of Defense worry that the energy role of the nuclear weapons laboratories may so expand that, even without a cessation of nuclear testing, the primary weapons functions of the laboratories might be seriously degraded. For that reason, there was, until the Carter Administration took office, serious study of whether the nuclear weapons role of ERDA (including that of the laboratories) should be shifted to the Department of Defense. This was the major question asked by the congressionally directed study noted above. (The answer reported to the Congress in May 1976 was that, for the time being, the weapons functions should remain with ERDA.) The creation of a Department of Energy and the declaration by President Carter of a "moral equivalent of war" on the energy problems can only heighten those worries. I believe it to be a real possibility that the laboratories' weapons functions might be squeezed out at the end of that battle.

What has been the cost to the taxpayer for the research and development capability of the nuclear weapons laboratories? Over an eight-year period from FY '70 through FY '77 an average of about $260 million per year was appropriated by the Congress for Atomic Energy Commission and ERDA nuclear weapons research and development programs. About $200 million more per year was appropriated for nuclear testing. Thus, the nuclear weapons research and development capability has been costing less than one-half billion dollars a year, or less than one-half of one percent of the Defense Department budget. Yet it provides the heart of the strategic and many of the tactical weapon systems needed by the Department of Defense. This is one of the biggest, yet lesser-known, bargains of the US government.

Contribution to Security

The nuclear laboratories have made significant contributions to our national security posture. First, and most obvious, all the nuclear weapons in our stockpile were designed, tested, and developed by either the Los Alamos or the Livermore laboratory.

Second, they have been pioneers in the development of highly reliable complex systems. The nuclear portion of a weapon system is its most reliable component. The laboratories envision a twenty-year or longer stockpile life for some nuclear devices. Some of our nuclear weapons either approach or exceed this lifetime.

Third, the laboratories have saved the nation untold billions of dollars. By advances in nuclear technology, they have made possible weapon systems that are far more effective than envisioned twenty years ago. One of the most impressive of these advances was the miniaturization that resulted in improvement in the yield-to-weight ratio of nuclear explosive devices. The United States thus has been able to build smaller and less expensive missiles and to develop the MIRV concept of one missile placing nuclear-armed reentry vehicles on several targets. In a recent panel discussion among senior managers at Lawrence Livermore Laboratory, William Nelson, a key division chief, commented:

> . . . An excellent example [of saving] is the Polaris submarine. It would have been very expensive if this Laboratory hadn't discovered the means for making the missile payload powerful, yet small enough to be carried by a submarine. Getting that payload to a specific point on the earth is a very expensive thing to do. And if we can make the payload smaller, lighter, and able to do its job more effectively, this saves money in the overall system.

What was said for Polaris also applies to the Minuteman and Poseidon missiles. It is even more a factor with the coming generation of new weapons—the Mark 12A warhead for Minuteman III, and warheads for the MX, the Trident, and the cruise missiles.

Miniaturization also made it possible for fighter-bomber aircraft to carry the thermonuclear bomb—a feat that could be done only by heavy bombers for the first-generation hydrogen bombs. That, in itself, caused an order of magnitude expansion in the mission and the effectiveness of the Air Force. It may make it less risky to carry out the controversial withdrawal of ground forces from South Korea, which the Carter Administration wants to do. The deterrent threat of nuclear-armed aircraft located within immediate striking distance is powerful. It is the heart of the NATO deterrent as well as of deterrence in the Pacific. The laboratories have made all this possible.

A fourth and extremely important contribution is that the laboratories' advances in the state of nuclear weapons technology gave a sound base for the SALT I negotiations. The SALT I Interim Agreements were accepted by the Congress and the American people primarily because the Nixon Administration assured them that the United States—while acknowledging a Soviet quantitative superiority in throw-weight, numbers of launchers, and on-going missile development programs—maintained its technological lead and continued to hold a qualitative superiority. As late as March 1974, James Schlesinger, who at that time was Secretary of Defense, told the Senate Foreign Relations Committee that the three US advantages providing balance under the SALT I Interim Agreements were MIRV and RV technology, guidance technology, and nuclear weapons technology.

Since SALT I, the Soviet Union has made major progress in MIRV and guidance technologies. We know that they continue to give strong support to their nuclear weapons laboratories. Thus, the need for the United States to retain a strong nuclear weapons scientific capability is more important than ever if we hope to reach an arms control agreement that will not harm US national security. A vigorous nuclear weapons technology might be the only advantage we retain. Even then, there is room for doubt since the 1963 Limited Test Ban Treaty eliminated the means for checking and measuring Soviet progress in nuclear weapons technology.

Declining Support

Since the Nixon Administration touted a strong nuclear weapons technology as an enabling factor for SALT I, it should have taken great pains to keep that technology healthy. In fact, the Safeguards associated with the Limited Test Ban Treaty of 1963, proposed by the Joint Chiefs of Staff as their prerequisite for agreeing to that treaty and accepted by President Kennedy, require the President to give strong support to the nuclear weapons laboratories. The two Safeguards that applied to the laboratories stated:

Safeguard A: The conduct of comprehensive, aggressive, and continuing underground test programs designed to add to our knowledge and improve our weapons in all areas of significance to our military posture for the future.

Safeguard B: The maintenance of modern laboratory facilities and programs in theoretical and exploratory nuclear technology which will attract, retain, and insure the continued application of our human scientific resources to these programs on which continued progress in nuclear technology depends.

However, the Nixon Administration did not support the nuclear weapons laboratories. Instead, it made steady annual reductions in the Atomic Energy Commission nuclear weapons budget, resulting in a significant deterioration in the research and development capabilities of the laboratories and in their ability to conduct nuclear weapons tests. In late 1974, the author was a professional staff member for the Joint Committee on Atomic Energy of the Congress. When the possible reduction in the nuclear laboratories came to light, Chairman Melvin Price directed me to conduct an investigation of the matter. The investigation was completed in March 1975, following detailed discussions at the three laboratories and with AEC headquarters personnel. My basic conclusion was that there had, in fact, been a deterioration in the US nuclear weapons research and development capability, a reduction in effort of about one-third, and that the deterioration had an adverse effect upon our national security that would become serious if the trend of the previous five years continued. Some of the key findings were:

- Over the previous five years, due primarily to Executive Branch decisions, there had been a series of annual reductions in the research and development capability of the AEC nuclear weapons laboratories. The funding level, annually, was at less than the rate of inflation.
- The reductions were reflected principally by cuts in laboratory weapons programs of about twenty-five percent (a cut of more than 3,000 people, from about 12,000 in 1970 to about 9,000 in 1975).
- At the same time there was evidence that the Soviet Union had increased noticeably its investment in nuclear weapons laboratories.
- In the same five years there had been a reduction in the nuclear weapons test effort by about fifty percent (a cut of about 4,500 man-years, from about 9,600 in 1970 to about 5,100 in 1975).
- As a result of decreased laboratory resources, the increased DoD demands for weaponization efforts, and the need to complete weapons testing in yields greater than 150 kilotons before the Threshold Test Ban Treaty was effective, *the advanced development effort in the laboratories was essentially abandoned.* (Italics added)
- The then current level of effort at the weapon design laboratories was not sufficient to the long-term task of maintaining the quality of the US weapons stockpile.
- Laboratory equipment was becoming increasingly obsolete due to reduction in capital equipment funds. One laboratory director stated that "present funding can no longer sustain an orderly equipment replacement program."
- There was evidence of declining morale among the key scientists in the weapons program. They viewed the constantly declining resources as evidence of lack of concern by the nation about its security, in the face of significant growth in the Soviet nuclear capability. A number of key scientists had left the weapons program for that reason.
- The design capability of the US nuclear weapons laboratories rests upon the unique skills of highly specialized scientists and technicians dealing with

problems and materials completely unknown outside of the laboratories. If this resource is dissipated—as it had been for the previous five years—it would not soon be regained. (This fact is especially pertinent in 1977 with the possibility of a cessation in nuclear testing that would cause an exodus of key scientists from the weapons program.)

What happened to that investigation? The Ford Administration generally acknowledged the validity of its findings and took action in the FY '77 ERDA budget to halt further decline in the laboratories' capabilities. ERDA took internal management actions with the objective of regaining and maintaining a balanced laboratory capability and program. This meant the renewal of interest in the advanced development programs that had been shelved for several years. During my time with ERDA in 1976 and 1977, I participated in those efforts. Yet I had the firm conviction that they were "too little and too late."

We may never know the price that we paid for the laboratories' halt in the advanced development projects.

This aerial photo shows the array of equipment used at the Nevada Test Site during an underground nuclear test. The detonation point was hundreds of feet below the convergence of the signal cables that lead to recording instruments in the trailers at right. Surface settling from a previous underground detonation is visible at left of center.

The corrective action is relatively inexpensive—allocating an additional $100 million a year to the weapons laboratories to allow replacement of aging equipment, and, most important, the resumption of promising advanced development work to push ahead the state-of-the-art in nuclear weapons technology. This would be about the cost of one B-1 bomber. It would pay far greater dividends.

Long-Term Consequences

There are some who believe that advanced development work should be discontinued and nuclear technology brought to a halt. With that in mind, I took a thorough look at the advanced development projects the laboratories said they would like to pursue if they had adequate resources. I examined the potential contribution to our future security posture if they were pursued with vigor. They are highly classified and cannot be discussed, but I am convinced that they would bring about improvements in the following areas: Safety (for example, work has proceeded on a high explosive for use with nuclear weapons, which is far more insensitive to shock than the present high explosives), security, better command and control, survivability, reduced civilian damage potential, further advances in miniaturization, clean nuclear explosives, means of making nuclear weapons less expensive, and increased understanding of nuclear physics.

These are very desirable objectives that ought to be pursued by the laboratories with priority equal to weaponization. That they are still not being pursued is tragic.

The nuclear weapons laboratories are not yet recovered from the neglect of the Nixon Administration. Yet they are now faced with the Carter Administration proposals to cease nuclear testing. These proposals would affect the nuclear laboratories directly and adversely. First, it is almost impossible to conduct a vigorous nuclear weapons program without having experimental nuclear explosions. Thus, the promising projects I noted earlier could not be pursued without the ability to conduct nuclear tests.

Second, a cessation of nuclear testing certainly would cause an exodus of highly skilled and specialized scientists from the weapons program. Such an exodus happened during the 1958–61 nuclear test moratorium. Their loss was felt severely after the Russians broke the moratorium in August 1961, and the United States then had to put together hurriedly a test series without the help of some of the key scientists who had worked on the designs.

In my view, if President Carter proceeds with his proposals to stop nuclear testing, he will be telling the nation that we no longer need the important nuclear weapons laboratories. It was clear, before my February 4, 1977, resignation from ERDA, that the Carter Administration had not examined and would not examine the impact on our long-range security posture, should the capabilities of the nuclear weapons laboratories be lost. That is a serious omission that ought to be corrected before the President proceeds with a Comprehensive Test Ban Treaty or a unilateral nuclear test moratorium.

Brig. Gen. Albion W. Knight has had many years of experience in the nuclear weapons program. Following his retirement from the Army in 1973, he was a professional staff member of the Joint Committee on Atomic Energy of the Congress. In August 1976, he joined ERDA as Technical Assistant to the Assistant Administrator for National Security. He resigned that position in February 1977 because of opposition to the Administration's nuclear policies, especially the President's proposals to stop nuclear testing, which, for reasons outlined in this article, General Knight feels are not in the best interests of the United States.

Why have two Administrations taken actions that lead to weakening our nation's key scientific nuclear capability at a time when the Soviet Union has made the most massive development and deployment of a strategic nuclear force the world has ever seen? In the case of the Nixon Administration, I believe that the main reason stemmed from the long-time separation of the nuclear weapons program from the rest of the national security program. In both the Legislative and Executive Branches, those who prepared, reviewed, and approved the AEC/ERDA nuclear weapons budget were not the same people who were responsible for the Department of Defense budget. As a result, cuts were made in the nuclear weapons research budgets of the Nixon era without a clear policy-level assessment of the impact of those cuts upon the overall national security program. This was also indicative that within the Atomic Energy Commission, those with budgetary functions were more powerful than those with a programmatic responsibility.

I believe that weakening the nuclear weapons laboratories under the Nixon Administration was due more to annual bureaucratic budget exercises than to a conscious national policy decision. The responsibility must rest upon the shoulders of the Atomic Energy Commission management for not raising with sufficient force the policy implications of the budget cuts.

On the other hand, the test-ban proposals being offered by the Carter Administration and the resultant weakening of the nuclear weapons laboratories will be the result of a conscious national policy decision. I believe that President Carter has an obligation to the nation to examine very carefully whether it is in the long-term interests of the nation to throw away the tool that has done so much in the past thirty years to give us the foundation for an effective nuclear deterrent force. Only if the basis of our national security posture is changing from nuclear weapons to some other weapons technology would the need for the nuclear weapons laboratories be eliminated. For the foreseeable future, that does not seem possible.

If the future unfolds as it now seems probable, the Soviet Union will continue to seek clear military superiority. There may come a time when President Carter or his successor will have to decide that the political consequences of Soviet superiority cannot be tolerated. It will then be necessary to repair the damage done to our security by emotionally satisfying nuclear disarmament policies, and to improve our weapon systems. Without the nuclear weapons laboratories in a healthy state, this would be extremely difficult, time-consuming, and very expensive.

It is wise not to throw away the paddle before pushing the canoe into white water. A cessation of testing, with a consequent critical weakening of the nuclear weapons laboratories, would be just that kind of action. ■

RED TAPE

As commander of the newly formed Military Air Transport Service (MATS), I tried to keep in some form of contact with our men who were serving in isolated assignments, to let them know we were interested in their welfare.

Flying north from Goose Bay, Labrador, to our emergency base at Resolute Bay on Baffin Island in the winter of 1948, I deviated our flight plan to pass over an isolated communications relay site west of Nachvak Fiord.

My radio operator established voice contact with the station. I took the microphone, and got a first-hand report from Sergeant Pedersen, the site commander. At the close of conversation, I turned him over to Major Watts, our Staff Communications Officer.

Keeping my headset plugged in, I listened to their discussion of technical matters. At the close of the conversation, Sergeant Pedersen added:

"Say, Major, there is one thing that I didn't want to complain about to the General. The last mail planes may have dropped canisters of movie films for us but, if so, they missed the drop zone and were lost in the snow. We have only two training films. One is about survival in the desert, and the other's about venereal disease."

For the next several weeks, successive mail planes homed in on this snowbound site and dropped canister after canister of films, each with a long, red streamer attached. None were training films, and none had anything to do with life in the desert, or with the causes, symptoms, or cure of VD.

That may have been the only time in the history of military affairs that red tape served a useful purpose.

—Contributed by Gen. Laurence S. Kuter, USAF (Ret.)

(AIR FORCE *Magazine will pay $20 for each anecdote accepted for publication.)*

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT

Antonov An-32 demonstrating its impressive take-off capability from an airstrip in the mountains

ANTONOV
OLEG K. ANTONOV DESIGN BUREAU; Headquarters: Kiev, USSR

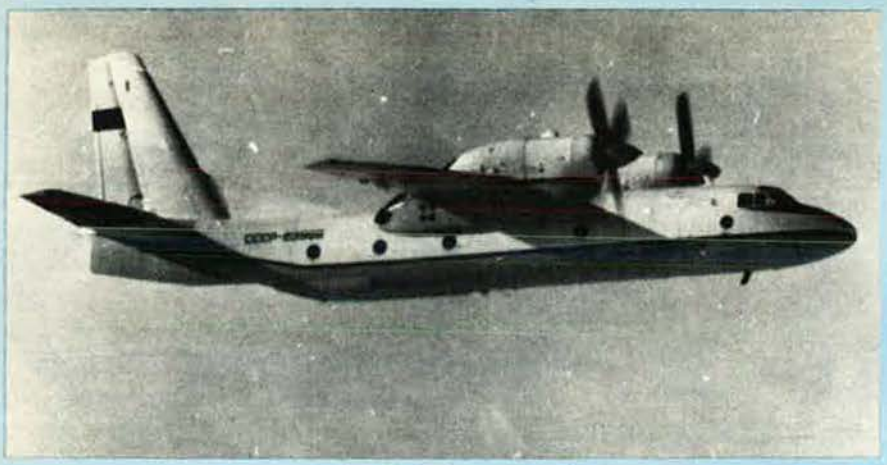
Latest product of the Antonov design bureau, displayed in public for the first time at the 1977 Paris Air Show, is a more powerful version of the An-26 twin-turboprop transport, designated An-32.

ANTONOV An-32

This short/medium-range transport, of which first details were released in May 1977, is a developed version of the An-26, intended for operation in high-temperature or high-altitude environments. Except for having much enlarged ventral fins and a full-span slotted tailplane, the airframe of the example displayed at the Paris Air Show in the following month appeared to be generally similar to that of the An-26. However, a three-view drawing distributed by Aviaexport shows a two-section spoiler forward of each of the four flap segments, and extended leading-edge chord on each 'anhedral' outer wing panel.

The An-32 is powered by two 3,862 kW (5,180 ehp) Ivchenko AI-20M turboprop engines, of the same basic type as those fitted to the Il-18 airliner, each driving a four-blade propeller. The large increase in power is intended specifically to improve take-off performance, service ceiling, and payload. Thus, the An-32 is able to operate from airfields 4,000–4,500 m (13,125–14,750 ft) above sea level in an ambient temperature of 25°C, and can transport 3 tonnes of freight over a 594 nm (1,100 km; 683 mile) stage length, with fuel reserves. The overwing location of the engines requires nacelles of considerable depth, as the main landing gear units continue to retract into the underwing portions.

A rear loading hatch and forward-sliding ramp/door, similar to those of the An-26,



Antonov An-32, a new version of the An-26 transport with a major increase in engine power for take-off

are retained; but hoist capacity is increased to 2,000 kg (4,409 lb) to facilitate handling of the maximum payload of 6 tonnes of freight. Alternative payloads include 39 passengers or 30 parachutists on a row of tip-up seats along each cabin wall, or 24 stretcher patients and a medical attendant; the normal crew of five comprises pilot, co-pilot, navigator, radio operator, and flight engineer.

Low-pressure tyres (of the same sizes as those on the An-26) permit operation from unpaved strips; and the high position of the engines reduces the possibility of stone or debris ingestion. A TG-16M APU, housed in the rear of the starboard landing gear fairing, helps to make the An-32 independent of ground servicing equipment by providing on-board engine starting capability at airfields up to 4,500 m (14,750 ft) above sea level.

DIMENSIONS, EXTERNAL AND INTERNAL:
As for An-26, except:
Propeller diameter 4.70 m (15 ft 5 in)

WEIGHT:
Max T-O weight 26,000 kg (57,320 lb)

PERFORMANCE:
Normal cruising speed
275 knots (510 km/h; 317 mph)
Max cruising height 8,000 m (26,250 ft)
Service ceiling 9,500 m (31,150 ft)
Service ceiling, one engine out
5,000 m (16,400 ft)
Range with max payload, 45 min reserves
432 nm (800 km; 497 miles)
Range with max fuel, 45 min reserves
1,188 nm (2,200 km; 1,367 miles)

HAL

HINDUSTAN AERONAUTICS LIMITED; Address: Indian Express Building, Vidhana Veedhi, PO Box 5150, Bangalore 560 001, India

By 31 January 1977 the Bangalore Complex of HAL had delivered to the Indian armed forces a total of 125 Marut Mk I ground attack fighters, 15 Mk IT tandem two-seat operational training versions of the Marut, and 113 Kiran Mk I two-seat jet basic trainers.

A major current programme is that concerning the Ajeet lightweight fighter/ground attack aircraft, deliveries of which to the Indian Air Force were expected to begin in the Spring of 1977.

HAL AJEET (UNCONQUERED)

The Hawker Siddeley Gnat light fighter and fighter-bomber was built under licence by HAL between 1962 and 1974, as described in the 1974–75 and 1975–76 editions of *Jane's*.

In 1974, the HAL Design Bureau completed the design of a Mk II version of the Gnat known as the Ajeet, with improved performance characteristics and equipment, including updated communications and navigation systems; more reliable longitudinal control; and increased combat capability. The last-named characteristic is achieved by a redesigned fuel system, dispensing with the underwing drop-tanks in favour of integral wing tanks, so permitting additional underwing armament to be carried.

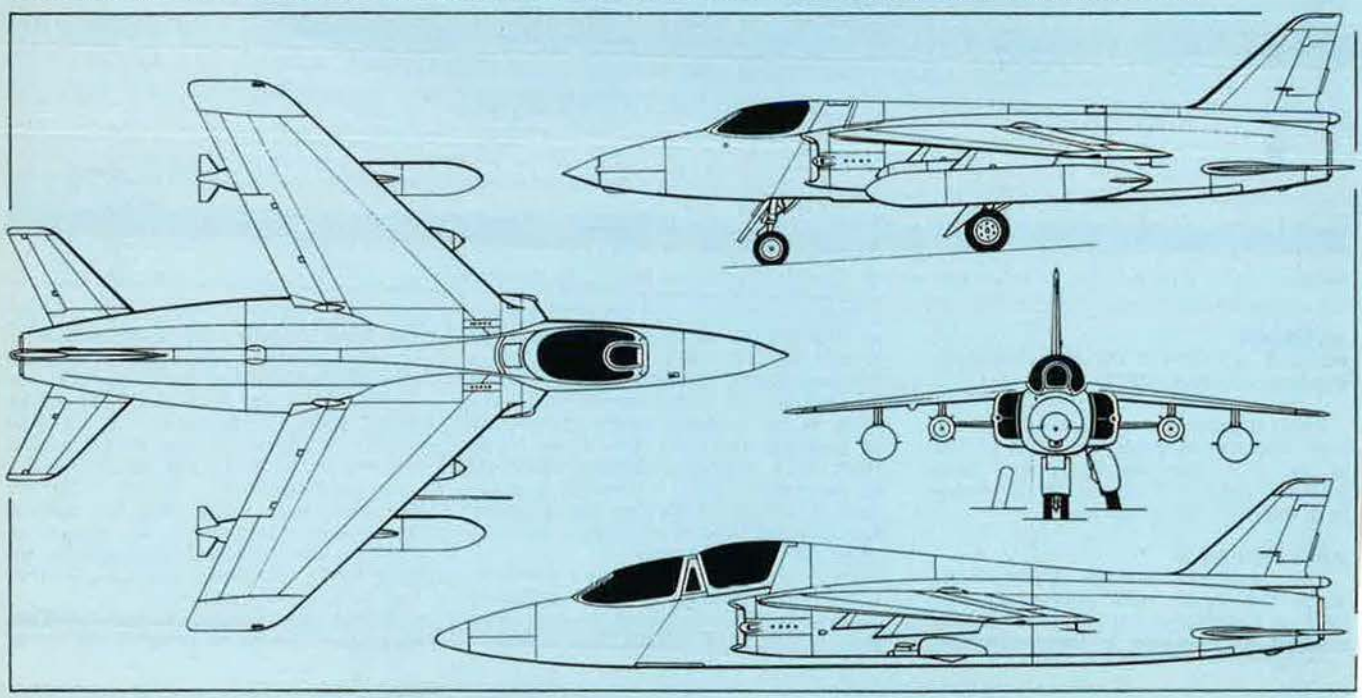
The last two Gnat Mk I aircraft were completed as prototypes for the Ajeet; the first of these (E1083) was flown on 5 March 1975, and the second (E1084) on 5 November 1975. Flight testing of the hydraulic system and electronics had earlier been carried out in two other Gnats (E1071 and 1080), which have since been brought up to Ajeet standard; a third was used for ground testing. First flight of a production Ajeet (E1956) was made on 30 September 1976, and deliveries to the Indian Air Force were to begin in the Spring of 1977.

TYPE: Single-seat lightweight interceptor and ground attack aircraft.

WINGS: Cantilever shoulder-wing monoplane. Sweptback wings, of RAE 102 section. Thickness/chord ratio 8%. Anhedral 5°. Sweepback 40° at quarter-chord. One-piece wing of two-spar thick-skin light alloy construction, fitting into recess in top of fuselage and secured by bolts at four points. Inboard ailerons, powered by hydraulic actuators, droop 22° to serve as flaps when the landing gear is lowered.

FUSELAGE: Light alloy semi-monocoque structure of pressed frames and extruded stringers.

HAL Ajeet lightweight interceptor/ground attack aircraft, with additional side view (bottom) of trainer version (Pilot Press)



TAIL UNIT: Cantilever all-metal structure. Three-spar sweptback fin, integral with fuselage. One-piece three-spar variable-incidence tailplane, operated hydraulically by modified Hobson PFC 1003 actuator. Rear portions of tailplane can be unlocked to perform as elevators; or locked to provide the functions of an all-moving tailplane. Ground-adjustable tab on rudder.

LANDING GEAR: Retractable tricycle type, all units retracting rearward hydraulically into fuselage. Dowty Rotol oleo-pneumatic shock-absorber struts. Wheel well fairings attached to individual landing gear units serve as airbrakes when landing gear is partly lowered, the relative movements of the airbrakes being so adjusted that no change of trim occurs at any speed. Dunlop main-wheel tyres size 20 x 5.25, pressure 9.3 bars (135 lb/sq in); twin nosewheel tyres, size 17 x 3.25. Hydraulically operated brakes and Maxaret anti-skid units on main wheels. Braking parachute in fairing at base of fin.

POWER PLANT: One Rolls-Royce Orpheus 701-01 non-afterburning turbojet engine, rated at 20 kN (4,500 lb st). Compressed-air starting. Air intakes in sides of fuselage. Seven crashproof flexible tanks and two metal tanks in fuselage, and two 250 litre (55 Imp gallon) integral wing tanks. Total internal fuel capacity 1,350 litres (297 Imp gallons). Fuel supplied to engine by electrically-driven booster pump in one of the tanks. Provision for two 150 litre (33 Imp gallon) underwing drop-tanks.

ACCOMMODATION: Pilot only, on Martin-Baker GF-4 zero-height/90 knot (167 km/h; 104 mph) lightweight ejection seat. Pressurised and air-conditioned cockpit, with jettisonable canopy which is hinged at rear and opens upward.

SYSTEMS: Normalair air-conditioning and pressurisation system, max differential of 0.24 bars (3.5 lb/sq in) at 12,800 m (42,000 ft). Oxygen system with demand type regulator. Dowty hydraulic system of 207 bars (3,000 lb/sq in), with Abex pump, for aileron, landing gear, main-wheel brake, and tailplane actuation. 28V DC electrical system, with 3.5kW Rotax generator and two 12V 25Ah Varley batteries. Oxygen system for pilot.

ELECTRONICS AND EQUIPMENT: Bendix TA/RA-22 VHF transceiver (initially; V/UHF later) and BEL AX-3 standby VHF set; Bendix DFA-73 ADF; IFF Mk 10 (BAT) transponder.

ARMAMENT: Two 30 mm Aden Mk 4 cannon in air intake fairings, one on each side of fuselage, with 90 rds/gun. Ferranti Type 195 ISIS gunsight. Vinten Type G90 gun camera. Four underwing hardpoints on which can be carried two 500 lb bombs (inner pylons), four Arrow Type 122 pods each containing eighteen 68 mm rockets, or two 150 litre (33 Imp gallon) drop-tanks (outer pylons).

DIMENSIONS, EXTERNAL:

Wing span	6.73 m (22 ft 1 in)
Wing chord at c/l	2.58 m (8 ft 5.6 in)
Wing chord at tip	1.17 m (3 ft 10 in)
Wing aspect ratio	3.575
Length overall	9.04 m (29 ft 8 in)
Height overall	2.46 m (8 ft 1 in)
Tailplane span	2.84 m (9 ft 4 in)
Tailplane chord at c/l	1.47 m (4 ft 10 in)
Tailplane chord at tip	0.61 m (2 ft 0 in)
Wheel track	1.55 m (5 ft 1 in)
Wheelbase	2.36 m (7 ft 9 in)

WEIGHTS:

Basic weight empty	2,307 kg (5,086 lb)
T-O weight 'clean'	3,539 kg (7,803 lb)
Max T-O weight	4,170 kg (9,195 lb)
Normal landing weight	2,767 kg (6,100 lb)

PERFORMANCE (in configurations indicated; A: ISA; B: ISA + 15° C; C: ISA + 30° C):

Max Mach No. at 12,000 m (39,375 ft) at 'clean' T-O weight:

A	0.96
B	0.953
C	0.948

Max level speed at S/L at 'clean' T-O weight:

A	595 knots (1,102 km/h; 685 mph)
B	612 knots (1,134 km/h; 705 mph)
C	622 knots (1,152 km/h; 716 mph)

Time to 12,000 m (39,375 ft) from brakes off, at 'clean' T-O weight:

A	6 min 2 sec
B	7 min 43 sec
C	9 min 33 sec

Service ceiling:

A, B, C	13,720 m (45,000 ft)

Turning performance at 450 knots (834 km/h; 518 mph) IAS at S/L:

A	5.30*g*
B	5.28*g*
C	5.00*g*

T-O run at S/L, zero wind, at T-O weight of 4,136 kg (9,118 lb) with two rocket pods and two 33 Imp gallon drop-tanks:

A	1,034 m (3,390 ft)
B	1,180 m (3,870 ft)
C	1,376 m (4,515 ft)

Landing run 'clean' at S/L, zero wind, at normal landing weight, no brake 'chute':

A	951 m (3,120 ft)
B	997 m (3,270 ft)
C	1,047 m (3,435 ft)

Landing run 'clean' at S/L, zero wind, at normal landing weight, with brake 'chute':

A	658 m (2,160 ft)
B	695 m (2,280 ft)
C	725 m (2,379 ft)

Combat radius (A, B, and C), low-level ground attack mission:

with two 500 lb bombs on inboard stations 110 nm (204 km; 127 miles)

with two Arrow rocket pods inboard and two 33 Imp gallon drop-tanks outboard 140 nm (259 km; 161 miles)

with four Arrow rocket pods 104 nm (193 km; 120 miles)

HAL HPT-32

Since the item in the August 1976 *Supplement* was prepared, news has been received that the first prototype of the HPT-32 (serial number X2157) made its first flight on 6 January 1977. As a consequence, revised Weights and Performance data have been issued by HAL, and these are given below.

The two prototypes, and the *ab initio* trainer production version, have a non-retractable tricycle landing gear, but the HPT-32 design allows for the use of a retractable gear on production aircraft for other duties. Under consideration is a four-seat 'commuter' version.

WEIGHTS:

Weight empty, equipped	1,034 kg (2,280 lb)
Normal T-O weight	1,322 kg (2,915 lb)
Max T-O weight	1,583 kg (3,490 lb)

PERFORMANCE (at normal T-O weight, ISA; A: with fixed landing gear; B: estimated with landing gear retracted):

Max level speed at S/L:

A	126 knots (233 km/h; 145 mph) EAS
B	152 knots (281 km/h; 175 mph) EAS

Stalling speed, flaps up:

A, B 69.5 knots (128 km/h; 79.5 mph) EAS

Stalling speed, flaps down:

A, B 58 knots (107.5 km/h; 66.5 mph) EAS

Max rate of climb at S/L:

A	244 m (800 ft)/min
B	290 m (950 ft)/min

Service ceiling:

A	3,950 m (13,000 ft)
B	4,575 m (15,000 ft)

T-O to 15 m (50 ft):

A, B	500 m (1,640 ft)

Landing from 15 m (50 ft):

A, B	575 m (1,885 ft)

Prototype Ajeet lightweight combat aircraft, developed by HAL from the Hawker Siddeley Gnat

Prototype HAL HPT-32 two/three-seat basic trainer

Range at 1,525 m (5,000 ft) with 50 Imp gallons fuel:
A 378 nm (700 km; 435 miles)
B 465 nm (861 km; 535 miles)
Range at 1,525 m (5,000 ft) with 80 Imp gallons fuel:
A 647 nm (1,199 km; 745 miles)
B 755 nm (1,400 km; 870 miles)
Endurance at 1,525 m (5,000 ft) with 50 Imp gallons fuel:
A, B 4 hr 0 min
Endurance at 1,525 m (5,000 ft) with 80 Imp gallons fuel:
A, B 6 hr 30 min
g limits +6.0; −3.0

LOCKHEED

LOCKHEED-GEORGIA COMPANY; Head Office: 86 South Cobb Drive, Marietta, Georgia 30063, USA

LOCKHEED C-141B STARLIFTER

Operational experience with the Lockheed C-141 StarLifter by the USAF's Military Airlift Command emphasised the need to provide these aircraft with a flight refuelling capability. Additionally, it had been found that on many occasions the cargo compartment was physically packed to capacity without the aircraft's maximum weight limitation being reached. As a result, the USAF awarded Lockheed-Georgia a $24.3 million contract in mid-1976 to extend the fuselage of an existing C-141 and, at the same time, to provide this aircraft with in-flight refuelling equipment.

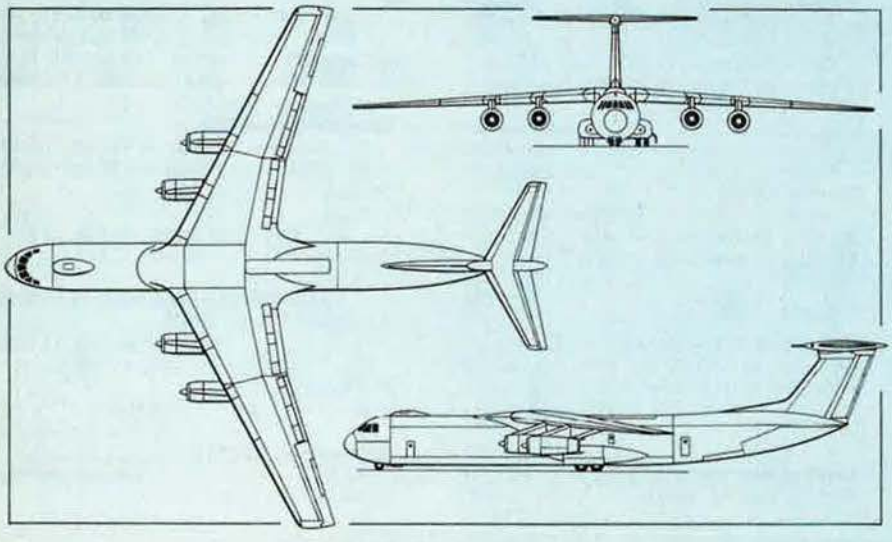
Designated YC-141B, the prototype conversion was rolled out on 8 January 1977, and made its first flight on 24 March. It has been fitted with flight refuelling equipment, and has been lengthened by the insertion of a 4.06 m (13 ft 4 in) fuselage plug immediately forward of the wing, and by a similar 3.05 m (10 ft 0 in) plug immediately aft of the wing. In addition, the YC-141B has improved wing root fairings to decrease drag, so providing higher speed and reducing fuel consumption. These fairings also change lift distribution, permitting the carriage of increased payload without affecting the fatigue life of the wing. The cargo compartment has its floor area increased by 21.65 m² (233 sq ft) and its volume increased by 59.47 m³ (2,100 cu ft), giving a clear space of 244.38 m³ (8,630 cu ft). In it can be accommodated thirteen standard 463L pallets, instead of the ten carried by an unmodified C-141.

The first flight of the YC-141B was made a month ahead of schedule, at a cost $4 million below budget. A successful flight test programme, which was scheduled for completion in July 1977, could result in a decision to modify the 271 C-141s currently in the USAF's inventory. Such a programme has been estimated to cost $700 million; but since it would increase the productivity of these aircraft by approximately one-third, it could be equivalent to providing 90 new aircraft without any requirement for additional crews or ground equipment.

WEIGHTS:
Max ramp weight (2.25*g*) 156,444 kg (344,900 lb)
Max ramp weight (2.5*g*) 147,418 kg (325,000 lb)
Max payload (2.25*g*) 40,439 kg (89,152 lb)
Max payload (2.5*g*) 31,242 kg (68,877 lb)
Operating weight (MAC) 67,970 kg (149,848 lb)
Design landing weight 116,800 kg (257,500 lb)
Max landing weight 153,224 kg (337,800 lb)

Prototype of the stretched Lockheed YC-141B StarLifter (foreground) beside a standard C-141. Overfuselage blister, aft of the YC-141B flight deck, is a flight refuelling receptacle

Lockheed YC-141B lengthened version of the StarLifter logistics transport (Pilot Press)



TONY TEAM

TONY TEAM INDUSTRIES INC, Foxjet International Division; Head Office: 6701 West 110th Street, Minneapolis, Minnesota 55438, USA

TONY TEAM ST-600 FOXJET

Tony Team Industries has designed and built the prototype of a lightweight four-seat twin-turbofan transport which, it is claimed, will operate at 20% of the fuel costs of the most economical business jet currently in service. This extremely low operating cost is attributed to the use of Williams Research WR19-3 turbofan engines to power this completely new aircraft, which has the designation ST-600 Foxjet. Orders for four production aircraft had been received by the late Spring of 1977.

TYPE: Four-seat business aircraft.

WINGS: Cantilever low-wing monoplane. Wing section NACA 23014 at root, NACA 23012 at tip. Dihedral 4°. Incidence 3° at root, 0° at tip. Sweepback at quarter-chord 11° 10′ 48″. All-metal fail-safe structure, primarily of light alloy. Two main spars and one auxiliary spar, with hat-section stringers and web-type ribs. Electrically-operated single-slotted trailing-edge flaps of light alloy construction. Manually-operated ailerons of light alloy construction. Hydraulically-operated spoilers, forward of flaps, serve also as airbrakes. Balance tab in each aileron; trim tab in port aileron. Inboard section of each wing leading-edge anti-iced electrically; outboard section has B. F. Goodrich pneumatic de-icing boots.

FUSELAGE: Semi-monocoque light alloy fail-safe structure of circular cross-section. Longeron/stringer/frame construction, with light alloy honeycomb pressure bulkheads and baggage deck.

TAIL UNIT: Cantilever multi-spar light alloy structure with swept vertical and horizontal surfaces. All-moving tailplane mounted approximately midway up fin. Tailplane has manually trimmable anti-servo tabs. Manually-operated rudder trim tab. Leading-edges of fin and tailplane have B. F. Goodrich pneumatic de-icing boots.

LANDING GEAR: Hydraulically-retractable tricycle type with twin wheels on each unit. Main units retract inboard, nose unit aft. Emergency extension by compressed gas

system. Oleo-pneumatic shock-absorbers. Main wheels size 5.00–5, with tyres size 14.2–5, pressure 3.11 bars (45 lb/sq in). Nosewheels size 11 x 4.00–5, with tyres size 10.6–4, pressure 3.11 bars (45 lb/sq in). Hydraulic disc brakes on main wheels.

POWER PLANT: Two 2.54 kN (570 lb st) Williams Research WR19-3 turbofan engines, pod-mounted on each side of the aft fuselage. Integral wing fuel tanks with combined capacity of 699 litres (184.6 US gallons). Refuelling point in outboard upper surface of each wing. Optional wingtip fuel tanks, each with capacity of 113.5 litres (30 US gallons), to give a max optional fuel capacity of 926 litres (244.6 US gallons). Oil capacity 1.89 litres (0.5 US gallons).

ACCOMMODATION: Four seats, in pairs, with optional jump seat for fifth person. Double-hinged door on port side, forward of wing, with fold-down step. Emergency exit on starboard side, opposite main door. Accommodation heated, air-conditioned, and pressurised. Birdproof windscreen with pneumatic system for rain removal, de-fogging, and de-frosting. Equipment access door on port side of fuselage nose. Baggage hold aft of cabin.

SYSTEMS: Pressurisation system with max pressure differential of 0.51 bars (7.4 lb/sq in) to provide cabin altitude of 3,050 m (10,000 ft) at 12,200 m (40,000 ft). Hydraulic system for operation of landing gear and spoilers, supplied by single battery-driven hydraulic pump at pressure of 131.1 bars (1,900 lb/sq in). Electrical system powered by 28V engine-driven generators and storage battery. Oxygen system with demand mask for pilot, and dropout solid-state constant-flow masks for passengers. Anti-icing system for engine and nacelle inlets, and for pitot/static probes.

ELECTRONICS AND EQUIPMENT: Standard electronics will include dual nav/com, autopilot/flight director, ADF, DME, transponder, and weather radar. Blind-flying instrumentation standard.

DIMENSIONS, EXTERNAL:

Wing span	8.69 m (28 ft 6 in)
Wing chord at root	1.91 m (6 ft 3 in)
Wing chord at tip	0.76 m (2 ft 6 in)
Wing aspect ratio	6.5
Length overall	9.49 m (31 ft 1¾ in)
Height overall	3.20 m (10 ft 6 in)
Tailplane span	3.28 m (10 ft 9 in)
Wheel track	2.03 m (6 ft 8 in)
Wheelbase	3.87 m (12 ft 8½ in)
Cabin door (port):	
Height	1.02 m (3 ft 4 in)
Width	0.61 m (2 ft 0 in)
Forward equipment door (port):	
Height	0.43 m (1 ft 5 in)
Width	0.56 m (1 ft 10 in)
Emergency exit (stbd):	
Height	0.58 m (1 ft 11 in)
Width	0.61 m (2 ft 0 in)

DIMENSIONS, INTERNAL:

Cabin, incl baggage compartment:	
Length	3.81 m (12 ft 6 in)
Max width	1.30 m (4 ft 3 in)
Max height	1.04 m (3 ft 5 in)
Floor area	3.48 m² (37.5 sq ft)
Volume	4.84 m³ (171 cu ft)
Baggage space	1.05 m³ (37.0 cu ft)

AREAS:

Wings, gross	11.61 m² (125 sq ft)
Ailerons (total, incl tabs)	0.63 m² (6.8 sq ft)
Trailing-edge flaps (total)	0.86 m² (9.3 sq ft)
Spoilers (total)	0.43 m² (4.6 sq ft)
Fin	2.29 m² (24.6 sq ft)
Rudder (incl tab)	0.67 m² (7.2 sq ft)
Tailplane (incl tabs)	2.79 m² (30.0 sq ft)

WEIGHTS AND LOADINGS:

Weight empty, basic, dry	967 kg (2,131 lb)
Max T-O and landing weight	1,896 kg (4,181 lb)
Max zero-fuel weight	1,352 kg (2,981 lb)
Max wing loading	163.3 kg/m² (33.4 lb/sq ft)
Max power loading	373.2 kg/kN (3.67 lb/lb st)

PERFORMANCE (estimated at max T-O weight):

Never-exceed speed at S/L	Mach 0.45
Never-exceed speed at 7,620 m (25,000 ft)	Mach 0.80
Max level speed at S/L	327 knots (606 km/h; 376 mph)
Econ cruising speed at 10,975 m (36,000 ft)	285 knots (528 km/h; 328 mph)
Stalling speed, flaps up	80 knots (148 km/h; 92 mph)
Stalling speed, flaps down	72 knots (134 km/h; 83 mph)
Max rate of climb at S/L	762 m (2,500 ft)/min
Rate of climb at S/L, one engine out	213 m (700 ft)/min
Service ceiling	11,885 m (39,000 ft)
Service ceiling, one engine out	5,180 m (17,000 ft)
T-O run	433 m (1,420 ft)
T-O to 15 m (50 ft)	677 m (2,220 ft)

Range, with 4 persons and max fuel, at econ cruising speed, with 30 min reserve 1,225 nm (2,270 km; 1,410 miles)

Mockup of the Tony Team ST-600 Foxjet prototype four-seat business aircraft

SIAI-MARCHETTI

SIAI-MARCHETTI SOCIETA PER AZIONI: Aerodrome and Main Works: Vergiate (Varese), Italy

Founded in 1915, SIAI-Marchetti (formerly Savoia-Marchetti) currently has four facilities (Vergiate, Sesto Calende, Malpensa, and Borgomanero) totalling 1,345,000 m² (14,477,450 sq ft) in area, of which 116,000 m² (1,248,600 sq ft) are covered, and employs more than 2,500 people.

The company is engaged in the overhaul and repair of various types of large aircraft (notably the C-130 Hercules transports of the Italian Air Force), and participates in the national and multi-national programmes for the Aeritalia G91Y and G222, Aeritalia (Lockheed) F-104S, and Panavia Tornado. In recent years it has also become increasingly involved in helicopter manufacture, and is currently taking part in co-production with Agusta of Boeing Vertol CH-47C, Bell 212, and Sikorsky SH-3D and HH-3F helicopters.

During its 62-year history, the company has produced a wide range of military and civil landplanes and flying-boats of its own design or development. The most successful of such current products is the SF.260 series of military and civil light aircraft.

SIAI-MARCHETTI SF.260

The prototype for the SF.260 series, known as the F.250, was designed by Dott Ing Stelio Frati and built by Aviamilano. Flown for the first time on 15 July 1964, it was powered by a 186.5 kW (250 hp) Lycoming engine and was certificated for aerobatic flying. A description appeared in the 1965–66 *Jane's*.

The civil version developed for initial production was manufactured, at first under licence from Aviamilano, by SIAI-Marchetti, and is designated SF.260A. It received FAA type approval on 1 April 1966. Since then SIAI-Marchetti has become the official holder of the type certificate and of all manufacturing rights in the SF.260; it has continued to develop the civil version, and has also evolved three other basic versions for military use. The four basic models are:

SF.260C. Current civil version, certificated by the RAI and FAA on 23 October and 30 December 1976 respectively. Preceded by two earlier civil series, each of 50 aircraft. Aircraft from the SF.260A first series, marketed in the USA under the name **Waco Meteor,** still hold two FAI Class C1b speed records set in 1969. The first of these is for a speed of 174 knots (322.52 km/h; 200.4 mph) over a 1,000 km closed circuit near Santa Monica, California, on 25 March 1969. The second, set up on 29 March 1969 near Los Angeles, is for a speed of 199.4 knots (369.43 km/h; 229.6 mph) over a 100 km closed circuit.

The second civil series (SF.260B), certificated by the FAA on 10 June 1974, incorporates many of the structural and aerodynamic improvements introduced by the SF.260M. Customers included Air France, Royal Air Maroc, and Sabena, which ordered the SF.260 for airline crew training.

Well over 100 civil SF.260s had been built by the Spring of 1977.

SF.260M. Two/three-seat military trainer, developed from the initial civil SF.260A and flown for the first time on 10 October 1970. Introduced a number of important structural and aerodynamic improvements, many of which were subsequently applied to the later civil versions. Meets the necessary requirements for basic flying training; instrument flying; aerobatics, including deliberate spinning and recovery; night flying; navigation flying; and formation flying.

Production to date of 138 SF.260Ms has included orders from the Italian Air Force (20 SF.260AMI), Belgian Air Force (36 SF.260M), Zaïre Air Force (12 SF.260MC), Moroccan Air Force (2 SF.260MM), Philippine Air Force (32 SF.260MP), Singapore Air Defence Command (16 SF.260MS), Royal Thai Air Force (12 SF.260MT), and Zambian Air Force (8 SF.260MZ). Deliveries were completed in the Spring of 1977 of the 20 SF.260AMIs for the Italian Air Force, from whom a follow-on order was anticipated later in the year.

SF.260W Warrior. Trainer/tactical support version of SF.260M, first flown (I-SJAV) in May 1972. Two or four underwing pylons, for up to 300 kg (661 lb) of external stores, and cockpit stores selection panel. Able to undertake a wide variety of roles, including low-level strike; forward air control; forward air support; armed reconnaissance; and liaison. Also meets same requirements as SF.260M for use as a trainer.

Customers to date include the Dubai Police Air Wing (1 SF.260WD), Irish Air Corps (10 SF.260WE, of which the first four were handed over on 4 March 1977), Philippine Air Force (16 SF.260WP), Tunisian Air Force (12 SF.260WT), and Comoro Islands (3 SF.260WC).

SF.260SW Sea Warrior. Version of SF.260W for surveillance, search and rescue, and supply missions. Retains the underwing pylons of the W, and is equipped also with specially designed enlarged tip-tanks containing a lightweight radar system (port) and photo-reconnaissance system (starboard).

Operational flight testing of the SF.260SW has been completed. No orders had been announced up to mid-1977.

By March 1977 a total of 320 SF.260s of all models had been delivered, of which nearly 300 were for export. Production was then continuing at a rate of 20 per month, with 180 scheduled for delivery in the last nine months of the year.

The following description applies primarily to the SF.260M, but is generally applicable to all current SF.260 models unless otherwise stated:

TYPE: Two/three-seat military and civil light aircraft.

WINGS: Cantilever low-wing monoplane. Wing section NACA 64_1–212 (modified) at root, NACA 64_1–210 (modified) at tip. Dihedral 6° 20′ from roots (5° on SF.260C). Incidence 2° 45′ at root, 0° at tip. No sweepback. Increased leading-edge radius compared with SF.260A, with lower datum line to improve stall characteristics. All-metal light alloy safe-life structure, with single main spar and auxiliary rear spar, built in two portions bolted together at centreline and attached to fuselage by six bolts. Press-formed ribs, with dimpled stiffening holes. Skin, which is butt-jointed and flush-riveted, stiffened by stringers between main and rear spars. Differentially-operating Frise-type light alloy mass-balanced ailerons (travel 24° up, 13° down), and electrically-actuated light alloy single-slotted flaps (max travel 50°). Flaps operated by torque tube and mechanical linkage, ailerons by pushrods and cables. Servo tab in each aileron.

FUSELAGE: Semi-monocoque safe-life structure of frames, stringers, and flush-riveted skin, exclusively of light alloy except for welded steel tube engine mounting, glassfibre front panel of engine cowling, stainless steel firewall, and detachable glassfibre tailcone.

TAIL UNIT: Cantilever light alloy safe-life structure, with sweptback vertical surfaces, fixed-incidence tailplane, and one-piece elevator. Two-spar fin and one-piece tailplane, bolted to fuselage; single-spar elevator, statically and aerodynamically balanced, and balanced rudder. Military models have reinforced tail unit/fuselage joints compared with SF.260C. Rudder (30° travel to left or right) and elevator (travel 24° up, 16° down) operated by cables. Controllable trim tab in starboard half of elevator; ground-adjustable tab on rudder.

LANDING GEAR: Electrically-retractable tricycle type, with manual emergency actuation. Inward-retracting main gear, of trailing-arm type, and rearward-retracting nose unit, each embodying Magnaghi oleo-pneumatic shock-absorber (type 2/22028 on main units). Each welded steel tube main leg is hinged to the main and rear spars. Nose unit is of leg-and-fork type, with co-axial shock-absorber and torque strut. Cleveland P/N 3080A main wheels, with size 6.00–6 tube and tyre (6-ply rating), pressure 2.45 bars (35.5 lb/sq in). Cleveland P/N 40-77A nosewheel, with size 5.00–5 tube and tyre (6-ply rating), pressure 1.96 bars (28.4 lb/sq in). Cleveland P/N 3000-500 independent hydraulic single-disc brake and parking brake on each main wheel. Nosewheel steering (20° to left or right) is operated directly by the rudder pedals, to which it is linked by pushrods. Up-lock secures main gear in retracted position during flight; anti-retraction system prevents main gear from retracting whenever strut is compressed by weight of aircraft. Compared with SF.260C, the military models have a reinforced nosewheel drag brace attachment and landing gear retraction supports; increased use of light alloy forgings, instead of welded steel, in certain landing gear components; and an improved retraction locking mechanism. On all models, the mooring point beneath the rear fuselage acts as a tail bumper.

POWER PLANT: One 194 kW (260 hp) Lycoming O-540-E4A5 flat-six engine, driving a Hartzell two-blade constant-speed metal propeller with spinner (HC-C2YK-1BF/8477-8R propeller on military models, HC-C2YK-1B/8477-8R or HC-C2YK-4F/FC-8477-8R on SF.260C). Fuel in two light alloy tanks in wings, each with capacity of 49.5 litres (10.9 Imp gallons); and two permanent wingtip tanks, each with capacity of 72 litres (15.85 Imp gallons) on SF.260M, W, and SW, 70 litres (15.5 Imp gallons) on SF.260C. Total internal fuel capacity 243 litres (53.5 Imp gallons) on SF.260M/W/SW, of which 235 litres (51.7 Imp gallons) are usable; and 239 litres (52.75 Imp gallons) on SF.260C. Individual refuelling point on top of each tank. In addition, SF.260W and SW may be fitted with two 83 litre (18.25 Imp gallon) auxiliary tanks on underwing pylons. Oil capacity (all models) 11.4 litres (2.5 Imp gallons).

ACCOMMODATION (SF.260C): Three seats in enclosed cockpit, two side by side in front and one at rear. Two children with a combined weight not exceeding 113 kg (250 lb) may occupy rear seat. One-piece fully-transparent rearward-sliding Plexiglas canopy, with rubber-cord canopy release. Baggage compartment, capacity 40 kg (88 lb), aft of rear seat. Cabin heated, ventilated, and soundproofed with glassfibre.

ACCOMMODATION (SF.260M; W and SW similar): Side-by-side front seats (for instructor and pupil in SF.260M), with third seat centrally at rear. Front seats are individually adjustable fore and aft, and have forward-folding backs and provision for back-type parachute packs. Dual controls standard. All three seats equipped with lap belts and shoulder harnesses. Baggage compartment aft of rear seat. One-piece fully-transparent rearward-sliding Plexiglas canopy, upper portion of which is tinted. Emergency canopy release handle for each front seat occupant. Steel tube windscreen frame for protection in the event of an overturn. Cabin carpeted, air-conditioned, heated, and ventilated; walls thermally insulated and soundproofed by a glassfibre lining. Slots at base of windscreen admit air for windscreen defrosting.

SYSTEMS (SF.260M; other models generally similar): Hydraulic equipment for main-wheel brakes only. No pneumatic system. 24V DC electrical system of single-conductor negative earth type, including 70A Prestolite engine-mounted alternator/rectifier and 24V 24Ah Varley battery, for engine starting, flap and landing gear actuation, fuel booster pumps, electronics, and lighting. Sealed battery compartment in rear of fuselage on port side. Connection of an external power source automatically disconnects the battery. Heating system for carburettor air intake. Emergency electrical system for extending land-

The new SIAI-Marchetti SF.260SW Sea Warrior, with Bendix radar in port wingtip pod, and underwing rescue pack

ing gear if normal electrical actuation fails; provision for mechanical extension in the event of total electrical failure. Cabin heating, and windscreen de-icing and demisting, by heat exchanger using engine exhaust air. Additional manually controlled warm-air outlets for general cabin heating. Oxygen system optional.

ELECTRONICS AND EQUIPMENT (SF.260M; W and SW generally similar): Basic instrumentation and military equipment to customer's requirements. Blind-flying instrumentation and communications equipment optional: typical selection includes dual Collins 20B VHF com; Collins VIR-31A VHF nav; Collins ADF-60A ADF; Collins TDR-90 ATC transponder; Collins PN-101 compass; ID-90-000 RMI; and Gemelli AG04-1 intercom. Landing light in nose, below spinner. Instrument panel can be slid rearward to provide access to rear of instruments. Compared with the 260C, the SF.260M has various improvements to flight controls, engine controls (duplicated propeller and throttle controls), electrical system, radio, and other equipment installations.

ARMAMENT (SF.260W): Two or four underwing hardpoints, able to carry external stores on NATO standard pylons up to a maximum of 300 kg (661 lb) when flown as a single-seater. Typical alternative loads can include one or two SIAI gun pods, each with one 7.62 mm FN machine-gun and 500 rds; two Matra MAC AAF1 7.62 mm gun pods; two Simpres AL-8-70 launchers each with eight 2.75 in FFAR rockets; two LAU-32 launchers each with seven 2.75 in FFAR rockets; two Simpres AL-18-50 launchers each with eighteen 2 in SNIA ARF/8M2 rockets; two Matra F2 launchers each with six 68 mm SNEB 253 rockets; two Matra 181 launchers each with eighteen 37 mm rockets; two SAMP EU 32 125 kg general purpose bombs or EU 13 120 kg fragmentation bombs; two SAMP EU 70 50 kg general purpose bombs; Mk 76 11 kg practice bombs; two Alkan 500B cartridge throwers for Lacroix 74 mm explosive cartridges, F 725 flares, or F 130 smoke cartridges; one Alkan 500B cartridge thrower and one photo-reconnaissance pod with two 70 mm automatic cameras; or two 83 litre (18.25 Imp gallon) auxiliary fuel tanks.

OPERATIONAL EQUIPMENT (SF.260SW): Retains the underwing pylons and gunsight of the SF.260W, but is equipped also with crew survival kit and specially designed enlarged tip-tanks incorporating a lightweight radar and a photographic reconnaissance system. Bendix RDR-1400 digital radar and transmitter-receiver in forward portion of port tip-tank for search, ground mapping, beacon identification, and weather avoidance. Radar control and display units are mounted at co-pilot's station, but a radar reconnaissance can be flown without a separate radar operator. Forward-looking obliquely-mounted 70 mm camera in front portion of starboard tip-tank. Rear portion of each tip-tank contains same amount of fuel (72 litres; 15.85 Imp gallons) as the smaller tip-tanks of the SF.260W. The SW can also be used for search and rescue or air supply delivery with various underwing survival kits (land or sea type) and emergency packs. Survival kit, in droppable underwing containers, is parachute-stabilised and includes 10-place (or Matra Samar 8-place) life raft, tents, rations, signals, or other equipment, depending upon prevailing climatic conditions.

SIAI-Marchetti SF.260WP light strike aircraft of the Philippine Air Force, with underwing 7.62 mm gun pods

DIMENSIONS, EXTERNAL:

Wing span over tip-tanks:	
C, M, W	8.35 m (27 ft 4¾ in)
SW	8.70 m (28 ft 6½ in)
Wing chord at root	1.60 m (5 ft 3 in)
Wing mean aerodynamic chord	1.325 m (4 ft 4¼ in)
Wing chord at tip	0.784 m (2 ft 6⅞ in)
Wing aspect ratio (excl tip-tanks)	6.33
Wing taper ratio	2.24
Length overall	7.10 m (23 ft 3½ in)
Fuselage: Max width	1.10 m (3 ft 7¼ in)
Max depth	1.042 m (3 ft 5 in)
Height overall	2.41 m (7 ft 11 in)
Elevator span	3.01 m (9 ft 10½ in)
Wheel track	2.274 m (7 ft 5½ in)
Wheelbase	1.66 m (5 ft 5¼ in)
Propeller diameter	1.93 m (6 ft 4 in)
Propeller ground clearance	0.32 m (1 ft 0½ in)

DIMENSIONS, INTERNAL:

Cabin: Length	1.66 m (5 ft 5¼ in)
Max width	1.00 m (3 ft 3¼ in)
Height (seat cushion to canopy)	0.92 m (3 ft 0¼ in)
Volume	1.50 m³ (53 cu ft)
Baggage compartment volume	0.18 m³ (6.36 cu ft)

AREAS:

Wings, gross	10.10 m² (108.70 sq ft)
Ailerons (total, incl tabs)	0.762 m² (8.20 sq ft)
Trailing-edge flaps (total)	1.18 m² (12.70 sq ft)
Fin	0.76 m² (8.18 sq ft)
Dorsal fin	0.16 m² (1.72 sq ft)
Rudder, incl tab	0.60 m² (6.46 sq ft)
Tailplane	1.46 m² (15.70 sq ft)
Elevator, incl tab	0.96 m² (10.30 sq ft)

WEIGHTS AND LOADINGS:

Manufacturer's basic weight empty:	
W	770 kg (1,697 lb)
SW	775 kg (1,708 lb)
Weight empty, equipped:	
C	780 kg (1,720 lb)
M	799 kg (1,761 lb)
W	814 kg (1,794 lb)
SW	857 kg (1,889 lb)
Fuel load:	
in-wing and wingtip tanks (all versions)	169 kg (372.5 lb)
underwing tanks (W and SW only)	114 kg (251.5 lb)
Typical mission weights:	
M, trainer ('clean')	1,140 kg (2,513 lb)
W, two 47 kg (103.5 lb) machine-gun pods and full internal fuel	1,163 kg (2,564 lb)
W, one Alkan 500B cartridge thrower, one two-camera reconnaissance pod, and full internal fuel	1,182 kg (2,605 lb)

SIAI-Marchetti SF.260AMI (SF.260MX series) two/three-seat military trainer of the Italian Air Force

W, trainer with 94 kg (207 lb) external stores 1,249 kg (2,753 lb)
W, self-ferry with two 83 litre (18.25 Imp gallon) underwing tanks 1,285 kg (2,833 lb)
W, two 125 kg bombs and 150 kg (331 lb) internal fuel 1,300 kg (2,866 lb)
W, two AL-8-70 rocket launchers and 160 kg (353 lb) internal fuel 1,300 kg (2,866 lb)
SW, reconnaissance patrol 1,246 kg (2,747 lb)
SW, search and rescue with two 90 kg (198.5 lb) survival kits, 60 kg (132 lb) of external weapons, and full internal fuel 1,264 kg (2,786 lb)
SW, armed patrol 1,300 kg (2,866 lb)
SW, surveillance with two 90 kg (198.5 lb) survival kits, two 47 kg (103.5 lb) gun pods, and full internal fuel 1,300 kg (2,866 lb)

Max T-O weight:
C, Aerobatic 1,000 kg (2,205 lb)
C, Utility 1,102 kg (2,430 lb)
M, Aerobatic 1,100 kg (2,425 lb)
M, Utility 1,200 kg (2,645 lb)
W, SW, max permitted 1,300 kg (2,866 lb)

Max wing loading:
C 109 kg/m² (22.4 lb/sq ft)
M 119 kg/m² (24.4 lb/sq ft)
W, SW 129 kg/m² (26.4 lb/sq ft)

Max power loading:
C 5.68 kg/kW (9.33 lb/hp)
M 6.19 kg/kW (10.17 lb/hp)
W, SW 6.70 kg/kW (11.01 lb/hp)

PERFORMANCE (C at AUW of 1,102 kg/2,430 lb; M at 1,200 kg/2,645 lb; W and SW at 1,300 kg/2,866 lb; unless stated otherwise):

Never-exceed speed:
M 235 knots (436 km/h; 271 mph)

Max level speed at S/L:
C 187 knots (347 km/h; 215 mph)
M 183 knots (340 km/h; 211 mph)
W 170 knots (315 km/h; 196 mph)
SW 164 knots (304 km/h; 189 mph)

Max cruising speed (75% power) at 3,050 m (10,000 ft):
C 186 knots (345 km/h; 214 mph)

Max cruising speed (75% power) at 1,500 m (4,925 ft):
M 174 knots (322 km/h; 200 mph)
W 155 knots (287 km/h; 178 mph)
SW 148 knots (275 km/h; 171 mph)

Stalling speed, flaps and landing gear up:
M 74 knots (137 km/h; 85.5 mph)
W, SW 88 knots (163 km/h; 101.5 mph)

Stalling speed, flaps and landing gear down:
C 57 knots (104 km/h; 65 mph)
M 64 knots (118 km/h; 73.5 mph)
W, SW 75 knots (139 km/h; 86.5 mph)

Max rate of climb at S/L:
C 540 m (1,771 ft)/min
M 475 m (1,558 ft)/min
W 335 m (1,099 ft)/min
SW 270 m (885 ft)/min

Time to 1,500 m (4,925 ft):
M 4 min 0 sec
W 6 min 20 sec
SW 7 min 30 sec

Time to 2,300 m (7,550 ft):
M 6 min 50 sec
W 10 min 20 sec
SW 14 min 45 sec

Time to 3,000 m (9,850 ft):
M 10 min 0 sec
W 18 min 40 sec

Service ceiling:
C 6,500 m (21,325 ft)
M 4,665 m (15,300 ft)

T-O run at S/L:
C (concrete) 250 m (820 ft)
C (grass) 290 m (952 ft)
M 384 m (1,260 ft)

T-O to 15 m (50 ft) at S/L:
C 472 m (1,550 ft)
M 606 m (1,988 ft)
W, SW 825 m (2,707 ft)

Landing from 15 m (50 ft) at S/L:
C 490 m (1,608 ft)
M 539 m (1,768 ft)
W, SW 645 m (2,116 ft)

Landing run at S/L:
C 240 m (788 ft)
M 345 m (1,132 ft)

Operational radius:
W, 6 hr 25 min single-seat armed patrol mission at 1,163 kg (2,564 lb) AUW, incl 5 hr 35 min over operating area, 20 kg (44 lb) fuel reserves 50 nm (92 km; 57 miles)
W, 3 hr 38 min single-seat strike mission, incl two 5 min loiters over separate en-route target areas, 20 kg (44 lb) fuel reserves 250 nm (463 km; 287 miles)
W, 4 hr 54 min single-seat strike mission, incl 5 min over target area, 20 kg (44 lb) fuel reserves 300 nm (556 km; 345 miles)
W, 4 hr 30 min single-seat photo-reconnaissance mission at 1,182 kg (2,605 lb) AUW, incl three 1 hr loiters over separate en-route operating areas, 20 kg (44 lb) fuel reserves 150 nm (278 km; 172 miles)
W, 6 hr 3 min two-seat self-ferry mission with two 83 litre (18.25 Imp gallon) underwing tanks, at 1,285 kg (2,833 lb) AUW, 30 kg (66 lb) fuel reserves 926 nm (1,716 km; 1,066 miles)
SW, 5 hr 17 min two-seat surveillance mission, incl 3 hr 40 min over operating area at 105 knots (195 km/h; 121 mph), 20 kg (44 lb) fuel reserves 100 nm (185 km; 115 miles)
SW, 5 hr 13 min two-seat surveillance mission, incl 2 hr 0 min over operating area at 105 knots (195 km/h; 121 mph), 20 kg (44 lb) fuel reserves 200 nm (370 km; 230 miles)
SW, 5 hr 27 min two-seat SAR mission at 1,264 kg (2,786 lb) AUW, incl 2 hr 15 min over operating area, 5 kg (11 lb) fuel reserves 200 nm (370 km; 230 miles)

Range with max fuel:
C (two-seat) 1,106 nm (2,050 km; 1,274 miles)
M (two-seat) 890 nm (1,650 km; 1,025 miles)

g limits (M and C):
at max Aerobatic T-O weight +6.0; −3.0
at max Utility T-O weight without external load +4.4; −2.2

Aeritalia G222 SAMA photographed during a firefighting demonstration

AERITALIA

AERITALIA SpA; Head Office: Piazzale Vincenzo Tecchio 51 (Casella Postale 3065), 80125 Naples, Italy

AERITALIA G222 SAMA

As mentioned in the December 1976 *Jane's Supplement*, the design of the G222 military transport aircraft makes it suitable for adaptation to such civil applications as firefighting, crop-spraying, aerial photogrammetry, and radio calibration.

Water-bombing tests for the firefighting role were completed successfully in 1976, using the second prototype G222 (I-MAXB) fitted with a dispersal system designed by Food Machinery Corporation. In this configuration, the aircraft is designated G222 SAMA (Sistema Aeronautico Modulare Antincendio), and differs from the military G222 in the following respects:

EQUIPMENT: Modular palletised firefighting pack can be installed in under two hours without any modification to the basic transport aircraft. The module consists of a 6,300 litre (1,385 Imp gallon) tank and four pressurised air containers to activate the pneumatic actuators and discharge the retardant/fertiliser through two nozzles. Length of area covered averages 300 m (985 ft).

WEIGHTS:
Operating weight empty 15,700 kg (34,614 lb)
SAMA equipment module 2,200 kg (4,850 lb)
Retardant 6,800 kg (14,990 lb)
Fuel 1,800 kg (3,968 lb)
Max T-O weight 26,500 kg (58,422 lb)

PERFORMANCE (at max T-O weight):
Max cruising speed 250 knots (463 km/h; 287 mph)
Drop speed (T-O configuration) 120 knots (222 km/h; 138 mph)
Optimum height above ground during drop 50–100 m (165–330 ft)
T-O run 750 m (2,460 ft)
T-O to 15 m (50 ft) 1,230 m (4,035 ft)
Max range 172 nm (320 km; 200 miles)

The North Atlantic Treaty Organization continues to live with many of its perennial problems plus some new ones. But there now is a difference. The initiatives proposed by President Carter in May and elaborated subsequently by Secretary of Defense Harold Brown contain an implied "or else." So the coming months may be . . .

NATO's Year of Decision

BY GEN. T. R. MILTON, USAF (RET.)

As everyone who has done any navigating will agree, an essential part of dead-reckoning is to know where you have been. Since we seem to be tracking across increasingly unmarked territory in pursuit of our own and the free world's security, a brief look back may be in order.

May 1, 1939, is as good a time as any to use for a fix. It was still, compared to what lay ahead, an uncomplicated time. The cover of *Life* Magazine that week bore a picture of Joe DiMaggio, the nonpareil of the New York Yankees, those all-white champions of the white baseball world. Another Italian name in the news that week was Benito Mussolini, whose soldiers were in the process of occupying Albania. The comic-opera Albanian ruler, King Zog, had fled to Greece, and the Italian conquest was complete.

The real world power in those days, however, was still Great Britain. Reacting to the Italian invasion of Albania, the British sent a force of thirty-five bombers to Greece and moved the British Mediterranean fleet to the eastern Med, while the French positioned their fleet in the western Mediterranean. The British House of Commons, reflecting all the power and majesty of the British Empire, met in solemn session to contemplate the situation. If Britain seized the island of Corfu, off the coast of Albania, the Commons was informed, Italy would guarantee "very serious consequences" (laughter). The British reply was that Britain would take "a very grave view if anyone else occupied Corfu" (cheers and laughter).

Britain's new allies were Poland and Romania. Prime Minister Neville Chamberlain, a seemingly tougher man that day than he had been in Munich the previous September, told the Commons, "In the event of any action being taken which clearly threatens the independence of Greece or Romania . . . His Majesty's Government will feel bound to lend at once to the Greek or Romanian Government, as the case may be, all the support in their power" (loud cheers).

Great Britain opted for its own Nimrod to fill the airborne warning and control system role, instead of the USAF-developed E-3A, shown above, the initial versions of which are operational.

Russia, then as now enigmatic, had an army of 1,800,000 that May of '39. The United States, by comparison, had an army of 115,000—5,000 men smaller than Belgium's. The question was whether or not the Soviet army was any good, and would it be able to forget ideologies and fight on the side of the democracies. Meanwhile, Adolf Hitler was marking his fiftieth birthday, serenely on his way to the Thousand Year Reich.

Here at home we were beginning, but only just beginning, to rouse ourselves to the threat.

Thirty-eight years later, Britain is celebrating the Queen's Jubilee. In all truth, there is really not much to

celebrate. The twenty-five years of Elizabeth II's reign have seen the British Empire become the United Kingdom, and, unlike the great days of the Empire, the sun now sets regularly on that medium-sized European nation. Even the name "United Kingdom" is being challenged. A curious word, devolution, a sort of well-bred version of revolution, has come into everyday usage. Webster defines it as "the surrender of powers to local authorities by a central government." It can also mean, according to Webster, degeneration. From the standpoint of the integrity of the United Kingdom, that is the real definition. Even Wales, without an equivalent economic weapon to Scotland's North Sea oil, is making devolution noises, and the terrible, apparently unsolvable, problem of Northern Ireland goes on. These are, then, grim days for the British, the Jubilee notwithstanding.

Britain's Role in NATO—and Vice Versa

Still, they are a different sort of grim days from those of 1939. There is no pretense any longer of being a world power, and there is no Winston Churchill sounding alarms about threats to Britain's security. These are different times, even though the threat may be at least as great. Instead of a Winston Churchill shouting from the rooftops the need for increased fighter production, the British are treated to the spectacle of a Defence Minister taking time out from his duties to march in a picket line.

Nonetheless, the British do have, left over from greater days, an essential role to play in the continuing saga of NATO. Out of the Far East, essentially out of the Mediterranean, no longer policing the far-flung Empire, the Brits now concern themselves with their own self-defense, for which NATO has become a synonym.

The Ministry of Defence in Whitehall is a little dingy these days, what with the years, reduced budgets, and the fact that the British do not seem to set much store on the size and elegance of their offices. And so, aside from the undeniable ring of the Horse Guards' Entrance, clearly one up on the Pentagon's Mall or River Entrance, there is not much that would excite the envy of any run-of-the-mill Pentagon bureaucrat.

The office of the Chief of Defence Staff, CDS as we old Whitehall types say, is a perfect case in point. Two or three aides occupy a cluttered outer office, which also serves as a waiting room. The office of the CDS himself is without pretension and trappings. It is simply an unadorned place to work, unchanged in any respect since I first visited it ten years ago, and doubtless, long before that. The present occupant is Admiral of the Fleet Sir Edward Ashmore, who succeeded to the post from that of First Sea Lord —certainly the grandest possible title for a chief of service—when Marshal of the RAF Sir Andrew Humphrey died last winter. Because the job of CDS rotates among the services and it is still the RAF's turn, Admiral Ashmore will be replaced this September by Marshal of the RAF Sir Neil Cameron.

It is one of the reassuring things about the British that the quality of their senior military has been kept at such a high standard. Andrew Humphrey was, without question, an exceedingly intelligent and thoughtful man, a superb choice for CDS. His sudden death brought Edward Ashmore to the post. Sir Edward is himself a true intellectual, a Russian linguist and a man keenly aware of the world's dangers. His successor, Neil Cameron, will keep up the standard. It serves as a nice and steadying counterbalance for what seems to be a growing tendency toward mediocrity, and worse, on the political side of the British government.

National vs. Alliance Interests

Much of what Sir Edward Ashmore worries about these days is out of his hands. The matter of Turkey and Cyprus, for instance. He feels, as do most NATO officials, that our Congress has done great, but not necessarily irreparable, harm to the situation in the eastern Med by its linkage of Cyprus to Turkish military assistance.

Closer to home, Sir Edward worries about air defense. The Soviet Backfire bomber, for instance, however it comes out in SALT, remains a serious threat to all of Western Europe. NATO's, and Britain's, air defenses are in sad shape, another Ashmore view shared generally within the NATO hierarchy. The justification for an airborne warning and control aircraft rests, of course, on this air defense weakness. NADGE, the acronym for the NATO Air Defense Ground Environment, has gaps, particularly at low altitude. Because the sites are well-known and pinpointed by the Soviets, NADGE would probably be an early casualty in any Warsaw Pact attack. Therefore, the need for airborne warning and control is a very real one if NATO is not to be left blind in the first moments of any war.

What is not so clearly logical is the British choice of their own Nimrod in lieu of the American E-3A airborne warning and control system. Regardless of the arguments Admiral Ashmore or anyone else advances in justification of that choice, it would appear to have been made on economic and political, not military, grounds. Admittedly, the Nimrod will be better than the present system, but it will not do the same job as the E-3A.

Perhaps in its zeal the United States may have overplayed things a little. The E-3A program is a frighteningly expensive one in terms of European defense budgets. We might have been more successful had we aimed somewhat lower on initial numbers. And while he never said so directly, the Admiral gives the impression that he thought some of our arguments, like the one that the USAF might not get the E-3A if NATO did not buy it, a little hard to swallow. In the end, however, it seems to have been the old NATO problem—a clash of national and alliance interests. As usual, national interests won. Our own squabble with Germany over the new battle tank delayed a German decision on the E-3A, a decision that might well have forced the British to come along quietly.

However, if the NATO E-3A program appears to be faltering, another important program is on track. Some years ago, a lot of us thought the Multi-Role Combat Aircraft, the Tornado, or to use the name everyone recognizes it by, the

MRCA, would founder in the development stage. This is a consortium airplane, built by the Germans, British, and Italians, with even a little Canadian money invested, and aircraft consortiums in Europe have often had their problems. In the case of the MRCA, rising costs, coupled with Britain's financial woes, were the bad omens. It now seems the doomsayers were wrong. The consortium has held together, and the British are determined to have the airplane. There was never any doubt the Germans would carry through on the project if they possibly could. Now, even though some doubt must remain about Italy in view of the internal troubles in that country, the MRCA seems to be solidly in NATO's future. (*See also p. 19.*)

The British are not yet through the transition period from empire and world power to a quasi-European nation dependent on allies for defense. The Navy, reduced from 870 ships when Elizabeth came to the throne to 200 or so in the year of her Jubilee, is now essentially for coastal defense. There are still some impressive ships, such as HMS *Belfast*, which swung at anchor opposite the Tower of London during Jubilee week, but not very many. The last aircraft carrier is on its way out. Nevertheless, it is worth remembering that the Royal Navy came up with the steam catapult, the angled deck, the mirror landing system. The Royal Navy is now embarked on some innovative ships using VTOL fighters and helicopters. Maybe, once again, they know something. In any case, Britain's troubles are, if not minor, at least no worse than those of her more prosperous neighbor across the Channel. Given the French proclivity for political upheavals, they are probably better.

NATO's Latin Legacy

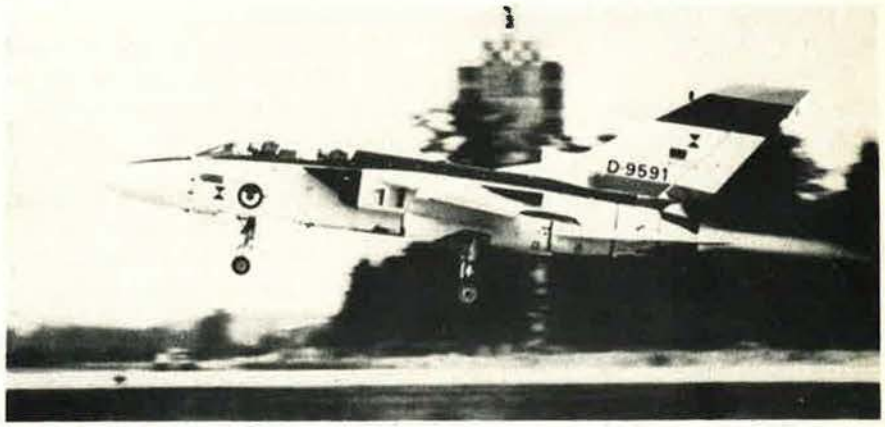
When Giscard d'Estaing won by a whisker over François Mitterand in the French elections three years ago, there was enormous relief throughout western Europe. Giscard, an elegant and accomplished man, seemed to have a potential for leadership, not only of France but of the European allies. As his hand strengthened in France, it was the great hope of the NATO allies that Giscard would lead France back into the Alliance proper. It seemed at the time a reasonable hope.

The three years of Giscard's presidency have been years of great disappointment for those who held that hope. Mitterand is back, again at the head of a confident leftist coalition that includes the Communists, and the situation is further complicated, and Giscard further weakened, by a challenge from the Gaullist right. Whatever comes to pass, France will move no nearer to NATO. It is a great pity because NATO and France would both be the winner if that were to come about.

Economically, France appears, to the casual visitor, a complete success story. Where twenty-five years ago there were mopeds and for the slightly more affluent, scooters, there now are automobiles, bumper-to-bumper automobiles. A scooter has only the slimmest of chances in today's traffic. The autoroutes speed the getaway for *le weekend*, an expression now firmly planted in the French lexicon, and *le weekend*, judging by the traffic, seems to start on Wednesday and end on Tuesday. The hotels in France are full, and never mind the outrageous prices. The three-star restaurants, where dinner for two can easily cost $200, turn away customers. It all seems too good to be true, and it probably is.

Meanwhile, however, the facade of a somewhat united Western Europe is preserved in the Common Market. It no longer aspires to fulfill the dream of Jean Monnet, but it exists and it functions.

There is, of course, growing uneasiness in Italy as the Communists slowly extend their influence, in a method unique for Communists, by winning local elections. It is some small encouragement to know that they are finding it just as difficult to



Top, the MRCA Tornado ground attack version will provide NATO forces a potent tank killer. Pact armies have several thousand T-54/55 tanks like the one above and many more modern armored vehicles.

govern places like Naples as did the Christian Democrats, but the fact remains that their power structure is spreading. It is also a fact that many Italians with money to spare are getting it out of the country, a process that may hasten a Communist takeover. Even that may be preferable to the growing anarchistic violence in that land.

Germany has a different outlook these days from her neighbors. It is obviously a rich country, and neither unemployment nor inflation has yet caused the kind of dissatisfaction so evident in the rest of Europe. Still, there are problems. One of them is the very fact of Germany's resurgence, for it creates an anomaly. The strongest, the richest, the best disciplined country in Western Europe cannot, simply because it is Germany and there are too many memories, take over the leadership of Europe. That job remains the responsibility of the United States, now as before. Short of a withdrawal from Europe, there is no way for the US to duck it.

The Carter Initiatives

Thus, the visit of President Carter to London and his attendance at the NATO summit meeting attracted more than the usual amount of attention. Presidential appearances at NATO meetings are always events, but this was different. The problems we have just touched on were at least in the backs of people's minds. Uncertainty about the course this new US Administration was about to take was in the front of everyone's mind.

Well, so far, so good. The President made the right sort of reassuring sounds in London, and he did more than that. He set some new goals for NATO. There is nothing new in any of that. All US Presidents have made reassuring remarks about NATO, and most Administrations, if not the President himself, have set some sort of new goals. The difference this time comes in the faintly ominous, and clearly implied, "or else" that accompanied these new initiatives. The invitation for NATO to meet in Washington next spring was clearly more than a nice touch of protocol. It was issued in the apparent expectation that the NATO functionaries would have something positive to report.

While the US initiatives proposed in London, and spelled out more fully by Secretary of Defense Harold Brown at the May ministerial meeting of the Defense Planning Committee, are still classified, there is, happily, an unclassified clue to what has been proposed. It lies in Dr. Brown's speech to the Atlanta Chamber of Commerce on May 12, just one week before the Brussels DPC meeting. There is every reason to believe the NATO improvements called for in that speech are the ones the NATO staff is beavering away on now. Briefly, Secretary Brown called for:

- Greater readiness, especially against a surprise attack;
- Better deployment of forces, citing the shifting of some US troops to the North German plain as illustrative;
- Overhauling NATO crisis management and alert procedures;
- Augmenting defense against armored attack;
- Building up munitions stocks;
- Rationalizing NATO's defense posture to achieve the best collective capability—at lowest cost—for coalition operations.

There is not much new in this list except for the fact that the Carter Administration expects something to come of these initiatives, and soon. It is interesting to note the absence from the list of any mention of standardization, long a venerated, if largely ignored, NATO credo. Instead, the call is for rationalization in the interest of coalition operations, an initiative that could open up some exceedingly interesting prospects for this alliance of equal, and nationally oriented, partners.

Rationalization is an idea that has been knocking around in NATO for a long time. Briefly, in its purest sense, it means that each nation would concentrate on doing those military tasks it is best suited for. Thus, the Netherlands Navy, for example, might be the main Dutch contribution. The Belgian Navy could then disappear in favor of an increased army commitment. Or within small air forces, some could devote themselves to close-air support, some to reconnaissance. Considering the fact that none of the

Gen. T. R. Milton, a regular contributor to AIR FORCE Magazine, was the US Representative to NATO's Military Committee prior to his retirement in 1974. A graduate of USMA, he led the historic Schweinfurt raid in October 1943. He was Chief of Staff of the Combined Airlift Task Force during the Berlin Airlift. Later he commanded Thirteenth Air Force and served as Chief of Staff of TAC and as Comptroller of the Air Force.

European NATO nations has any real military credibility on its own, at least not against the only credible adversary, rationalization makes unarguable good sense.

The problem with rationalization is mainly an emotional one: To achieve it, European nations will have to give up a bit of their sovereignty in the interests of mutual defense. While in theory they have long since done just that in belonging to NATO, it is only true in theory. The NATO allies have gone, for the most part, their own separate ways in deciding how much to appropriate and where to spend their defense budgets. NATO military organizations do not exist as such. Each nation has its own way of organizing. Rationalization is an idea whose time came long ago, but until now it has been out of reach. Logic is firmly on the side of rationalization as NATO's wave of the future. Once started, the process will be irreversible. Next spring, presumably, we will see how the Carter pressure has worked.

The other initiatives are all sensible and needed, although redeployment, for economic and political reasons, is more easily talked about than accomplished.

Rumsfeld's Revelation

Nothing in NATO is so vulnerable to criticism and reform as the crisis management and alerting procedures, and it ties directly to the proposal for greater readiness. Years ago such a reform was tried and, for mainly nationalistic reasons, failed. It was my doubtful good fortune to be cochairman, along with a wise and cynical Lord Coleridge, of a committee to refine and simplify NATO alert procedures. Lord Coleridge and I were

representing the civilian and military hierarchies. The members of our committee were representing the positions of their respective nations. We met on and off for a year, after which we handed in a somewhat dejected report recommending that everything be left as it is. Maybe this time, under the US whip, the subject will get better treatment.

The fact remains that NATO's ability to react to any threat is crippled by its creaking and antiquated decision-making machinery. The crisis management and alert procedures are really a relic of those bygone days when any real crisis was presumably going to be handled by Uncle Sam. As Harold Brown said in his Atlanta speech, and hence, presumably, to the DPC, no NATO ally, the United States included, can afford any longer "those elements of a go-it-alone approach which have been tolerable in the past."

The proposals for augmenting the antiarmor capability and increasing stockpiles of munitions are not really controversial except in the sense that they will cost money. It has always been a difficult thing for NATO countries to divert money from limited defense budgets toward stockpiles at the expense of things like tanks, airplanes, and even force structure. Traditionally, then, the munition stockpiles have been inadequate, with an unadmitted but nonetheless clear hope that the US will make up the shortages should the day ever come.

Another reason for this reluctance to spend money on munitions, instead of things that show and can be used in parades, was a growing feeling in Europe that the threat was probably exaggerated. The Russians, while undeniably nearby, were not really making all the warlike preparations the military said they were. Donald Rumsfeld, in his last weeks as Secretary of Defense, had a scheme to take care of that complacency. He turned over to NATO US photos of Soviet formations in East Germany. The photography shows, in telling detail, the extravagance with which the Soviets are outfitting their units. Such equipment as river assault gear is shown in profusion. A briefing was set up and offered to the various NATO capitals, and it was given by the NATO Chief of Military Intelligence, a Dane. The effect of this exercise was a confirmation of the old saw about a picture being worth a thousand words. And so the preparation has at least been made for a receptive attitude toward these US proposals.

The Shadow of SALT

In the midst of this drive toward allied interdependence, however, one aspect still remains of the old go-it-alone days. It is SALT, and these discussions between the US and the Soviets are a source of continuing uneasiness to the allies. While it would be misleading to infer there ever was a European strategic balance vis-à-vis the Warsaw Pact, there was for a good many years the comfortable assurance of US strategic superiority. Tactical nuclear weapons have, of course, long been an essential part of the strategy of flexible response, a sort of equalizer to the obviously greater conventional strength of the Warsaw Pact.

With the exception of Britain and, if you accept that she is more or less a NATO ally, France, NATO's nuclear weapons are under US control. The fact that Forward Based Systems have begun to creep into SALT is a cause for NATO worry, a worry that stems from the sometimes inevitably conflicting aims of SALT and NATO security. Fighter-delivered nuclear weapons, with some on strip alert, are basic to the NATO defensive posture. Cruise missiles appear to have been made to order for this mission of theater nuclear delivery, and so the allies wish fervently that SALT would avoid any negotiation of this European capability. No matter what, the British and the French, as minor nuclear powers, would remain a separate and complicating factor. In the NATO view, the whole subject of Forward Based Systems should be avoided in any purely bilateral negotiations between the Soviets and the US.

A Year of Decision

The months ahead will be fascinating ones for old NATO watchers. We have, first of all, the situation in Britain, a nation that must, along with Germany and the US, remain as one of NATO's main pillars if the Alliance is to survive. Devolution, if it comes about, will hurt Britain's capacity and credibility to perform as a leader in the Alliance, just as the everlasting tragedy in Ireland has already hurt. Communist gains in Italy and France, however moderate these Communists may appear to be, strike at the very foundation of an alliance created to combat a spread of Moscow's sphere of influence.

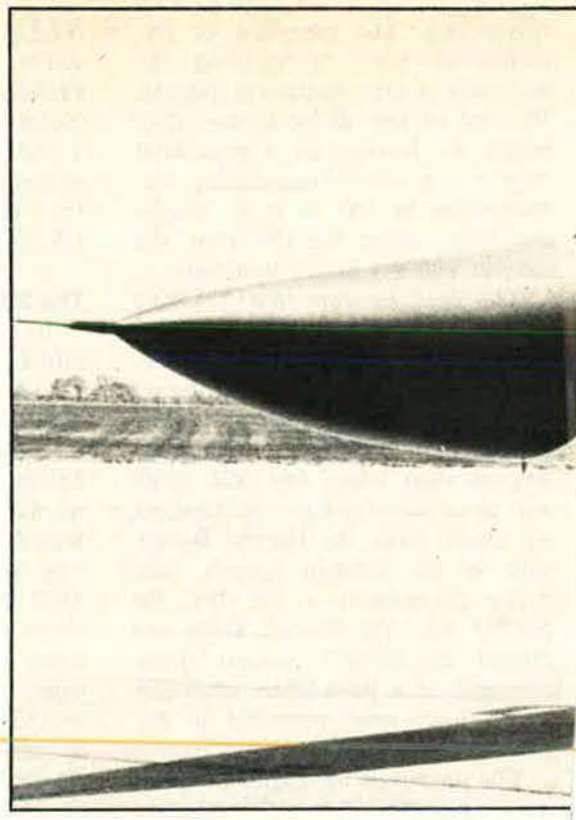
The Mediterranean, and the situation in respect to Turkey, continues to be an area of worsening NATO fortunes. Only the United States can begin to reverse that slide in the Med. How we behave this year should tell the tale.

The initiatives advanced by Secretary Brown are a needed stimulus to NATO, and they come at a crucial time. The veiled threat behind the Carter Administration's advancement of these proposals, a threat that implied the US would begin to reexamine its commitment if nothing positive comes of those proposals, is a powerful stimulus to some bureaucratic activity.

We can all hope the proposals do move the allies toward positive action. There is no question as to the need for some rejuvenation in NATO, especially in view of the reduced quality of US strategic deterrence. Undoubtedly the proposals are things that urgently need doing. The worrisome factor in the Administration's stand is the "or else." Or else, what?

If, for budgetary or political reasons, or just because weak coalition governments have no ability to decide things like this, the proposals stall for awhile, the United States should reflect a bit before it starts to back away from NATO. However exasperating it may sometimes be, however inefficient it may sometimes seem to be, and however unequal to the threat of a major attack it may appear, it is still the best, the only thing we have. In these increasingly troublesome days when the political future of Western Europe itself seems in doubt, it is the fervent hope of all our NATO friends that, if worst comes to worst and no new initiatives can be agreed, we stick by them as we have all these years. ■

EF-111A
USAF's Supersonic Electronic Shield



BY EDGAR ULSAMER
SENIOR EDITOR

Vietnam and the Yom Kippur War demonstrated that electronic warfare capabilities decisively affect the outcome of tactical air warfare. In turn, EW effectiveness is determined by how smart and powerful these systems are compared to those of the other side. On both counts, the future looks bright for USAF's proposed new tactical jamming system.

FIFTY years from the day Charles Lindbergh took off from Roosevelt Field on Long Island to make aviation history, Grumman Aerospace Corp. rolled out, not far from that site, a new USAF aircraft—the EF-111A Tactical Jamming System—that is likely to make electronic warfare (EW) history.

Informally christened the "Electric Fox" by Grumman's Chairman/President George Skurla, only four or five of these modified F-111As, properly spaced and flying "race-track" patterns, could erect an unbroken electronic screen across Europe, from the Baltic to the Adriatic, to blind and deceive the thick curtain of air defense and surveillance radars along the Warsaw Pact's western perimeter. Upon completion of the weapon system's flight and ground testing, and assuming a favorable DSARC (Defense System Acquisition Review Council) ruling on full production go-ahead, the Air Force next year may buy forty or more of these aircraft.

Born of the electronic warfare lessons of the Southeast Asian war when Soviet-built long-range radars detected "our aircraft from gear up to their attack run," the EF-111s, according to the Air Force Systems Command's Vice Commander, Lt. Gen. Robert C. Mathis, is being tailored to "support the tactical strike forces worldwide with high-power steerable, directional ECM [electronic countermeasures] jamming against early warning, height finder, ground control intercept, and acquisition radars." The new weapon system is to replace obsolete, inadequate EB-57s and EB-66s and to modernize USAF's EW capabilities in concert with F-4G and F-105G Wild Weasels, EW RPVs, and ECM pods carried by other combat aircraft.

Major, steady advance in Soviet/Warsaw Pact EW and air defense capabilities makes a compelling case for modernizing and strengthening USAF's electronic warfare forces. Over the past two decades, the Soviets have introduced at least one new type of electronic air defense system each year and, concomitantly, the Warsaw Pact's western border has been transformed into the world's densest thicket of electronic defenses, with as many as a thousand radar beams "painting" any airborne target within range.

Three Jamming Missions

With US/NATO tactical airpower as the principal force to checkmate the Pact's numerical preponderance, penetration and suppression of the hostile multilayered air defenses become USAF's first order of business in Europe. For the foreseeable future, radar technology pre-

sumably will continue as the basis of the Pact's early warning and air defense weapons control.

As early as 1971, the Air Force recognized the need for a dedicated airborne tactical jamming system because strike aircraft no longer can carry enough electronic countermeasures gear—or the required electric power—to jam the growing number and variety of hostile radars. On the basis of initial tests, the EF-111A appears capable of meeting the whole range of USAF's radar jamming requirements. The new EW 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 an onboard computer.

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," General Mathis points out.

In the penetration/escort mission, the EF-111As 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.

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 is well suited to the role of an airborne EW platform. The aircraft, as General Mathis stressed, offers fighter performance combined with great endurance on station.

Intrinsic pluses include the aircraft's compatibility 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.

Also crucial is the EF-111A's ability to loiter for up to five hours without refueling—in part a result of its VSW (variable sweepwing) design. This protracted endurance is especially important for standoff jamming. The aircraft's

operating envelope extends to speeds in excess of Mach 2.1 at altitudes up to 50,000 feet and to the low supersonic regime on the deck. The EF-111A carries more than 32,000 pounds of fuel and can range more than 2,000 miles.

The F-111A airframe can be modified without major redesign to accommodate the bulky and heavy jamming system. Three tons of sophisticated electronics equipment, including antennas, computers, and display devices, had to be fitted into the two-place high-performance aircraft.

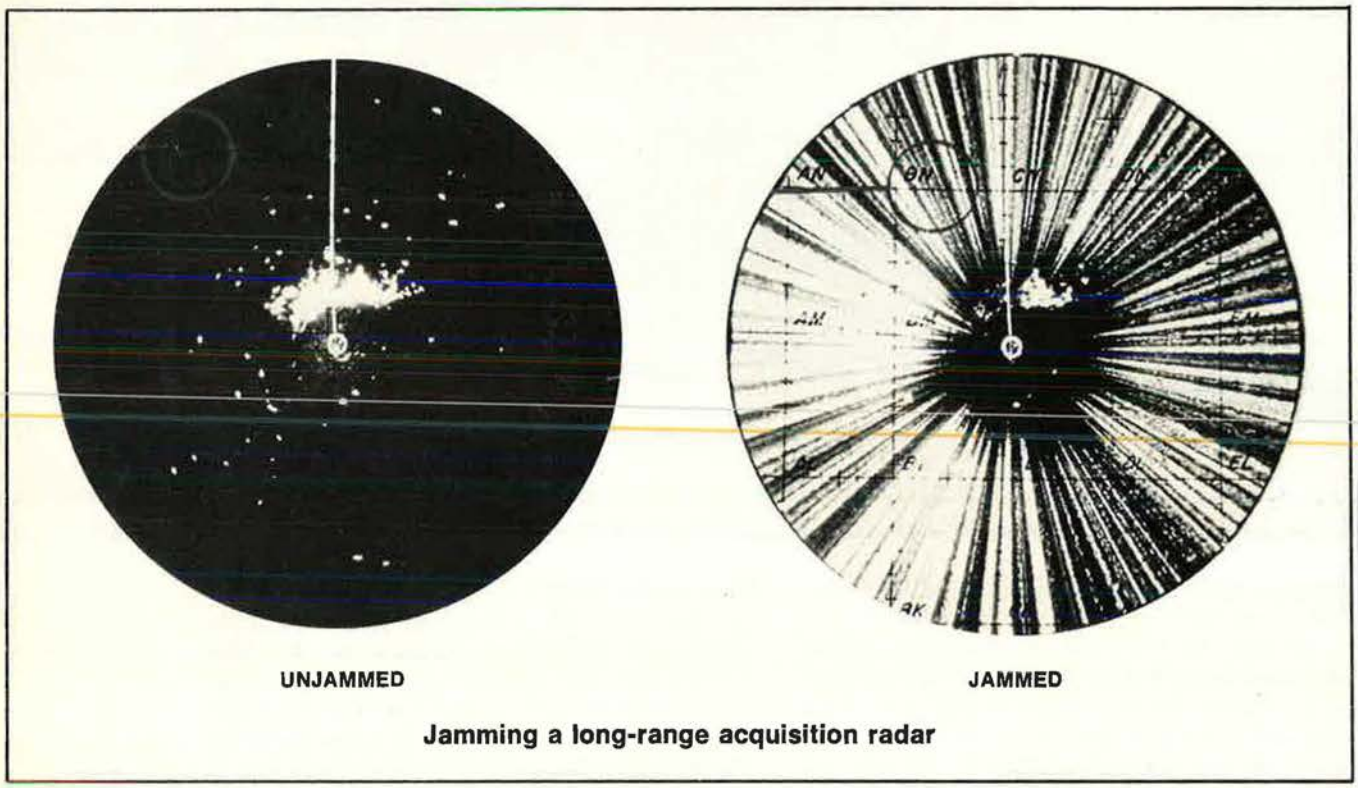
Exterior modifications include a narrow, canoe-shaped radome, sixteen feet in length, on the underside of the fuselage, that houses the antennas for the high-powered jamming transmitters; and a pod mounted on the vertical stabilizer for the receiving antennas and ancillary equipment, including a processor to detect hostile radar emissions. Other modifications of the original airframe include structural beefup, rearranging the cockpit, and upping the cooling and electrical power capacities. The central component of the EF-111A is the AN/ALQ-99E electronic jamming subsystem, an improved version of US Navy/Grumman ALQ-99.

The Prototype Program

On December 26, 1974, the Air Force selected Grumman to qualify and test two prototype EF-111A aircraft during a thirty-eight-month program phase called IB. During the preceding program phase, IA, Grumman and General Dynamics competitively conducted systems analyses and design definition of major modifications and integrations necessary for developing the tactical jamming system. Phase IA involved some hardware and brassboard demonstrations of major components. Phase IB formally got under way on January 30, 1975, with the award of an $85.86 million contract to Grumman that has been exceeded because of the requirement to redesign some components.

The current program phase involves two EF-111A prototypes and the ground and flight testing of the three principal subsystems that are being integrated: an improved, special version of Grumman's ALQ-99 jamming subsystem that in basic form now serves already aboard the US Navy's EA-6B electronics countermeasures aircraft; a terminal threat warning subsystem; and a standard Sanders Associates' ALQ-137 self-defense system that can provide protection from airborne intercepts, antiaircraft fire, and SAM attacks.

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 rang



Jamming a long-range acquisition radar

Loss of early warning radar "vision" is illustrated by views of unjammed (left) and jammed (right) returns. ALQ-99 blinds hostile radars to all aircraft movements in virtually all directions out to a range of 125 nautical miles.

Grumman EF-111A Tactical Jamming System

Crew	2—Pilot and Electronic Warfare Officer.
Power Plant	2 Pratt & Whitney TF30-P-3 turbofans, rated at 18,500 lb (8,391 kg) with afterburning.
Wing Span	63 ft. (19.20 m).
Wing Span (Swept)	32 ft. (9.75 m).
Overall Length	77 ft. (23.47 m).
Height	20 ft. (6.1 m).
Maximum Speed	1,262 knots (2,338 km/hr).
Maximum Cruise Speed	430 knots (797 km/hr).
Minimum Takeoff Distance	5,000 ft. (1,524 m).
Service Ceiling	50,000 ft. (15,240 m).
Ferry Range	2,100 nautical miles (3,889 km).
Weight, Empty	53,600 lb. (24,313 kg).
Internal Fuel	32,785 lb. (14,871 kg).
Maximum Takeoff Weight	87,800 lb. (38,825 kg).

Full-scale tests in DoD's shielded anechoic chamber located at Grumman's Calverton facility (the world's largest) confirmed the electronic compatibility of the EF-111A's various electronic subsystems.

of frequencies, according to Col. Larry McKenna, the EF-111A's outgoing Systems Program Director. The Airborne Instruments Laboratory ALQ-99E jammer is a fourth-generation system that appears capable of defeating the vast majority of known Soviet radars. (Claims by the General Accounting Office about the system's vulnerability to some Soviet radars are being investigated and, if verified, could lead to minor modifications or computer software changes.)

In selecting the ALQ-99, the Air Force capitalized on some $250 million the US Navy already has 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, according to Colonel McKenna.

The reason why 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, according to Colonel McKenna, 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 if the plug-in modules, available from aircraft service cards, are used. 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, according to Grumman engineers.

Compared to the relatively unambiguous counting of bombs-on-target, measuring the effectiveness of EW systems in peacetime is far more difficult and its findings less certain. An eventual production decision on the EF-111A—considered for the spring of next year—therefore is being preceded by extensive flight and

EF-111A—MAJOR SUBCONTRACTORS

American Aerospace Controls
Farmingdale, N. Y.
current sensor

American Electronic Laboratories, Inc.
Lansdale, Pa.
jamming subsystem receiver, low-band transmitter

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

Atlas Corp.
Atlas Titeflex Div.
Springfield, Mass.
flex hose

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

Canadair Ltd.
Montreal, Canada
vertical stabilizer

Cutler-Hammer, Inc.
AIL Div.
Deer Park, N. Y.
jamming subsystem and encoder

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

Dorne & Margolin, Inc.
Bohemia, N. Y.
jamming transmitter

Fairchild Space & Instrument Corp.
Syosset, N. Y.
converter synchronizer

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

General Dynamics
Fort Worth, Tex.
aft self-protection system

Grimes Manufacturing Co.
Urbana, Ohio
warning panel

Hartman Electric
Mansfield, Ohio
main line contactors

Hughes-Treitler 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
Brea, Calif.
seals

Lear Siegler
Elyria, Ohio
aft self-protection cooling system

Lourdes Industries
Hauppauge, N. Y.
relief valve

McDonnell Douglas Corp.
Douglas Aircraft Div.
Long Beach, Calif.
housing connector

Metal Bellows
Chatsworth, Calif.
accumulator, water tanks

Micro Lab
Livingston, N. J.
dummy load

Microphase Corp.
Cos Cob, Conn.
rf distribution network

Microwave Research Corp.
North Andover, Mass.
high-band power divider

Mite Corp.
Gar Electro Forming Div.
Danbury, Conn.
antenna horn

Novatronics, Inc.
Pompano Beach, Fla.
interference blanker unit

Randtron
Menlo Park, Calif.
jamming transmitter antennas

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

Sage Laboratories
Natick, Mass.
coupler

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

Seaton Wilson Inc.
Burbank, Calif.
fluid disconnectors

Simmonds Precision Products, Inc.
Tarrytown, N. Y.
ram air actuators

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.
Edison, N. J.
jammer pallet

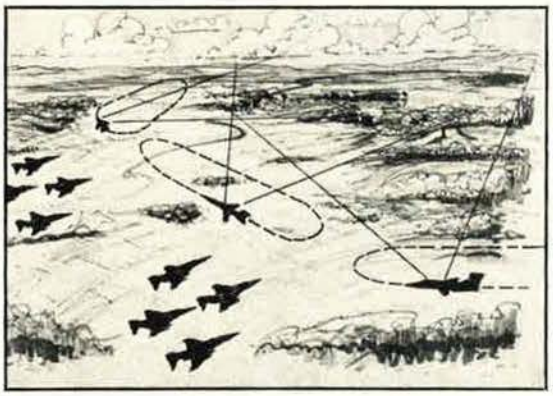
Walter Kidde & Co.
Fenwal, Inc., Div.
Ashland, Mass.
sensors

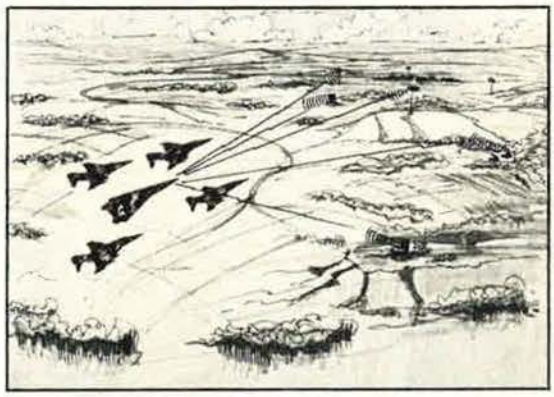
Wavecom
Northridge, Calif.
power divider, coupler, filters

ground testing at Grumman's Calverton, L. I., facility; USAF's Rome, N. Y., Air Development Center; and the REDCAP EW simulation facility of Calspan Corp. at Buffalo, N. Y.

Initial findings tend to confirm that there is no known equivalent to the EF-111A jamming subsystem in terms of airborne EW sophistication and sheer radiated power, according to USAF spokesmen. Coupled with the high-performance F-111A airframe, it appears to represent the "smartest," most powerful, and most versatile EW weapon system anywhere—now and for years to come.

Delivery of the first production aircraft is scheduled for mid-1980 and USAF's full programmed buy of forty-two aircraft—assuming that there is no increase of the required number—is slated for mid-1982. ■





Above left: In the barrier standoff mission, EF-111As orbit near the FEBA, jamming early warning and other long-range surveillance radars. Above right: In the penetration escort mission, an EF-111A accompanies a strike force deep into enemy territory to cause confusion, delays, and loss of effectiveness in the enemy's air defense system. Right: The close air support mission brings the "Electric Fox" to the FEBA to suppress the enemy's air defense while the strike force carries out the attack.

Following two high-speed passes of the EF-111A during the rollout ceremony at Grumman's Calverton facility, Long Island, N. Y., the event's keynoter, Air Force Systems Command Vice Commander Lt. Gen. Robert C. Mathis, consults with four Grumman executives: Douglas R. Herd, electronic warfare operator; George Skurla, Chairman of the Board and President; Charles A. Sewell, chief test pilot; and Robert C. Miller, vice president.

Dr. Charles C. Moskos, Jr., the "country's leading military sociologist," holds that contemporary societal values are transforming the military from a calling to a job. Air Force investigations of this thesis have turned up some surprising answers to the question . . .

USAF: INSTITUTION OR OCCUPATION?

BY ED GATES, CONTRIBUTING EDITOR

A WAY of life, an institution? A job, an occupation? Military service over the years has been far more closely associated with the former than the latter. And this has been considered salutary—because institutionalism is linked with patriotism, duty, discipline, loyalty, and dedication. A "calling," a "way of life," and "taking care of its own" are popular expressions tied to what is becoming known Air Force-wide as the "institutional model."

Until recently, military members' personal priorities supposedly were not focused overwhelmingly on their own self-interest, but rather on the presumed higher good of the service. The institution.

But some authorities fear changes are in the making. They say that "occupational values," under which self-interest expressed primarily in pay and working conditions is paramount, are gradually moving to the forefront. They see undue concentration on a "nine-to-five" job, complete individual freedom, a comfortable life, fewer restrictions, and less discipline.

The perceived erosion of benefits is partially responsible for this shift. There is also the feeling, held erroneously by many, that military leadership remains mute when traditional benefits and privileges come under fire. A consequence of further movement toward the "occupational format," the Air Force leadership fears, may lead to "increasing susceptibility to the unionization of the military establishment."

Air Force officials do not intend to let that happen, at least not without a scrap. And they are fully aware that highly motivated members who "are all the way in" work harder, learn quicker, and contribute more than the nine-to-five crowd. So the service has launched a many-pronged campaign to keep troops in the institutional fold—and win back those who have strayed.

Recruits and new officers are a different story. Generally they enter service primarily to learn a skill, gain an education, travel. Most regard service as a job of short tenure. Whatever their motivations, however, Hq. USAF officials feel they undoubtedly are influenced in varying measure by the professional, or "institutional," side of Air Force life. And for some, this influence helps reshape their interests and steers them to a full career. The Air Force hopes to increase the number heading in this direction.

The Moskos Thesis

High-level interest in the "just-a-job" vs. the "way-of-life" issue increased last year following an address by Dr. Charles C. Moskos, Jr., at an Air Force Academy symposium. The forty-three-year-old professor of sociology at Northwestern University, called by followers the "country's leading military sociologist," has maintained close association with all the services and has lectured to numerous officer groups.

At the Academy gathering, Professor Moskos advanced a strong case for his favorite point—that "the American military is moving from a predominantly institutional format to one more resembling that of an occupation." He insists that the end of the draft and the arrival of the all-volunteer force (AVF) in early 1973 were mainly responsible for the swing to occupational values. The architects of the AVF, he declares, placed primary reliance to recruit an armed force "on monetary incentives determined by marketplace standards." By contrast, Moskos adds, the draft was "premised on the notion of citizenship obligation—with the concomitant low salaries for draftees—and the ideal of a broadly representative enlisted force."

Some Air Force officials don't buy that argument, of course, holding instead that institutional values are more closely linked with the AVF than with the draft.

Air Force officials had begun promoting the institutional thesis well before Dr. Moskos delivered his Academy address. But that and similar presentations to various military groups generated increased interest. They made an impression on USAF's Chief of Staff, Gen. David C. Jones.

In his article, "The Air Force Is a Way of Life" (May '77 AIR FORCE Magazine), General Jones endorsed the Moskos ideas. He echoed the sociologist's views on the adverse impact of "marketplace standards." The Chief said, "We are seeing a fundamental shift in the motivational bases of the military system away from a calling toward an occupation —just another job—where the first priority readily could become self-interest rather than the organization and the job to be done." This trend could lead to unionization, he added.

USAF's IMPACT 77 Study

Air Force officials proceeded to apply the Moskos theories to USAF's special problems. They placed heavy emphasis on elevating the "quality of life" in many areas. A major thrust was the establishment late last year of the IMPACT 77 study group, headed by Maj. Gen. Thomas M. Sadler, the Air Force Chief of Security Police. The group's assignment: find ways to improve "professionalism and institutional commitment" within the service.

General Sadler holds that under an institutional configuration, "work days are sometimes longer than eight hours, and working conditions may be harsh and family separations frequent." Accordingly, he told AIR FORCE Magazine, if high-caliber people are to remain in the fold, Air Force must "take care of its own" in the fullest sense, strive constantly to improve the quality of life, and sound off loud and clear in support of traditional values and benefits.

The IMPACT study, in its final report, says the move to occupationalism is also occurring in non-military professions that have been "somewhat" in the institutional column. In a significant note, the report added "that the unionization of those professions began with a concern that benefits were being eroded, that the members of the profession were being taken for granted, and that they had no real spokesman."

The report places some of the blame for the shift from institutionalism on both the "perceived" and the "actual" erosion of benefits. It mentions a full colonel who last March "articulated the general feeling" that Pentagon leaders "didn't know or didn't care that recent pay raises had not kept pace with inflation." Yet this was three months after former Defense Secretary Donald Rumsfeld had publicly "demonstrated exactly that point."

On the actual erosion front, the report states that while last year's military pay raise did not equal the

Prestige and Status

USAF survey results tend to contradict a Moskos premise that the advent of the all-volunteer force has triggered a shift among military people away from institutional values to occupational values. One Air Staff office checked survey responses to a question asked annually about prestige and status—both institutional-related values—provided by the Air Force as compared to a civilian job.

The results show that they rated higher in the USAF in 1975 (an AVF year) than in 1971 (a draft year), by a score of thirty-seven percent to 32.3 percent. This runs counter to the Moskos claim. The office also faults the sociologist's contention that "the draft with its underlying feature of 'forced labor' fostered the feeling of a 'calling.' "

rate of inflation, increased personal income for most Americans topped it considerably.

Until late last year, the Defense Department kept a tight rein on what service leaders could say publicly about the proposed cuts in commissary funds and other benefits under attack. But in November the service chiefs and their personnel officers, after sustained pushing, gained Secretary of Defense support for a moratorium on benefits changes in the FY '78 budget. That, according to Col. Paul Arcari, the Hq. USAF expert on personnel incentives, was "the turning point" in the erosion battle. Colonel Arcari has been deeply involved in USAF efforts to defend cherished people programs.

Playing major roles in this campaign, in addition to the Chief of Staff, are the service's new Deputy Chief of Staff for Personnel, Lt. Gen. Bennie L. Davis, and his predecessor, Lt. Gen. Kenneth L. Tallman, now the Air Force Academy Superintendent.

The USAF Surgeon General, Lt. Gen. George E. Schafer, has been especially vocal in denouncing reductions in dependent and retiree health-care programs, and he has been fighting for increased medical funding.

Through a variety of outlets, the service has been telling the troops what it wants in the way of major—as well as minor—improvements. These include a government-subsidized dependent dental care program, quarters allowances for all bachelors residing off base, and full travel benefits for low-ranking enlisted families.

Meanwhile, there is progress in small packages, such as improvements in living conditions at remote bases. Even better, the Air Force says it may soon send fewer people to the unpopular isolated sites. In a related move, Air Force plans to curtail still more transfers and thus further curb personnel turbulence. These are institutional pluses.

And for the immediate present at least, the pay news is reasonably good. The Administration has indicated it won't trim the October 1 active-duty pay raise below what the comparability figures show is justified. And a month earlier, on September 1, the second retired pay hike of the year becomes effective.

Recommended Reading

The message to Air Force officers should be clear: "Read Moskos." For example, the Assistant Vice Chief of Staff recently wrote all high-level Hq. USAF officers, suggesting that they get acquainted with still another paper by the sociologist, titled "The Armed Forces in American Society." The same word went to all air staffers via a recent issue of the Hq. USAF Daily Staff Digest.

And just in case commanders missed the earlier Moskos presentations, they can turn to the June 1977 *Supplement to the Air Force Policy Letter for Commanders.* Published by the Office of the Secretary of the Air Force, it reprints the Moskos article, "The Armed Forces: An Occupation or Calling?" That's the one he presented at the Air Force Academy fourteen months earlier. It helped push him into the military spotlight.

Positive and Negative Moves

The IMPACT 77 report says that Air Force recognized and reacted to some of the problems raised by Dr. Moskos. It cites several examples, including the following:

- Job enrichment efforts at Hill AFB, Utah, have boosted worker motivation to the point that all Logistics Command bases are adopting the program. And job enrichment was employed with considerable success in the security police unit at Ellsworth AFB, S. D.
- USAF's Office of Information network is feeding to commands and to bases statements of top officials that defend members' interests. This "fosters institutional values," the IMPACT study claims.
- Recruiting advertising previously spotlighted almost exclusively occupational items like education and training opportunities. But Col. Don Burggrabe, the Recruiting Service's advertising chief, reports that the overall recruiting theme is now "USAF Is a Great Way of Life." This, he says, "incorporates the principles of dedication and commitment which the Air Force stands for, institutionally." Under production is a recruiting film showing that "Air Force enlistment requires commitment, dedication, and service to country," Colonel Burggrabe added.
- The Hq. USAF personnel shop came up with the rather bold E-4 airman-NCO split which, the report declares, has increased the self-esteem and job prestige of thousands of younger airmen.
- The traveling officer-NCO teams from the Leadership and Management Development Center, Maxwell AFB, Ala., visit bases where they smoke out problems for quick solution. (*For more on the LMDC, see "Speaking of People," December '76 issue.*)

These are positive steps, but there are more than enough negative ones around also. Some Air Force officials, for instance, are concerned over the Defense Department's attitude toward the moratorium on pay-benefits changes the services pursued earlier. New Assistant Secretary (Manpower, Reserve Affairs, and Logistics) John P. White, for example, has said Defense can't go along 100 percent with the request.

The moratorium idea, of course, is much tougher to get across to Congress and various executive agencies. The House Appropriations Committee, for instance, totally ignored at least the spirit of the moratorium recently when it recommended that all retirees hired by the government after October 1 must surrender their full retired pay.

Another example of "outside interference" finds the Justice Department and the Civil Service Com-

mission determined to consider the part-time baggers at commissaries as regular employees. If their ruling sticks—USAF opposes it—the baggers would become full-time employees and receive at least the minimum wage. When that happens, the surcharge paid by customers will rise, Hq. USAF said.

Encouraging Evaluations

General Sadler, in an interview with AIR FORCE Magazine, said changing life styles have contributed to the drift of young members away from the institutional viewpoint. More live off base. Base attractions such as clubs formerly tended to "hold" people on installations, and this contributed to the institutional image. Now that old appeal is missing, and club membership and attendance are down. For some, General Sadler said, "bases are now regarded as just places to work."

Dr. Moskos, in a related observation, notes "the increasing aversion of many military wives at officer and noncom levels to take part in customary social functions." USAF's Brig. Gen. Chris C. Mann, a veteran personnel official and a top aide to General Davis, challenges that assertion, however.

General Mann, who has worked closely with USAF wives groups, told AIR FORCE Magazine that wives today are "more motivated and more supportive" of Air Force projects and objectives than a decade or two ago. She acknowledged that changing life styles—more wives work today, for example—tend to pull many off base for longer periods. But the dedication remains strong, she said.

The general drift away from bases may be behind suggestions that slot machines be reinstated in overseas clubs—to bring the strayers "back home." Shrunken club treasuries wouldn't suffer either. Additionally, there is reported occasional dissatisfaction with USAF's alcohol "deglamorization" program on the basis that it turns people away from installations and they wind up at bars in town.

Despite changing life styles and viewpoints, General Sadler and the IMPACT study group are not despairing about the Air Force's future. They're impressed with the high caliber of the membership and the general dedication. These officials endorse continuation of the current quality-of-life improvement efforts. And they have conceived some fifty new moves, several of which the Chief of Staff has approved "in principle" (*see accompanying list*). Endorsement of the others was pending at press time.

But a new thrust is required. Needed, the IMPACT report declares, is a monumental in-service education effort to assure that decision-makers at all levels understand the phenomenon Dr. Moskos describes and appreciate that their "individual decisions can influence the movement of the Air Force on the institutional/occupational continuum."

The idea, in short, is to make all in authority fully aware that their decisions may accelerate, or delay, movements toward occupationalism. This means "think very carefully before acting." General Sadler cited an example—a case where a base commander, in reacting to an individual violation, clamped stringent restrictions on the entire base population. This may have nudged a few people toward the occupational side of the fence.

While officials concede that the trend—not a major shift—is running against the institutional viewpoint, reassurances still surface, such as the responses to the following question in the May 1976, Air Force-wide survey:

"I see the Air Force as a way of life and not simply a place to work:"

Strongly Agree	12.6%
Agree	42.2
Undecided	14.8
Disagree	23.1
Strongly Disagree	7.3
	100.0%

Omitting the undecideds, a 54.8 yea–30.4 nay vote in favor of a calling isn't bad. It's important to keep it that way. Colonel Arcari put it very simply: "If the Air Force is viewed as an institution by its members, and not as a job, our efforts to improve readiness and mission accomplishment will be enhanced significantly." ■

Recommendations of the IMPACT 77 Study

The following recommendations of the IMPACT 77 study, designed to enhance USAF's institutional thrust, have received Chief of Staff approval in principle (others were pending endorsement at press time):

- Welcome retirees as full-fledged members of the Air Force community. Make better use of their skills.
- Eliminate the need to formally reenlist career airmen.
- Make sure members are not involuntarily selected to serve consecutive tours that require excessive TDY.
- Expand job enrichment applications.
- Beef up distribution of Guidelines for Command, "A Handbook on Management of People for Air Force Commanders and Supervisors."
- Replace certain AFROTC officer faculty members with chief master sergeants.
- Found an annual Benjamin Foulois Memorial Essay Contest on "Leadership and Esprit de Corps in Tomorrow's Air Force."
- Create a USAF Monuments Commission to promote an Air Force memorialization policy fostering institutional values, membership to consist of retired Air Force generals and chief master sergeants of the Air Force.
- Stimulate institutional values through AFROTC instructor enrichment, via a special course at the USAF Academy that all new instructors would take en route to their assignments.
- Liberalize local rules governing self-help improvements to family housing. For example, occupants won't have to return quarters to their original state if properly approved improvements enhanced their appeal and value.

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"Partners in Aerospace Power"

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Applied Technology, Div. of Itek Corp.
AVCO Corp.
Battelle Memorial Institute
BDM Corp., The
Beech Aircraft Corp.
Bell Aerospace Textron
Bell Helicopter Textron
Bell & Howell Co.
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Day & Zimmermann, Inc.
Dayton T. Brown, Inc.
Decca Navigation Systems, Inc.
Dynalectron Corp.
E-A Industrial Corp.
Eastman Kodak Co.
ECI Div., E-Systems, Inc.
E. I. Du Pont de Nemours & Co.
Emerson Electric Co.
Engine & Equipment Products Co.
E-Systems, Inc.
Ex-Cell-O Corp.—Aerospace
Fairchild Industries, Inc.
Federal Electric Corp., ITT
Firestone Tire & Rubber Co.
Ford Aerospace & Communications Corp.
GAF Corp.
Garrett Corp.
General Dynamics Corp.
General Dynamics, Electronics Div.
General Dynamics, Fort Worth Div.
General Electric Co.
GE Aircraft Engine Group
General Motors Corp.
GMC, Delco Electronics Div.
GMC, Detroit Diesel Allison Div.
GMC, Harrison Radiator Div.
General Time Corp.
Goodyear Aerospace Corp.
Gould Inc., Government Systems Group
Grumman Corp.
GTE Sylvania, Inc.
Harris Corp.
Hayes International Corp.
Hazeltine Corp.
Hi-Shear Corp.
Hoffman Electronics Corp.
Honeywell, Inc.
Howell Instruments, Inc.
Hudson Tool & Die Co., Inc.
Hughes Aircraft Co.
Hughes Helicopters
Hydraulic Research Textron
IBM Corp.
International Harvester Co.
Interstate Electronics Corp.
Israel Aircraft Industries, Ltd.
ITT Aerospace, Electronics, Components & Energy Group
ITT Defense Communications Group
Kelsey-Hayes Co.
Lear Siegler, Inc.
Leigh Instruments, Ltd.
Lewis Engineering Co., The
Libbey-Owens-Ford Co.
Litton Industries, Inc.
Litton Industries Guidance & Control Systems Div.
Lockheed Aircraft Corp.
Lockheed Aircraft Service Co.
Lockheed California Co.
Lockheed Electronics Co.
Lockheed Georgia Co.
Lockheed Missiles & Space Co.
Logicon, Inc.
Loral Corp.
Magnavox Government & Industrial Electronics Co.
Martin Marietta Aerospace
Martin Marietta, Denver Div.
Martin Marietta, Orlando Div.
McDonnell Douglas Corp.
Menasco Manufacturing Co.
MITRE Corp.
Moog, Inc.
Motorola Government Electronics Div.
Northrop Corp.
OEA, Inc.
O. Miller Associates
Pan American World Airways, Inc.
PRC Information Sciences Co.
Products Research & Chemical Corp.
Rand Corp.
Raytheon Co.
RCA
Redifon Flight Simulation Ltd.
Rockwell International
Rockwell Int'l, Electronics Operations
Rockwell Int'l, North American Aerospace Operations
Rolls-Royce, Inc.
Rosemount Inc.
Sanders Associates, Inc.
Science Applications, Inc.*
Singer Co.
Space Corp.
Sperry Rand Corp.
Sundstrand Corp.
Sverdrup & Parcel & Associates, Inc.
System Development Corp.
Teledyne, Inc.
Teledyne Brown Engineering
Teledyne CAE Div.
Teledyne Ryan Aeronautical Div.
Texas Instruments Inc.
Thiokol Corp.
Tracor, Inc.
TRW Systems, Inc.
Union Carbide Corp.
United Technologies Corp.
UTC, Chemical Systems Div.
UTC, Hamilton Standard Div.
UTC, Norden Div.
UTC, Pratt & Whitney Aircraft Div.
UTC, Research Center
UTC, Sikorsky Aircraft Div.
Vought Corp.
Western Electric Co., Inc.
Western Gear Corp.
Western Union Telegraph Co., Government Systems Div.
Westinghouse Electric Corp.
World Airways, Inc.
Wyman-Gordon Co.
Xonics, Inc.

* *New affiliation*

The Bulletin Board

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

People Programs Under Fire

Congressional opposition to retired service members being hired by the federal government intensified during June, and the lawmakers took other thrusts that may impact adversely on the military community. These included a new swipe at commissaries, the first step toward phasing out technicians in the Reserve Forces, a slap at USAF for continued "grade growth," and threatened increased charges for Space-A travelers.

Most of the action was within the House and Senate Appropriations Committees, both of which voted to withhold retired pay from military retirees who start working for the government, Congress included, after September 30. Later, however, the full House rejected its committee's recommendation 220 to 173 on a motion by Rep. Bob Wilson (R-Calif.). Final Senate action was pending at press time. The military community has been stunned by the decisions. The CIA has already stopped hiring most categories of military retirees (*see below*).

In its report on the FY '78 military spending bill, the House committee blasted the practice of service retirees working for the government and collecting two paychecks. The committee report called the estimated 150,000 retired military people who are so employed "reemployed retirees," saying they draw more than $3 billion a year from Uncle Sam, $1 billion of which is retired pay. The employment of retired military is unfair to career civil servants, the report said. It put the unfunded liability of the military retirement system at more than $160 billion. It's time to start restraining spiraling retirement costs, the committee said.

According to one congressional source, however, there is more behind the attempted crackdown. "Some lawmakers," a knowledgeable Capitol Hill source told AIR FORCE Magazine, "get mighty irked when they see retired officers, like colonels, drawing more in retirement (military retired pay plus Civil Service pay) than they get."

In an allied money-saving step, the committee voted to halt the long-standing Navy-Marine Corps practice of allowing their enlisted members to take "twenty-year" retirement after as little as eighteen and a half years of service. This special feature has cost millions in extra retirement costs.

In other actions, the House:

- Voted to prohibit the employment or replacement of any Reserve Forces civilian technicians after October 1. This would lead to an ultimate phaseout of those persons who, among other things, belong to unions. The Air Reserve

AFA Believes . . .

A Bomb Is Ticking . . .

As this is written, a bomb lies ticking in the Fiscal Year 1978 Defense Appropriations Bill.

This bill has a provision that would require *all* military retirees who are hired by the federal government after September 30, 1977, to forfeit *all* their retired pay.

The proposal is billed, unfairly, by its backers as an economy measure (*see last month's "Bulletin Board"*). But it is not the "bomb" referred to above.

The real bomb is what could follow. If the federal government takes such action, the next step will surely be reduced or eliminated retired pay for military retirees working for any government—federal, state, or local—and then for working retirees—period.

Item—President Carter has publicly deplored "double-dipping." He has announced a study of all retired pay systems, both private and government. (*See this month's "Bulletin Board".*)

Item—Legislators in California and Louisiana are looking at bills that would require an offset of military retired pay for those retirees employed by their state governments.

Item—Sen. Thomas F. Eagleton (D-Mo.) has told the Senate: ". . . The pay scales in the military today are comparable to those on the outside in a whole host of pursuits. Thus, the 'package' concept, especially with the 'twenty-and-out' factor . . . no longer applies. When someone retires at age forty-one, forty-two, or forty-three, in the prime of his life, receives a very generous pension, and then starts a new civilian career, often with the federal government, it definitely raises very serious actuarial and cost problems. . . ."

Item—Employers, when looking for military retirees for job openings say, "With their pension, I'm sure they'd be willing to take a little bit less than we'd have to offer somebody else."

Item—The CIA doesn't wait for legislation but issues an order banning the hiring of military retirees.

This is the ticking bomb.

AFA's position is quite clear. We support the right of anyone now retired or serving as a career military person to draw the retired pay he or she has earned.

We support the concept that anyone should be able to compete for any job for which he/she is qualified, without consideration of whether or not that person has other income from the government, private investment, Aunt Nellie's will, or whatever.

We recognize that the President and the Congress are rightly concerned about cost. However, no changes in retirement programs should be made retroactively—in other words, those now retired or on active duty have a right not to have changes made to the system that they accepted in return for their service. Fair is fair.

If you are a military retiree—or a military careerist—or a mother, father, spouse, or dependent of either, don't ask for whom this bomb ticks. It ticks for you. —J. A. McD.

The Bulletin Board

and Air Guard have about 30,000 technicians who are civilian employees during the week and don their uniforms for weekend drills. Getting rid of them will reduce costs and enhance readiness, the committee said.

• Cut $6 million from USAF's personnel budget because of what it called grade growth, formerly known as "grade creep." And all the services were "cautioned against unwarranted increases in military grades."

• Charged that Space-A travel, as a percentage of total passengers, has increased each year from nine percent in 1968 to twenty-four percent in 1975. To offset the rising costs the committee said that a charge of $10 should be assessed Space-A passengers for each terminal they pass through.

The new threat to the commissaries has come from the Senate Appropriations Committee; it voted to phase out the $300 million annual subsidy for the stores over three years, starting with a cut of about one-third in FY '78. During each of the past two years, the Senate has voted for similar phase-outs, but they were dropped in conference with the House.

AFA JOAC Project Well Received

Many new and about-to-be commissioned USAF officers are reading a booklet recently distributed by the Air Force Association. From all reports they're finding it both interesting and helpful. The booklet is "The Young Air Force Officer's Handbook."

Described as "a road map for your development as a professional Air Force officer," it was conceived by AFA's Junior Officer Advisory Council as a help to the new officer, based on advice from people who, not too long ago, had trod the same path. Written in conversational style, the Handbook is free of gobbledygook.

The Handbook is divided into ten chapters, ranging from "Goals" to "The Job" to "The Young Officer as Supervisor" (which addresses the erroneous perception that very few young officers supervise with the comment that "Officers lead people . . . even the greenest second lieutenant will often be looked to for guidance"). One chapter covers "Career Development for Guard and Reserve Officers," recognizing their special situations.

AFA's Junior Officer Advisory Council, currently under the Chairmanship of Capt. Al "Stretch" Strzemieczny, a command briefer at SAC Headquarters, is celebrating its tenth anniversary as an AFA advisory group. It is composed of one representative from each major command and separate operating agency, with an executive committee of about fifteen young men and women who guide it between meetings of the entire group at AFA's Annual Convention in Washington, D. C., each September. The Council highlights items of interest to junior officers for AFA's consideration, and also works on projects, such as the booklet, that have broad Air Force application. Past projects have included (in cooperation with AFA's Enlisted Council) an Air Force-distributed slide-briefing telling the Air Force story to civilian audiences, particularly as a briefing aid for junior officers and airmen addressing civic and high school groups. Advisor to the group is Lt. Gen. Bennie L. Davis, USAF's DCS/Personnel.

AFA has made an initial distribution of the booklet at command level. The prime method of follow-on distribution will be in conjunction with AFA's on-going Salute Program, which offers a complimentary one-year AFA membership to all newly commissioned officers. (The Salute Program also covers graduates of NCO Academies.) One major command, recognizing that "older" new officers might also benefit from the guide, is reproducing it for command-wide distribution. AFA encourages this, asking only appropriate credit.

Here are some typical comments from commanders:

". . . your handbook will aid the young officer in the transition from civilian to Air Force officer";

". . . the best overview contained in a single document I have seen";

"The basic information is useful, timely, and too often unknown";

"Senior officers can use it as a guide to help them brief junior officers. . . ."

USAF Chief of Staff Gen. David C. Jones summed it up: ". . . it's well done and on target."

Encouraged by this success story, the JOAC is planning a sequel, emphasizing the personal problems young officers face—family, finances, etc.

AFA's Enlisted Council has decided to follow suit. Their handbook, now in the planning stage, will zero in on identifying, for a broad military/civilian audience, the many management positions being filled by enlisted men and women. The recruiting value of such a booklet could be tremendous.

In late June, both Councils met at San Antonio, Tex. In addition to receiving briefings on recruiting, AFMPC, ATC, basic military training, and the OER system, they put

The US Junior Chamber of Commerce has named three ADCOM Headquarters captains as 1976 Outstanding Young Men of America. From left, Gary W. Dahlen, Roger C. DeKok, and Efrain U. Gonzales. All three of the Jaycee selectees are engaged in Air Force space programs.

ogether a rough outline of their new projects.

Wear Mufti, Travelers Warned

Hq. USAF Air Staff officers received this message recently (it would apply service-wide): When at or en route to foreign commercial airports, always wear "conservative civilian clothing." USAF's rationale: Hijacking is more likely abroad than Stateside. Wearing the uniform, which symbolizes the US government, would attract would-be hijackers and the officers would become their victims.

Airmen Early Outs Okayed

Airmen separation rates have declined in recent months, so the supply exceeds USAF's demands. As a result, early outs in 156 skills have been offered first-termers. Exits begin this month. Air Force is moving to a military personnel strength of 571,000 (96,000 officers and 475,000 EM) by September 30. As of May 31, total strength was 579,909. The service is scheduled to remain at the 571,000-level throughout FY '78.

Readable Writing Drive Intensifies

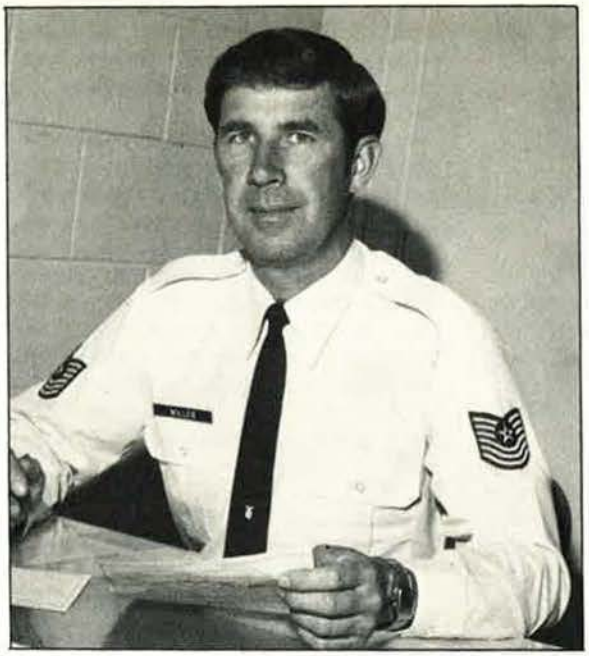
The Air Force is bearing down hard on fog counts, hackneyed phrases, and gobbledygook in official prose. The service got the signal from President Carter when he let the entire federal bureaucracy know he wanted readable official writing.

Soon thereafter, Hq. USAF produced new Operating Instruction S-2, which directs Air Staff offices "to use plain English." It tells writers of regulations and other documents how to measure the reading grade levels (RGL) of their audiences, and write accordingly. There's even a list of airmen AFSCs and the RGL for each; they range from eight to 13.5. The RGL for officers and GS-9s and above is held to be fourteen.

If a writer finds the level of his writing too high for his audience, he must try again and replace long, tired words with short ones. Or revise and tighten the material. As a result, some Hq. USAF offices have had to rewrite manuscripts several times and delay publication.

Instruction S-2 also contains a full page of stereotyped words and phrases together with more acceptable substitutes, such as "need" for "requirement," the latter being perhaps the most abused noun in Air Force literature.

Because the Carter policy aims to identify the "perpetrators" of officialese, the names of the document writers and the approving authority appear on each new directive. In the case of Instruction S-2, Col. James J. Shepard, USAF's Director of Administration, is the approving authority. Colonel Shepard also pounds home the clear-writing theme repeatedly in the Hq. USAF Daily Staff Digest.



The Tacoma, Wash., Area Federal Executive Association recently named MSgt. Paul A. Miller of McChord AFB, Wash., the outstanding enlisted military member for the Southern Puget Sound area for 1976. The eighteen-year veteran, administrative supervisor of the 25th Air Division, was cited for playing a major role in his unit's receiving excellent ratings in administration and human reliability programs. Sergeant Miller is also heavily involved in church, PTA, and other community activities.

USAF: Restrain Women's Buildup

USAF has rejected Defense Department suggestions that it increase its female membership far more rapidly than the on-going buildup calls for. Insufficient housing, more pregnancies accompanied by reduced work productivity, and more "in-service" marriages are among reasons given for restraining the expansion. There are currently about 14,000 such marriages in the USAF, but under a major expansion the number—and the problems—would grow too fast.

In FY '72, USAF had 16,000 female members; it now has about 39,000. The present game plan calls for gradual expansion each year to a figure of 56,800 (8,600 officers and 48,200 enlisteds) by the end of FY '82.

Earlier this year, however, Defense Secretary Harold Brown told the services to determine how many women could be assigned in the next five years. Dr. Brown was worried about the increasing problems and expense of recruiting well-qualified young men and was aware that high-quality young enlisted women are readily available. A crash study of all the factors involved followed. Defense's report on the exercise, titled "Use of Women in the Military," was issued in June.

Air Force told Defense that in the buildup to date, it has not gotten the desired number of women for technical and other "nontraditional" assignments. An overall boost of the size Defense suggests would enlarge this problem.

Because of insufficient housing abroad, enlisted women cannot be assigned to nearly half of USAF's overseas billets. This means that men are assigned overseas "disproportionately in relation to the relative male/female mix by job specialty."

A complement of 68,000 Air Force women by FY '82, the service said, would mean about 5,500 pregnancies annually, with about 3,000 women each year remaining on board with tots. This, too, would present many difficulties, the report says. The overall tone of the report suggested, however, that big increases in women in all the services are likely in the next few years.

(Continued on following page)

The Bulletin Board

Pay Raises Coming Up

Active-duty and retired pay raises are just ahead. A recent estimate puts the October 1 active-duty hike at 6.5 percent. The retired pay boost, effective September 1, is estimated to be 4.5 percent. Retired pay was last raised in March.

In other pay actions:

- Congress has junked the provision that Academy cadet pay and ROTC cadet field training pay be pegged at half the second lieutenant basic pay rate. Instead, it has approved a monthly "rate" of $313.20, but actually has frozen cadet pay at the current $345 figure that will remain in effect until basic pay increases cause the $313.20 rate to exceed $345. The new system applies equally to ROTC cadets on field training.
- Air Force has replaced its confusing Leave and Earnings Statement (LES) with a new, easy-to-understand statement. Distribution to members Air Force-wide was to begin last month.
- The President said he will appoint a special study group to examine the entire problem of retirement pay—not only military but federal, other governmental, and private industry retirement as well. This study will be in addition to the Blue Ribbon Commission probe that will examine all military pays, including retirement pay. Meanwhile, an all-service group continues a months-long study of Reserve compensation.

Added Responsibility for Assistant Secretary Chayes

Ms. Antonia Handler Chayes, a Boston attorney with a background in education, has been named Assistant Secretary of the Air Force (Manpower, Reserve Affairs, and Installations). Senate confirmation was expected last month. (*See July "Aerospace World," p. 20.*)

Until June, the Air Force had an Assistant Secretary for Installations and Logistics. However, it is not being filled until Defense Secretary Harold Brown decides on proposals to reduce the number of service assistant secretaries. So the installa-

Ms. Antonia Handler Chayes was recently named Assistant Air Force Secretary for Manpower, Reserve Affairs, and Installations (see item).

Ed Gates . . . Speaking of People

Survey Charts Views of Air Force Commanders

Most USAF commanders below the star level are pleased with the quality of leadership in their service. They're happy with the new "three-tier" structure for their airmen, the Commander's Call program, and the amount of freedom they receive to perform their jobs. About ninety percent of the commanders—of everything from sections to wings—say they are either downright "enthusiastic" about their jobs or they "love" them.

On the other hand, the commanders generally feel that officer prestige has declined in recent years and discipline isn't tough enough. Most say their advisory councils are of moderate or little value. And while the commanders endorse the standards the Air Force has set for personal appearance, wear of the uniform, and haircuts and mustaches, most hold that enforcement of these standards is either "somewhat lax" or "too lax."

These are a few of the attitudes and opinions gleaned from the recent "Commanders Survey," one in a special series of extensive "Quality of Life" question-and-answer exercises the Air Force has been conducting. Previous polls in this series were directed at rank-and-file members, spouses, Air Force civilian employees, and base commanders. These and routine periodic surveys have provided service leaders with a mountain of information about members' feelings on dozens of existing plans and programs. The output helps decision-makers chart policies and avoid wrong turns. Questions often serve as trial balloons. Survey results also help the Air Force document projects it may push with the Defense Department and Congress.

Headquarters not surprisingly gives considerable weight to what colonel-and-below commanders have to say. They' close to the troops, and it's from their ranks that the genera of tomorrow will come.

The survey, containing 144 questions, was distributed to t 3,400 officers holding a current commander's AFSC. The p was optional and anonymous, but even though names we not recorded some declined to participate. A total of 2,6 persons, more than half O-5s and O-6s, completed the s vey. Some 100 first and second lieutenant commanders we included.

Different blocks of questions zeroed in on special p grams. One set, dealing with the commander's job, fou ninety-three percent reporting that they wanted the job th hold. Eighty-two percent said it is challenging, and alm that many said they have ample authority to carry out th responsibilities.

And how many hours do they toil each week? More th fifty was the average, though one in four said "over sixt Only 3.5 percent said they put in less than forty hours ea week.

Officials have devoted much attention in recent years revamping the airman-NCO structure, laying on the three- plan, and trying to beef-up noncom prestige. So, for a dir report on how it's working, the survey probed with such qu tions as "Do you like the changes?" and "Are they doing job the AF intended?"

The responses were all positive and should be reassu to the architects of the program at Hq. USAF. For exam two-thirds of the commanders endorsed the new E-4 to N appointment program.

tions functions have been given to Ms. Chayes.

The logistics function has been shifted to the newly redesignated post of Assistant Secretary, Research, Development, and Logistics. (*See also "Aerospace World," p. 14.*)

Carter on Veterans Problems

President Carter told a mid-June White House meeting of organization representatives, including AFA, that he is "committed to veterans." He listed several items of veterans' benefits emanating from his Administration, including a cost-of-living increase for disability pensions and a heavy emphasis on public service job programs, with Vietnam veterans receiving hiring priority.

The Chief Executive said veterans problems cannot be approached in a vacuum. Rather, he declared, "the whole range of society's problems" that he must deal with, including unemployment, energy tax reform, housing, and health, have implications for veterans. These implications as well as the larger problems must be considered together, he said. He added that veterans projects must not become general welfare programs.

He closed his appearance by asking the visitors to let him know how veterans' problems tie in with the larger sociological problems and how, within that context, he can be of most help.

In related comments, Presidential Assistant Stuart Eisenstat said that the President has no immediate intention of abolishing VA hospitals as recommended recently by a National Academy of Sciences report. Mr. Eisenstat also said the President has asked Defense Secretary Harold Brown to accelerate a Defense manpower study begun weeks ago, so that necessary changes can be incorporated in the FY '79 budget request.

Short Bursts

If a service member or federal employee supports a second family, the government can withhold up to half his pay for alimony or child support. If he's not supporting a second family, sixty percent can be withheld. If the person is twelve weeks in arrears in payments, those percentages may be increased to fifty-five and sixty-five, respectively. These are recent changes in the controversial **military-federal garnishment program.** Previously in some states there was no limit on the amount that could be withheld. USAF said that persons wishing to press garnishment proceedings against Air Force members should contact the Accounting and Finance Center, 3800 York St., Denver, Colo. 90279, or call (303) 302-7736.

In 1974, the House Armed Services Committee gave **Ready Reservists one day of base exchange privileges** for each day they drilled. Wives could accompany them, but—get this—not their kids. So what if the parents wanted to buy shoes or clothing for junior? Too bad. This nonsense naturally infuriated many Reservists, yet it was allowed to continue until just a few weeks ago when it was decided that "all dependents" can accompany the parents.

Because of **cuts in the missile crew force,** only 125 captain and major openings in the career field are slated for FY '78, the smallest

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A related question sought their views on below-the-zone motions recently established for aspiring E–4s. A resound- eighty-three percent endorsed it heartily, which prompts question: Will BTZs be extended to other enlisted grades? ny airmen have urged such a course; the survey results uldn't hurt the prospects.

While many answers to survey questions are fairly pre- table, there are some surprises. For instance, despite avy USAF emphasis and publicity on the subject, forty, or percent of the respondents, said they "were not aware" USAF's Equal Employment Opportunity Plan of Action. at response raised some eyebrows at Hq. USAF.

On the other hand, the service welcomes the report that arly two-thirds of the commanders feel the quality of air- n joining up today has "increased" over recruits of pre- us years. Twenty-one percent said it remains about the ne, while twelve percent said the quality has decreased.

Among other responses of possible significance, the com- nders:

- Said drug and drinking are "problems" in the Air Force.
- disturbing response for alcohol abuse broke down as ows:

Not a problem	1.5%
A minor problem	39.1
A serious problem	43.6
A major problem	15.8
	100.0%

se are worrisome but doubtless accurate measurements; nyone has a clear reading on the local drinking situation, ould be the unit commander.

By a slim margin, said they feel Air Force is now pro- ng members enough information about "actions that may act on their fringe benefits." The vote was 45.7 percent eing there is enough information against 44.6 percent disagree. The rest were undecided. Overall it seems to mean considerable improvement. Not many months ago, the feeling was running high that Air Force was negligent in keeping the force clued about attacks on benefits.

- Agreed with their troops that military pay has not kept pace with the cost of living.
- Overwhelmingly agreed that the position of first sergeant serves a necessary function in the USAF.
- Are convinced that racial discrimination is either no problem or a minor one in the Air Force.
- Were not impressed with their advisory councils. Eighty-eight percent, for example, said their junior officer councils were of "moderate," "little," or "no" value to their organizations.

A large segment of the poll sought commanders' views on twenty-three separate USAF standards dealing with such items as personal appearance, military courtesy, weight control, officer-EM relationships, leave procedures, and dormitory living.

The responses said the "standards are about right" (their other two choices were "too strict" or "too lax"). For example, more than sixty-two percent endorsed the tough haircut regulation, seventy percent did the same for drills and ceremonies rules, and ninety percent blessed current leave standards.

However, most commanders found enforcement of numerous standards too lax. This was particularly true of personal appearance, wear of the uniform, and military courtesy and customs. Two of every three said enforcement of the haircut rules isn't tough enough.

Overall, the survey results make crystal clear that Air Force commanders are an extremely dedicated group. It isn't the promotion system, training opportunities, fringe benefits, travel, the retirement system, or a number of other factors that most influenced their career decision. Rather, it is the "Air Force job," with its many challenges and sense of accomplishment that is the big motivating force. And this is as it should be. ■

The Bulletin Board

in years. Those entering the Minuteman program, officials remind, can win MBA degrees via the Minuteman education plan.

Rep. Melvin Price (D-Ill.) and Rep. Bob Wilson (R-Calif.) have introduced a much needed **bill for military trailerites**—H.R. 6276—which would remove all the curbs and disadvantages trailerites now face at moving time. A group of congressmen, headed by Rep. Benjamin J. Gilman (R-N. Y.) has introduced H.R. 7507, which would give veterans up to fifty-four months of **GI Bill schooling benefits,** eliminate the time limit within which the educational assistance must be used, and restore certain previously ended benefits.

Headquarters has a message for base commanders: Think seriously about letting on-base drivers make **right turns on red** (RTOR). After all, the Hq. USAF note says, forty-seven states permit RTORs and the Transportation Department endorses them. Air Force says RTORs reduce traffic delays, fuel consumption, and auto emissions. A related nudge from the head shed to base commanders: axe four-way stop signs and put up "yield" signs.

USAF's **Office of Special Investigations** has job openings abroad for E-5s and E-6s who can speak German, Greek, Italian, Korean, Persian, Turkish, Spanish, Portuguese, or Dutch. See Chapter 8, AFR 39-11. ■

Senior Staff Changes

RETIREMENTS: M/G Alden G. **Glauch;** B/G Phillip N. **Larsen;** M/G O. Donald **Olson;** M/G Edmund A. **Rafalko;** B/G George L. **Schulstad.**

CHANGES: M/G John G. Albert, from Comdt., Def. Sys. Mgmt. College, Ft. Belvoir, Va., to V/C, AF Acq. Log. Div., AFLC, Wright-Patterson AFB, Ohio . . . **B/G John H. Bennett,** from Asst. DCS/Ops. for Ops. & Tng., Hq. TAC, Langley AFB, Va., to Cmdr., 86th TFW, USAFE, Ramstein AB, Germany, replacing B/G Cornelius Nugteren . . . **B/G William E. Brown, Jr.,** from Cmdr., 1st Air Base Wg., MAC, Andrews AFB, Md., to Chief, USAF Security Police, Bolling AFB, Washington, D. C., replacing M/G Thomas M. Sadler . . . **L/G John J. Burns,** from Dep. CINC, US Forces, and Dep. CINC, UN Command, Korea, to Dep. CINC, Hq. US Readiness Command, MacDill AFB, Fla. . . . **B/G James E. Dalton,** from Dep. Dir., Concepts, DCS/P&O, Hq. USAF, Washington, D. C., to Asst. Dep. Dir. (Force Devel. & Strat. Plans), J-5, JCS, Washington, D. C.

B/G Jay T. Edwards III, from Asst. DCS/Log. Ops., Hq. AFLC, Wright-Patterson AFB, Ohio, to Asst. for Intl. Log., Hq. AFLC, Wright-Patterson AFB, Ohio . . . **M/G Billy J. Ellis,** from Dep. Insp. Gen., Hq. USAF, Washington, D. C., to DCS/Ops., Hq. TAC, Langley AFB, Va., replacing M/G (L/G selectee) Charles A. Gabriel . . . **B/G Howard M. Estes, Jr.,** from DCS/Compt., Hq. AFLC, Wright-Patterson AFB, Ohio, to DCS/Plans & Programs, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G James P. Mullins . . . **M/G (L/G selectee) Charles A. Gabriel,** from DCS/Ops., Hq. TAC, Langley AFB, Va., to Dep. CINC, US Forces, and Dep. CINC, UN Command, Korea, replacing L/G John J. Burns . . . **M/G Fred A. Haeffner,** from Cmdr., TAC Tng., TAC, Luke AFB, Ariz., to V/C, Ninth AF, TAC, Shaw AFB, S. C. . . . **M/G Larry M. Killpack,** from V/C, Hq. ATC, Randolph AFB, Tex., to Asst. DCS/Personnel, Hq. USAF, Washington, D. C.

B/G Frederick L. Maloy, from Dir. of Data Automation, ACS/CCR, & Cmdr., AF Data Automation Agency, Washington, D. C., to Dir., J-6, US Readiness Command, MacDill AFB, Fla., replacing B/G David E. Rippetoe, Jr. . . . **Col. (B/G selectee) William E. Masterson,** from Sp. Asst. for Joint Matters, JCS, Washington, D. C., to Cmdr., 40th AD, SAC, Wurtsmith AFB, Mich., replacing B/G Walter B. Ratliff . . . **M/G Harry A. Morris,** from C/S, Hq. MAC, Scott AFB, Ill., to Dir., Personnel Plans, DCS/P, Hq. USAF, Washington, D. C. . . . **M/G James P. Mullins,** from DCS/Plans & Programs, Hq. AFLC, Wright-Patterson AFB, Ohio, to Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, replacing retiring M/G Edmund A. Rafalko . . . **M/G William C. Norris,** from Cmdr., 76th Airlift Div., MAC, Andrews AFB, Md., to Cmdr., Third AF, USAFE, RAF Mildenhall, England, replacing M/G Evan W. Rosencrans . . . **B/G Cornelius Nugteren,** from Cmdr., 86th TFW, USAFE, Ramstein AB, Germany, to V/C, Ogden ALC, AFLC, Hill AFB, Utah, replacing retiring B/G George L. Schulstad.

B/G Earl T. O'Loughlin, from Dep. Dir., Maint. Engrg. & Sup., DCS/S&L, Hq. USAF, Washington, D. C., to V/C, Oklahoma City ALC, AFLC, Tinker AFB, Okla. . . . **B/G Walter B. Ratliff,** from Cmdr., 40th AD, SAC, Wurtsmith AFB, Mich., to Dep. Dir. of Ops. & Readiness, DCS/P&O, Hq. USAF, Washington, D. C. . . . **B/G David E. Rippetoe, Jr.,** from Dir., J-6, US Readiness Command, MacDill AFB, Fla., to Dep. Dir., J-3, US Readiness Command, MacDill AFB, Fla. . . . **M/G Evan W. Rosencrans,** from Cmdr., Third AF, USAFE, RAF Mildenhall, England, to V/C, Hq. ATC, Randolph AFB, Tex., replacing M/G Larry M. Killpack . . . **M/G Thomas M. Sadler,** from Chief, USAF Security Police, Bolling AFB, Washington, D. C., to Cmdr., Twenty-first AF, MAC, McGuire AFB, N. J., replacing retiring M/G Alden G. Glauch . . . **B/G Leroy W. Svendsen, Jr.,** from Def. Attaché, Cairo, Egypt, to Asst. DCS/Personnel for Mil. Personnel, and Cmdr., Hq. AFMPC, Randolph AFB, Tex. . . . **M/G (L/G selectee) Eugene F. Tighe, Jr.,** from ACS/Intelligence, Hq. USAF, Washington, D. C., to Dir., DIA, Washington, D. C.

SENIOR ENLISTED ADVISOR CHANGE: SMSgt. George A. Hammond, from Personnel Inspector, Air University, Maxwell AFB, Ala., to become the first Senior Enlisted Advisor at Hq. AFROTC, Maxwell AFB Ala. ■

Airman's Bookshelf

A Military Library

The Encyclopedia of Military History: From 3500 B.C. to the Present (Revised Edition), by R. Ernest Dupuy and Trevor N. Dupuy. Harper & Row, New York, N. Y., 1977. 1,464 pages, including index. $25.

Here is a military library in one volume. In twenty-one chapters, each covering an historical period, the authors outline military history from the dawn of civilization through 1975. This revised edition includes the final stages of the Vietnam War, details on the Yom Kippur War, and data on revolutions and *coups d'état* that have occurred since the volume's first printing in 1970.

Methodically arranged and meticulously indexed and cross-referenced, this masterful work includes at the beginning of each chapter an introductory essay analyzing military trends of the period, the general progression of military tactics, strategy, weaponry, and organization, and the era's outstanding military leaders. Chapters are then divided into major regions. Within each, subsections describe chronologically military events affecting nations, states, and peoples in the region at the time. The book is organized to allow the reader to follow a nation's or a region's military history by turning to the appropriate section in each chapter. Major wars are handled separately since they involve more than one geographical area and have significance beyond regional boundaries.

The value of this exhaustive work to the military scholar or to the enthusiast is obvious. But nowhere is it more obvious than in the way the book is indexed. Every name or event mentioned in the 1,345-page text is thoroughly cross-referenced. Two additional indices cover "battles and sieges" and "wars." Here, listed under each entry, are the major topical, conceptual, or abstract terms associated with the entry. Once the reader has found what he is looking for, he can relate it immediately to the local and world situation at the time and to the state of the military art. More than 250 illustrations and maps and an extensive bibliography make this volume well worth the price.

—Reviewed by Robin Whittle, Assistant Director of Communications, AFA.

Authoritative Source

Jane's Weapon Systems 1977, edited by Ronald T. Pretty. Franklin Watts, Inc., 730 Fifth Ave., New York, N. Y. (US distributor), 1977. 879 pages, large format. $72.50.

This massive annual volume, covering weapon systems (excluding aircraft) of all major and many lesser countries, is comparable in girth and cost to its companion volume, *Jane's All The World's Aircraft (JAWA).* It should rank close behind *JAWA* in interest to readers of AIR FORCE Magazine. For one thing, *Weapon Systems* is a comprehensive and authoritative source of information on strategic offensive and defensive missiles of all countries possessing such systems.

Weapon Systems also reports in detail on a wide range of other weapons and supporting systems. In its nearly 900 pages are technical data and photographs of radars, fire control systems, air-to-air and air-to-surface missiles, electronic warfare and surveillance equipment, RPVs, artillery and mortars, naval guns, and armored fighting vehicles. There are more than 100 pages of tables showing weapon system characteristics and national inventories.

The editor's Foreword is an able summary of the state of weapons technology around the world. It is supplemented by articles on naval weapons and air defense, written by two British authorities.

—JLF

New Books in Brief

Crazy Charlie's Crew, by Rocky Whitely, Col., USAF (Ret.). The lighter moments of the Vietnam War a la M*A*S*H are in this novel by a former director of training at Eighth Air Force Headquarters and in Southeast Asia. The author, who retired in 1973, based the novel on his own experiences. With the humor comes the devastation and horror that was also Vietnam. Exposition Press, Inc., 900 S. Oyster Bay Road, Hicksville, N. Y. 11801, 1977. 109 pages. $6.

The History of the German Resistance 1933–1945, by Peter Hoffman. This massive book, translated from the German by Richard Barry, is for scholars, not casual readers. There are nearly 300 pages of notes and sources. For those heroes who tackle it, there is a wealth of new information about the extent of the opposition to Hitler. The MIT Press, Cambridge, Mass., 1977. 534 pages of text. $19.95.

Lindbergh Alone, by Brendan Gill, is a longish essay by a distinguished critic and journalist that will appeal to Lindbergh buffs who cherish each nostalgic fact. It is not a biography, nor does it pretend to be, but contains some priceless anecdotes and a number of photographs never before published. Harcourt Brace Jovanovich, New York, N. Y., 1977. 214 pages. $11.25.

US Army in World War II: The Mediterranean Theater of Operations—Cassino to the Alps, by Ernest Fisher, Jr. Part of the US Army in WW II series and fourth in the Mediterranean subseries, this volume puts the finishing touches on the bitter and controversial struggle of Allied forces in the western Mediterranean. Maps, photos, index. Center of Military History, US Army. Available from the Superintendent of Documents, Government Printing Office, Washington, D. C., 1977. 584 pages. $17.

—Reviewed by Robin Whittle

The Community College of the Air Force, building on the pioneering work of AFA's Aerospace Education Foundation, has earned the distinction of becoming the first US military institution to award degrees to enlisted people at . . .

CCAF's First Graduation

BY RICHARD J. KNAPP
AFA DIRECTOR OF COMMUNICATIONS

For the first time in history, an American military service has awarded academic degrees to enlisted people.

The five-year-old Community College of the Air Force (CCAF) used the degree-granting authority it was given early this year to confer Associate of Applied Science degrees on 272 Air Force enlisted men and women stationed around the world. The associate degree is normally awarded after satisfactory completion of two years' post-secondary academic work in a junior or community college or vocational/technical school.

Fifteen of CCAF's graduates represented the others in late-April ceremonies at Air Training Command Headquarters, Lackland AFB, Tex., where CCAF's administrative offices are located. They received their degrees from Gen. John W. Roberts, ATC Commander. Gen. William V. McBride, Air Force Vice Chief of Staff, delivered the commencement address and headed a delegation of a dozen general officers and other dignitaries attending the ceremonies. Among them was James H. Straubel, Executive Director of both AFA and the Aerospace Education Foundation, a member of CCAF's Board of Advisors.

General McBride noted that underlying the degree-granting authority "is the recognition by the nation's educators of the real educational quality and value of our military training. . . .

"For years," General McBride told the commencement audience, "an airman who left the Air Force after four or more years had only a discharge certificate to show for his increased training, improved education, and maturity. Now every airman who wants to improve himself can obtain an associate degree—and, with it, great opportunity and incentive to build upon that base."

Prior to obtaining degree-granting authority, CCAF awarded Career Education Certificates to those who completed the required curriculum. These certificates and Air Force courses were not universally recognized by civilian schools and employers.

The formation of CCAF in 1972, its accreditation a year later, and its authority to grant degrees in 1977 all stemmed, to a large degree, from the work of the Air Force Association and its affiliate, the Aerospace Education Foundation, which demonstrated the worth of Air Force technical training courses and made them available to civilian schools.

In 1967, with a grant from the US Office of Education, the Foundation sponsored independent studies to determine how Air Force-designed courses would stack up against comparable civilian courses. The tests showed that students learned more, faster, and retained it longer using the Air Force courses.

Since then, the Foundation has adapted a broad range of Air Force technical training courses for use in civilian schools. The Foundation now offers civilian schools twenty course packages on subjects as diverse as principles of electronics; cooking, baking, and serving; and still photography. It has sold, on a nonprofit

USAF Vice Chief of Staff Gen. William V. McBride delivers the commencement address at the first Community College of the Air Force degree-granting ceremony.

Above, MSgt. Philip L. Olson receives his CCAF degree from ATC Commander Gen. John W. Roberts. TSgt. Jared W. Carithers, above right, and SMSgt. Dennis A. Lindquist, right, applied their training in radar technology and data processing to earn associate degrees in their respective fields.

basis, more than 1,100 course packages to 450 schools around the country and overseas.

This broad acceptance of Air Force-developed educational systems in accredited civilian schools led to the question, "If civilian students can receive credit for successfully completing Air Force-developed courses in civilian schools, why can't Air Force students?"

Thus, with AFA and Foundation support, the Air Force sought and received academic accreditation by regional educational associations for seven of its technical schools. These became the nucleus of CCAF, which itself was accredited by the Southern Association of Colleges and Schools' Commission on Occupational Education Institutions in 1973. Since then, other Air Force schools have been accredited and have become part of CCAF. Students may major in areas ranging from avionics technology to resource management.

It was a logical follow-on that CCAF be allowed to grant associate degrees. Since the Air Force does not offer courses in the humanities, those wishing to earn a degree must supplement their Air Force training with required humanities courses in civilian institutions.

Last year, Congress adopted legislation, supported by AFA and the Foundation, that permitted CCAF to grant associate degrees providing the Commissioner of Education certified the CCAF program. An Office of Education team unanimously agreed that CCAF was academically sound, and the Commissioner of Education approved degree-granting authority for the School.

Chief Master Sergeant of the Air Force Thomas N. Barnes, before his retirement on August 1, termed this "the greatest educational breakthrough for enlisted people in the history of our armed forces."

More than 50,000 Air Force men and women are enrolled in CCAF. ■

Current Board Chairman Gerald V. Hasler has been nominated to become AFA President for the next year, with current President George M. Douglas nominated by acclamation to become Chairman of the Board. These and nominees for other national offices and directorships will be presented next month to delegates attending AFA's 1977 National Convention...

AFA Nominees for 1977-78

BY DON STEELE, AFA AFFAIRS EDITOR

Gerald V. Hasler

In conjunction with a meeting of AFA's Board of Directors, the Association's Nominating Committee met in Colorado Springs, Colo., on May 28 to select new leaders for the year 1977–78.

The Nominating Committee, which consists of AFA national officers, the members of the Board of Directors, and the President of each AFA State Organization or his designee, chose a slate of four National Officers and twenty Directors.

This slate will be presented to the delegates at AFA's 1977 National Convention, to be held in Washington, D.C., September 18–21.

For National President, the Nominating Committee nominated Gerald V. Hasler, of Endwell, N. Y. Mr. Hasler is the President and Chief Executive Officer of an architectural design and remodeling corporation. During World War II, he was a B-25 instructor pilot. Immediately following the war, he was with the United Nations Relief and Rehabilitation Administration as its Director for the French Zone of Occupation, and Director of Supply and Transport for Austria, with headquarters in Austria. An AFA member since 1963, Mr. Hasler currently serves as Chairman of AFA's Board of Directors, as a member of the Executive and Convention Site Committees, and as a member of the Aerospace Education Foundation's Board of Trustees. He is a former Chapter and State President, National Committee Chairman, National Parliamentarian, AFA National Director, and Treasurer of the Aerospace Education Foundation.

George M. Douglas, of Denver, Colo., was nominated by acclamation for Chairman of AFA's Board of Directors. Mr. Douglas is Assistant Vice President/Marketing of Mountain Bell. During World War II, he served with the Army in the Pacific Theater. Currently he is an AFRES major general with an assignment as the Mobilization Assistant to the Deputy Chief of Staff/Personnel, at USAF Headquarters. A Life Member of AFA, he now serves as AFA National President;

George M. Douglas

as Chairman of the Executive, Nominating, and Convention Site Committees; as a member of the Finance, and Resolutions Committees; as an ex officio member of all committees and councils; and as a member of the Board of Trustees of the Aerospace Education Foundation. Mr. Douglas is a former National Director, and State and Chapter President.

Jack C. Price

Incumbent National Secretary Jack C. Price, of Clearfield, Utah, was nominated by acclamation for a second term. A former Air Force NCO, he now is an Air Force civilian executive at the Ogden Air Logistics Center, Hill AFB, Utah. A Life Member of AFA, Mr. Price also serves as Chairman of the Resolutions Committee and a member of the Executive Committee. He has served as a Chapter and State President, Vice President for AFA's Rocky Mountain Region, Chairman of the Organizational Advisory Council, and an AFA National Director.

Incumbent National Treasurer Jack B. Gross, of Hershey, Pa., was nominated by acclamation for reelection. Mr. Gross, a colonel retired from the Air Force Reserve, is a prominent civic leader and businessman. He is now serving his sixteenth term as National Treasurer, and also serves as Chairman of AFA's Finance Committee; as a member of the Executive, Resolutions, and Convention Site Committees; and as a member of the Aerospace Education Foundation's Board of Trustees. He has served as Chairman of the Board, an elected National Director, and a State and Chapter President. He is a Life Member of AFA.

The following are permanent members of the AFA Board of Directors under the provisions of Article IX of AFA's National Constitution:

John R. Alison, Joseph E. Assaf, William R. Berkeley, Edward P. Curtis, James H. Doolittle, George M. Douglas, Joe Foss, Jack B. Gross, George D. Hardy, Martin H. Harris, Gerald V. Hasler, John P. Henebry, Joseph L. Hodges, Robert S. Johnson, Arthur F. Kelly, George C. Kenney, Thomas G. Lanphier, Jr., Jess Larson, Curtis E. LeMay, Carl J. Long, Howard T. Markey, Nathan H. Mazer, John P. McConnell, J. B. Montgomery, Martin M. Ostrow, Julian B. Rosenthal, John D. Ryan, Peter J. Schenk, Joe L. Shosid, C. R. Smith, William W. Spruance, Thos. F. Stack, Arthur C. Storz, Harold C. Stuart, James M. Trail, Nathan F. Twining, and A. A. West.

Jack B. Gross

The twenty men whose pictures appear on the following page are nominees for the eighteen elective Directorships for the coming year. (Names marked with an asterisk are incumbent National Directors.)


Brosky


Campbell


Carr


Clark


Emrich


Fisher


Grazioso


Haire


Harris


Haug


Keith


Kregel


Nedder


Nettleton


Stearn


Stewart


Taylor


West


Wilkins


Withers

Nominees for AFA's Board of Directors

***John G. Brosky,** Pittsburgh, Pa.—judge. Former Chapter, State President; National Convention Parliamentarian; National Council member. Current National Committee member; Aerospace Education Foundation Board of Trustees member. AFA Presidential Citation 1970 and 1974. Life Member.

***Stanley L. Campbell,** San Antonio, Tex.—company executive. Former State President; National Committee member; National Council Chairman; Vice President (Southwest Region). Current National Committee Vice Chairman. AFA Presidential Citation 1975.

***Robert L. Carr,** Pittsburgh, Pa.—real estate broker. Former Chapter, State President; Vice President (Northeast Region). Current National Committee member.

***Earl D. Clark, Jr.,** Kansas City, Kan.—construction company executive. Former Chapter officer; State President; Vice President (Midwest Region). Current National Committee member. Life Member.

Richard C. Emrich, McLean, Va.—management analyst, FAA. Former Chapter, State President. Current Vice President (Central East Region). Life Member.

***Herbert O. Fisher,** Kinnelon, N. J.—retired metropolitan area aviation official. Former Chapter President. Current National Council member; Aerospace Education Foundation Board of Trustees member. Honorary Life Member.

***James P. Grazioso,** West New York, N. J.—roofing and sheet metal contractor. Former Chapter officer; State President; Vice President (Northeast Region). Current Chapter President; National Council member.

***John H. Haire,** Huntsville, Ala.—NASA engineer. Former Chapter, State President; Vice President (South Central Region). Current National Council member; Aerospace Education Foundation Board of Trustees member. AFA Presidential Citation 1975. Life Member.

Alexander E. Harris, Little Rock, Ark.—property management executive. Former Chapter, State President; Vice President (South Central Region); National Director. Current National Committee Member. Life Member.

***Roy A. Haug,** Colorado Springs, Colo.—telephone company executive. Former Chapter, State President; Vice President (Rocky Mountain Region); National Council member. Current National Council Chairman; National Committee member; Aerospace Education Foundation Board of Trustees member. Life Member.

***Sam E. Keith, Jr.,** Fort Worth, Tex.—traffic and maintenance engineering manager. Former Chapter, State President; National Council member; Vice President (Southwest Region). Current National Committee member; Aerospace Education Foundation Board of Trustees member. AFA "Man of the Year" 1967. Life Member.

Vic R. Kregel, Dallas, Tex.—industry executive. Former Chapter, State President. Current Vice President (Southwest Region); National Council member. AFA "Man of the Year" 1976. Life Member.

***Edward T. Nedder,** Hyde Park, Mass.—attorney. Former Vice President (New England Region); National Council member. Current National Committee member.

***J. Gilbert Nettleton, Jr.,** Washington, D. C.—aerospace industry executive. Former Squadron Commander; Chapter President; Chairman of National Air Force Salute; Chairman of the Board of Trustees, Aerospace Education Foundation. Current National Committee member; Aerospace Education Foundation Board of Trustees member. AFA Presidential Citation 1966 and 1974. Life Member.

***Edward A. Stearn,** San Bernardino, Calif.—aerospace industry executive. Former Chapter President; State officer; National Committee member. Current National Council member. AFA Presidential Citation 1972; Special AFA Award 1976.

***Hugh W. Stewart,** Tucson, Ariz.—attorney. Former Chapter, State President; National Committee Chairman. Current National Committee member; Aerospace Education Foundation Board of Trustees member. Life Member.

***L. T. "Zack" Taylor,** Lompoc, Calif.—aerospace industry executive. Former Chapter, State President. Current National Council member. Special AFA Citation 1976.

***Herbert M. West, Jr.,** Tallahassee, Fla.—environmental consultant. Former Chapter, State President; Vice President (Southeast Region). Current National Council member; Aerospace Education Foundation Board of Trustees member AFA Special Citation 1976.

Sherman W. Wilkins, Bellevue Wash.—aerospace industry executive. Former Chapter President. Current Vice Presiden (Northwest Region); Nationa Council member. Life Member

Jack Withers, Dayton, Ohio—industry executive. Forme Chapter, State President; Na tional Director; National Com mittee member. Current Vic President (Great Lakes Re gion); Aerospace Educatio Foundation Board of Trustee member. Life Member.

Plan Now To Celebrate . . .

USAF's 30th Anniversary at AFA's 1977 National Convention and Aerospace Development Briefings & Displays

September 18-22 Washington, D.C.

AFA's 1977 National Convention and Aerospace Development Briefings and Displays will be held at the Sheraton-Park Hotel, Washington, D.C., September 18-22. Hotel accommodations are available at the Sheraton-Park, and a limited block is available at the nearby Shoreham-Americana Hotel.

All reservations requests for rooms and suites at the Sheraton-Park should be sent to: Reservations Office, Sheraton-Park Hotel, 2660 Woodley Road, N.W., Washington, D.C. 20008. The Shoreham-Americana Hotel's address is: 2500 Calvert St., N.W., Washington, D.C. 20008. We urge you to make your reservations as soon as possible. To assure acceptance of your reservation request, refer to the AFA National Convention.

Convention activities will include a Sunday evening visit to the popular National Air and Space Museum, AFA business sessions, luncheons honoring the Secretary of the Air Force and the Air Force Chief of Staff, the annual Salute to Congress, and the Air Force Anniversary Reception and Dinner Dance, featuring a salute to the Air Force on its 30th Anniversary.

Again, we urge you to make your reservations at the Sheraton-Park or Shoreham-Americana as soon as possible to ensure obtaining your reservations. Arrivals after 6:00 p.m. require a one-night deposit or guarantee for the night of arrival.

Advance Registration Form

Air Force Association National Convention and Aerospace Development Briefings & Displays
September 18-22, 1977 ● Sheraton-Park Hotel ● Washington, D.C.

Type or print

Name _____

Title _____

Affiliation _____

Address _____

City & State _____

Make checks payable to AFA and mail to 1750 Pennsylvania Ave., N.W., Washington, D.C. 20006

Reserve the following for me:

Advance Registrations
@ $60.00 per person ___ **$** _____

Current Registrations*
@ $70.00 per person ___ **$** _____

AF 30th Anniversary Reception & Dinner Dance Tickets
@ $35.00 per person ___ **$** _____

Amount enclosed **$** _____

*** Current Registration Fee (After Sept. 9): $70**

AFA State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are l cated. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtaine from the state contact.

ALABAMA (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **Donal B. Cunningham,** 1 Keithway Dr., Selma, Ala. 36701 (phone 205-875-2450).

ALASKA (Anchorage, Fairbanks): **Daniel C. Crevensten,** Box 60184, Fairbanks, Alaska 99706 (phone 907-452-5414).

ARIZONA (Phoenix, Tucson): **Robert J. Borgmann,** 2431 E. Lincoln Cir., Phoenix, Ariz. 85016 (phone 602-955-7845).

ARKANSAS (Blytheville, Fort Smith, Little Rock): **Jack Kraras,** 120 Indian Trail, Little Rock, Ark. 72207 (phone 501-225-5575).

CALIFORNIA (Apple Valley, Edwards, Fairfield, Fresno, Hawthorne, Hermosa Beach, Long Beach, Los Angeles, Marysville, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Barbara, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Dwight M. Ewing,** P. O. Box 737, Merced, Calif. 95340 (phone 209-722-6283).

COLORADO (Aurora, Boulder, Colorado Springs, Denver, Ft. Collins, Grand Junction, Greeley, Littleton, Pueblo, Waterton): **Edward C. Marriott,** 11934 E. Hawaii Cir., Aurora, Colo. 80012 (phone 303-934-5751).

CONNECTICUT (East Hartford, North Haven, Stratford): **Joseph R. Falcone,** 14 High Ridge Rd., Rockville, Conn. 06066 (phone 203-565-3543).

DELAWARE (Dover, Wilmington): **George H. Chabbott,** 33 Mikell Dr., Dover, Del. 19901 (phone 302-697-6943).

DISTRICT OF COLUMBIA (Washington, D. C.): **James M. McGarry,** 2418 N. Ottawa St., Arlington, Va. 22205 (phone 703-534-2663).

FLORIDA (Bartow, Broward, Cape Coral, Ft. Walton Beach, Gainesville, Jacksonville, New Port Richey, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tampa): **Eugene D. Minietta,** Box 286A, Route 1, Oviedo, Fla. 32765 (phone 305-423-8541).

GEORGIA (Athens, Atlanta, Rome, Savannah, St. Simons Island, Valdosta, Warner Robins): **William L. Copeland,** 1885 Walthall Dr., NW, Atlanta, Ga. 30318 (phone 404-355-5019).

HAWAII (Honolulu): **James Dowling,** 2222 Kalakaua Ave., Honolulu, Hawaii 96815 (phone 808-923-0492).

IDAHO (Boise, Pocatello, Twin Falls): **Larry L. Leach,** 6318 Bermuda Dr., Boise, Idaho 83705 (phone 208-344-1671).

ILLINOIS (Belleville, Champaign, Chicago, Elmhurst, O'Hare Field): **Hugh L. Enyart,** 112 Ruth Dr., O'Fallon, Ill. 62269 (phone 618-398-1950).

INDIANA (Logansport, Marion, Mentone): **William Pfarrer,** 604 Green Hills Dr., Logansport, Ind. 46947.

IOWA (Des Moines): **Ric Jorgensen,** 4005 Kingman, Des Moines, Iowa 50311 (phone 515-255-7656).

KANSAS (Topeka, Wichita): **Albin H. Schweers,** 7221 Woodward St., Overland Park, Kan. 66204 (phone 816-374-4267).

KENTUCKY (Louisville): **Stanley P. McGee,** 5405 Wonding Ct., Louisville, Ky. 40207 (phone 502-368-6524).

LOUISIANA (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Shreveport): **Norman L. Gunn,** 4510 Willowick Blvd., Alexandria, La. 71301 (phone 318-487-2431).

MAINE (Limestone): **Alban E. Cyr,** P. O. Box 160, Caribou, Me. 04736 (phone 207-492-4171).

MARYLAND (Andrews AFB, Baltimore): **James W. Poultney,** P. O. Box 31, Garrison, Md. 21055 (phone 301-363-0795).

MASSACHUSETTS (Boston, Falmouth, Florence, Hanscom AFB, Lexington, Taunton, Worcester): **Frederick J. Gavin, Jr.,** 38 Tremlett St., Boston, Mass. 02124 (phone 617-282-2059).

MICHIGAN (Battle Creek, Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Petoskey, Sault Ste. Marie, Southfield): **Dorothy Whitney,** 3494 Orchard Lake Rd., W. Bloomfield, Mich. 48033 (phone 313-682-4550).

MINNESOTA (Duluth, Minneapolis, St. Paul): **David J. Little,** 1888 Princeton Ave., St. Paul, Minn. 55105 (phone 612-699-3600).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Billy A. McLeod,** P. O. Box 1274, Columbus, Miss. 39701 (phone 601-328-0943).

MISSOURI (Kansas City, Knob Noster, Springfield, St. Louis): **Donald K. Kuhn,** 3238 Southern Aire Dr., St. Louis, Mo. 63125 (phone 314-892-0121).

MONTANA (Great Falls): **Jack R. Thibaudeau,** P. O. Box 2247, Great Falls, Mont. 59403 (phone 406-727-3807).

NEBRASKA (Lincoln, Omaha): **Lyle O. Remde,** 4911 S. 25th St., Omaha, Neb. 68107 (phone 402-731-4747).

NEVADA (Las Vegas, Reno): **Dale O. Smith,** 3055 Heathridge Ln., Reno, Nev. 89502 (phone 702-786-7791).

NEW HAMPSHIRE (Manchester, Pease AFB): **William W. McKenna,** RFD #5, Strawberry Hill Rd., Bedford, N. H. 03102 (phone 603-472-5504).

NEW JERSEY (Andover, Atlantic City, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Forked River, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Leonard Schiff,** 246 Franklin Ave., Cliffside Park, N. J. 07010 (phone 201-861-2950).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **William J. Denison,** 2615 Vista Larga Ave., N. E., Albuquerque, N. M. 87110 (phone 505-264-1733).

NEW YORK (Albany, Bethpage, Binghamton, Buffalo, Catskill, Chautauqua, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Kenneth C. Thayer,** R. D. #1, Ava, N. Y. 13303 (phone 315-827-4241).

NORTH CAROLINA (Charlotte, Fayetteville, Goldsboro, Greensboro, Raleigh): **William M. Bowden,** P. O. Box 1255, Goldsboro, N. C. 27530 (phone 919-735-4716).

NORTH DAKOTA (Grand Forks, Minot): **Leo P. Makelky,** 611 16th Ave., S. W., Minot, N. D. 58701 (phone 701-839-5186).

OHIO (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Toledo, Youngstown): **Edward H. Nett,** 1449 Ambridge Rd., Centerville, Ohio 45459 (phone 513-461-4823).

OKLAHOMA (Altus, Enid, Oklahoma City, Tulsa): **David L. Blankenship,** P. O. Box 51308, Tulsa, Okla. 74151 (phone 918-835-3111, ext. 2207).

OREGON (Corvallis, Eugene, Portland): **Robert G. Ringo,** 2835 SW DeArmond, Corvallis, Ore. 97330 (phone 503-757-1213).

PENNSYLVANIA (Allentown, Beaver Falls, Chester, Dormont, Erie, Harrisburg, Homestead, Horsham, King of Prussia, Lewistown, Philadelphia, Pittsburgh, State C lege, Washington, Willow Grov York): **Lamar R. Schwartz,** 3 Broad St., Emmaus, Pa. 180 (phone 215-967-3387).

RHODE ISLAND (Warwic **Charles H. Collins,** 143d TA (RIANG), Warwick, R. I. 028 (phone 401-737-2100).

SOUTH CAROLINA (Charlesto Columbia, Greenville, Myrtle Beac Sumter): **Edith E. Cailiham,** P. Box 959, Charleston, S. C. 294 (phone 803-723-6681).

SOUTH DAKOTA (Rapid Cit **James Anderson,** 913 Mt. Rus more Rd., Rapid City, S. D. 577 (phone 605-342-3128).

TENNESSEE (Chattanooga, Kno ville, Memphis, Nashville, Tull homa): **Thomas O. Bigger,** AR Inc. (SE/WA), Arnold AFS, Ten 37389 (phone 615-455-2611, e 247).

TEXAS (Abilene, Austin, E Spring, Commerce, Corpus Chris Dallas, Del Rio, El Paso, Fo Worth, Harlingen, Houston, Ke ville, Laredo, Lubbock, San A gelo, San Antonio, Waco, Wichi Falls): **E. F. Faust,** 1422 E. Gra son, San Antonio, Tex. 782 (phone 512-223-2981).

UTAH (Brigham City, Clearfie Ogden, Provo, Salt Lake Cit **Leigh H. Hunt,** 1107 S. 1900 Salt Lake City, Utah 84108 (pho 801-582-0935).

VERMONT (Burlington): **Rona R. Corbin,** 204 Staniford Rd., Bu lington, Vt. 05401 (phone 802-86 2847).

VIRGINIA (Arlington, Danvil Harrisonburg, Langley AFB, Lync burg, Norfolk, Petersburg, Ri mond, Roanoke): **John Pilot,** Whitney Rd. N. W., Apt. A3 Roanoke, Va. 24012 (phone 7 563-5879).

WASHINGTON (Port Angel Seattle, Spokane, Tacoma): **M garet A. Reed,** P. O. Box 888 Seattle, Wash. 98188 (phone 2 575-2875).

WEST VIRGINIA (Huntingt **Ralph D. Albertazzie,** 1550 nawha Blvd., E., Charleston, W. 25311.

WISCONSIN (Madison, Milw kee): **Charles W. Marotske,** S. Verdev Dr., Oak Creek, 53154 (phone 414-762-4383).

WYOMING (Cheyenne): **Watson,** 908 Arapahoe, Cheye Wyo. 82001 (phone 307-638-3

Perspective
Comment & Opinion

By Charles A. Wahler, HQ., USAFE CLASS VI FUND

Why Not a DCS/Services?

Adequate management of customer services within the USAF is becoming increasingly difficult, and the availability of professional talent needed to operate the services functions is rapidly eroding. A major deterioration of the quality and quantity of services is in sight, if something is not done quickly.

Here are a few factors that contribute to the deterioration:

- Manpower reductions that dilute the time talented people can give to the service activity to which they are assigned, often as a secondary responsibility.
- Spiraling costs of salaries and wages in nonappropriated fund services.
- Rising costs of all commodities connected with services.
- Low return on capital assets due to decreased patronage.

We have to agree that the planners are trying; evidence the Air Force Engineering and Services Agency at Kelly AFB, Tex. However, a total services atmosphere can never be realized until services are recognized as a major functional area along with logistics, personnel, and the other staff sections. The old adage that the activity which functions best is the one the commander is most interested in applies. When services are assigned to an officer whose primary responsibility is not services, and the officer is rated on his primary, the services portion of his job is not likely to get the attention it deserves.

The nonappropriated funds study conducted a few years ago made some excellent recommendations, but unfortunately, the study did not get to the root of the problem, and that is malassignment of functions. What is needed is a staff agency to administer and technically supervise all customer services in the USAF.

A customer services organization at deputy chief of staff USAF level is both technically feasible and fiscally sound. Putting all of the customer-oriented services such as open messes, clubs, and sales stores under one roof is doing nothing more than following the time-honored management principle of grouping like functions together. Why not merge them into one happy family of services by themselves?

Most service activities are compatible; they all are basically organizations that serve people and provide for the individual welfare of people. Specialized functions could be siphoned off existing organizations and any needed augmentation could easily be added if necessary. Broader utilization of existing regional warehousing and distribution capabilities would be especially advantageous overseas. The facilities exist; they just are not being properly used.

There are bound to be observations that it would involve comingling of revenue-producing, sundry, and appropriated funds. This is an accounting matter and can be handled by simple accounting procedures.

A Deputy Chief of Staff/Services would not be hampered by controls and administrative practices that are present when essentially operating activities are married to staff functions. Neither would its assigned talent be dissipated by other influences and interests. An organization such as this would be able to fully concentrate on performing its assigned mission. Resources allocated to its mission would be clearly identified and easily accounted for.

Of course, appropriated funds to support such an organization would be needed, but when properly utilized, they should be no greater than those of all the individual entities that now exist. This support would be more readily identifiable since it would be directed to a specific military unit.

It is even possible that some economies in appropriated-fund support could eventually be effected by such actions as: reductions in military manning spaces due to increased professional capabilities of employees resulting from training and assignment controls; lesser local storage space requirements from better-managed inventory and consolidated warehousing; decreases in transportation support by consolidated procurements and bulk shipments; and reductions in the workload of subordinate operating activities.

The above organizational combination would provide a single accountable authority, responsible to the Air Force Chief of Staff, for an annual cash flow in excess of $50 million, the proper utilization of nonappropriated fund capital assets of more than $25 million, and the provision of certain services to USAF personnel on an acceptable standard, in an economical fashion. It would provide technical guidance and supervision to all separate and now widely dispersed operating entities at base level, having missions basic to individual morale, comfort, and welfare. ■

HOW TO SHARE YOUR PERSPECTIVE

The purpose of this department is to encourage the presentation of novel ideas and constructive criticism pertinent to any phase of Air Force activity or to national security in general. Submissions should not exceed 1,000 words. AIR FORCE Magazine reserves the right to do minor editing for clarity, and will pay an honorarium to the author of each contribution accepted for publication.

AFA News

By Don Steele, AFA AFFAIRS EDITOR

Unit of the Month

THE MERCED COUNTY CHAPTER, CALIF. . . . cited for consistent and effective programming in support of the missions of the Air Force and AFA, most recently exemplified by the effective involvement of the local community and its leadership in the Chapter's recent Honors and Awards Night program.

AFA President Douglas Visits Alaska and Hawaii

In Alaska, AFA National President George M. Douglas participated in the Alaska State AFA's 1977 Convention, was the guest speaker at the Anchorage Chapter's Annual Awards Banquet, and visited with the Commander of the Alaskan Air Command and his staff, and with representative groups of Air Force civilian employees, Junior Officers, and enlisted people of all grades at Elmendorf and Eielson AFBs, and Tatalina AFS. While in Hawaii, to establish a second chapter, Mr. Douglas visited with the Commander in Chief of the Pacific Air Forces and his staff, and with representative groups of Air Force civilian employees, Junior Officers, and enlisted people of all grades at Hickam and Wheeler AFBs. In **photo No. 1,** Mr. Douglas, right, speaks to the delegates attending the Alaska State AFA Convention. Alaska State AFA President Ed Monaghan is seated at left. **Photo No. 2** shows Mr. Douglas, left, visiting at the Anchorage Chapter's Annual Awards Banquet with, from left, Lt. Gen. M. L. Boswell, Commander, Alaskan Air Command; SSgt. James M. Carter, II, the AAC nominee for selection as one of the Air Force's Twelve Outstanding Airmen; and Mrs. Carter. In **photo No. 3,** Mr. Douglas and Sherm Wilkins, Vice President for AFA's Northwest Region, visit with a group of Eielson AFB NCOs and their wives. Shown are, from left, TSgt. Thomas Campbell, Mr. Wilkins, TSgt. George Edwards, Mrs. Edwards, TSgt. Carl Cline, Mrs. Cline, Mrs. Baker, SSgt. David Baker, and Mr. Douglas. **Photo No. 4** was taken during a discussion session with a group of Air Force civilian employees, Junior Officers, and enlisted people of all grades at Wheeler AFB.


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chapter and state photo gallery

The Anchorage, Alaska, Chapter's Annual Awards Banquet was held in the Elmendorf AFB Officers' Club in conjunction with the Alaska State AFA's 1977 Convention. During the program, Chapter President Adam Johnston, left, presented SSgt. and Mrs. Atwell Stewart, Jr., the Chapter's award for Outstanding Contributions to the Air Force community.

During the Anchorage Chapter's recent Awards Banquet, plaques commemorating the Twenty-fifth Anniversary of the Civil Reserve Air Fleet were presented to Reeve Aleutian Airways and to Wien Air Alaska in appreciation of their participation in the Civil/Military partnership that contributed so much to enhancing the Military Airlift Command's ability to provide airlift support for the common defense of the United States. Dick Reeve, left, Administrative Vice President, accepted for Reeve Aleutian Airways; Ray Petersen, center, Board Chairman, accepted for Wien Air Alaska; and Lt. Gen. M. L. Boswell, Commander, Alaskan Air Command, made the presentations on behalf of the Commander in Chief of the Military Airlift Command.

he Missouri State AFA's 1977 Convention was hosted in St. Louis by the reater St. Louis Chapter. During the convention banquet, AFA National resident George M. Douglas, right, presented Col. James St. Clair, Director f the Defense Mapping Agency Aerospace Center, a Chapter citation for his upport to AFA through the Greater St. Louis Chapter. Donald Kuhn, seated left, was elected President of the State AFA for 1977-78.

Gen. Nathan F. Twining, USAF (Ret.), a former USAF Chief of Staff, is one of the most recent Jimmy Doolittle Fellows. The Jimmy Doolittle Fellow plaque for General Twining was sponsored by the South Carolina State AFA and was presented in the General's home at Hilton Head Island, S. C. Shown during the ceremonies are, from left, Mrs. Twining, General Twining, South Carolina State AFA President Roger Rhodarmer, and South Carolina State AFA Aerospace Education Director H. Foster Hamilton.

AFA News

The Holiday Inn at the Los Angeles International Airport recently became an AFA Community Partner and, at a Greater Los Angeles Airpower Chapter business meeting, the Community Partner Certificate was presented to Innkeeper John Tarantini, center. The presentation was made by Chapter President Jim Cozad, left, and the Chapter's President for 1977-78, Dick Doom, right.

South Carolina State AFA President Roger Rhodarmer, center, is shown as he presented AFROTC Cadet Mark M. Crabbe of The Citadel the State AFA's Outstanding Achievement Award. Lt. Gen. George M. Seignious II, USA (Ret.), the President of The Citadel, is at left. The award was presented during the State AFA's recent convention at Charleston AFB.

Rear Adm. William P. Lawrence, Director, Aviation Programs, Office of the Deputy Chief of Naval Operations, and a POW in North Vietnam for six years, was the guest speaker for the Greater Harrisburg, Pa., Area Armed Forces Day Luncheon. Shown with Admiral Lawrence, left, are the luncheon sponsors, from left, Rear Adm. James E. McKenna, Supply Corps, USN, Commanding Officer, Navy Ships Parts Control Center; Brig. Gen. Joseph H. Kastner, Deputy Commandant, Army War College; and Daniel Beigh, President of AFA's Olmsted Chapter.

INTERESTED IN JOINING A LOCAL CHAPTER?

For information on AFA Chapters in your area, write:
Assistant Executive Director/Field Operations
Air Force Association
1750 Pennsylvania Ave., N. W.
Washington, D. C. 20006

Pictured are the individuals who received awards at the North Carolina State AFA's 1977 Convention at the Seymour Johnson AFB Officers' Open Mess. They are, top row from left, Capt. W. T. Fowler, Outstanding Junior Officer; SSgt. D. J. Brees, Outstanding Junior NCO; A1C P. L. Hairston, Outstanding Airman; Capt. J. E. Harper, Outstanding AFROTC Instructor; TSgt. T. Alexander, Outstanding AFA member; bottom row, from left, William Bowden, Outstanding Chapter President and newly elected North Carolina State AFA President; SMSgt. M. L. Pigg, Outstanding Senior NCO; CAP Maj. R. Sweesy, who accepted award for the Outstanding CAP Cadet, CAP Cadet Col. J. A. Wolfe; AFJROTC Cadet Maj. T. L. Green, Outstanding AFJROTC Cadet; S. A. Murray, Honorary AFA Member; AFROTC Cadet Maj. J. S. Jones, Outstanding AFROTC Cadet, and retired MSgt. R. G. Trussell, Outstanding AFJROTC Instructor.

chapter and state photo gallery

The Alamo Chapter, Tex., recently sponsored a luncheon at San Antonio's University Club to honor Gen. John Roberts, Commander, Air Training Command, on his promotion to four-star general. Head-table guests included, from left, Texas State AFA President E. F. "Sandy" Faust; Chapter Secretary W. R. Cummings; General Roberts; State AFA Membership Chairman Beverly Jacobsen; Chapter President Bill Roth; and Texas State AFA Executive Vice President Vern Flatt.

AFA National President George M. Douglas, left, visits with California State AFA President Dwight Ewing, center, and Merced County Chapter President Charles Hoenisch, right, at the Merced County Chapter's recent Honors and Awards Night. Mr. Douglas was the guest of honor and speaker.

COMING EVENTS

Academy of Model Aeronautics' 1977 **National Model Airplane Championships,** March AFB, Calif. (AFA's Riverside County Chapter is a cosponsor), August 6–14 . . . **AFA's 31st Annual National Convention,** Sheraton-Park Hotel, Washington, D. C., September 18–21 . . . **AFA's Aerospace Development Briefings and Displays,** Sheraton-Park Hotel, Washington, D. C., September 20–22 . . . **Sixth Annual Air Force Ball,** Century Plaza Hotel, Los Angeles, Calif., October 28.

While in Memphis, Tenn., for the Thirty-fifth Anniversary Reunion of the Doolittle Tokyo Raiders, Lt. Gen. James H. Doolittle, USAF (Ret.), one of AFA's founders and its first National President, took time out to present AFA's Medal of Merit to Tennessee State AFA President Tom Bigger for his accomplishments while serving as President of the H. H. Arnold Memorial Chapter at Tullahoma. Shown at the presentation ceremonies are, from left seated, Mr. Bigger, General Doolittle, and Mrs. Bigger; from left standing, Dulmin Brown, Vice President for AFA's South Central Region; AFA National Director Jack Haire; and Everette R. Cook Chapter President Chuck Ferrell.

Brig. Gen. H. J. Dalton, Director of Information, Office of the Secretary of the Air Force, was the guest speaker at a recent meeting of AFA's Tulsa Chapter, Okla. General Dalton, center, shown here visiting with Chapter President Ed McFarland, left, and Oklahoma State AFA President David Blankenship, right, spoke on "The United States Air Force Now."

AFA News

Col. Thomas Kirk, Jr., center, Vice Commander of the Lowry Technical Training Center, receives a standing ovation as he is named the recipient of the Blue Barons Chapter's Distinguished Staffel Member award, presented annually to the individual who has done the most to promote aerospace power in Colorado. The award was presented at the Chapter's annual DSM Awards Dinner. Others in the photo are, from left, Sandy Schloffman, Mrs. Kirk, and Mrs. Andrew Pringle, wife of the Lowry Technical Training Center Commander.

Lt. Col. Donald Madonna, center, Commander of the 65th Fighter Weapons Squadron at Nellis AFB, Nev., and the guest speaker at a recent meeting of AFA's Robert H. Goddard Chapter in Solvang, Calif., accepts an artist's rendition of the Space Shuttle's first landing at Vandenberg AFB. The painting was presented by Brig. Gen. Don M. Hartung, left, Commander, Space and Missile Test Center at Vandenberg AFB, and Chapter President Bill Leary, right.

Fifty-five members and other civic leaders participated in the James H. Straubel Chapter's recent Detroit AFA/Civic Leader visit to Wright-Patterson AFB, Ohio, and the Air Force Museum at the base. On hand to welcome the group to the museum were, from left, Nelson Hall, Restoration Division Supervisor at the Museum; Chapter President Leonard W. Isabelle; Lt. Col. Nick Apple, Chief of Information, 2750th Air Base Wing (AFLC); and Sgt. M. R. Pettinger, of the Information Office.

CMSAF Thomas Barnes was the guest speaker at the Texas State AFA's quarterly Executive Committee Meeting, which was hosted by the Concho Chapter in San Angelo. Shown with CMSAF Barnes, right, are, from left, CMSgt. Earl Frank, Senior Airman Advisor at Goodfellow AFB; and Col. (Brig. Gen. selectee) Norma Brown, Goodfellow AFB Commander.

photo gallery

Col. Ted Swain, USAF (Ret.), right, a former Secretary/Treasurer of the Charleston Chapter, S. C., poses with, from left, SMSgt. Floyd T. Donahue, Sgt. Jeremy Summers, and A1C Michele Crenshaw, Charleston AFB's Senior NCO, and Airman of the Year, respectively. During the Chapter's annual awards banquet, Colonel Swain presented each of them a $50 savings bond from the Chapter.

Following his address at the Sacramento, Calif., Chapter's Honors and Awards Banquet, AFA National President George M. Douglas, left, receives a memento of his visit from Chapter President Ed Cook.

check for more than $26,000, the net proceeds om the Eglin, Fla., Chapter's three-hour show eaturing Comedian Bob Hope, recently was resented to Nick Masone, Executive Director the Air Force Enlisted Men's Widows Home oundation. The check was presented by hapter President-elect Joe Guidry. Shown with e check are, from left, Lt. Col. William hrimsher, Eglin Project Officer for the show; . Masone; and CMSgt. Donald Howarth, lin Coordinator for the show.

During the H. H. Arnold, N. Y., Chapter's Annual Awards Banquet, a Jimmy Doolittle Fellow Plaque, sponsored by the Chapter, was presented to Thomas O'Brien, left, by AFA Board Chairman Gerald V. Hasler, right. Mr. O'Brien is a member of the Chapter's Executive Council and the President and General Manager of PRD Electronics, Harris Corp.

20% Dividend Paid for 1976!

NOW . . . with a New Aviation Death Benefit!

Air Force Association

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 (20% for 1976) to insured members in twelve of the past fifteen years, and has increased the basic amount of coverage on four 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 Military 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 active duty personnel of the Armed Forces of the United States and members of the Ready Reserve* and National Guard* (under age 60), Armed Forces Academy cadets*, and college or university ROTC cadets* are eligible to apply for this coverage provided they are now, or become, members of the Air Force Association.

*Because of restrictions on the issuance of group insurance coverage, applications for coverage under the group program cannot be accepted from cadets or Reserve or Guard personnel residing in Florida, New York, Ohio or Texas. Members in these states may request special application forms from AFA for individual policies which provide coverage quite similar to the group program.

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.

CURRENT BENEFIT TABLES

AFA STANDARD PLAN

PREMIUM: $10 per month

Insured's Attained Age	Life Insurance Coverage*
20-24	$75,000
25-29	70,000
30-34	65,000
35-39	50,000
40-44	35,000
45-49	20,000
50-54	12,500
55-59	10,000
60-64	7,500
65-69	4,000
70-74	2,500

Aviation Death Benefit:*

Non-war related	$25,000
War related	$15,000

AFA HIGH OPTION PLAN

PREMIUM: $15 per month

Insured's Attained Age	Life Insurance Coverage*
20-24	$112,500
25-29	105,000
30-34	97,500
35-39	75,000
40-44	52,500
45-49	30,000
50-54	18,750
55-59	15,000
60-64	11,250
65-69	6,000
70-74	3,750

Aviation Death Benefit:*

Non-war related	$37,500
War related	$22,500

***Extra Accidental Death Benefit:** In the event of an accidental death occurring within 13 weeks of the accident, this AFA plan pays an additional lump sum benefit of $12,500 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.

OPTIONAL FAMILY COVERAGE

(may be added to either Standard or High Option Plan)
PREMIUM: $2.50 per month

Insured's Attained Age	Life Insurance Coverage for Spouse	Life Insurance Coverage for each Child*
20-39	$10,000	$2,000
40-44	7,500	2,000
45-49	5,000	2,000
50-54	4,000	2,000
55-59	3,000	2,000
60-64	2,500	2,000
65-69	1,500	2,000
70-74	750	2,000

*Between the ages of six months and 21 years, each child is provided $2,000 coverage. Children under 6 months are provided with $250 coverage once they are 15 days old and discharged from hospital.

Military Group Life Insurance

APPLICATION FOR
AFA MILITARY 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

Please indicate category of eligibility and branch of service.

☐ Extended Active Duty ☐ Air Force
☐ Ready Reserve or National Guard ☐ Other _____ (Branch of service)
☐ Air Force Academy ☐ _____ Academy
☐ ROTC Cadet _____
Name of college or university

Name and relationship of primary beneficiary

Name and relationship of contingent beneficiary

This insurance is available only to AFA members

☐ I enclose $10 for annual AFA membership dues (includes subscription ($9) to AIR FORCE Magazine).
☐ I am an AFA member.

Please indicate below the Mode of Payment and the Plan you elect.

HIGH OPTION PLAN		Mode of Payment	STANDARD PLAN	
Members Only	Members and Dependents		Members Only	Members and Dependents
☐ $ 15.00	☐ $ 17.50	**Monthly** government allotment. I enclose 2 months' premium to cover the period necessary for my allotment (payable to Air Force Association) to be established.	☐ $ 10.00	☐ $ 12.50
☐ $ 45.00	☐ $ 52.50	**Quarterly.** I enclose amount checked.	☐ $ 30.00	☐ $ 37.50
☐ $ 90.00	☐ $105.00	**Semiannually.** I enclose amount checked.	☐ $ 60.00	☐ $ 75.00
☐ $180.00	☐ $210.00	**Annually.** I enclose amount checked.	☐ $120.00	☐ $150.00

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, sanitarium, 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

8/77
Form 3676GL App

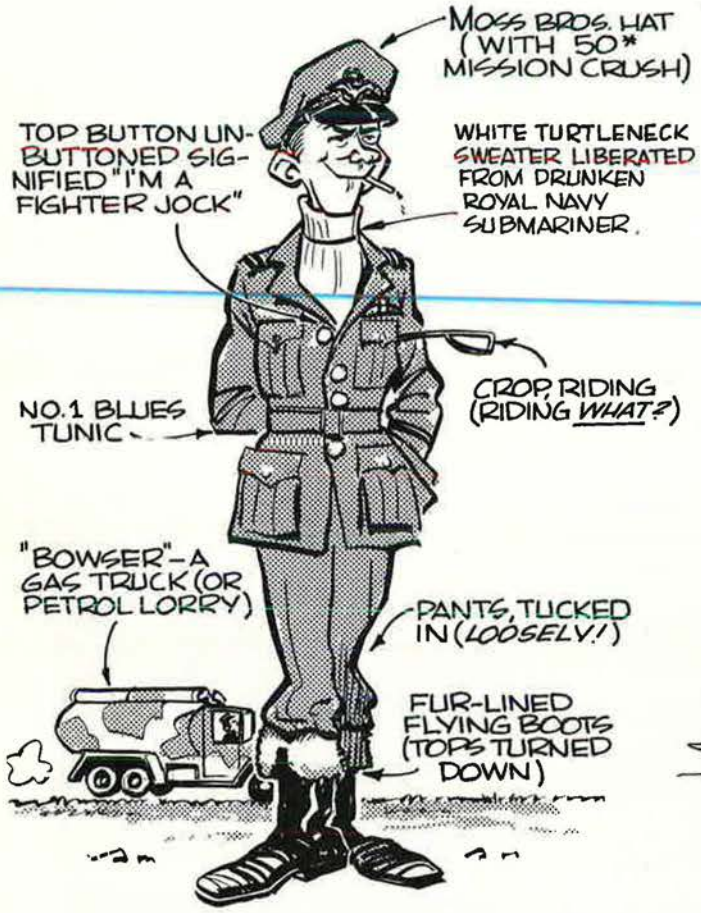
Application must be accompanied by check or money order. Send remittance to: Insurance Division, AFA, 1750 Pennsylvania Avenue, NW, Washington, D.C. 20006

Bob Stevens'

"There I was..."

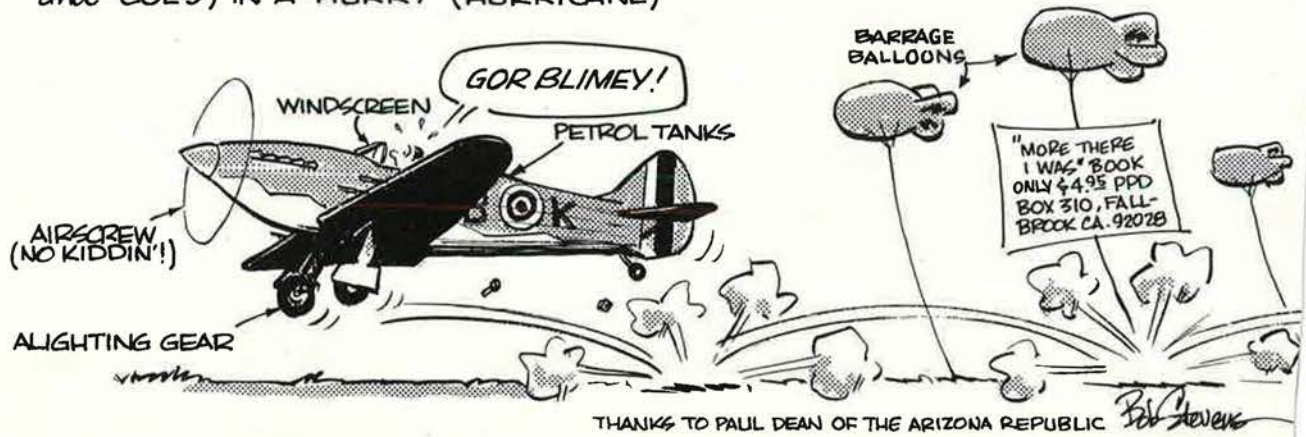
LET'S TAKE A LOOK AT OUR ENGLISH COUSINS DURING "THE BIG ONE." THEY HAD A VOCABULARY OF FLIGHT THAT WAS UNIQUE and AS FAR REMOVED FROM OURS AS THE U.S. WAS FROM JOLLY OLD.

"PILOT OFFICER PRUNE" – THE RAF EQUIVALENT OF ROGER RUDDER. WAS NORMALLY 19 YRS OLD WITH PIMPLES.



"TANNOY" (LOUDSPEAKER) USUALLY MANNED BY SOME LAC (LEADING AIRCRAFTSMAN) WHO RETIRED TO THE SACK AFTER ROUSTING OUT ALL THE LADS.

* ALTHOUGH HE HAD BARELY SURVIVED THREE "CIRCUITS-and-BUMPS" (TOUCH-and-GOES) IN A "HURRY" (HURRICANE)



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For more information about the F-15 Eagle, write:
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The F-15 Eagle
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