July 1970 / 60c

AIR FORCE

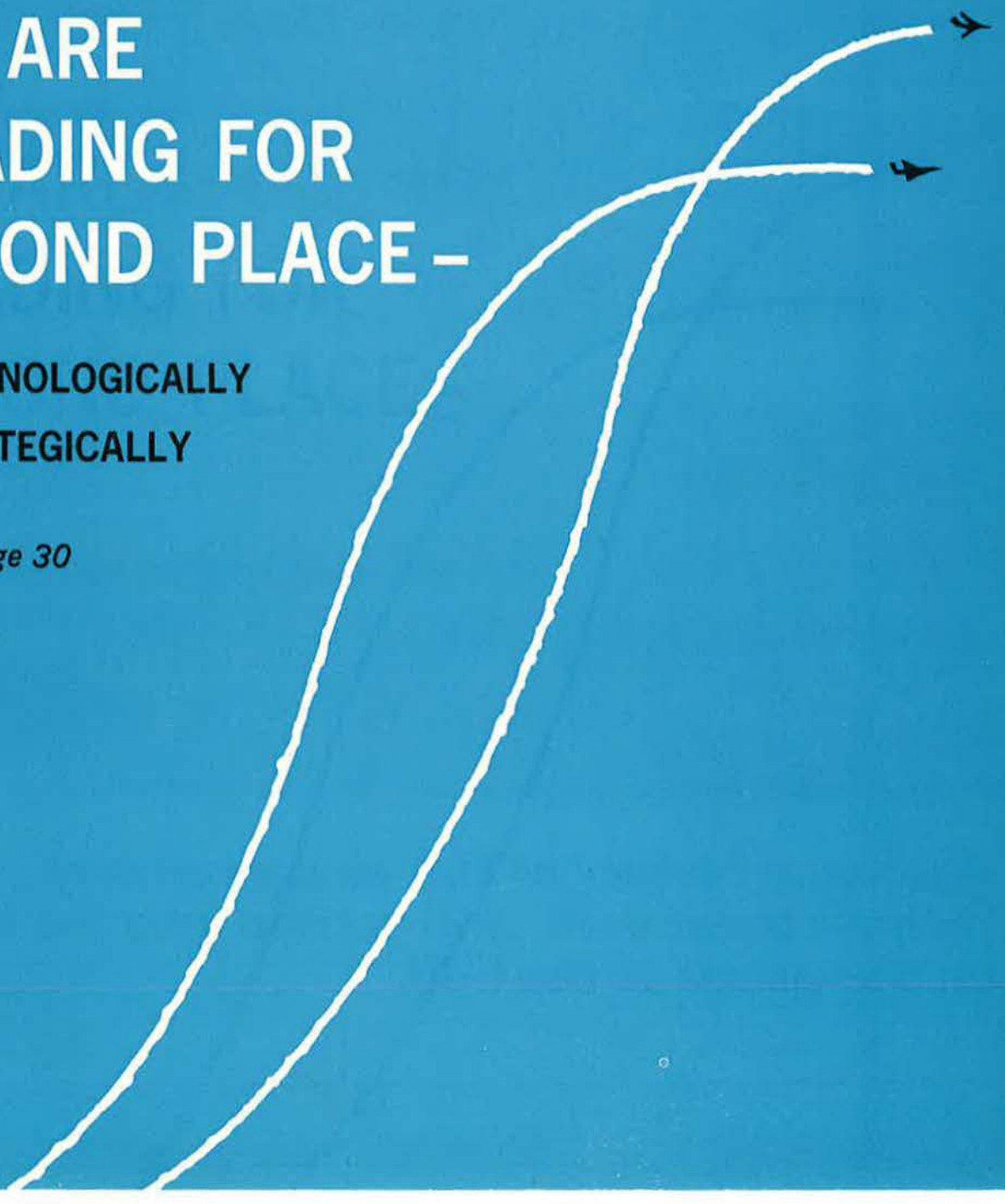
and SPACE DIGEST

The Magazine of Aerospace Power / Published by the Air Force Association

WE ARE HEADING FOR SECOND PLACE –

- TECHNOLOGICALLY
- STRATEGICALLY

— See Page 30



1924 U.S. Army Air Service used "Douglas World cruisers" for 25,553-mile 'round-the-world' flight.

1934 Advanced low-winged fighter carried XFT-1 designation.

1942 B-26 and A-26 see multi-theater duty throughout WWII.

1924 75 0-2 type observation aircraft ordered.

1939 More than 1500 aircraft delivered, including B-18.

1942 C-54 "Skymaster" gave new dimension to military airlift missions.

1927 C-1C flew cargo, troop transport, evacuation missions.

1939 Famed A-20-A "Havoc" also flew as Royal Air Force DB-7.

1942 "Sacred Cow" (C-54) assigned to AAF for Presidential use, is now in Smithsonian.

1927 0-2C became standard observation aircraft.

1941 "World's largest bomber," B-19 contributed to science of strategic bombing.

1943 Radar-guided Roc I was early missile project.

1931 Production of observation planes continued with 0-38 (shown), 0-43 and 0-46.

1941 First experimental McDonnell Aircraft contract was from AAF for XP-67 Bomber Destroyer.

1944 XB-42 and jet-powered XB-43 configuration advanced bomber technology

1934 A-17 went into quantity production.

1941 First of more than 10,000 military versions of the DC-3 goes to war as the C-47 "Gooney Bird."

1946 C-118 enters service, was flown in "Independence" configuration as Presidential aircraft.

A 46-year history of U.S. air supremacy... built on teamwork, and carried into the future on the wings of the F-15.

1947 XF-88 supersonic fighter, prototype to the Voodoo series.

1955 Multi-mission Thor serves as intermediate-range ballistic missile, and space vehicle booster.

1960 Quail decoy missile duplicates performance and image of SAC B-52 bombers.

1947 C-74 was first in long series of outsized military cargo carriers.

1956 Burly, efficient C-133 became logical follow-on to C-124 as cargo workhorse.

1962 RF-101 Voodoo revealed Soviet missiles in Cuba.

1948 XF-85 "Goblin," smallest jet fighter ever built, was designed to be launched and retrieved by bombers.

1957 F-101 became world's fastest operational fighter, with 1207 mph speed record.

1963 Mach 2 F-4 Phantom became world's leading air superiority, fighter-bomber, and reconnaissance aircraft for USAF.

1949 Successor to C-74, giant C-124 became standard heavyweight cargo hauler.

1957 Genie, high-velocity, air-to-air missile gives ADC nuclear defense capabilty.

1965 ASSET re-entry vehicle studied Mach 18 atmospheric flight.

1953 X-3 research aircraft made significant contributions to titanium usage.

1959 Alpha Draco achieved Mach 5 in guided flight within the atmosphere.

1968 The C-9A Nightingale is the first pure-jet aeromedical airlift transport in MAC history.

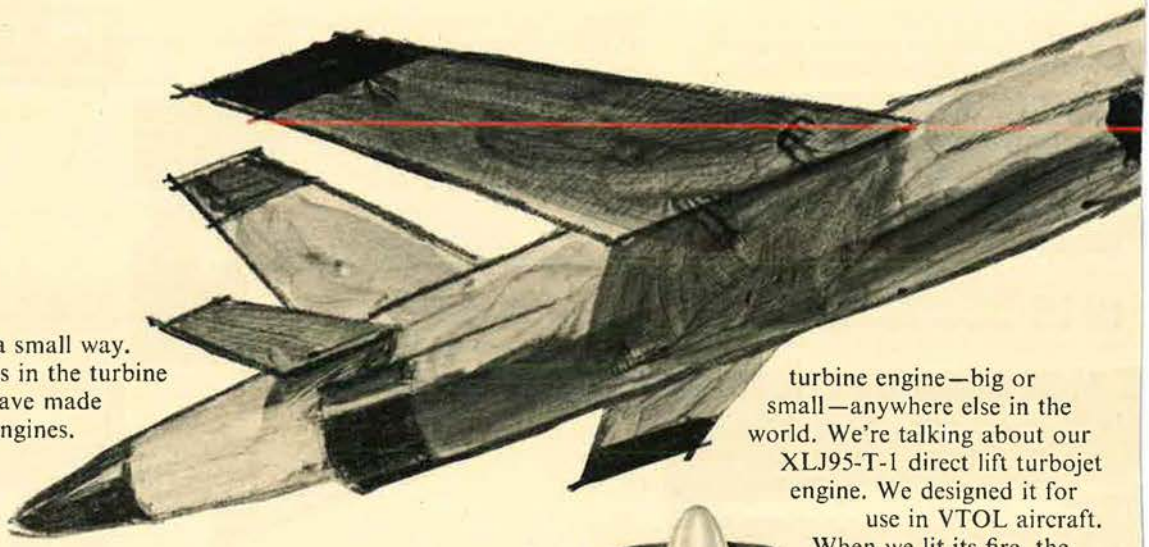
1955 B-66/RB-66 "Destroyer" enters service as USAF twinjet bomber.

1969 Thunderbirds, USAF Air Demonstration Squadron, transitions to F-4E Phantoms.

1969 USAF chooses McDonnell Douglas to build F-15 air superiority fighter.

MCDONNELL DOUGLAS

We've in a



We've made it big in a small way.

There are companies in the turbine engine business that have made it big by making big engines.

Then there's us. Teledyne CAE.

We've made it big by making small turbine engines.

Like our engines for target drones. We happen to be the world's leading manufacturer of turbojet drone engines. So far, Teledyne CAE engines in the BQM drone series alone have been successfully launched over 20,000 times. And nearly 10,000 of these launches have been in the air. Way up in the air.

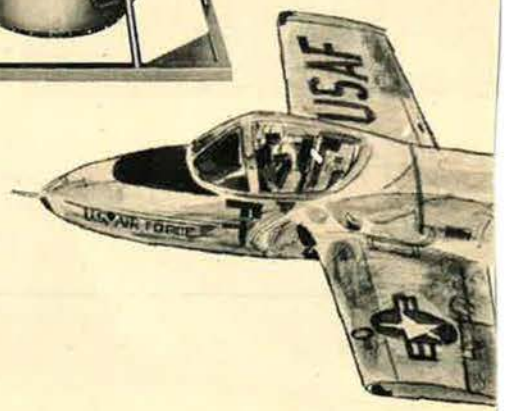
Just recently our 1920-pound thrust YJ69-T-406 engine completed its flight test program in the Navy BQM-34E drone. It reached Mach 1.1 at sea level and Mach 1.5 at 60,000 feet. This same engine is programmed for the Air Force BQM-34F, incidentally.

Another one of our drone engines, the Tri-Service J69-T-29 is famous, too. But for a slightly different reason. On a per pound of thrust basis, it's the lowest cost engine in the world today.

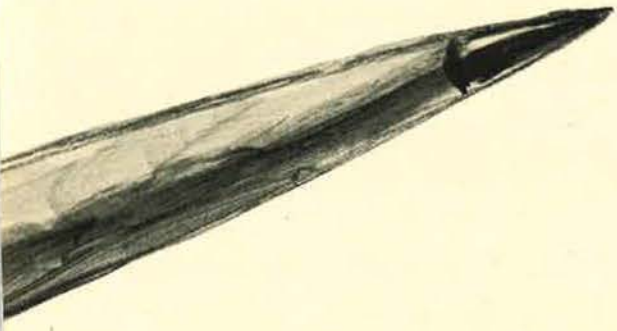
And, as you know, thrust per dollar is the name of the game.

We own another record that also hasn't been duplicated in another turbine engine—big or small—anywhere else in the world. We're talking about our XLJ95-T-1 direct lift turbojet engine. We designed it for use in VTOL aircraft. When we lit its fire, the XLJ95-T-1 demonstrated a thrust-to-weight ratio in excess of 20:1.

You don't get that kind of a thrust-to-weight ratio unless you know all about the most advanced



made it big small way.

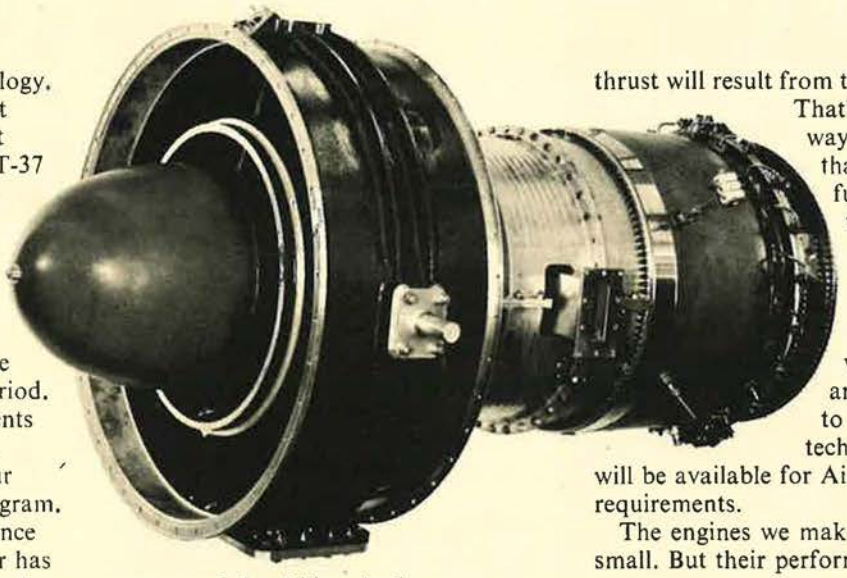


concepts in gas turbine technology.

We also build an engine that has been powering the T-37 jet trainer ever since there was a T-37 jet trainer. From the beginning of the program until now, the 3,900 engines we've supplied have logged over 7,000,000 flight hours.

It also has the lowest maintenance cost of any engine in the Air Force inventory. Period.

One of our latest developments isn't in the military inventory. Not yet, that is. It's part of our ATEGG or "core" engine program. For some time now, our Advance Turbine Engine Gas Generator has been demonstrating extremely high levels of performance and durability. And we expect that turbofan engines with a thrust to weight ratio of 10:1 and specific fuel consumption of less than 0.4 lbs/hour/lb. of thrust will result from this technology.



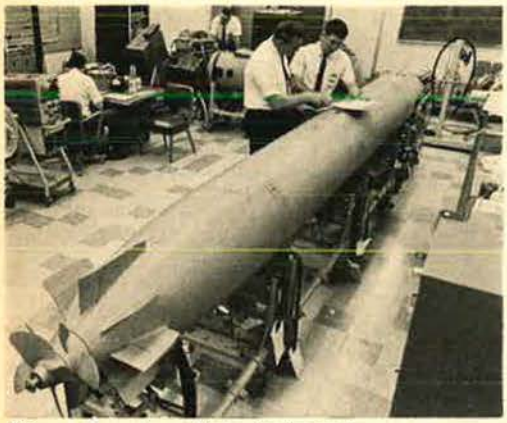
That's a technical way of saying that, in the future, small turbofan engines in the 2,000-5,000 lb. thrust range with performance equivalent to large advance technology engines will be available for Air Force requirements.

The engines we make may be small. But their performance is big.

TELEDYNE CAE

1330 LASKEY ROAD • TOLEDO, OHIO 43601

COST-CONSCIOUS TECHNOLOGY AT NORTHROP



This underwater vehicle designed by Northrop for the U.S. Navy to simulate a full-sized submarine will permit significant savings in anti-submarine warfare training.

Northrop saved more than 2,000 critical pounds in designing the 153-foot fuselage for the magnificent 747 airliner.

The most modern target in service for low-level surface-to-air missile training, the MQM-74A has the lowest cost per mission in its performance class.

Northrop is a major designer and builder of navigation and guidance systems for long-range subsonic and supersonic aircraft. The heart of one such system is this unique spherical platform.

More than 14,000 USAF pilots have graduated in the T-38 Talon, world's first supersonic trainer. Since 1961, more than 1,100 of the Northrop jets have logged over 2½ million hours in Air Force, Navy, NASA and German Air Force service.

Iran's new nationwide communications system will double the number of phones, provide a national TV network and expand telegraph and data transmission facilities. A Northrop-led consortium of multi-national companies is building the 8,700-mile system.

Northrop is one of the nation's biggest producers of special purpose, light-weight, low-cost digital computers for airborne electronics and navigation systems.

The Northrop F-5, in service with 15 nations, is designed to provide the needed performance level while taking into account purchase, maintenance and operation costs.

JAMES H. STRAUBEL
Publisher
JOHN F. LOOSBROCK
Editor and Assistant Publisher

EDITORIAL STAFF
1750 Pennsylvania Ave., N. W.
Washington, D. C. 20006

Richard M. Skinner, Managing Editor

Claude Witze, Senior Editor; **William Leavitt**, Senior Editor/Science and Education; **John L. Frisbee**, Senior Editor/Plans and Policy; **William P. Schlitz**, News Editor; **Edgar E. Ulsamer**, Associate Editor; **J. S. Butz, Jr.**, Technical Editor; **Jackson V. Rambeau**, Military Affairs Editor; **Don Steele**, AFA Affairs.

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•

Irving Stone, West Coast Editor, 10000 Santa Monica Blvd., Los Angeles, Calif. 90067 (213-878-1530). **Stefan Geisenheyner**, Editor for Europe, 6200 Wiesbaden, Germany, Wilhelmstr. 52a, Apt. 123.

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ADVERTISING DEPARTMENT

Charles E. Cruze, Advertising Director, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006 (202-298-9123).
Mary Bixiones, Production Manager; **Joanne M. Miller**, Production Assistant, Suite 400, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006 (202-298-9123).

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EASTERN SALES OFFICE: Douglas Andrews, Mgr.; John Hemleb, Regional Mgr., 112 E. 40th St., New York, N.Y. 10016 (212-687-3544). **MIDWEST:** James G. Kane, Mgr., 3200 Dempster St., Des Plaines, Ill. 60016 (312-296-5571). **WESTERN:** Harold L. Keeler, West Coast Mgr., 10000 Santa Monica Blvd., Los Angeles, Calif. 90067 (213-878-1530). **SAN FRANCISCO:** William Coughlin, Mgr., 420 Market St., San Francisco, Calif. 94111 (415-421-0151). **UNITED KINGDOM AND EUROPE:** R. A. Ewin, European Sales Director, 20-23 Holborn, London EC1, England (01-242-7484). **FAR EAST:** Yoshi Yamamoto, Regional Mgr., P.O. Box 410, Central Tokyo, Japan (535-6614).

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AIR FORCE and SPACE DIGEST

The Magazine of Aerospace Power
Published by the Air Force Association

VOLUME 53, NUMBER 7 **JULY 1970**

DEPARTMENTS

An Editorial

Air Defense— The Forgotten Front

By John L. Frisbee
SENIOR EDITOR, PLANS AND POLICY

WE CAN hardly remember when we last read or heard reports in the media of any defense official who was worried about the condition of this country's air defenses. It's not particularly hot copy these days. But that doesn't mean no one's concerned. Secretary of Defense Melvin Laird talked about air defense deficiencies in his budget presentation to the Congress in February. So did Air Force Secretary Robert Seamans, Jr., and Chief of Staff Gen. John D. Ryan.

It is astounding that some members of Congress and so many reporters and commentators have apparently written off the Soviet bomber threat. Ten years ago, it was regarded seriously. Yet since then, the Soviets haven't reduced their bomber force much, if at all, while at the same time, the USAF Aerospace Defense Command has been cut to the bone. It's hard to escape the conclusion that the United States is *more* vulnerable to air attack today than it was a decade ago, when we did worry about it.

Some people take comfort from the fact that the US has about 500 B-52s, a handful of FB-111s, and a go-ahead to build seven prototype B-1 supersonic bombers, while the Soviets are reported to have only 200 heavy bombers. (Of late, reconnaissance versions of the Soviets' Bear bomber have been frequent visitors to Cuba.) Well, bombers don't shoot down attacking bombers. Furthermore, the USSR also has about 700 medium bombers (we have none) that could attack the US, with refueling or on one-way missions. They also have a swingwing, supersonic bomber flying, although, so far as we know, it is not yet in operational units. The several hundred Soviet bombers, each carrying multiple weapons, look pretty formidable when you consider that nearly half of the American people live in our hundred largest cities.

Secretary Seamans also pointed out to the House Armed Services Committee that "if our air defenses are allowed to deteriorate, the Soviets can use their bomber force . . . to further increase their first-strike potential."

We think the US air defenses *have* deteriorated, although not by Air Force choice. You can judge for yourself by balancing what we have today against a Soviet bomber force that hasn't deteriorated in size or quality.

The Air Force budget for strategic defense—that is, air defense—declined by approximately twenty-five percent between Fiscal Years 1962 and 1971. If inflation is taken into account, the reduction is closer to fifty percent.

In 1962, Regular and Air National Guard units operated 1,525 interceptors in fifty-five squadrons. Today, the Regular and ANG interceptor force totals only thirty squadrons, with about 570 aircraft. There are three squadrons of McDonnell Douglas F-101 Voodoos and eleven of Convair F-106 Delta Darts in the Regular force; the Air Guard operates three F-101 squadrons and thirteen squadrons of Convair F-102 Delta Daggers.

The F-102 first flew in 1953, the F-101 in 1954, and the F-106 in 1956. Not a very good track record for modernization. As Secretary Seamans told the House committee: "We have drawn down our air defenses very heavily in the last few years . . . without compensating qualitative improvements."

There have also been reductions in both Air Force and Army surface-to-air missile units and in numbers of search radars. The offshore extension of radar coverage by EC-121 aircraft has been reduced to a "contingency-only" basis, except for a handful of these early-warning aircraft in Florida. Our warning system, and hence our effective operational area, has dwindled to a perimeter defense.

The imbalance in US/USSR air defense capabilities is both alarming and substantial, with the Soviets maintaining a force of some 3,400 interceptors, including units of the Mach 3 Foxbat. The ratio of Soviet interceptors to US bombers is about six to one. The ratio of our interceptors to Soviet bombers ranges from one to one downward, depending on how many medium bombers the Soviets might decide to use against US targets.

There are a few bright spots on the air defense horizon, but they are few indeed. The FY '71 budget includes $87 million for engineering development of an Airborne Warning and Control (AWACS) aircraft with look-down radar that can spot low-flying intruders and steer our interceptors to them. It could be operational by 1976 (*see AF/SD, June '70*), but AWACS would not be fully effective without over-the-horizon (OTH) radar to give distant early warning of approaching bombers, and without a new interceptor aircraft of extended range, higher speed, and a "look-down, shoot-down" fire control and missile system.

There is only $5.3 million in the FY '71 budget request for preliminary work on OTH radar. Congress has rejected the Air Force proposal to modernize the F-106 and has also rejected a request for funds to buy a small number of Lockheed F-12 interceptors. The new budget includes only $2.5 million to study the interceptor problem. A leading candidate for the interceptor role is an air defense version of the McDonnell Douglas F-15. It probably could not be operational until the late 1970s. Modernization in both Regular and Air Guard units is a dangerously long way off.

The low priority granted air defense systems simply doesn't square with what we consider to be the seriousness of the Soviet bomber threat (*see also the interview with DoD's Dr. John Foster, starting on page 31 of this issue*). It is both unwise and uneconomical to continue with obsolete and expensive systems when the technology for a modern air defense complex is at hand and its ten-year cost is little, if any, higher than that of today's dubious defense force.

We think the US air defense situation deserves a hard look. Not just by Defense officials, but by the Congress —and by the American public.—END

AIRMAIL

Help for POWs

Gentlemen: . . . We are most appreciative of the continuing support which the Air Force Association has given in our efforts to resolve the plight of our prisoners of war and missing-in-action personnel.

The October 1969 AIR FORCE/SPACE DIGEST article ["The Forgotten Americans of the Vietnam War," by Louis R. Stockstill], as you well know, was the first major story on the prisoner question and provided much of the momentum in making the prisoner question an issue in America.

As one who has come into the Department of Defense from the business community, I can assure you that the most important contribution I can ever hope to make would be to play a role leading to the return of our men and the accounting of all those missing. I know all of you at AFA are dedicated to that same goal.

We continue to seek every possible opportunity for a solution, and I appreciate the latest efforts of AFA as reflected in the June publication ["The Plight of the Prisoners," by Maurice L. Lien].

RICHARD G. CAPEN, JR.
Assistant to the Secretary for Legislative Affairs
Office of the Secretary of Defense
Washington, D. C.

Gentlemen: Again you have lived up to your outstanding reputation. . . .

Your [June] editorial and "Mo" Lien's article on the prisoners are most outstanding. I don't think any of us will ever forget that all of you were the forerunners in getting this issue before the American public.

My best wishes as you continue this endeavor, and I stand anxious to provide any assistance.

COL. M. K. KEGLEY, USAF
Special Assistant to the Assistant Secretary for Legislative Affairs
Office of the Secretary of Defense
Washington, D.C.

Calm Approach

Gentlemen: Thank you for your restrained and sensible editorial treatment of the issues elsewhere so hysterically addressed following the President's commitment of our forces in Cambodia. . . .

Thank you also for your challenge to Americans to show their support of their countrymen now prisoners of war or missing in action, and for John Frisbee's commentary on the Red River Valley Fighter Pilots Association ["Serving Those Who Sit at Home and Wait," June '70]. As a member of both AFA and RRVFPA, I deeply appreciate your stand on the human as well as on the military/political issues besetting our great nation.

LT. COL. JOHN M. VERDI, USMCR
Santa Ana, Calif.

Program Ended

Gentlemen: We have your current annual [Air Force Almanac] issue of AIR FORCE/SPACE DIGEST and are pleased to see that, once again, you have produced another excellent end product.

May I, however, call your attention to one item of interest to the Defense Atomic Support Agency? Paragraph 1 on page 155 is outdated, in that DASA is no longer connected with high-altitude sampling studies made by WU-2D aircraft. This particular program was concluded in June 1967. . . .

LT. COL. M. GRACE JOHANCEN, USA
Public Affairs Officer
Defense Atomic Support Agency
Washington, D.C.

A Bit of Background

Gentlemen: Your article on the Air Force Communications Service in the May issue has been read with much interest.

There is an error in the first paragraph, as the AACS *did* have a home of its own.

In December of 1945, Langley AFB was assigned to the AACS. The purpose of this assignment was to provide a home for the AACS and the Weather Service.

At about this time it was required that we change the name to Airways Communication Service (ACS) as we were not allowed to usurp the Signal Corps's prerogative of handling command and administrative traffic. Some months later, Gen. Harold McClelland was able to provide this service and changed the name to Air and Airways Communications Service, regaining the initials AACS. For the record, Headquarters AACS, to which the base was assigned, also was officially carried as the 74th AAFBU. Unfortunately, this assignment did not last for very long.

BRIG. GEN. IVAN L. FARMAN, USAF (Ret.)
Bradenton, Fla.

• *Many thanks for providing this interesting footnote to the article.*—THE EDITORS

F-104Gs and the GAF

Gentlemen: The German Air Force has a long history of producing excellent pilots since the early days of flying in World War I; and they were a formidable adversary during World War II. In 1945 the Luftwaffe came to an abrupt standstill and lay dormant for a few of the postwar years.

At its reactivation, a new group of inexperienced young men received training as pilots. Even when some of the Luftwaffe veterans returned, they had to be retrained since the most experienced were proficient in propeller-driven aircraft but lacked experience in modern jet aircraft and modern operations. Training was rushed at a fast pace, and when they selected an aircraft, they picked a high-performance fighter in the F-104 Starfighter.

The F-104G, like other high-performance aircraft, required top experienced pilots to handle it, especially in the manner in which the Luftwaffe sometimes operates in low-altitude, adverse weather missions. Yet, with all their early problems, due for the most part to inexperience in flight operations, the Germans are now experiencing a very low loss rate, and they are flying a sizable force of F-104Gs.

In the Twentieth Annual Air Force Almanac, May 1970, where you refer to the F-104G as being "accident prone" [page 31], you have placed a second reference to the F-104G in the form of a photo of Professor Willi Messerschmitt chatting with USAF Col. J. J. Burns of Luke AFB, Ariz. The caption states that they are discussing methods of maintaining the F-104G Starfighters.

The Germans have found a good fighter in the F-104 as has our USAF, the Japanese, Canadians, Belgians,

(Continued on page 9)


We won't talk.
Many of the communications services we provide for the military and the Federal government are classified. So about them we won't talk.
But for detailed case histories of many other effective communications systems—some of which are bound to benefit you—call us. No obligation. In the meantime, may we suggest you read our column on the facing page.

Dutch, Italians, Nationalist Chinese, Spanish, Greeks, Turks, and several other air forces. Since first becoming operational in 1958, this fighter has enjoyed a long inventory life and has given protection to the nations fortunate enough to have it in their air forces.

LT. COL. JAMES F. COTTER
Canoga Park, Calif.

More on Management

Gentlemen: Leadership is a highly valued and sought-after quality, both in the military and industry. When we are faced with poor or out-of-date leadership, we must somehow reconcile these differences, or ignore them.

From what I have seen in the Air Force, the latter has the upper hand. Too many good officers and enlisted personnel have left the service in favor of careers in industry. They have been written off by many of our "elderly" officers as individuals pursuing the "God of the Dollar." Yet, these are the same men who have caught the "Goddess of Security." Where else can you become a piece of human driftwood and get paid for it when you retire? I do not dislike the military; I dislike these people.

I ask these men to consider the meaning of the word motivation. Motivation has long been used as a synonym for drive or activation, the implication being that an individual's actions are partly influenced in direction and strength by his own inner nature. But, what about the other part? What is it that exists within the military concept of management that denies the individual growth, improvement, and achievement? I do not know, for I am still trying to define the military definition of management, *i.e.*, crisis adjustment.

This is why I must look to organizations like AFA. [Your] magazine —its editorials and articles on the shape of things to come—makes it possible for one with [my] pessimism to still have faith. What we have now just does not make it!

1ST LT. HARRY D. LANDIS, III
Tucson, Ariz.

Restoration Awaited

Gentlemen: A Spitfire, Messerschmitt, P-40 "Flying Tiger," Grumman Wildcat, P-38 Lightning, Japanese Zero, and a host of other planes that once blazed their way across the skies and etched their names into history are awaiting a return to glory.

The planes are at The Air Museum, Ontario, Calif., International Airport, waiting to be restored to flying condition. When airworthy, they will tour the nation, then retire temporarily to be displayed in the new Movieworld Planes of Fame in Buena Park.

To bring back the great chapters of aviation history to the generations that followed their days of fame, the museum needs volunteer technicians and mechanics to put the ancient warriors back in the sky. We need qualified personnel to join in the effort to preserve these historic planes. We especially want those who once worked on them.

Volunteers who contribute at least 100 hours will have their names placed on the Gold Honor Roll of those who have contributed to the preservation of aviation history. Volunteers interested in participating in this historic effort may contact

EDWARD T. MALONEY, DIRECTOR
The Air Museum
Ontario International Airport
Ontario, Calif. 91761
Phone: (714) 984-0410

UNIT REUNIONS

Grand Reunion

There has never been a grand reunion of all World War II air combat veterans. This 25th year since the end of WW II is the time. All air- and ground-crew members of any unit that served in any WW II theater of war are invited and urged to attend. Reunion will be held in St. Louis, Mo., Labor Day weekend, September 5-7, 1970. For details contact

Grand Reunion
P.O. Box 383
Addison, Tex. 75001

B-17 "Stinky"

The crew of the B-17 "Stinky" is having a reunion at Dayton, Ohio, July 26-28. Everybody, especially J. Easby-Smith and Russ Nash, contact the Chief,

M. Lubinsky
274 Hillside Ave.
Livingston, N.J. 07039

49th Fighter Group (TFW)

The reunion of the 49th Fighter Group is planned for July 17-18, in Nashville, Tenn., at Biltmore Motor Inn, 2400 Franklin Rd. A reunion feature will be a tour of the Arnold Engineering and Development Center. For details, write

Donald H. Smith, Chairman
2710 Greystone Rd.
Nashville, Tenn. 37204

485th Bomb Group

The sixth annual reunion of the 485th Bomb Group, 15th Air Force, will be held August 14-16, in Oklahoma City, Okla. For additional details and the annual newsletter, contact

Carl P. Gigowski
344 Eola St., SE
Grand Rapids, Mich. 49507

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AIRPOWER IN THE NEWS

By Claude Witze
SENIOR EDITOR, AIR FORCE/SPACE DIGEST

Is the Enemy in Hanoi?

WASHINGTON, D.C., JUNE 10

Results of the latest Gallup Poll, released a few days ago, show that fifty-nine percent of the nation's adults approve of President Nixon's performance. The test was taken before his June 3 television report to the nation, in which he proclaimed our military venture into Cambodia a success, indicating that his critics were mistaken in their outburst of early May.

According to the Gallup experts, one factor in Mr. Nixon's favor at this time is the overwhelming opposition of the adult population to the student revolt that followed the Cambodian move. They disapprove of it by a factor of five to one.

This kind of reaction, which seems to show that the neo-liberals are their own worst enemy, also is evident in results of the recent primary elections. The returns do not indicate that the President is being repudiated. The victory of George C. Wallace in Alabama was hard to take, but it means that the Nixon Administration will probably push its "Southern strategy" all the harder, despite what critics of it may think. It is interesting that Mr. Wallace scored only a few days after Senator Margaret Chase Smith (R-Me.) warned on the Senate floor that extremism is polarizing the nation and forcing the American people to make a choice between anarchy and repression. And, she lamented, they will choose repression. The Alabama vote proves, to the satisfaction of some, that the lady was right. And it was the people most upset by the Wallace philosophy who must shoulder most of the blame, just as the student outbursts helped drive Mr. Nixon's score up with the Gallup pollees.

Up on Capitol Hill these past few weeks, there have been several demonstrations that Congress itself is not immune to these errors. A lot of important business, including specific debates on what we need for national defense and for domestic tranquility, is being postponed because Senators John Sherman Cooper (R-Ky.) and Frank Church (D-Idaho) want to amend the Military Sales Act. Their proposal would prohibit the use of any funds to retain US forces in Cambodia, pay for US instructors there, or conduct any combat activity in the air above Cambodia in support of Cambodian forces, unless Congress enacted legislation to authorize such operations. The amendment is intended to prevent further US involvement in Cambodia; it would not have retroactive effect on our "clean-up" operations unless these are expanded in scope and duration.

Senate debate on this suggestion has been under way for about a month both on the floor and at hearings before the Foreign Relations Committee, of which J. William Fulbright (D-Ark.) is chairman. Senators Church and Cooper are also members of the committee.

It is the attitude of the chairman that deserves critical attention. Because the Military Sales Act is under his jurisdiction, it gives him a chance to cross-examine officials of the Department of Defense, whose usual platform at the Capitol is before the Committee on Armed Services. The main concern of this group, chaired by Senator John Stennis (D-Miss.), is our national security. Mr. Fulbright, who is highly critical of the military effort, frankly says that his main purpose in holding hearings on the Cooper-Church amendment is to examine the possibility of reasserting "a degree of congressional control over the course of this war."

When the Tonkin Gulf Resolution was passed in 1964, it was Mr. Fulbright who guided it through the Senate. Now he refers to "the deception used to obtain passage of the Gulf of Tonkin Resolution" and "the failure to consult with the Congress prior to the invasion of Cambodia." He charges that "the Executive branch [President Nixon] has failed to follow the spirit, if not the letter, of the Constitution."

Most of what the powerful Foreign Relations Chairman has to say is before his committee, not on the Senate floor.

One reason for this may be his record, the vulnerability of which was turned into prime debating material by Senator Gordon L. Allott, a Republican from Colorado. Mr. Allott is himself a veteran of the air war in the South Pacific, where he served with the 339th Fighter Squadron of the Army Air Forces in World War II. He has been in the Senate since 1954.

Mr. Allott, observing all the niceties of the Senate "club," heaped praise and admiration on Mr. Fulbright. He said his distinguished career was climaxed by his record of longest service as Foreign Relations Chairman. He said Mr. Fulbright has strong beliefs that should be consulted at this hour. He selected a speech made by the Senator from Arkansas, on January 22, 1951.

Mr. Fulbright said in that speech, delivered while we were fighting in Korea, that the President has responsibility for command of the armed forces, adding: "If in the exercise of his best judgment, the defense of this country requires the sending of troops to Europe, he has the power and the duty to do so. . . . In the long run, decisions on military strategy are best left to the Executive. That is the plain intent of our constitutional system. It would be dangerous for our future welfare to change the underlying principle simply because a strong minority or even a majority of the Congress may lack confidence in the wisdom of the Executive in some particular instance, such as the present one."

Mr. Allott said he agreed fully with the Fulbright of 1951. He said Mr. Fulbright had discussed the Truman Doctrine and warned against trying to oversimplify proposed solutions in the area of foreign policy.

"We Americans are an impatient people," said the Foreign Relations Chairman in 1951, "and we cannot understand why our leaders do not tell us right off just exactly, in detail, what we should do and quit arguing about it. With a little reflection, I believe it becomes apparent that, in a matter as difficult as combating the imperialism of the Russian Politburo, there is no simple blueprint for action, and it is a dangerous illusion to accept one even if it is offered."

Mr. Allott said that thesis was true in 1951 and it is true today. He said all arguments of true philosophic importance are timeless, and "to suggest that they do vary would do a grave injustice to the sagacity of the junior Senator from Arkansas." He continued to praise Mr. Fulbright as "especially cogent in stating the case for flexibility in policy designed to cope with a resourceful Communist enemy" and "congressional respect for Executive prerogatives in foreign dealings." He offered more

1951 Fulbright quotes and said they represented "the sober reflection of a mature statesman."

The Colorado Senator then skipped to 1961. On August 17 of that year there was a debate in the Senate about a proposed amendment designed to prohibit the President from giving any assistance to nations in the Sino-Soviet bloc. Again, Mr. Allott credited Mr. Fulbright with "warmth" and "clarity" and "cogent" reasoning.

"As I understand the Constitution," Mr. Fulbright said in 1961, "it gives to the President of the United States primary responsibility for the conduct of our foreign relations. The Senate, basically, in most cases—with respect to recognition of countries, recognition of independence, acceptance of ambassadors, and so on—is in a position of advising and consenting; scarcely in a position of dictating to the President."

In the fall of 1961, the Arkansas Senator contributed an essay to the *Cornell Law Quarterly*. In it, he said presidential power is the real source of an effective foreign policy under our system. And, that quick and decisive action is required to cope with communism and fascism and aggressive nationalism.

Another telling Fulbright quote from 1961 was:

"With their excessively parochial orientation, congressmen are acutely sensitive to the influence of private pressure and to the excesses and inadequacies of a public opinion that is all too often ignorant of the needs, the dangers, and the opportunities in our foreign relations."

Of this, Mr. Allott had the misgiving that Mr. Fulbright's enthusiasm led him to overstate the disabilities of Congress. "I would judge," he said, "that he [Fulbright] thinks that it is for Congress to cooperate with the President in stipulating the general goals and broad contours of American foreign policy, but that Congress must leave to the President decisions about details and tactics—such decisions being, in the words of the Senator, 'inherently executive in character.'"

Mr. Fulbright's dilemma, when his record is thrown on the table, and under a spotlight, is not unlike that of the dissident students and the impatient liberals who have contributed to the unsavory reactions that Mrs. Smith predicted with accuracy. Students in this country represent something less than two percent of the voting population. They are pressing to increase that by lowering the voting age to eighteen years. Reports from Oregon, where the issue was on the ballot, indicate they again were their own worst enemies and drove the votes away. The more sarcastic observers suggested a more sensible change would be to raise the voting age to thirty.

At the moment, there has been no determination of the fate of the Cooper-Church amendment. The Administration is seeking a modification in the proposal. The White House wants it to specify that the prohibition against retaining forces in Cambodia "shall not preclude the President from taking such action as may be necessary to protect the lives of United States forces in South Vietnam or to facilitate the withdrawal of United States forces from South Vietnam."

This is being assailed as "another Tonkin Gulf Resolution," but not by Mr. Fulbright, who sponsored the original one and is on record in favor of giving the President all possible flexibility.

The Pinch Grows Tighter

The men in our military services are going to make more money. Some pay raises already are scheduled and more will be sought next year. But in order to provide them, there will be more cuts in armed forces manpower and further dollars squeezed out of procurement.

The defense budget for the fiscal year starting July 1, three weeks from this writing, is planned at $71.8 billion. For the fiscal year starting July 1, the figure could be from $6 to $7 billion higher, chiefly because of the pay increases. The Nixon Administration will not permit this.

At the Pentagon it is estimated that about $4 billion of the total needed for next year is required by the scheduled pay increases, despite all the personnel cuts already made or planned. One hope is that the boosts will stimulate volunteer service, reduce the draft requirement, and result in lower training expenditures.

The Pentagon has denied a report published in a Washington newspaper that the White House wants the 1972 defense budget cut to around $65 billion. The figures sent up to Congress by Defense Secretary Melvin R. Laird are called "rock bottom," but the search goes on for places to slash some more, and both military procurement and research proposals are under close scrutiny.

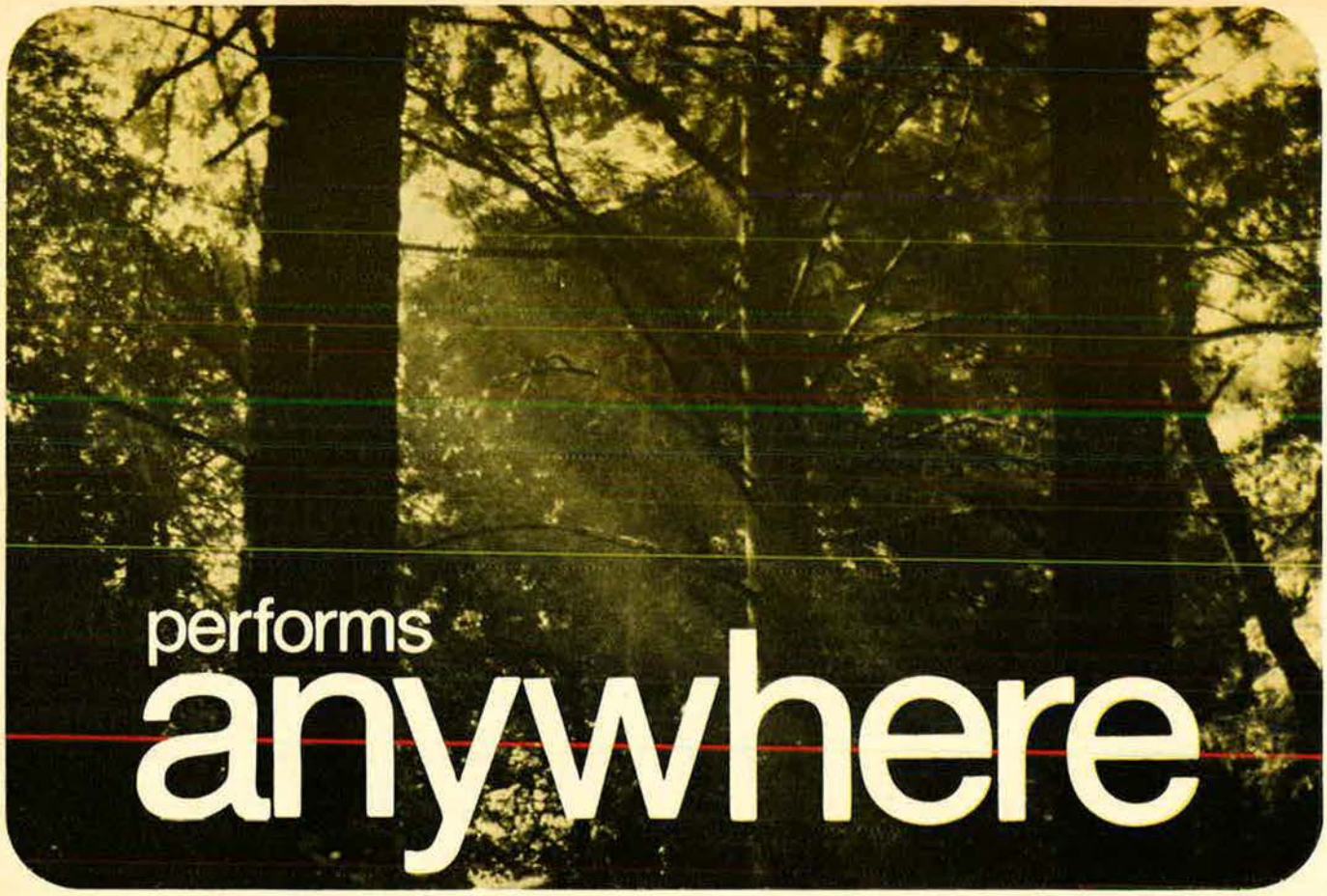
The specter of inflation hangs over every session on the subject of the budget, in the Pentagon and at the endless committee meetings at the Capitol. The best grasp of the significance of this was displayed by USAF Secretary Robert C. Seamans, Jr., in his appearance before the House Defense Appropriations Subcommittee. In terms of purchasing power, he said, the Air Force budget is only slightly higher than it was in 1964, the year that the Vietnam War got into high gear.

More specifically, Dr. Seamans pointed out, in 1964 USAF devoted about half its budget to development and

(*Continued on page 15*)

Senator J. W. Fulbright of Arkansas is described as a man of strong beliefs. In the past twenty years, those beliefs have undergone many changes.

Senator G. L. Allott, of Colorado, says he agrees with Mr. Fulbright, but cites only the speeches made in 1951 and 1961 as Fulbright doctrine.



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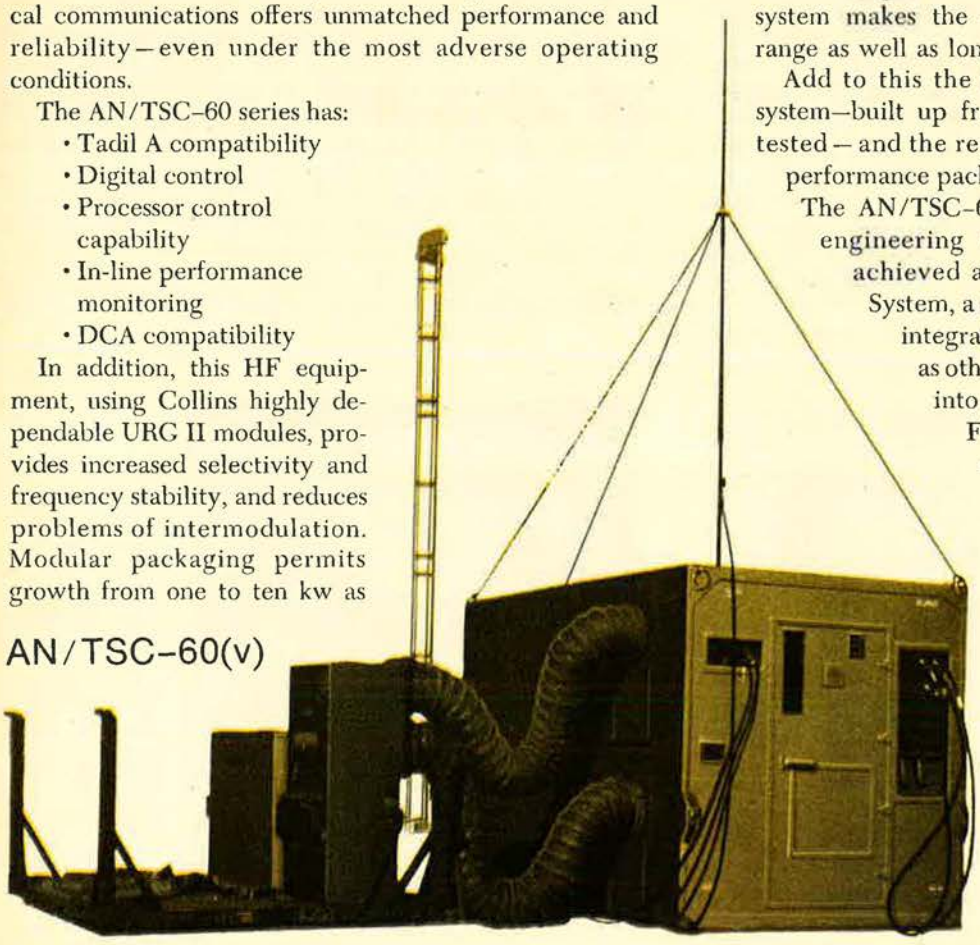

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force modernization. By 1970 that had been reduced to forty percent. The important dilemma that the Secretary now faces is that, with further force reductions, the force modernization becomes more and more a critical factor in determining USAF's capability to meet its mission requirement. The financial road ahead is rough.

The Wayward Press (cont.)

In the Washington *Post* of May 23 Chalmers M. Roberts, one of that newspaper's senior reporters, discussed an interview with Defense Secretary Melvin R. Laird, broadcast the previous day by NBC. Wrote Mr. Roberts:

"Laird said, 'I think it would be a mistake . . . to make a firm timetable and establish it here for the South Vietnamese forces to withdraw' from Cambodia. This was in contrast to President Nixon's May 8 press conference statement that 'I would expect that the South Vietnamese would come out approximately at the same time we do.'"

Here the *Post* readers have an example of how a quote can be misquoted by so simple a device as skipping as few as four words.

On May 8 the President was asked whether the South Vietnamese "abide by the same deadline as you have laid down for the American forces?" The answer (italics added):

"No, they do not. I would expect that the South Vietnamese would come out," . . . etc.

Contrary to the Chalmers M. Roberts' version, the statement of Mr. Laird did not stand in contrast to Mr. Nixon's statement of May 8.

* * *

At a recent convention of the American Society of Newspaper Editors, held in San Francisco, there was a poll taken of the registrants. According to *Straus Editor's Report,* a weekly newsletter, the questions were asked by a "peace group," not otherwise identified, and only twenty editors responded.

The information revealed, if this sample is meaningful, is intriguing. For example, a dozen of the men believe the US is plagued by disrespect for authority, yet sixteen do not resent upheavals by minorities and youth.

Even more revealing is the disclosure, according to *Straus,* that "supplementary wire services outranked AP [the Associated Press] and UPI [United Press International] as the definitive source for forming an opinion on such events as the ABM controversy and the trial of the Chicago seven." Alas, alas, alas.

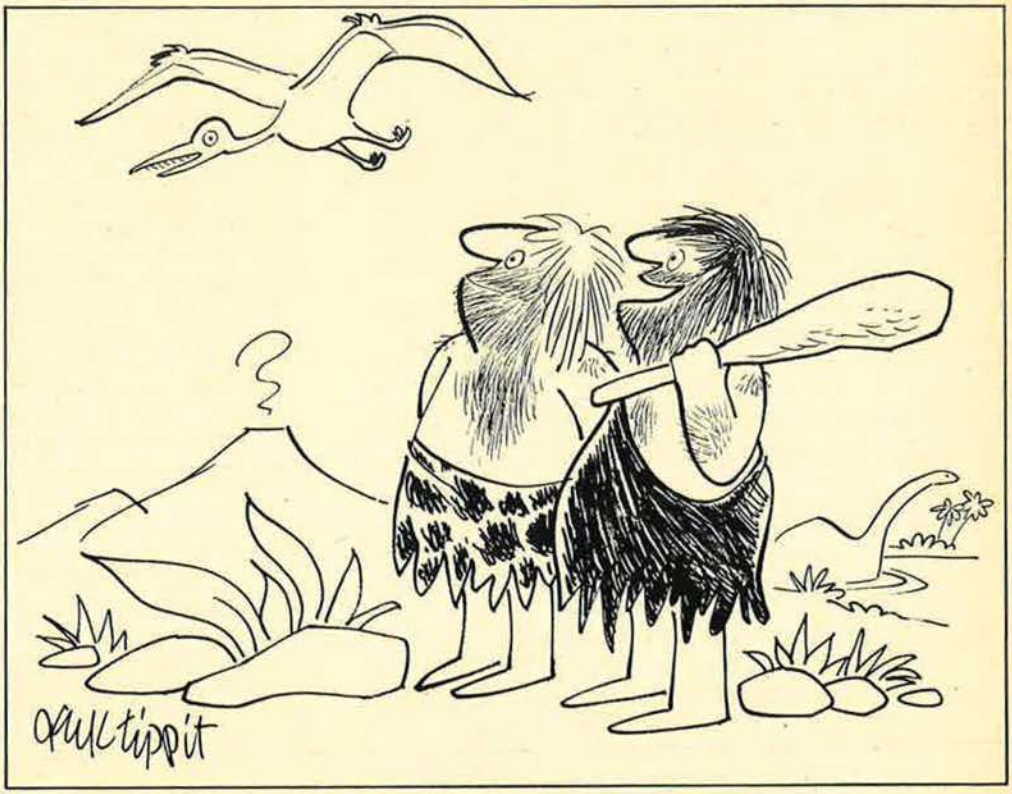
* * *

The American excursion into Cambodia, in addition to the paroxysms on college campuses, produced an unusual outburst of editorial condemnation, some of it in unexpected places. One of these was *The New Yorker* magazine, which heatedly declared that President Nixon's order "was in disregard of the Constitution, the tempering strictures of our history, and the principles of the American democracy. It was, therefore, an act of usurpation."

The essay is generally accepted as the product of Richard Goodwin, at one time or another associated with John F. and Robert Kennedy, Eugene McCarthy, and George McGovern. Mr. Goodwin was active among the dissenters at the Democratic Convention in Chicago in 1968. A few days after *The New Yorker* appeared, there was a letter to the editor in the New York *Times,* which appears to have been sent there because Mr. Goodwin's magazine rarely prints letters to the editor.

The *Times* letter said the President's action was neither unauthorized nor illegal. Authorities cited were the Constitution and the Tonkin Gulf Resolution. And, said the author, "if a belligerent violates neutral territory of a state which fails to repel the invader, the other belligerent may lawfully enter the territory to prevent the violation from operating to his disadvantage."

The *Times* letter was signed by Benjamin B. Ferencz, former Executive Counsel, Nuremberg War Crimes Trials.—END



"I'll admit the pterodactyl is faster, but the pteranodon carries a greater payload and requires less space to take off."

AIRMAN'S BOOKSHELF

Getting the Picture

Overview: A Lifelong Adventure in Aerial Photography, by George W. Goddard, Brig. Gen., USAF (Ret.), with DeWitt S. Copp. Doubleday & Company, New York, 1969. 415 pages. $8.95.

This is a fascinating tale of adventure and achievement—spiced by the account of a nearly incredible service intrigue that all but cashiered George Goddard out of the Air Corps at the peak of his accomplishments.

To many old-timers in aviation, George Goddard was "Mr. Camera" of the Air Corps and of its progenitors, in which he had signed up in 1917 to be a pilot. But the Army welshed on the deal before it got started because young Goddard had a camera and the knack of taking good pictures. It was two long years before this born finagler finally acquired his coveted pilot's wings and official sanction to fly airplanes, in which he had long since demonstrated his piloting ability.

Billy Mitchell discovered Goddard at Carlstrom Field, Fla., in 1919, installing an aerial camera on a pursuit plane's undercarriage, atop a four-tennis-ball shock-proof and vibration-damping mount of his own design. Impressed, Mitchell packed him off to McCook Field, Dayton, Ohio, as Director of Aerial Photographic Research and Development. In 1921, when Mitchell's bombers sent three captured German warships, including the "unsinkable" battleship *Ostfriesland,* to the bottom off the Virginia capes, Goddard's aerial photography crews recorded the event.

In the summer of 1942, Goddard capped twenty years of developmental work in aerial photography by testing his own pet project in a fighter plane. It was a shutterless, stereoscopic, twin-lens strip camera whose film-roll speed was synchronized with the aircraft's. "On this flight," Goddard says, "we had stopped motion for the first time with an aerial camera which did not have a shutter." To everyone in the Wright Field laboratory, the strip camera was an instant and unqualified success—but not to AAF headquarters in Washington. An unnamed officer "nemesis" Goddard had acquired earlier was now there and had gained the confidence of General Arnold. Goddard's strip camera was rejected, and he himself was relieved from his job and barred from further duty in aerial photography. Goddard took his camera and went on leave.

One of his outraged friends told then Navy Secretary Frank Knox about the camera. The Navy "borrowed" Goddard, tested his camera, and immediately ordered 100 duplicates. An Air Corps general had Goddard tell his story to Robert A. Lovett, then Assistant Secretary of War for Air. Lovett instructed the Air Corps to purchase 200 strip cameras "at once."

That same night, Lovett sent Goddard to London and gave him a letter for President Roosevelt's son Elliott, who had an Air Corps photo-reconnaissance unit in England. The strip camera went along. Roosevelt had "heard all about" the camera and wanted no part of it.

Goddard, characteristically, ran across an old friend in Royal Air Force reconnaissance, secretly briefed him and a group of recce staff officers, and helped them install the strip camera in one of their planes. The RAF took some strip-camera pictures, and the Eighth Air Force wanted to know why they were so much sharper than those Roosevelt's unit had been getting. Roosevelt found out, apologized to Goddard, and said he wished there was something he could do as penance for his earlier attitude. Goddard said there was. Shortly thereafter, George Goddard's Washington nemesis was transferred to India for the duration of the war.

—Reviewed by C. B. Allen. Mr. Allen was for many years the Aviation Editor of the New York Herald Tribune.

Belated Laurels for a Leader

The Man Who Won The Battle of Britain, by Robert Wright. Charles Scribner's Sons, New York, 1970. 291 pages. $6.95.

On November 20, 1940, Air Chief Marshal Sir Hugh Dowding was summarily dismissed from the command of RAF Fighter Command, a position he had held since 1936. Mr. Wright, who served on Dowding's staff in 1940, describes the career and character of a man who was shabbily treated by his service and his country. The author covers Dowding's experiences as a World War I fighter squadron commander, his association with research and development between the wars, his appointment to command Britain's air defense in 1936, his leadership in battle, and finally the controversy that culminated in his dismissal.

In British history, the Battle of Britain ranks with the defeat of the Spanish Armada and with Trafalgar, and for good reasons. Dowding, alleges Mr. Wright, was the architect of victory. He encouraged the development of the Hurricane and Spitfire aircraft, he supported those scientists who believed in the potential of radar, and he was responsible for an air defense organization that withstood the wrath of the Luftwaffe. Through all this, concern for his pilots remained uppermost in Dowding's mind. In a "bombers' world," he pressed for fighter development; in the War Cabinet, he defied Churchill in order to preserve RAF fighter aircraft for the defense of Britain, in the face of pressure from France to use them on the Continent.

Why, then, was such a man dismissed immediately after the most important air victory in history? Why was he given no official recognition of his services? Why did he resign his commission some three years later?

Mr. Wright weaves the answers throughout his biography. "Stuffy" Dowding did not make friends easily—the nickname was not originally a term of affection. His professionalism was based on thoroughness, dedication, and "manners." He expected both his subordinates and his seniors to possess equal integrity, and when they didn't he was frequently slow to recognize its absence. He was forceful in his expression of ideas and never relied on the "old boy" net to smooth their passage. Consequently, he made enemies, perhaps even of Churchill himself. He admitted that he did not act soon enough to curb the ambitious and not overscrupulous Air Vice Marshal Leigh-Mallory. His policy of allowing considerable freedom to his Group commanders, within the overall strategy of close fighter control, allowed the controversy over "Big Wing" tactics to grow until it brought about his own downfall.

(Continued on page 21)

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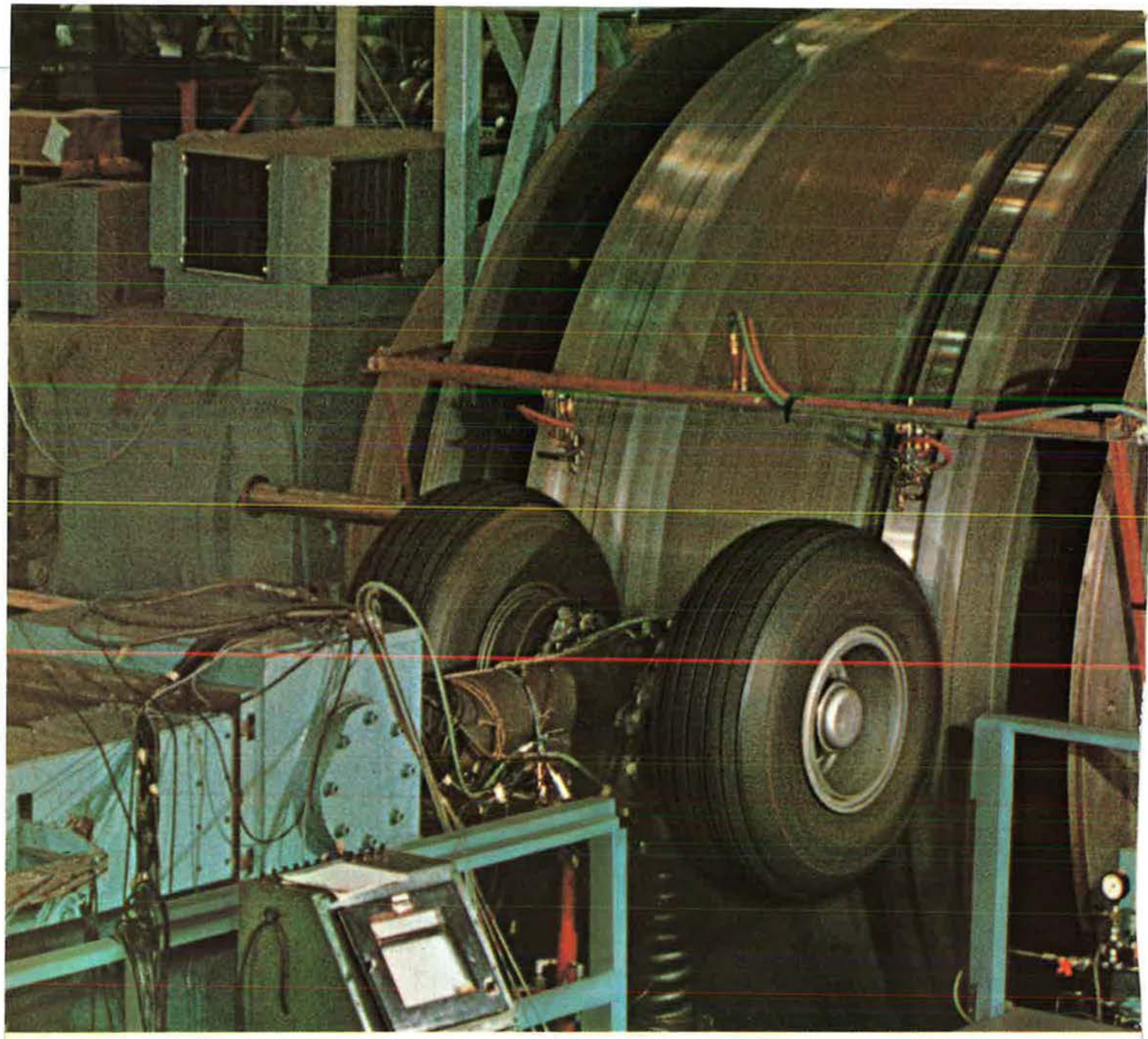

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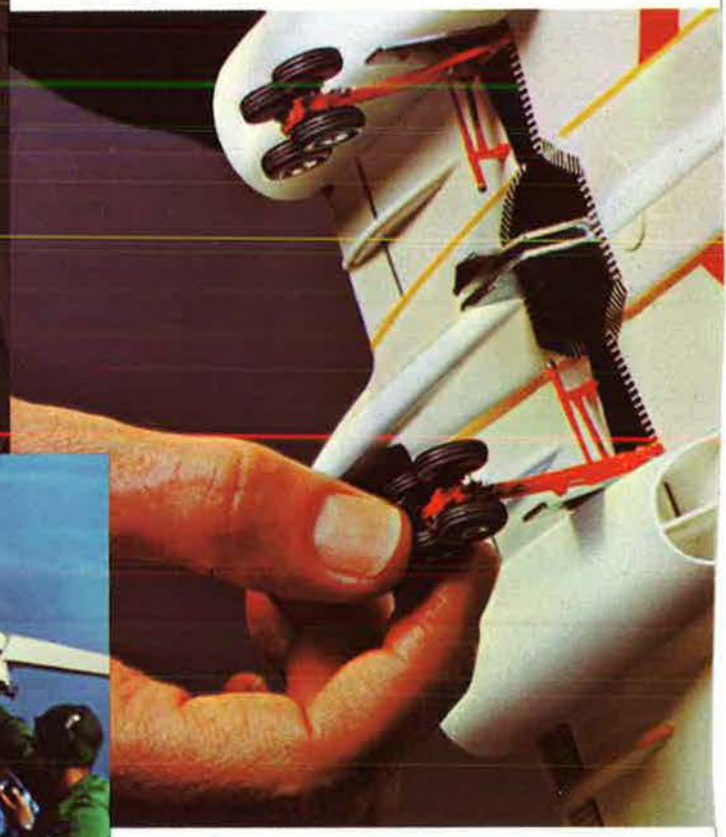

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GOODYEAR

PUTS IT ALL TOGETHER—TIRES, WHEELS BRAKES AND SKID CONTROL SYSTEMS

Mr. Wright has drawn heavily on personal recollections of his subject, as well as his own observations. He is deeply concerned to give Dowding the credit for a victory, which so long has been denied him. Consequently, the author's evidence is not impartial. He is critical of Churchill, the Air Staff, and the Air Marshal's subordinates. Regrettably, sources too often are not documented, and where impartial sources, such as Air Staff papers before 1939, are available, they are not referred to. This is a pity, because Dowding's great breadth of vision deserves more than the support of hearsay and second-hand evidence. Seldom has a senior officer developed such a grasp of rapidly advancing technology and incorporated it so effectively into organization, strategy, and tactics before a battle actually started.

As a large part of the critical "Big Wing" controversy arose from the geographical and organizational problems of Group control, the absence of either maps or diagrams must be regretted. There are, in fact, no illustrations at all, no bibliography except in the "acknowledgments."

Nevertheless, this is a book that needed to be written. It has great quality as a subjective reappraisal and contains, frequently between the lines, many comments on the qualities required for air force leadership at any level of command.

—Reviewed by Squadron Leader Richard A. Mason, RAF, an exchange officer who is presently an instructor in the Department of History at the US Air Force Academy in Colorado.

A Classic Is Born

The Encyclopedia of Military History, by R. Ernest Dupuy and Trevor N. Dupuy. Harper and Row, New York, 1970. 1,406 pages with bibliography and indexes. $20.

Once in a blue moon there appears a book destined immediately to become a standard in its field, and to gain lasting recognition as a classic. This is such a book. The Dupuys, a father-and-son team of retired Army colonels, spent ten years compiling this unique and massive volume. It adds much luster to their already considerable reputation as military historians.

The book is far more than a chronological recounting of wars, campaigns, and battles. In addition to that essential information, each of the *Encyclopedia's* twenty-one chapters, devoted to an arbitrary time period, is introduced by an essay assessing the military trends of the period; its leaders; and significant developments in tactics, strategy, weapons, and organization. Within many chapters are supplementary essays on national military systems and events. A sequential reading of the essays alone comprises a broad, lucid course in military history.

The authors have used maps and illustrations lavishly. The book's ingenious organization and its 117 pages of indexes make it exceptionally usable as a reference. Henceforth, neither military buff nor professional historian can claim a rounded working library if it does not include the Dupuys' *Encyclopedia.*

—Reviewed by John L. Frisbee. Mr. Frisbee is AF/SD's Senior Editor for Plans and Policy.

Fewer Swords—More Plowshares

Of special interest to planners and managers in industry and government at all levels is a series of studies on Conversion of Industry from a Military to Civilian Economy, published in May by Praeger. The hardbacked series is edited by Seymour Melman and includes: *The Conversion of Military-Oriented Research and Development to Civilian Uses,* by Marvin Berkowitz (Hofstra Univ.), 630 pages, $22.50; *Conversion of Nuclear Facilities From Military to Civilian Uses,* by Aris P. Christodoulou (Booz Allen), 118 pages, $12.50; *The Defense Economy,* Seymour Melman (ed.) with contributions by eleven authorities from industry and universities, 558 pages, $19.50; *The Conversion of Shipbuilding from Military to Civilian Markets,* by D. M. Mack-Forlist (Bethlehem Steel) and Arthur Newman (Lever Brothers), 232 pages, $15; and *Potential Civilian Markets for the Military-Electronics Industry,* by John E. Ullmann (Hofstra Univ.), 368 pages, $18.50. An additional volume, *Local Economic Development After Military Base Closures,* by John E. Lynch (Dept. of the Air Force), 240 pages, $17.50, is forthcoming.

NEW BOOKS IN BRIEF

Last Plane Out, by John Ball. This novel, by the author of *In the Heat of the Night,* is about planes and the people to whom nothing is more important than understanding and flying aircraft. Little, Brown and Co., Boston. 308 pages. $5.95.

Moon Landing, Project Apollo, by Maj. James C. Sparks, USAF (Ret.). This account details the Apollo-11 flight—the construction of the spacecraft, the blastoff and the lunar landing, and the complex tasks the astronauts had to perform perfectly to insure a successful moon landing and safe return. Major Sparks, who served as a Public Affairs Officer for the Mercury and Gemini series, also discusses the future potentials, both scientific and strategic, of space exploration. With photographs. Dodd, Mead & Co., N.Y. 109 pages. $4.50.

Playboy Squadron, by Arch Whitehouse. Mr. Whitehouse's latest novel follows a group of American college students flying with the RAF in World War I. Doubleday & Co., N.Y. 267 pages. $5.95.

The Republic F-105 "Thunderchief," by Robert D. Archer. The F-105 overcame its early poor reputation to perform admirably in combat over North Vietnam. Included in this illustrated paperback are histories of the F-105's progression and of the units that have used it, technical details of the F-105's performance, and details of markings. Aero Publishers, Inc., Fallbrook, Calif. 80 pages. $4.25.

Where the Winds Sleep, by Neil P. Ruzic. In his "projected history" Mr. Ruzic explores the benefits to be gained and problems to be solved in man's colonization of the moon from 1975 to 2045. Doubleday & Co., N.Y. 236 pages. $5.95.

Five new titles have been added to the Ballantine Books (New York) series of illustrated histories of World War II. These paperbacks, well researched, written, and illustrated, are produced in cooperation with the Imperial War Museum, London. The new books, each 160 pages in length, are: *Airborne,* by Charles MacDonald; *Bomber Offensive: The Devastation of Europe,* by Noble Frankland; *The Defense of Moscow,* by Geoffrey Jukes; *The Nuremberg Rallies,* by Alan Wykes; and *PT Boats,* by Bryan Cooper. $1 each.

—JOANNE M. MILLER

AEROSPACE WORLD

News, Views & Comments

By William P. Schlitz
NEWS EDITOR, AIR FORCE/SPACE DIGEST

WASHINGTON, D.C., JUNE 8

Seventh Air Force has terminated the Misty/Commando Sabre forward air controller operational mission in Vietnam.

The operation was originally activated under the 37th Tactical Fighter Wing in June 1967 at Phu Cat AB, South Vietnam, but was transferred to the 31st TFW at Tuy Hoa AB in May 1969.

The Misty FAC operation (also known as Commando Sabre) was officially the responsibility of Detachment 1 of the 416th Tactical Fighter Squadron, a unit that pioneered the high-speed forward air controller operation in Southeast Asia, flying F-100 Supersabres. The mission was "to conduct visual reconnaissance and control strike operations, with the objective of interdicting the flow of enemy logistics and destroying his capability to fight. Secondary tasks include suppressing enemy antiaircraft artillery defenses, conducting rescue combat air patrol over downed aircraft and personnel, and providing photo reconnaissance of their area of interest."

The pilots who volunteered for these exacting tasks were highly qualified strike pilots. In addition, Detachment 1 helped train other units, including a Marine fighter squadron, in the tactics developed for high-speed FACs.

During three years in SEA, 160 pilots flew more than 21,000 hours in support of the air war.

☆

The Air Force, on June 5, awarded engineering-development contracts for its next strategic bomber, the B-1, to North American Rockwell Corp. (system integration and airframe) and the General Electric Co. (engines). The contracts, set at $1,350,814,739 for North American Rockwell's airframe work and $406,654,000 for GE, provide for the development of five flying prototypes, two ground-test aircraft, and forty engines. North American Rockwell is to assemble a team of electronics subcontractors and to negotiate subcontracts for the B-1 avionics package, whose total cost is to be announced later. (*See April AF/SD, page 37, "USAF's Most Versatile Bomber"; and page 45, "The B-1—Blue Chip in the Deterrent Stack."*)

☆

While the United States is at least two years away from deployment of a prototype manned space station that would demonstrate manned capabilities in orbit for twenty-eight to fifty-six days (*see "Speaking of Space," page 60*), there are some indications that the Russians are already working toward month-long manned stays in space. It's possible that the Soyuz-9 two-man craft, in orbit just a few days at this writing, may try to do just that. Or Soyuz-9 might be the prelude to a later effort to orbit men for a month.

In any case, it seems clear that the general thrust of the Russian space effort is in near orbital space and that, one way or another, they will be proceeding toward development of a fairly elaborate orbital space station within the next couple of years. Their Soyuz manned spacecraft, while roomy, is not a space station in the sense that the projected US Skylab (*see "Speaking of Space"*) will be. But it is probably capable of sustaining men for a month. It's true, too, that the Soviets already hold the endurance record for orbital flight of living organisms. Their 1966 orbital mission carried two canines on a trip that lasted twenty-two days.

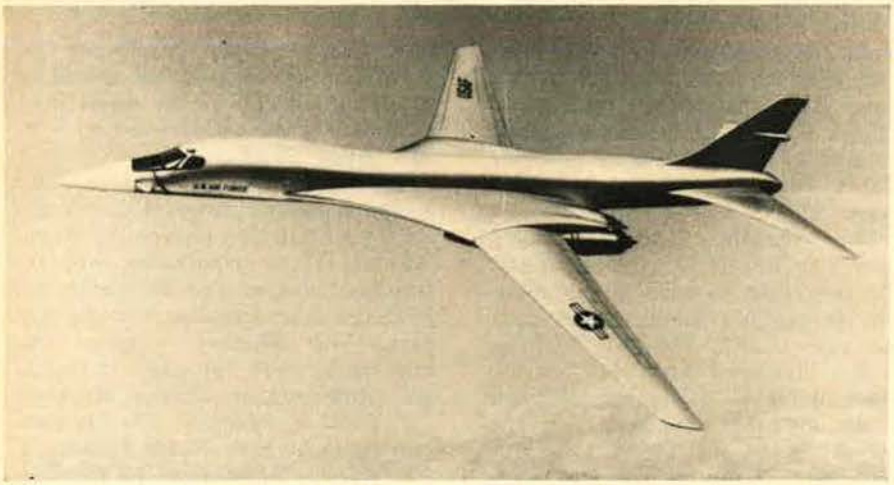
All of which raises the question: Having spectacularly gone to the moon and expended great effort and vast amounts of money, with whom were we racing? If it's true that the Soviets either never intended to race us to the moon or dropped out early and continued to concentrate instead on developing manned space-station capability, with all its military potential, we can ask, too, who was smarter —they or we?

☆

Early in June, the Air Force moved quickly to bring aid to the victims of the Peruvian earthquake—one of the most destructive natural disasters in world history.

Within hours of the tragedy, the first relief planes (C-130 transports carrying medical and other supplies) were landing at Lima's Jorge Chavez International Airport. Helicopters were to be an essential part of the relief cargo—to provide access to mountain villages cut off from the outside.

In the early hours following the



Artist's concept of the Air Force's upcoming B-1 strategic bomber for which North American Rockwell and GE were recently awarded engineering-development contracts. Besides its assured-destruction role as part of the US's deterrent package, the B-1 will also have a limited-war capability. Eight years of design studies have preceded the contract-letting phase of its development.

—United Press International photo

The first operational C-5 transport to go into USAF's inventory comes in for its landing at Charleston AFB, S.C. At the controls is Gen. Jack J. Catton, Commander of the Military Airlift Command. To the embarrassment of USAF and Lockheed, builder of the C-5, on touchdown the aircraft blew one tire and lost another (lower photo), but landed safely on its remaining twenty-six wheels.

quake and resulting floods, clouds of fog and dust in the affected areas made it impossible to conduct aerial surveys and air-drop supplies.

Later aerial photos showed that whole villages and even large towns had disappeared in the area of Peru's seacoast city of Chimbote, itself half destroyed.

The story of what occurred in the remote communities and the total number of dead will probably never be known. Several Americans—among them missionaries and Peace Corps workers—were among the known dead.

☆

Strategic Air Command B-52 crews amply demonstrated their proficiency in this spring's 1970 Royal Air Force Strike Command Bombing and Navigation Competition in England.

The SAC team piled up 1,531 points—177 more than the second-place team—to win the Blue Steel Trophy for combined bombing and navigation.

SAC crews competing for the trophy were the 319th Bomb Wing, Grand Forks, N.D.; 320th BW, Mather AFB, Calif.; and the 379th BW, Wurtsmith AFB, Mich. These participants were joined by the 2d BW, Barksdale AFB, La., in a try for the best single bombing and navigation prize.

USAF's order of finish in this trial, for which the Camrose Trophy is awarded, were: 2d BW, second place with 286 points; 320th BW, third with 270 points; 319th BW, eleventh place with 200 points; and 379th BW, twelfth with 194 points.

In the race for the Electronics Trophy for the best single navigation mission: 319th, second with 322 points; 2d BW, fourth with 305 points; 320th, ninth with 285; and 379th, thirteenth with 260.

USAF F-4E Phantoms also distinguished themselves recently in Europe's 1970 AFCENT (Allied Forces Central Europe) Air Defense Competition, leading Sector 1 (Western Eu-

(Continued on following page)

F-4E Phantoms of the 32d Tactical Fighter Squadron, Camp New Amsterdam, the Netherlands, fly formation with F-104 Starfighters of the Royal Netherlands Air Force's Leeuwarden Air Base during the recent 1970 AFCENT Air Defense Competition. They joined with German and Dutch ground controlled intercept operators to form the Sector 1 team that won the match's Guynemer Trophy.

Competitors from the 44th Strategic Missile Wing, Ellsworth AFB, S.D., won both the title "Best of the Best" and the Blanchard Trophy at SAC's 1970 Missile Combat Competition. Front row, from left, are: 1st Lt. Allen R. Greco; Capt. George S. Allyn, Jr.; SSgt. Bruce W. Berg; Col. Ralph H. Dowell, Wing Commander; 1st Lt. Rodney DeRego; and Capt. Charles E. Gordon. Back row, from left, are: SSgt. Scott L. Kinney; 1st Lt. James A. Carlton; SSgt. Ronald W. Huston; SSgt. John H. Coffman; SSgt. Richard A. Vesper; SSgt. Samuel A. Wall; and TSgt. Dale E. Paris. The 44th had a score of 4,574 points, just nineteen points ahead of the runner-up, the 351st SMW, Whiteman AFB, Mo.

rope is broken up into defense sectors) to victory and award of the Guynemer Trophy, the first for the sector in three years.

Phantoms of the 32d Tactical Fighter Squadron teamed with F-104Gs of the Netherlands AF and German and Dutch ground controlled intercept (GCI) controllers.

Sector 2 was runner-up for the Guynemer Trophy, and the United Kingdom won the Hudleston Trophy for the best fighter-interceptor team. The French Sector was awarded the Burniaux Trophy for the best GCI team, and AFCENT's Sector 3 was judged best in maintenance.

The 32d TFS was the only USAF unit in this year's competition.

On the missile scene at home, the 44th Strategic Missile Wing, Ellsworth AFB, S.D., took top honors in the 1970 SAC Missile Combat Competition, which ended in May.

The 44th SMW was awarded the Blanchard Trophy for posting 4,574 points, just nineteen points better than the runner-up, the 351st SMW, based at Whiteman AFB, Mo. The 44th conducted pretty much of a clean sweep, claiming Best Minuteman Wing, Best Crew, and Best Minuteman Crew Awards.

The Best Titan Wing was the 390th SMW, Davis-Monthan AFB, Ariz., a unit that also took the Best Reentry Vehicle Trophy.

☆

The Israeli Navy currently is being equipped with a new sea-to-sea missile called Gabriel, designed and produced entirely in Israel.

Gabriel is an automatic homing weapon that utilizes a sophisticated electronic-guidance system to deliver a 331-pound warhead. It can be fired in rough weather and is effective in an electronic countermeasures environment.

Gabriel was designed from the outset as a tactical weapon in naval warfare, to supplement Israel's air-delivered ordnance. It can be carried aboard small patrol vessels as well as on larger ships.

The 882-pound weapon, built by Israel Aircraft Industries, is stored and mounted aboard ship in reinforced fiber-glass containers, three to a rotating servo-pedestal. The containers include the missile's launching beam and are equipped with hydraulically operated lids.

☆

The Soviet Union's Minister of Aviation, Marshal E. F. Loginov, has accepted an invitation to be a featured guest at the 1970 US International Aerospace Exposition/Milwaukee, officials of the exposition said.

Marshal Loginov is in charge of all civil-aviation activities in Russia, and in this capacity sets all policy guidelines. He is to be the main speaker at the exposition's Air Age '70 celebrity banquet.

Exposition officials are also trying to arrange the appearance of the Soviet YAK-40 trijet transport, the KA-26 general-purpose helicopter, and a mockup of the TU-144 SST.

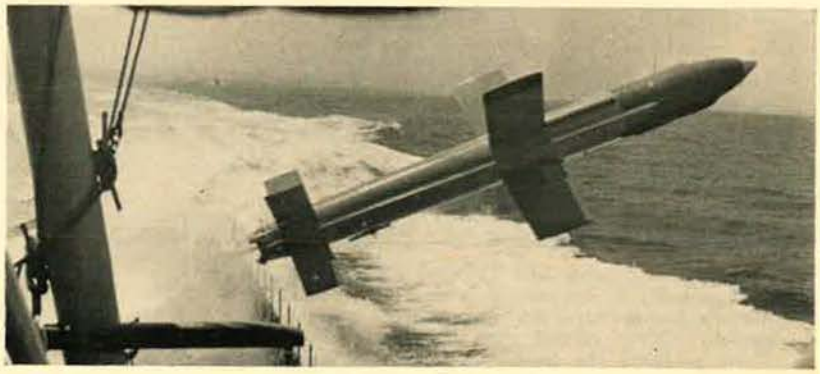
Another international aspect will be the participation of Sir Richard Smeeton, Director of the Society of British Aerospace Companies, officials said. RAF aircraft will also be hosted in Milwaukee. A mockup of Britain's SST will be on display.

The public air show at Milwaukee is scheduled for July 24, 25, and 26. Among scheduled aerial activities will be demonstrations by the US Army's Golden Knights parachute team and the Navy's Blue Angels, performing in their F-4J Phantoms.

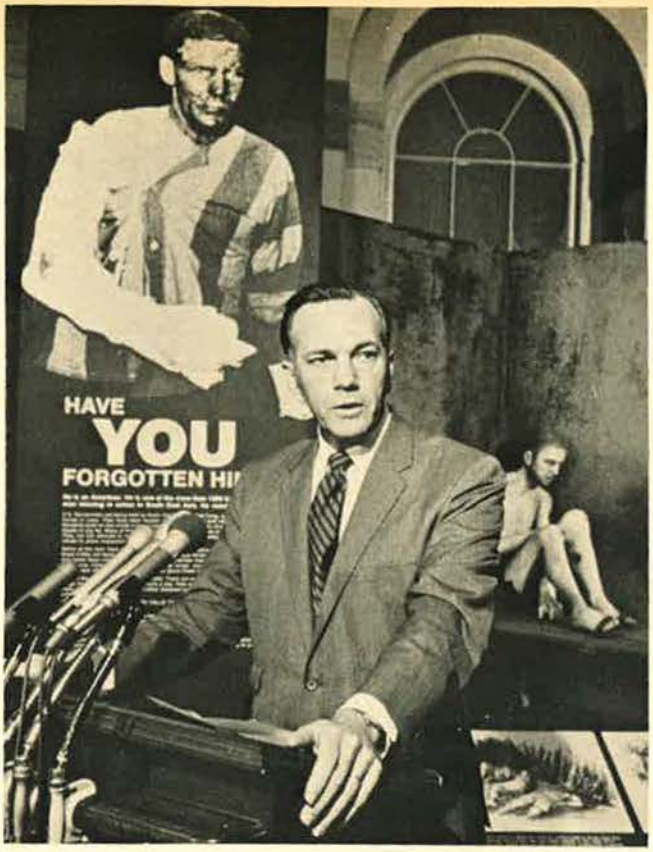
☆

The Air Force plans to equip all its KC-135 Stratotankers with a new computerized instrument system that will considerably ease the pilot's workload.

A display of lights and indicators



Israel's new sea-to-sea missile, Gabriel, is test-fired from a naval patrol vessel. The weapon, designed and produced entirely in Israel, will bolster seaborne firepower.



Dr. G. Warren Nutter, Assistant Secretary of Defense (International Security Affairs), at the opening of a new Prisoner of War exhibit at the US Capitol. The startlingly realistic exhibit was conceived and financed by H. Ross Perot of Texas to arouse public support for those Americans being held by North Vietnam. The exhibit will be open through the summer.

on the cockpit's instrument panel is hooked into the computer, which assembles essential flight data. At the pilot's request, the computer will indicate through visual representation on the system's indicators what course of action to take in an intended maneuver. The pilot has the option of disregarding the directions and reprogramming the computer for a different maneuver, thus using the system simply as a handy tool in flying the aircraft.

One device in the "FD-109" system is the attitude director indicator, in which the aircraft is indicated by an orange delta-shaped symbol. Two yellow, wedged-shaped "command bars" on either side of the delta shape suggest the aircraft's correct attitude. The pilot then controls his aircraft to keep the plane symbol lined up between the two command bars, automatically performing the computer-suggested maneuver.

☆

Boeing Co. reports from Seattle that the program it set up in July 1969 to help find jobs for those caught in the company's series of employment cutbacks has met with a measure of success. (A similar effort is being undertaken by North American Rockwell Corp.)

Boeing says that a large number of salaried personnel has been placed with other firms, and that twenty to twenty-five percent of the hourly workers contacted by employers through the program have been hired.

At Boeing's Vertol Division in Philadelphia, the Pennsylvania State

(Continued on following page)

Israel's Gabriel is equipped for automatic homing. A sophisticated electronic-guidance system delivers a 331-pound warhead on target.

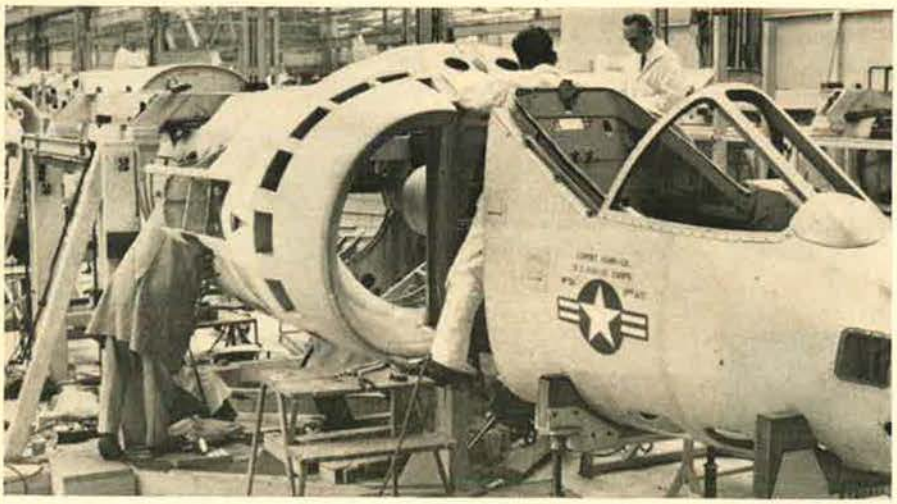
Workers begin mating wings to Lockheed's 1011 TriStar at the company's Palmdale, Calif., plant. The plane is expected to roll out in September, fly for the first time in November, and enter airline service in the fall of 1971.

Employment Services is cooperating. This organization is working closely with the US Employment Service to keep current on job openings throughout the country. Vertol also is in contact with about 280 companies from coast to coast that have expressed an interest in hiring people in various job categories.

Within the parent Boeing, itself, a clearing house has been established to share information with the satellite organization or division nearest a job opportunity. Also, résumés of laid-off professional or technical salaried employees are sent to potential employers throughout the US.

But despite these rays of hope, the California job market has been hit hard. The unemployment rate there is far above the national average.

The depression in the US aerospace industry is having far-reaching effects nationally, as well. For example, because of lack of advertising dollars, aerospace-oriented publications are being pinched severely—perhaps to death. In June, Ziff-Davis Publishing Co. announced that it was suspending publication of *Space/Aeronautics* and *Armed Forces Management* after the July issues.



First export versions of Hawker Siddeley Aviation's Harrier V/STOL fighter take shape on the production line. They are scheduled to enter US Marine Corps service in 1971. Production of the aircraft is taking place at the company's Kingston and Dunsfold factories. USMC initially ordered twelve of the aircraft, with a follow-up of eighteen carried in the Fiscal 1971 budget. Hawker Siddeley and McDonnell Douglas have signed a licensing agreement for the production in the US of any significant numbers of the Harrier ordered under US government contracts. The Royal Air Force is already flying the Harrier.

☆

British Aircraft Corporation and Breguet Aviation of France say that the prototype of the Jaguar aircraft destined for French naval use has completed its initial carrier-deck landing and takeoff trials.

The Anglo-French tactical aircraft performed trials, consisting of catapult takeoffs and arrested landings, at the facilities of the Royal Aircraft Establishment, Bedford, England.

An extensive schedule of further tests was to take place in June, followed by test flights from the French aircraft carrier *Clemenceau*. Seven prototypes of five design variants have flown to date. The two countries have 400 of the aircraft on order.

☆

The Martin B-57 Canberra is an old USAF hand, having been in TAC's inventory since 1955. Now the venerable craft is being prepared for yet another role—that of a self-contained attack aircraft capable of seeking out and destroying targets at night.

The new "G" version will serve initially at MacDill AFB, Fla., with the 13th Tactical Bomb Squadron and the 4424th Combat Crew Training Squadron.

The latter will train B-57G crews for the 13th TBS, which is scheduled to deploy to Southeast Asia at an as yet undetermined date.

Westinghouse Corp. has upgraded the aircraft's sensors and detection equipment to enable it to locate targets under minimum conditions of darkness and low altitude, and a computer will simultaneously provide the crew with navigation and weapon-release data.

Other modifications include a small increase in fuselage length and changes in the GE J65W5D engines to increase thrust.

☆

According to the joint Canadian-US North American Air Defense Command, which keeps a careful eye on objects in space, Red China's first satellite has a life expectancy of from five to twenty years or more.

How long the satellite will continue to transmit data cannot be determined.

The satellite, launched in April, put Red China in the slim ranks of space explorers. The satellite is in near perfect orbit, circling the earth once

very 114 minutes. NORAD says the ehicle's orbiting time may change a ew seconds over a period of weeks. t is space item number 4,382—the umber of objects in space since the Soviet Union's Sputnik I in 1957. The count of satellite-owning nations or organizations now stands at twelve. Besides China, they are: the US, England, France, Japan, USSR, Canada, Australia, West Germany, NATO, the European Space Research Organzation, and Italy (which no longer has satellites in space).

☆

The Coast Guard is experimenting with the use of helicopters to prevent massive oil spills from stricken oil tankers. It hopes eventually that the technique developed with the helicopters will be effective as far as 300 miles offshore.

The Coast Guard plan relies on removing the cargo from a distressed tanker before the oil spreads out on the ocean surface and becomes unmanageable.

Theoretically, when a tanker in trouble is located, a helicopter would deposit a salvage crew and pumping equipment aboard. Oil in the holds would be pumped into giant, floating rubber containers, each of which can store up to 140,000 gallons (or 500 tons) of oil.

Sikorsky HH-52A and HH-3F choppers have participated in a series of tests to prove the system. They flew from the Coast Guard Air Base at Elizabeth City, N.C., to a "disaster" scene in the Chesapeake Bay.

In the latest test, a Coast Guard H-130B transport parachuted equipment pallets into the water near a simulated tanker—a Navy water barge loaded with fresh water. The equipment was then snaked aboard the barge by helicopter.

In a short time, the fresh water was being pumped into a 140-foot bladder alongside the barge. The plan calls for any oil salvaged in this manner to be towed to shore and placed in storage tanks. The rubber containers are reusable.

☆

The General Electric Co. has contributed yet another novel application for the computer—to provide the changing outside scenery in cockpit trainers. No television cameras, motion-picture film, or videotapes are used, yet the terrain changes in response to the maneuvers of a pilot undergoing training at the controls of the mockup cockpit.

The VESS (Visual Environment Simulation System) is located at GE's Aircraft Equipment Division Avionic Controls Laboratory at Binghamton, N.Y., where it was designed as a research tool and to demonstrate the possibilities of relatively low-cost computer-generated visual simulation, GE says.

(Continued on following page)

On May 29, an F-4 Phantom fighter was presented to the Air Force Academy Cadet Wing by the Utah Air Force Association. Brig. Gen. Robin Olds, Commandant of Cadets, who set a combat record by downing four MIGs as an F-4 pilot during combat in Southeast Asia, here is shown delivering the dedicatory address. Speaking of the F-4, a first-line Air Force tactical fighter, he called it "the total summation of a pilot's wildest, fondest desire. It is the purest exaltation of flight." The F-4, rebuilt by the Utah AFA at Hill AFB, Ogden, Utah, joins an F-105 Thunderchief and an F-104 Starfighter on display at the Academy.

Gen. Bruce K. Holloway, right, Arthur C. Storz, center, and Maj. Gen. Earl L. Johnson look over a copy of April '70 AF/SD. Mr. Storz, an AFA National Director and former President of Omaha's Ak-Sar-Ben Chapter of AFA, was discussing AFA membership matters with SAC Commander in Chief Holloway and SAC Ass't DCS/Ops, General Johnson.

In ceremonies just before his retirement and the inactivation of SAC's Eighth Air Force at Westover AFB, Mass., AFA Chapter President Andrew Trushaw, left, presents a plaque from the Chicopee Chapter of AFA to Lt. Gen. William B. Kieffer, Commander. General Kieffer was cited for his many years of high dedication to aerospace power.

GE has built other such computer-driven visual simulators for NASA and the Office of Naval Research.

GE says VESS will utilize inputs from any simulation system and produce accurate, full-color, true-perspective views of a three-dimensional environment. The scene content can range from spacecraft flight to highway driving.

☆

NEWS NOTES—The **4392d Supply Squadron**, Vandenberg AFB, Calif., has won the USAF's **Outstanding Unit Award**. The 4392d was cited for "outstanding professional skill . . . that added immeasurably in obtaining the goals of the Air Force missile launch programs" between July 1, 1968, and June 30, 1969.

Ground-breaking ceremonies for the Air Force Museum's new home (*see May AF/SD, pages 28 and 157*) at Wright-Patterson AFB, Ohio, took place June 3. AF Secretary Robert C. Seamans, Jr., did the honors.

In December 1969, AF/SD reported on the first recorded instance of a pilot downed offshore being **rescued by surfers**. Now from Vero Beach, Fla., we hear that Woody Woodruff used his surfboard to rescue test pilot Lewis Mason after the latter bailed out into the drink.

SAC has placed **an urgent call** for airmen to **retrain** as B-52 gunners and KC-135 tanker boom operators, now in short supply.—END

INDEX TO ADVERTISERS

Why Bell is ready for the Technical Revolution of the 1970's

DEVELOPMENTS: ☐ X22-A V/STOL AIRPLANE ☐ SK-5 AND HYDRO-SKIMMER ACVs ☐ AGENA ROCKET ENGINES ☐ ALL-WEATHER AIRCRAFT LANDING SYSTEMS ☐ AIR CUSHION LANDING SYSTEMS ☐ APOLLO POSITIVE EXPULSION TANKS ☐ LUNAR LANDING TRAINING VEHICLES* ☐ ROCKET PROPULSION SYSTEMS ☐ ADVANCED PROPULSION FOR MINUTEMAN III ☐ SURFACE EFFECT VEHICLES ☐ REACTION CONTROL SYSTEMS

CAPABILITIES: ☐ BONDED STRUCTURES ☐ AUTOMATIC WELDING SYSTEMS ☐ TARGET DETECTION AND RECOGNITION ☐ GRAPHITE COMPOSITE STRUCTURES ☐ DIFFUSION BONDING ☐ AUTOMATED STRUCTURAL ANALYSIS ☐ MACH 3.0 EROSION TESTING ☐ ADAPTIVE SIGNAL PROCESSING ☐ THERMAL PROTECTION SYSTEMS ☐ ELECTRON BEAM WELDING ☐ INFORMATION PROCESSING ☐ THERMOSTRUCTURAL OPTOMIZATION ☐ FLUIDELASTIC ANALYSIS ☐ ECM/EDM CHIPLESS MACHINING ☐ ELECTRON MICROSCOPY ☐ ELECTROFORMING ☐ OPTICS ☐ HIGH ENERGY RATE FORMING ☐ AUTOMATED OPTIMUM DESIGN

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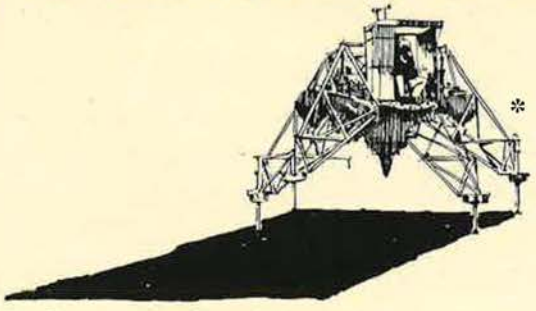

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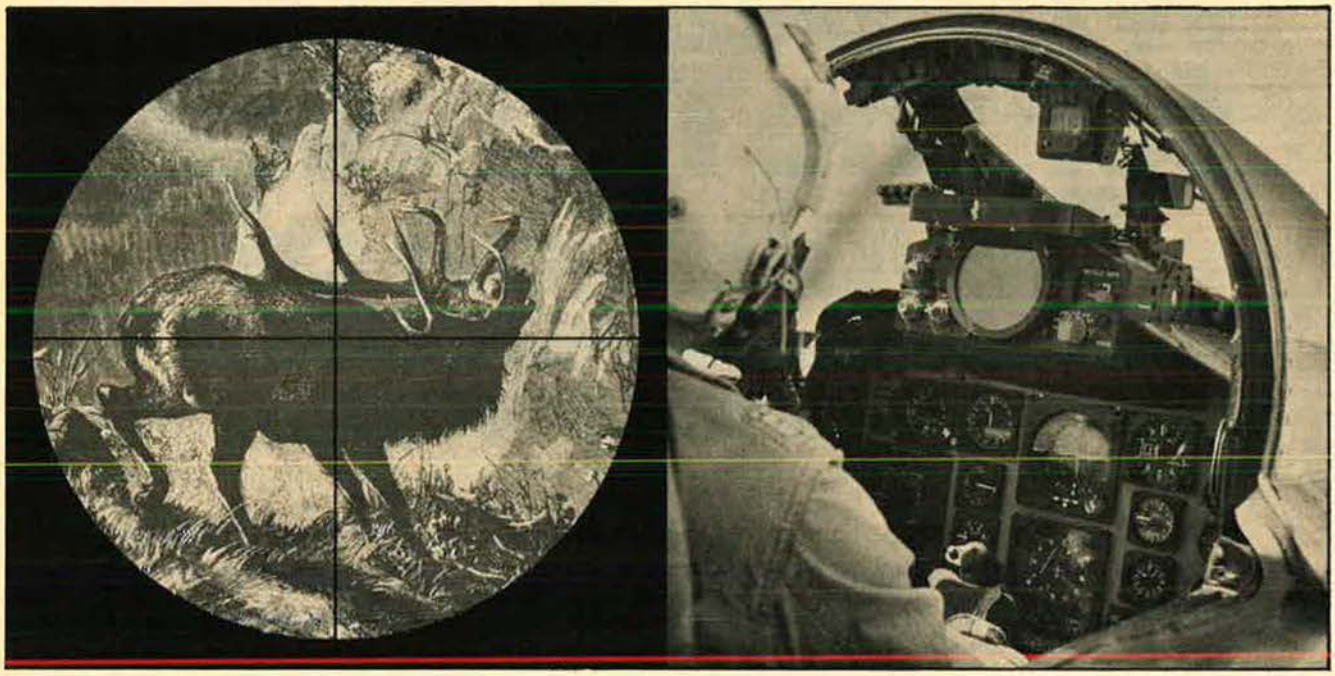

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Are We Headed for Strategic Second Place?

AIR FORCE
JULY 1970

"US security depends on our being technologically superior. I don't believe that we can maintain our national security if we have parity [with the Soviet Union] or are in second position with regard to research . . ."

Technological Superiority—Key to US Security and Survival

A report on an exclusive AIR FORCE *Magazine interview with the Pentagon's Director of Defense Research and Engineering.*

BY EDGAR E. ULSAMER
Associate Editor, AIR FORCE/SPACE DIGEST

THE security and survival of the United States depend on strategic and technological superiority. Yet this country is perilously close to the point of being "second best" on both counts.

These sobering views were expressed to AIR FORCE/SPACE DIGEST by the government's ranking weapons technologist, Dr. John S. Foster, Jr., Director of Defense Research and Engineering, of the Department of Defense.

Because of the need to compensate for the Soviets' ability to conduct major research and development programs in total secrecy, a tactical advantage denied the United States, Dr. Foster concludes that "we simply can't survive under parity." He illustrates the practical significance of covert Soviet technological efforts by pointing out that the US intelligence community, in two consecutive years, and to a lesser extent in prior years, had "underestimated" the growth of the Soviet military effort. Ironically, public reaction to warnings by Secretary of Defense Melvin R. Laird concerning the Soviet threat, even though the warnings proved to be understated, frequently was one of incredulity. Mr. Laird was accused of saber-rattling and of overstating the strategic threat to the United States.

The Soviet military momentum, Dr. Foster points out, is manifest in two areas:

- Rapidly expanding strategic capabilities. The Soviet strategic offensive inventory is currently being increased by the equivalent of about 700 Minuteman II missiles annually while the total US force level is now, and will continue to be, about 1,700 land- and sea-based strategic missiles. The effect on US security is immediate, and a Soviet first-strike capability by about 1975 is a real possibility.
- The steady increase in military and military-related R&D by the Soviet Union, which exceeds the combined levels of the Department of Defense, NASA, and the Atomic Energy Commission by about twenty-five percent. The annual rate of increase in the Soviet technological effort continues to range between ten and thirteen percent while the *shrinkage* in the comparable US effort is now, and will continue to be, "several percentage points a year." The effect on US security is long-term, with the Soviet Union seemingly aiming at broad technological superiority over the United States by the end of this decade.

The Strategic Threat

The US strategic force level has remained constant since 1965, at 1,000 Minuteman and fifty-four Titan missiles, about 550 strategic bombers, and forty-one Polaris submarines. The Soviet force level, according to Dr. Foster, includes a land-based missile component

(Continued on following page)

Dr. John S. Foster, Jr., Director of Defense Research and Engineering, is the third highest official in the Department of Defense. A native of New Haven, Conn., he holds a Bachelor of Science degree from McGill University, and a Ph.D. from the University of California at Berkeley. A technical consultant of the Army Air Forces in Europe during World War II, Dr. Foster joined the Lawrence Radiation Laboratory at Berkeley in 1948, specializing in radar countermeasures and in nuclear physics. Leaving Lawrence as Director of the Livermore facility, he assumed his present position on October 1, 1965.

"significantly larger than ours." It consists of more than 280 SS-9 missiles in operation or in the process of being deployed. SS-9 missile deployment has been averaging about fifty per year. This missile has approximately ten times the payload of the Minuteman II missile, and testing indicates the Soviets may seek to deploy three independently targeted (Multiple Independently Targeted Reentry Vehicles—MIRV) nuclear warheads on each SS-9, each one substantially larger than the single warhead of Minuteman II.

The USSR also has operational or is deploying a total of more than 830 SS-11 missiles and is increasing its inventory of this missile type at an annual rate of about 100. The SS-11 is roughly equivalent to the Minuteman missile in terms of payload.

According to Dr. Foster, the US, for the moment, enjoys a substantial lead over the Soviet Union in sea-launched ballistic missiles. This preeminence is likely to be dissipated by 1974 or 1975 because of the high rate at which the USSR is introducing "Y class" (comparable to the US Polaris class) submarines into its inventory. Nine Y class submarines are currently operational, and an additional twenty-five Y class submarines are known to be under construction. The total payload of all presently operational Soviet sea- or land-launched ballistic missiles exceeds that of the United States by a factor of two. Combined, the Soviet ballistic missile force, as presently configured, can carry three times the nuclear megatonnage that US strategic missiles can deliver.

Beyond sheer numbers, two factors—their ability to survive attack and their ability to penetrate—determine the credibility and efficiency of ballistic missiles in a deterrent role, Dr. Foster emphasizes. As for the first category, all land-based US and Soviet missiles are "hardened" while the two countries' sea-launched ballistic missiles are "dispersed," thereby achieving a form of equality so far as initial survivability is concerned. Survivability of the Soviet land-based missiles is enhanced, however, because the Russians have already deployed "a relatively complete ballistic missile defense, at least in the first phase, around the Moscow industrial area where they emplaced four facilities with about sixteen launchers each." Dr. Foster stresses that on the basis of the best available evidence there is "no reason to doubt the effectiveness of this system."

Total payload of all presently operational Soviet . . . missiles exceeds that of the United States by a factor of two. [Their] force . . . can carry three times [our] nuclear megatonnage.

More important to the security of the United States than this Moscow industrial area system, Dr. Foster believes, is the existence of Soviet ballistic missile defense acquisition and tracking radar ("Henhouse," in NATO parlance) installations located at about "half a dozen points around the Soviet Union and arranged in much the same way that we propose to deploy Safeguard [the US antiballistic missile defense system]."

Some of [their] radar installations are already operational, and others are still under construction. In . . . sheer . . . magnitude, the Soviet "Henhouse" radars are described as twice the size of the Pentagon.

Some of these radar installations are already operational, and others are still under construction, with completion of the system expected in two or three years.

In terms of sheer physical magnitude, the Soviet "Henhouse" radars are described as twice the size of the Pentagon. The fact that the Soviet system's interceptor, the Galosh missile (larger than our proposed Spartan ABM and roughly equal in size to our Minuteman ICBM), is as yet deployed only in the Moscow area, is not surprising, Dr. Foster points out. The radar installation is the long-lead-time component of any

ABM system, and the interceptor force, therefore, is not deployed until the radar is close to operational status. Coverage (area defense), in terms of effective interception, extends from the "Moscow system's" phased-array radar acquisition and tracking installations along about a 500-mile radius, according to Dr. Foster.

Presumably this will be true also for the other radar sites if and when the Soviets deploy the Galosh interceptor missile, thereby creating an effective bulwark around most of their ICBM silos and bomber bases.

Somewhat enigmatic in terms of ballistic missile defense is the role of the Soviet Union's so-called Tallinn system, employing the SA-5 surface-to-air missile.

Crediting the Tallinn system with "a rather good capability against aircraft," Dr. Foster indicates that US defense planners believe it has "only a limited capability against ballistic missiles, when working in conjunction with its own, local radar system.

"I do believe, however, that if the SA-5 system is given information from the large ballistic missile acquisition and tracking radars, then it could have considerable capability in making successful intercepts of incoming ballistic missiles," Dr. Foster says.

Dr. Foster, who has been in his present Department of Defense assignment since 1965, emphasizes that the high level of the Soviet ABM efforts is the "primary" reason why "MIRVing" the US ballistic missiles is mandatory. If the US missiles are not given a greater capability to penetrate the growing Soviet ABM system, Dr. Foster stipulates, the credibility of US deterrence is jeopardized. (The secondary reason for MIRVing, he says, is to make "the surviving [after a first strike] sea-based and land-based US missiles more effective.")

If the US ballistic missiles are not given a greater capability to penetrate the growing Soviet ABM system, Dr. Foster stipulates, the credibility of US deterrence is jeopardized.

In assessing the ballistic missile capabilities of the US and the USSR with regard to "penetrability," Dr. Foster places considerable emphasis on the superior payload and total megatonnage of the Soviets, saying "what counts most in the long run is payload. The way the Soviets have configured their force, this comes to about three times the megatonnage" of US missiles.

The Bomber Deterrent

The third component of the strategic, nuclear forces of the two countries is bombers. The Soviet Union has 200 long-range and 700 medium-range bombers in its inventory at this time. About 300 of the nuclear-range bombers could be deployed against the United States, "either on one-way missions, or by using half of them in a tanker role with the remainder performing two-way nuclear attack roles." In the latter eventuality, the effective Soviet bomber inventory, Dr. Foster says, comes to about 350 aircraft, compared to about 550 US bombers. Both countries either have under development or plan to develop a follow-on advanced bomber.

The Soviet Union, Dr. Foster points out, "is developing a new strategic aircraft which could perform nuclear bombing attacks against the US. The Russians don't have a strategic force of this new type of aircraft as yet, however."

The Soviet Union, Dr. Foster points out, "is developing a new strategic aircraft which could perform nuclear bombing attacks against the US. The Russians don't have a strategic force of this new type of aircraft as yet, however." The Air Force has just named North American Rockwell Corp. to develop the United State's next strategic bomber, the B-1 (*see April '70 AF/SD, page 37*).

The principal "worry involving the effectiveness of the US bomber force, and I suspect this is equally true so far as Soviet thinking is concerned, is whether the strategic alert force, on warning, can be safely airborne before the missiles of the enemy submarine force, presumably located close to the bomber bases, strike," in Dr. Foster's view.

Vulnerability to submarine-launched missile attack is "more severe in our case than in that of the Soviet bomber force, for reasons of geography. The flight distances involved in [the] case of the USSR are on the order of 2,000 miles if the Russians move their bomber fields inland. This puts considerable restraint on our [range-limited] Polaris submarine missiles. By contrast, even if we were to move all our bomber bases away from the coastal areas, the maximum distance geography permits us to attain would be just about 1,000 miles," Dr. Foster emphasizes.

The Triad Concept of Deterrence

Presently, US policy pivots on three different offensive strategic weapon systems (land-based missiles, sea-launched missiles, and strategic bombers) "employing different technologies and each one capable of providing deterrence by itself." It is the result of the twofold circumstances that "three strings on our deterrence bow are most desirable, on the basis of our experience during the past ten years, [and] because the underlying technologies can indeed give us three viable, separate systems."

Dr. Foster points out that "so far as these three weapon systems are concerned, we don't, and we can't, know everything about their underlying science and technology. From time to time, in the past, we encountered problems and difficulties [with one or the other of these systems] because of changes in Soviet capabilities or because of advances through our own studies and research. These difficulties were of a nature that could cause gross malfunction of a large portion of a particular force. Sometimes the corrections could be made in a matter of weeks or months, and sometimes this required years."

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For this reason, Dr. Foster considers it "unacceptable to rest the security of America on a single force which for the foreseeable future, would be prone to the same kind of vulnerability through change and technological surprise as has been characteristic of its past."

Dr. Foster, furthermore, is sanguine about "the viability of these three systems in the foreseeable future.

"Bombers can be based on alert and can have sufficient active defense to permit them time and sufficient warning to become safely airborne in case of nuclear attack.

"We have this capability today, and I believe that, through the deployment of our ABM system and the development of the B-1 bomber [which permits substantially greater dispersal and faster flushing], we will have this capability in the future," Dr. Foster points out.

"Further, the bomber has another invaluable feature: It penetrates enemy defenses in a very different way from that used by ballistic missiles. This forces the enemy to deploy an entirely different strategic defensive system."

As to extending the viability of land-based ICBMs well into the 1980s, Dr. Foster considers most "promising among the several approaches under review, a combination of active defense systems and mobility." The Safeguard system, he believes, "is the best way to approach active defense. If the threat should grow to beyond those levels that can be coped with by a full implementation of the Safeguard system around the Minuteman fields, then it would be possible to add—if and as necessary—more, but smaller radars since they don't have to be as capable [for the hard point-defense role] as the current missile site systems, and to increase the number of interceptors," he says.

[It is] unacceptable to rest [our] security on a single force which . . . would be prone to . . . vulnerability through change and technological surprise [that] has been characteristic of [the] past.

"On the strength of our present calculations, the cost of intercepting incoming objects is about equal to the cost of developing new offensive systems.

"We can now provide defense systems for less expense than the cost of the Soviet offensive systems. We have to allow, however, for the future possibility of the Soviets developing new penetration techniques that might change this cost ratio around. Looking at the end gain, I suspect that over the years the cost of defense will about equal the cost of offense," Dr. Foster says.

Dr. Foster exudes a high degree of confidence that the United States can, and must, create an effective missile defense system to provide for the survival of several hundred Minuteman missiles as well as of the cutting edge of the US bomber fleet—a surviving force "capable of meting out an unacceptable level of assured destruction on any aggressor contemplating a first strike against the US."

[It is] "a complete falsehood" [to] claim that both sides have enough weapons to kill the other many times and that, therefore, further expansion of [our] deterrent forces is both unnecessary and provocative. . . . What is true is . . . that . . . peace or war . . . rests on the prevention of any serious imbalance in capabilties of the potential adversaries.

(Dr. Foster rejects as "a complete falsehood" the claim that both sides have enough weapons to kill the other many times and that, therefore, further expansion of this country's deterrent forces is both unnecessary and provocative: "This simply is not true. What is true is the fact that the case for peace or war rests on the prevention of any serious imbalance in capabilities of the potential adversaries," he says.)

The Mobile Minuteman Force

Studies of how a portion of the Minuteman force can be made mobile have shown "that the technique that looks rather feasible involves either a wheeled or surface-effect (also known as ground-effect machine—GEM) system, which enables the missiles to flee on warning to hardened, underground shelters. There would be many more shelters than there would be missiles, the end gain being that we could construct substantially more shelters than the number of reentry vehicles that the enemy can place on his missiles," Dr. Foster says.

"We consider this to be a favorable exchange ratio because we can build additional target points, *i.e.*, shelters, for considerably less than $1 million, whereas we believe that it costs the Soviets considerably more—by a factor of five to one or even higher—to provide additional warheads," according to Dr. Foster.

The Minuteman missile . . . can be adapted "rather directly" to either a wheeled or GEM system, requiring only limited changes to provide for more rapid launch capability or transportability.

As yet undecided is whether such a mobile system should employ special, heavy trucks capable of speeds in the thirty- to fifty-mph range, or surface-effect machines operating in the sixty- to 100-mph range. In the case of a GEM system, about twelve months of special design work would be necessary "before we could proceed with advanced development of such a system, which some planners favor over the wheeled method which has been under study for almost a decade," Dr. Foster says.

The Minuteman missile, Dr. Foster finds, can be adapted "rather directly" to either a wheeled or GEM

system, requiring only limited changes to provide for more rapid launch capability and transportability.

The Sea-Launched Ballistic Missile

There is at this time no serious technological threat in sight that would render obsolete the US submarine-launched ballistic missiles, the third component of this country's triad of deterrences, according to Dr. Foster.

"The sea is such a difficult medium in terms of detection that Secretary [of Defense Melvin R.] Laird has concluded that for the next few years our [SLBM] missiles will continue to enjoy relative invulnerability. It is very difficult for a submarine to find another submarine, for a surface ship to find a submarine, or for an air- or satellite-based system to find a submarine. We don't, of course, dismiss the possibility that in the future some new technique might evolve which would make submarine detection easier than it is now. The one worry we have about our SLBMs is the fact that because the sea is such a *difficult* medium, it is very difficult for us to find out just how successful the Soviets are in detecting and tracking our Polaris submarines.

"To assure the continued utility of our sea-based missiles, we are proposing some actions in the Fiscal 1971 budget that will extend the relative invulnerability of the Polaris platform through the remainder of the 1970s," Dr. Foster explains.

But by the 1980s, "we believe it will be necessary to replace the Polaris system with a new platform capable of launching longer-range missiles and with improved submarine characteristics," he adds.

Current study efforts involving an Underseas Long-Range Missile System (ULMS) are "not being pushed very hard at this time," Dr. Foster points out.

The Significance of Military Space

The United States, in Dr. Foster's view, enjoys a considerable lead over the USSR in terms of basic space technology and in applying such technologies to practical military requirements. US programs in the areas of "communications, mapping, warning, surveillance, weather, and other activities directly related to the military have been extremely rewarding. On a short-term basis, I believe the continuation of these efforts to the degree that we now propose is well warranted," he says.

As for the requirement of manned military space operations, he theorizes that "over a longer range, we will come to realize that there are military needs in space that cannot be accomplished without placing much larger payloads in orbit [than are being planned now by NASA]. It is much more efficient, and less complex and costly, to perform the whole job in orbit. The main cost of our present communication satellite systems, for instance, is absorbed by ground elements.

"The costs of the ground terminals are determined to a major extent by the capability of the satellite, both in terms of the power that is needed on the ground and the power available in the satellite," he says, adding that for this reason an onboard system could perform the military mission better and more economically.

While he regrets the cancellation of the MOL program, Dr. Foster believes that the current, joint NASA-DoD effort involving a space-transport system, including a two-stage reusable space shuttle, "can be worked out in a manner that is mutually satisfactory." (Current differences of opinion between the Air Force—DoD's executive agency on the program—and NASA center around the military's need for larger payloads, higher orbits, and a substantially increased, so-called cross range, *i.e.*, the ability to maneuver the 707-size orbiter stage in airplane fashion following its return from space. NASA favors a low cross range to facilitate the basic design task.)

The United States, in Dr. Foster's view, enjoys a considerable lead over the USSR in terms of basic space technology and in applying such technologies to practical military requirements.

Assuming that this controversy will be resolved, Dr. Foster believes that the NASA space shuttle "should be pursued vigorously; the Department of Defense supports it strongly and we believe that, when available, it will be of great use to us."

The Mounting Soviet R&D Momentum

Nothing is as worrisome to US defense planners as the destabilizing influence on our long-term deterrent capability that results from the present high momentum in Soviet weapons development and R&D.

To evaluate the technological capabilities of the US and the USSR, Dr. Foster employs two criteria: the status of technology today, and the current level of R&D effort and its portents.

In the first case, he believes that the United States still has an overall lead on the Soviet Union but that there are a number of specific areas of technology where the Russians are ahead of this country. Among them he cites greater Soviet efforts and experience involving high-yield nuclear weapons in the one- to sixty-megaton range, and space-based experimentation involving high-energy physics. The US lead in most areas of technology, according to Dr. Foster, ranges "from about a year to a few years, which doesn't mean that we will lose all technological superiority that rapidly, since, in certain areas, that might require five or even ten years."

Because of the "cutback in US R&D efforts by a few percentage points annually, and the Soviet increase of between ten and thirteen percent each year—plus the fact that Russia's R&D effort in the areas of space, nuclear energy, and direct military matters already exceeds ours by about twenty-five percent—the US is fast approaching the point of becoming second best in terms of total technological capability," Dr. Foster fears.

In sharp conflict with these trends, Dr. Foster points out that "US security depends on our being technologically superior. I don't believe that we can maintain our national security if we have parity or are in second

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position with regard to research. This is so because the Soviet Union enjoys a veil of secrecy over its R&D effort and weapons deployment. To counter this advantage, the United States simply must be in a position of 'essentially having been there' technologically before the Soviets, so that we can assess the dangers to our security [of a given technological development] and take whatever action is prudent and necessary."

Accentuating the critical imbalance in Soviet and US R&D levels, Dr. Foster emphasizes, is the fact "that we are torn between encroaching Soviet technological superiority and inflation. We are finding that the weapon systems that can be designed, superior as they are to those in the field, extract such a high price in acquisition that we can't afford them. If we are to maintain our security in the years ahead, we will have to do the R&D job at less cost. In the next year or two, perhaps even for longer, we will have to rather ruthlessly squeeze out all unnecessary costs in our weapons development and procurement programs.

"In taking these belt-tightening economy moves, we will have to exercise infinite care to watch that the long-

Yet another factor that impinges on the military technology effort . . . is the . . . lassitude the American people have brought to military preparedness during periods of relative peace. This is coupled with the effect of [Vietnam] on public attitudes and the fact "that the growing threats to [our security and deterrent] are not taking shape . . . where [the public] can see them."

lead aspects of our research and development programs, such as basic research, exploratory research, and some advanced developments, are maintained in the important, critical areas," he stresses.

He cites as an example the explosive area of laser technology with its implication for rapid advances in terms of defense systems as well as for other applications. The US, in spite of present budgetary restrictions, is "undertaking an aggressive effort in laser technology," he says, adding "of course we would like to do more if additional monies were available. There is no way of establishing whether the US is ahead of the USSR in laser technology or vice versa."

"We have been running number one for so long that we have become wasteful at times. Also, part of our difficulty at the moment is that we have a larger aerospace industrial base than we have budgets to support it. What we have to do is to employ some of the measures [of frugality] that are being practiced by those nations that are currently number two, three, or four, in order not to become number two, three, or four ourselves. If we fail to take those measures, then surely that fate lies ahead for us, too," Dr. Foster warns.

There is considerable room to improve the US management of technology in his view. "In a business as large and as complex as that of aerospace, there is always room for improvement" he says, adding that the Department of Defense, under the aegis of Deputy Secretary of Defense David Packard, has just completed a comprehensive document that "outlines the areas where the most progress can be made." These areas, in turn, will require detailed attention by the services, he points out.

The main focus is on "the creation of first-class teams—and people are all-important—to implement the programs, and to delegate to them not only clear responsibility but also corresponding authority to manage." Basically the Department of Defense directs the services to an understanding, "as complete as possible," of any given technological problem before any action is taken and, secondly, to the need to concentrate on the "necessary rather than the desirable solutions," he says.

Public Disregard of the Threat

Yet another factor that impinges on the military technology effort of the United States at this time, in Dr. Foster's view, is the historic lassitude the American people have brought to military preparedness during periods of relative peace. This is coupled with the effect of the Vietnam War on public attitudes and the fact "that the growing threats to American security and our ability to deter are not taking shape in areas where the American people can see them.

"The American people don't see the Soviet SS-9s, SS-11s, or SS-13s; they don't see the deployment of Soviet ballistic missile defense; they don't see the Soviet Polaris-type submarines off our coasts; and they don't see the seriousness of the threat facing our allies," he points out. As a result, and in spite "of the uncommon effort by Secretary Laird to release as much tangible evidence of the Soviet threat, certainly more than any of his predecessors have made available to the public," public reaction to the current threats has been impassive, he admits.

In addition, Dr. Foster detects a basic disenchantment with and rejection of technology on the part of a portion of the public, stemming from the facile belief "that the national security situation is getting worse instead of better and that this worsening is due to technology making available weapons of ever-increasing destructiveness."

From this premise, "some people conclude that the only way out is to stop military research and development. The problem is, of course, not quite that simple. Technology, in my view, is not the source of the problem. Technology can be used for good or evil, it can be used for peace or war and, in fact, the first alternative is how America is using it," Dr. Foster explains.

"I believe that we cannot maintain our national security and our freedom without more, rather than less, technology. In order to meet the necessary military capability with a minimum expenditure of our resources and money, we need technology. The only alternative is to buy more and more weapon systems that are obsolescent, which certainly is the least effective way of achieving a given military capability," he argues with considerable conviction.

Given the validity of Dr. Foster's point of view and the persuasiveness of his presentation, this reporter cannot escape the conclusion that, in time, the Congress and the public will come to share his and DoD's thinking.—END

An AIR FORCE Magazine Special Report

Those who pin their hopes for peace on a split between the Soviet Communist Party and Soviet military leaders are chasing a will-o'-the-wisp. The Soviet military and its methods are the creations of civilian-military cooperation in a monolithic power structure—a structure that gives every evidence of great endurance . . .

In the Soviet Union 'Hawks' and 'Doves' Are Birds of a Feather

THERE is a popular notion in the West that the Soviets have their own internal power struggle between their hawks and their doves. The hawks, of course, are seen as mainly in the Soviet armed forces; the doves (along with some few hawks) in the civilian Party hierarchy.

This view of the Soviet establishment postulates frequent internal tugs-of-war, with the hawks advocating aggressive ventures and the doves attempting to restrain them. This theory has been used, for example, to explain why the Soviet government hesitated before sending troops into Czechoslovakia in 1968. On that issue, according to those who believe in the Soviet hawk-dove split, the doves lost.

In optimistic contrast, Soviet agreement to participate in preliminary Strategic Arms Limitation Talks at Helsinki and to continue the SALT talks at Vienna has been regarded as evidence that the doves are currently in control, but with the hawks probably fighting a rear-guard action—with Soviet intervention in the Middle East as an example.

Belief in this kind of dichotomy among Soviet policymakers is demonstrably and dangerously wrong. It is a mirage which can lead the unwary and naïve deeper and deeper into a wasteland from which there might be no return.

On major issues of Soviet military policy, strategy, or doctrine, there is no place for civilian-military conflict and there never has been, at least not since the Stalinist purge of the military prior to World War II. The reason is simple. In the USSR, military policy is not conceived by a civilian hierarchy and handed down to military leaders for implementation. Rather, the top Soviet military leaders form an integral and powerful part of the group that determines policy and supervises its execution.

That this fusion of civilian and military in policy formulation is not widely recognized may be attributable partly to the fact that Soviet military men whose names appear in the press are frequently not identified by their military rank. For example, when Defense Minister Marshal Malinovsky died, the prevailing opinion of the US press was that Malinovsky would be replaced by a civilian. Communist Party leaders were said to believe that a civilian defense minister would "keep the military under control." The "civilian" most often mentioned for Malinovsky's job was D. F. Ustinov, a Candidate Member of the Politburo, responsible for industry. "Mr." Ustinov is a three-star Colonel General in the Soviet army. As it turned out, Malinovsky was actually replaced as Defense Minister by Marshal A. A. Grechko.

Who Are Party Members?

The union of civilian and military elements within the Soviet government has its foundation in Communist Party membership. In the Soviet Union, the Communist Party is an elite group, the "vanguard of the masses," and the military are important members of this vanguard. The Party is strong precisely because it is highly selective. Most Soviet citizens cannot meet the stiff requirements for membership. Out of a popu-

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lation of about 240,000,000, only some 12,000,000, or about five percent, are Party members.

This percentage does not apply to the officer corps of the Soviet armed forces. Prior to 1930, only about one-third of Soviet officers belonged to the Party. The idea that the remaining, potentially powerful two-thirds were not under Party discipline galled Stalin. So he simply decreed that all officers had to join the Party. Thirty-five years later, in July 1966, Secretary General Brezhnev told the graduating classes of the Soviet military academies that ninety percent of the officer corps were either Party members or Komsomols (members of the Young Communist League). The figure for all ranks is eighty-three percent.

In theory, policy for both Party and government is formulated by the Congresses of the Communist Party of the Soviet Union. These are now held about every five years. Of the 4,942 delegates to the last Party Congress in 1966, 352 represented the Soviet armed forces. The next Party Congress, the XXIV, will be held later in 1970.

The Party Congress selects a Central Committee of the Communist Party, and the Central Committee, in turn, selects the Politburo and the Secretariat of the Central Committee. The Politburo and the Secretariat perform daily tasks of the Party between Plenums of the Central Committee, convened three or four times a year.

There are 195 Members and 165 Candidate Members of the Central Committee. Only Members have a vote, but Candidates attend all Committee deliberations. Of the 360 Party members now on the Central Committee, thirty-six are military—fifteen Members and twenty-one Candidate Members.

The Soviet political-military relationship continues through the lower levels of both Party and government. For example, the Central Auditing Commission, which acts as the Party's "General Accounting Office," handling complaints, Party funds, and the use of Party facilities, has seven military members among the total of seventy-six—about ten percent, as in the case of the Central Committee.

Top military leaders participate in Party matters at the local level, and many generals serve on Presidiums of the Soviet Socialist Republics (SSRs), units roughly comparable to our states. The Central Committees of the Union Republic Communist Parties, with the one exception of the Kirgiz SSR, include at least sixty-six generals from the Military Districts and admirals from Fleets in their areas. The numbers of military men serving on these Committees range from fourteen in the Ukrainian SSR to two in some of the less-populated SSRs. The same fusion of civilian-military membership is found in more localized Party and government units.

This civilian-military fusion is not one-sided. The first secretaries of the Central Committees and Territorial Committees of the Union Republic Communist Parties, and many first secretaries of regional Party Committees, are also members of the Military Councils of Military Districts and Fleets. Constant contact at local levels tends to weld bonds of cooperation between Party and military leaders, which surface at national levels in later years when the promotion of Party functionaries leads to promotion of their military associates.

Few Soviet citizens would understand terms that are common to us, such as "civilian control of the military" or "military dominance of civilian policy." The Soviet power structure is monolithic with both civilian and military members participating in policy decisions at the higher levels. This duality extends even to the formulation of military doctrine, a point discussed in *The CPSU and the Building of the Soviet Armed Forces* (Military Publishing House, Moscow, 1967):

"Soviet military doctrine, elaborated on the basis of the guiding decisions of the Central Committee of the Communist Party, the Soviet government, and the data of military science, represents a system of views on questions of the military defense of our country and the whole socialist camp from imperialist aggression."

What Lies Ahead

In the foreseeable future, there is little likelihood of a Party crackdown on the Soviet military professionals, nor will a military man-on-horseback topple Communist Party power in the Soviet Union. The senior military leaders, over the years, have had to prove themselves good Party members as well as capable military commanders. They comprise a group of the world's senior Communists. Many of them joined the Party before 1920, and antedate Secretary General Brezhnev in Party membership. Fifty years of turbulent history show little to suggest that they or their subordinates ever have questioned the dictates of the Party.

Today the Russian marshals, generals, and admirals form an integral part of the Soviet political structure. Their future, collectively and individually, cannot be divorced from the Communist Party to which they owe their allegiance. And without their military support, the Party itself cannot stay in power.

This is not to say that there have been no disputes over strategy or doctrine within the Soviet policy-making structure. Most certainly there have been, but these disagreements have been settled inside the authoritative structure of the Communist Party. And it has not always been possible to tell who the hawks were and who the doves. Two young colonels, Rybkin and Bondarenko, who generally have been regarded as military hawks by Western analysts are, in fact, faculty members of the Military Political Academy, *i.e.*, members of the Political Administration, not officers of the line.

Those who pin their hopes for peace on a split between Party and military leaders, assuming that the reasonable views of Party political leaders will hold in check the military strategy, doctrine, and programs of the Soviet armed forces, are chasing a will-o'-the-wisp. The Soviet military and its methods are the creations of civilian-military cooperation in a monolithic power structure.

That is one Communist monolith that gives every evidence of enduring.—END

Report From Capitol Hill

The McClellan Subcommittee has recently completed its seven-year, on-and-off hearings on the F-111 (TFX). Senator McClellan's report is expected to call for changes in the highly centralized management scheme of former Secretary of Defense Robert McNamara. Here, a veteran Capitol Hill reporter reveals several of the reasons, based on some eye-opening testimony by former Defense Department officials—including Mr. McNamara—in this report on . . .

Project Icarus and the F-111

By Claude Witze

SENIOR EDITOR, AIR FORCE/SPACE DIGEST

IN *Confirm or Deny*, a recently published volume of reminiscence written by Phil G. Goulding, a former Assistant Secretary of Defense for Public Affairs, there is only one reference to the biservice aeronautical effort called the F-111. Mr. Goulding says "it never was of particular importance" to Defense Secretary Robert S. McNamara "whether the public understood his position" on the controversial airplane.

That may be true, but in the light of the facts now being placed in the public record concerning Mr. McNamara's handling of the F-111 project, no luster is being restored to a phase of the McNamara record that grows more and more tarnished as time goes on. Senator John L. McClellan (D-Ark.), who is chairman of the Senate Permanent Subcommittee on Investigations, of the Committee on Government Operations, is pursuing the subject.

If your memory is good, you will recall that Mr. McClellan started chewing this bone in 1963, back in the days when the joint Navy-Air Force project was called the TFX (for Tactical Fighter, Experimental). At that time, focus was on the fact that General Dynamics Corp. was selected to design and produce the airplane. It is about seven and a half years since Secretary McNamara, supported by USAF Secretary Eugene Zuckert and Navy Secretary Fred Korth, made this decision, eliminating the Boeing Co. from the competition. Chairman McClellan says they "summarily overruled the recommendations of the highest ranking military officers and aeronautical experts of the armed services."

In the first McClellan hearings, in 1963, there was great effort put into a search for some kind of hanky-panky in this procedure. There is no doubt that the

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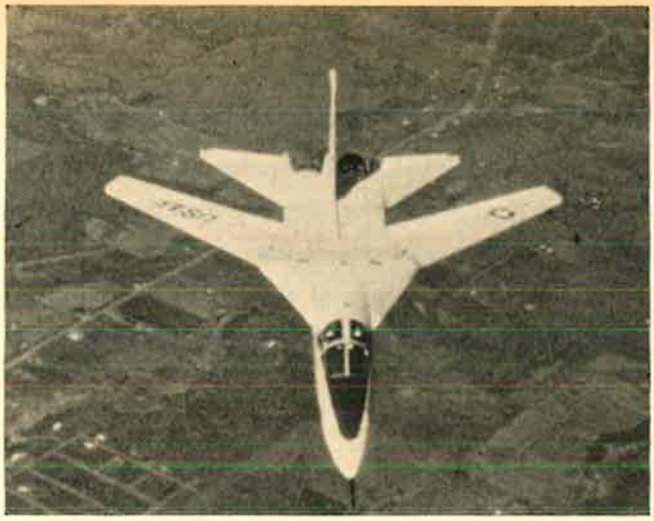
Senator John L. McClellan, who has been studying the F-111 program for more than seven years, is highly critical of the controls imposed by Defense Secretary McNamara on the project's management.

Robert S. McNamara, the Defense Secretary who took personal charge of both military and industrial efforts, attended twenty-two Icarus meetings but testified that he seldom had any contact with the contractors.



At slow speed, F-111 has wings straight, tucks them back . . .

whole affair, like the Lockheed Aircraft Corp.'s financial upset over some of its defense contracts in 1969 and 1970, contributed to image problems for the entire military-industrial complex, if that phrase can be used without its usual connotations. It is one of the tricks of history that the aerospace industry, in particular, has had to put up with such disasters as the TFX concept, total-package procurement, and the war in Vietnam, all while its noisiest critics say it has gone out of control.

The record shows that controls have been exercised, and this has contributed to the plight that the defense industry, the military establishment, and the nation are in today. There is no better example than the fact that the Air Force and the Navy did not agree with Mr. McNamara when he said the F-111 could perform both their missions and ". . . we could meet all three objectives—an advanced aircraft with high dependability and low cost, and we could do this with the resultant saving of about $1 billion. . . ." Time has proved that the Air Force and Navy were right.

Mr. McClellan says that the idea of one plane for both services came out of a directive from Mr. McNamara in 1961. There were civilian and military experts who said it was impossible.

"They continued to voice that expert judgment during the source-selection process in 1962," the Senator says. "They repeated it in our 1963 hearings when the contract was fresh in General Dynamics' hands; they said it throughout the research and development process for the TFX. The Pentagon and the contractor have had more than seven years to prove that a single plane to perform the different service missions could be produced."

The Chairman believes the resulting USAF plane costs too much and could have better performance. He says the McNamara commonality concept is basically responsible for failure of the Navy version and its final cancellation by Congress.

This appears to be what Mr. McClellan intends to show in his final report to Congress, a document that may be some months away. The educated guess is that it will emphasize the individual experience of the Air Force and Navy in the business of developing and building airborne weapon systems. The McClellan conviction is that the services should run their own programs with a minimum of centralization and without an elevation of decision-making to an upper level of incompetence in such matters. The McClellan report, when it comes along nearly eight years after the show opened, is expected to call for a different kind of management than that displayed on the TFX, or F-111, project.

The curtain opened in late March 1970 on an act that can be credited, in part, to Greek mythology. On the stand that day, the subcommittee had Lt. Gen. John W. O'Neill, Vice Commander of the Air Force Systems Command, and Brig. Gen. A. L. Esposito, Director of the F-111 Systems Project Office. There was some discussion, late in the morning, about a series of Saturday meetings, called by Mr. McNamara and presided over by him. Summoned to these sessions were top executives of General Dynamics and two major subcontractors—Pratt & Whitney Aircraft, which makes the engines, and Grumman Aircraft Engineering Corp., which worked on the Navy version, the F-111B.

There was no publicity at the time about these sessions, and the Pentagon's top civilian management did not want it known they were held. The facts were hard to conceal, however, when some of the nation's highest paid and most competent industrial managers were called in and told how to run their businesses. There was a good deal of bitter talk about the dictation given to men who had spent their whole lives building airplanes and engines. Some of this leaked out, and one Saturday morning a newspaper reporter stood outside the River Entrance to the Pentagon, making a list of those who entered.

It was General Esposito who fielded the first McClellan questions. At the time of the meetings, in 1966 and 1967, he had the rank of colonel and was in charge of USAF's F-111 office in the Pentagon headquarters. Mr. McClellan asked General Esposito what was done at the meetings. The reply was that the witness never went to the meetings; he was not invited. Mr. McClellan was incredulous. You were the project officer and you were not asked to attend? That was correct.

However, the General volunteered, his office was

. . . as it goes faster, to reach high Mach configuration.

asked to prepare data for these meetings; pieces of paper that had to meet a Thursday or Friday deadline. And, he continued, for the sake of military orderliness they had a code name for the exercise in their own office, so they would know why they were compiling certain information. What was the code name? The answer was the kickline of the act: "Project Icarus, sir."

Icarus, if your Bulfinch is rusty, was the son of Daedalus. He tried to escape from imprisonment by flying away with wings fastened to his body with wax. He flew too close to the sun, the wax melted, and he fell to his death in the sea. Icarus, in fact, could not fly at all, once he got close to the source of all light (and heat).

F-111F—Latest in the Series

The latest model in the F-111 series, and the one that will best serve the Air Force mission, is the F-111F. The F-111F differs from the F-111D only in its engine and its avionics system. A new Pratt & Whitney P-100 engine will provide a twenty-five percent increase in thrust. The avionics system will be less costly than the originally proposed Mark II package but will have similar capabilities, except against moving land targets.

At one time USAF planned to buy 219 F-111Fs. This number was reduced to ninety-eight, the last forty of them to be purchased in Fiscal 1971, out of the budget now before Congress. Now USAF has found that the $566 million in the Fiscal 1970 budget and the $283 million requested for Fiscal 1971 will fall about $125 million short of what ninety-eight planes would cost. For this reason, there will be a further cut in the order. The exact number depends on negotiations under way at this time.

Meanwhile, the Australian government has postponed delivery of its twenty-four F-111Cs, pending full correction of deficiencies and proof of the aircraft's performance. For the interim, the Defense Department has agreed to lease twenty-four McDonnell Douglas F-4E Phantoms to Australia.

At a subsequent meeting, Mr. McClellan revealed that he knew more about Icarus than Mr. McNamara had intended him to find out. It seems that an officer who did attend the meetings kept notes, and these were made available to the subcommittee after Melvin R. Laird became Defense Secretary. What the notes show is that the man with the credibility gap was Robert S. McNamara.

The Icarus meetings were held from late August of 1966 through the spring of 1967. There were Icarus meetings, almost all of them on Saturdays, and "preliminary" Icarus meetings, usually on the preceding Thursdays. The record shows that Mr. McNamara was in attendance at fifteen of these sessions between August 25, 1966, and January 28, 1967.

Yet, on January 27, 1967, the eve of the last meeting mentioned above, there was this exchange before the Senate Defense Appropriations Subcommittee:

SENATOR MCCLELLAN: Mr. Secretary, you keep saying you are not familiar with these things. Do you not have a meeting once a week with your contractors yourself?

SECRETARY MCNAMARA: No, sir.

SENATOR MCCLELLAN: How often do you have [meetings] with them and discuss these matters?

SECRETARY MCNAMARA: I probably have met with the contractors—I am meeting with them tomorrow morning at 9:00 o'clock. I probably have met with them twice in two and a half months or two months.

And, later:

SECRETARY MCNAMARA: I answered categorically [that] I have not had a meeting with the contractors once a week. I have met with them probably two to three times in the last two months.

This credibility gap was not narrowed at that same hearing when the Defense Secretary told Senator McClellan, "I am not intimately acquainted with the deficiencies that you say now exist" in the F-111. The Icarus file shows that he participated in discussions of these alleged deficiencies on August 25, September 9, September 10, September 17, and October 22, 1966. The subcommittee says the Secretary, at every Icarus meeting he attended (and there were seven more of

(Continued on following page)

The F-111 has the best safety record of any new military aircraft since the early 1950s. It will provide the most cost-effective bomb-delivery system.

these after January 27, 1967, to make a total of twenty-two), "listened to and participated in extensive discussions of the specific technical problems introduced at the first meeting, and that he made decisions and judgments frequently in relation to them."

Here's another: The Icarus file shows that at a meeting on September 14, 1966, Mr. McNamara asked for F-111 cost figures and an explanation of why they were increasing. Defense Comptroller Robert N. Anthony was assigned the task. On October 20, Dr. Anthony's report was put on the action list for the next meeting. On November 17, Mr. McNamara displayed the tables and lamented what he called "a disgraceful cost position." A little more than two months later, there was this exchange at a Senate hearing:

SENATOR MCCLELLAN: The question was regarding a recently completed and extensive cost study. You say you do not have that?

SECRETARY MCNAMARA: I say I do not know of any recently completed cost study of the production cost of Air Force and Navy planes.

And, later:

SECRETARY MCNAMARA: The last time we had a definitive study of costs by the contractors was at the time we negotiated the contract with the United Kingdom, and that would have been roughly a year and a half ago.

Two days later, at another session:

SENATOR MCCLELLAN: You don't recall a special study?

SECRETARY MCNAMARA: No, sir, I don't.

SENATOR MCCLELLAN: That you directed be made?

SECRETARY MCNAMARA: No, sir, I don't.

SENATOR MCCLELLAN: And that was made in this area?

SECRETARY MCNAMARA: I don't say it wasn't made, but I don't recall it, and I am certain I didn't ask for it.

SENATOR MCCLELLAN: Mr. Secretary, did I understand you correctly a while ago that you have no knowledge of any cost studies?

SECRETARY MCNAMARA: No, sir, I do not.

The Icarus file includes a note to the effect that there was a discussion on the prospects for a variable-wing F-4 at the meeting of September 16, 1966. "Mr. McNamara," the note adds, "indicated he was not interested in the sweptwing F-4 now and did not welcome the pressure being exerted on the issue by the press."

A little more than four months later, at the January 27 Senate hearing:

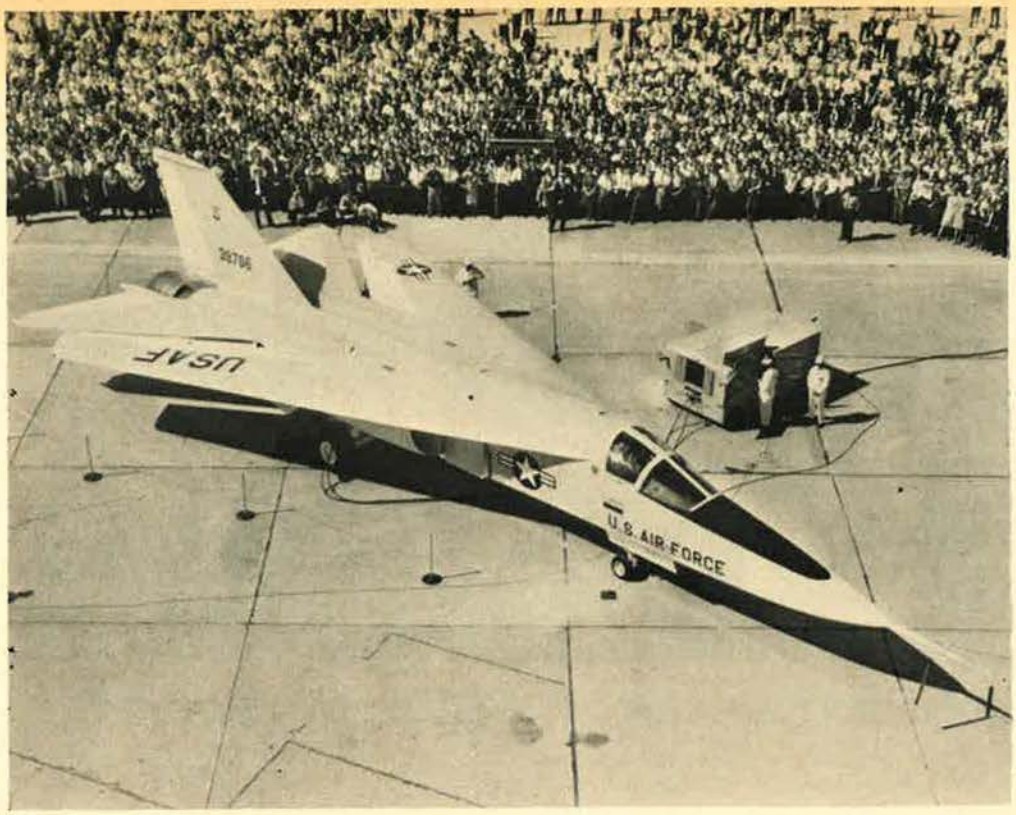
SENATOR MCCLELLAN: Would you have such a proposal, is it likely that such a proposal as this has been submitted by McDonnell Aircraft Co., and you not know about it?

SECRETARY MCNAMARA: Oh, yes, surely. The services receive hundreds of proposals that I don't know about.

SENATOR MCCLELLAN: Then you don't recall it ever having been discussed with you?

SECRETARY MCNAMARA: I don't recall it. I am not aware that it was submitted, sir, but it may have been. I am not familiar with all the weapons proposals submitted by contractors to the services.

Dr. Harold Brown, then Secretary of the Air Force, does not escape unscathed in the Icarus file study. In meetings from November 17, 1966, to June 24, 1967, he displayed interest in the efforts of the contractor to meet specifications. He said they had not succeeded and were not "measuring up." The original specification on ferry range was 4,180 nautical miles, the reduced specification was 3,713 n.m., and the range demonstrated, as of late 1966, was 2,948 n.m. Dr. Brown said he would take no more than twenty-five planes



In Vietnam, USAF F-111 missions all were at night, usually in foul weather. Bombing accuracy was better than that achieved by other planes in daytime operations.

with 2,700-n.m. range and he "particularly wanted to avoid the criterion that what's acceptable is what's available."

On March 14, 1967, more than a month before making the latter statement to the Icarus conferees, Dr. Brown appeared before the House Armed Services Committee. At that hearing, he said:

"We currently estimate that the F-111A will have a ferry range of at least 3,300 n.m. with internal fuel only [with items under development, the number may be as high as 3,600 n.m. or more in later aircraft]; the 3,300 n.m. is an originally stated parameter and permits deployment without in-flight refueling, to either Europe or the Far East."

A little more than three months later, June 24, 1967, he told the Icarus meeting that "range was now 2,900 n.m. Could come up to 3,300 with fixes." The McClellan Subcommittee says the ferry range is 2,750 n.m., thirty-four percent less than the specification.

At an Icarus meeting in late 1966, Dr. Brown said "a lot of money and effort has been spent trying to get to Mach 2.5, and it would be unwise not to continue trying to meet the specifications now." In January 1967, he said Mach 2 was not acceptable; the goal was Mach 2.5 but "there is no assurance we can get even to Mach 2." In February he said he simply didn't know whether the aircraft ever would reach Mach 2.5, in which he was supported by Dr. John Foster, Director of Defense Research and Engineering.

On March 14, 1967, about a month later, he testified to the House Defense Appropriations Subcommittee as follows:

"These features—coupled with a low-level dash speed of Mach 1.2 in all weather, using automatic terrain-following radar and a maximum high-altitude burst speed of Mach 2.5, with air-to-air missiles and radar—provide a higher penetration and survival potential than that of any current tactical aircraft."

On May 26, 1967, Dr. Foster asked at the Icarus meeting whether straight and level Mach 2.5 performance could be obtained with the configuration being discussed. Frank Davis, President of General Dynamics, "doubted it," according to the Icarus file.

A few weeks later, on July 14, Deputy Defense Secretary Paul Nitze told a Senate Appropriations hearing: "As I understand, 2.2 was our guarantee. The spec called for was 2.5. The 2.5 has been met in the 'A' version."

The subcommittee credits both the USAF and Navy aircraft with a maximum speed of Mach 2.2, which is twelve percent less than the specified 2.5.

So far as USAF is concerned, General O'Neill had no argument with the subcommittee's charts showing performance specifications in the contract compared to the performance actually achieved. He said they were incomplete, because there was no data on utilization rate, maximum sustained speed, and the in-commission rate. The General also responded to questions on the significance of these deficiencies in military operations. He said the two with greatest impact were excessive takeoff weight and reduced supersonic-dash distance. The takeoff weight is 82,500 pounds, up twenty percent from the specified 69,122 pounds. The supersonic-dash distance is thirty miles, down eighty-five percent from the specified 210 miles.

It was inevitable that professional critics of the system would pounce on the new round of McClellan hearings. One job was done in the Washington *Post* by staff reporter Bernard D. Nossiter on April 26. He culled the Icarus file and the hearings to come up with a thesis that the program's shortcomings were

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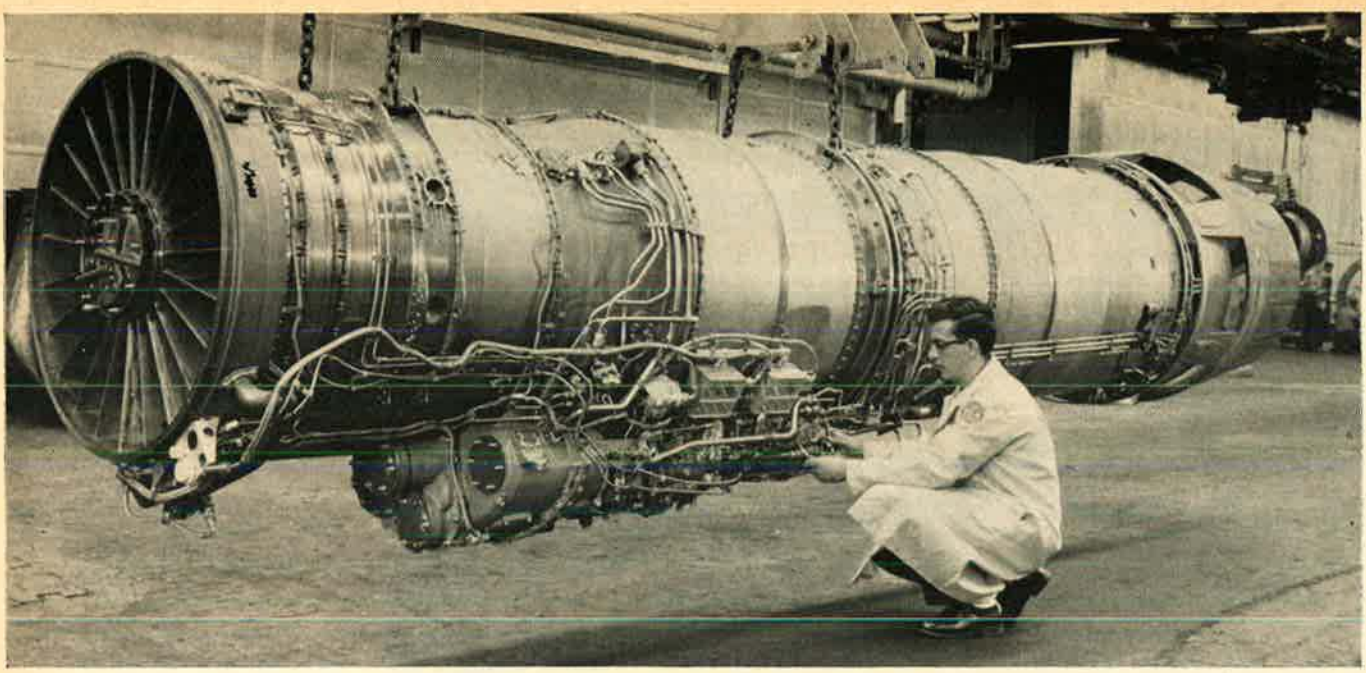


Newest version of this Pratt & Whitney duct-burning turbofan engine, now designated the P-100, will be used in the F-111F. Thrust has been increased up to twenty-five percent to meet requirements for the Air Force mission.

due to military and contractor calumny and that Mr. McNamara, struggling nobly, was frustrated by his own minions. He pictured the Secretary as "the gifted administrator, frantically trying to control a runaway machine."

As might be expected, this brought a reply. It was offered to the *Post*, and printed. The author was Congressman Jim Wright (D-Tex.), who acknowledged at the outset his debt to 20,000 constituents in Fort Worth, Tex., who build the F-111. The Congressman refrained from pointing out, as Mr. McClellan had done, that the military services did not make the decisions, from the choice of a contractor to the Icarus meetings which served to tell the contractor how to perform. Mr. Wright was satisfied to call the F-111 "the monster of popular fantasy—conceived in the mind of a senior senator, fabricated in a stormy set of hearings, flight-tested on page one, and sent shivering into combat on the Huntley-Brinkley Report."

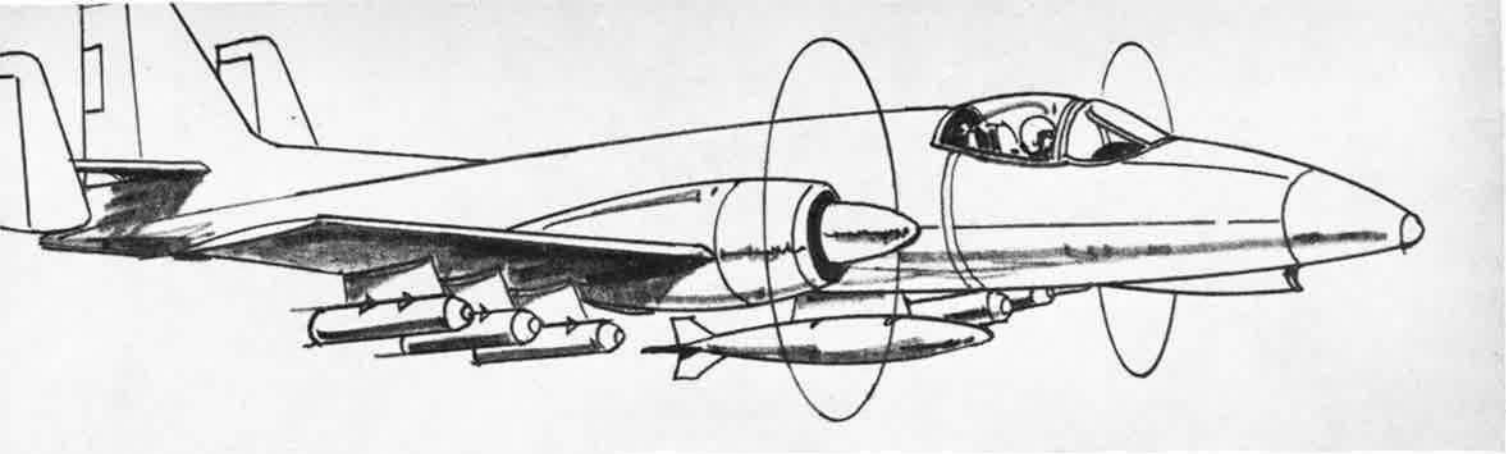
Then, Representative Wright gave some facts about the airplane, none of which has been controverted:

- The F-111 has the best safety record of any new military aircraft built in this country since the early 1950s. It has had a total of eighteen serious accidents—twenty-one if you count three lost in Vietnam. For a comparable number of hours of flight, outside of combat, the eighteen compare with twenty-two for the F-106, thirty-four for the F-105, forty for the F-102, fifty-one for the F-104, and fifty-nine for the F-100.
- It surpasses more of its original specifications than it fails.
- The F-111 can carry three times the bomb load for better than twice the distance as the next best tactical bomber in our inventory.
- Before the bombing of North Vietnam was stopped, an Air Force F-111 detachment flew more than fifty combat missions there—all of them at night and eighty percent in weather so bad no other aircraft were operating. Bombing accuracy was better than our other planes were achieving in daytime. The F-111 is the best aircraft in the world for delivering a payload on a heavily defended target, regardless of visibility.
- Air Force pilots who have flown the F-111 are enthusiastic about it (*see* AF/SD, *December '67*). It is the only American aircraft that has aroused Russian concern at the SALT talks, now under way in Vienna.
- The F-111 is the most cost-effective bomb-delivery system in USAF history. The initial cost is high, but it would take thirty-one different aircraft to perform a mission that can be carried out by the four F-111s. It needs no tankers, radar scramblers, or fighter escorts on a typical 1,000-mile mission.

The sad part of the F-111 story is the focus of the headlines, and the Senate interest, on matters other than what the F-111 can do. Senator McClellan is determined to make a major issue out of Mr. McNamara's insistence on commonality and his (McNamara's) assault on the aeronautical competence of military men. After all, Wright-Patterson Air Force Base has been in Dayton for many years, and it was preceded by McCook Field; the Wright brothers were there before that.

The decision of Mr. McNamara to take over personal direction of the program is a fit topic for investigation. The fact, recounted in the Icarus record, that he was running it from week to week at its most critical period and gave Congress considerably less than the whole truth is a charitable evaluation of that record.

The report of Mr. Goulding that the Defense Secretary didn't seem to care whether the public understood his position is not important. No bureaucrat is with us forever. The fact that Mr. McNamara went out of his way to humiliate the military services and the defense industry and to deceive key members of Congress may be the greatest in a long list of disservices to national defense.—END



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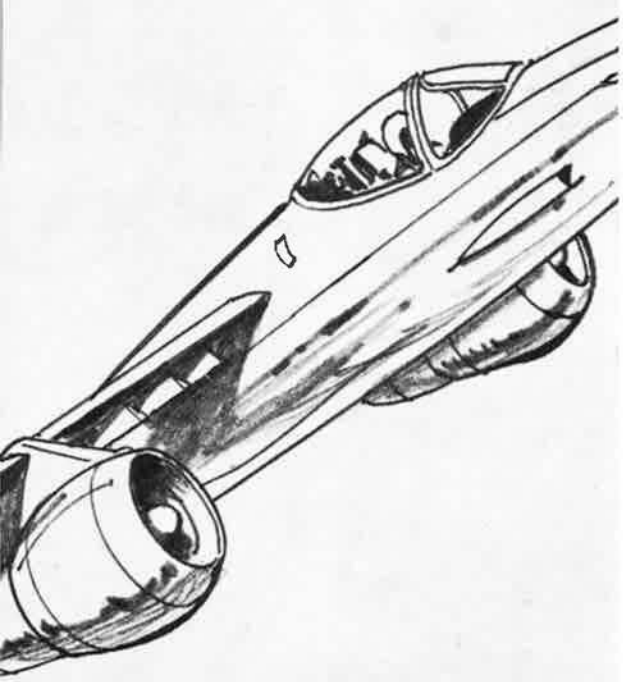

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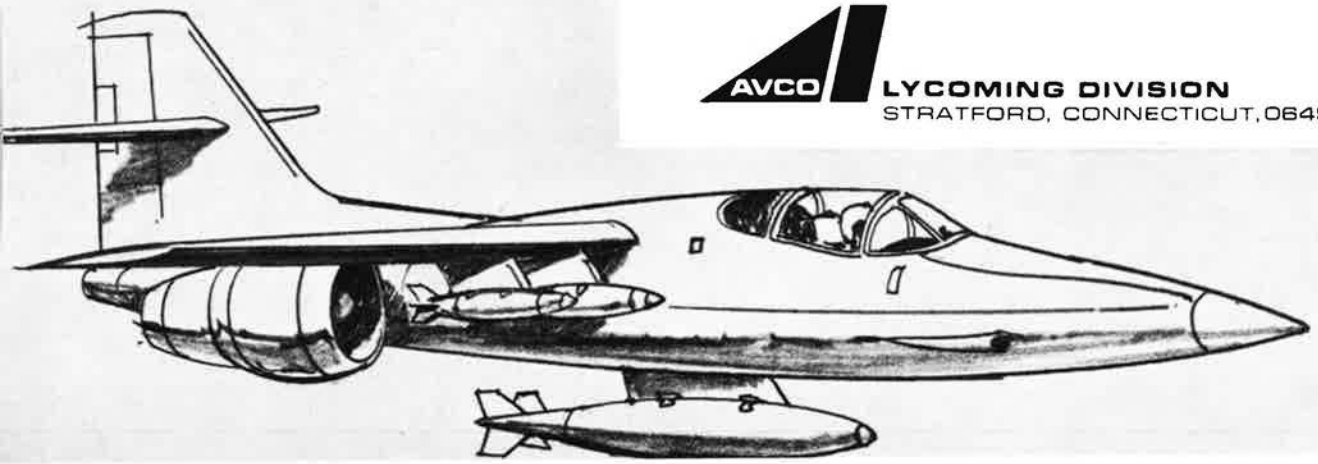

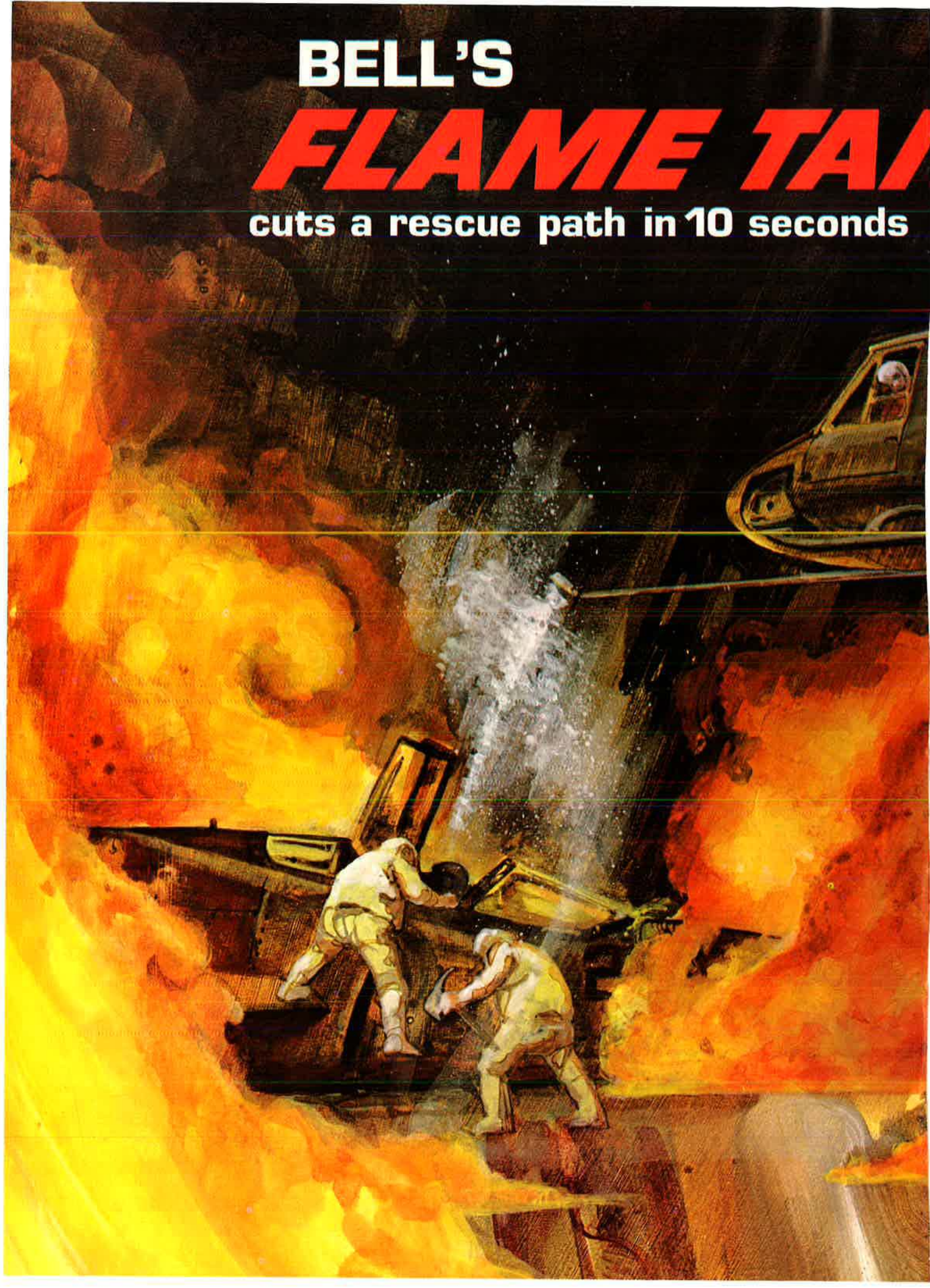
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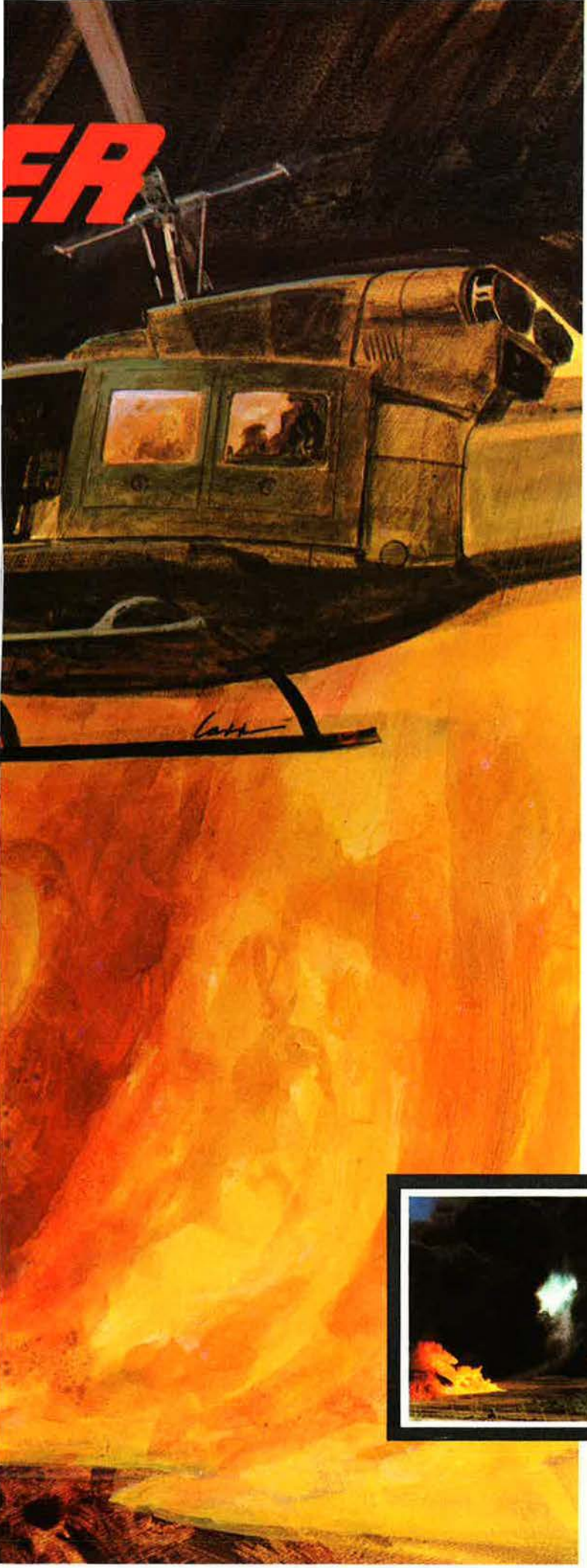

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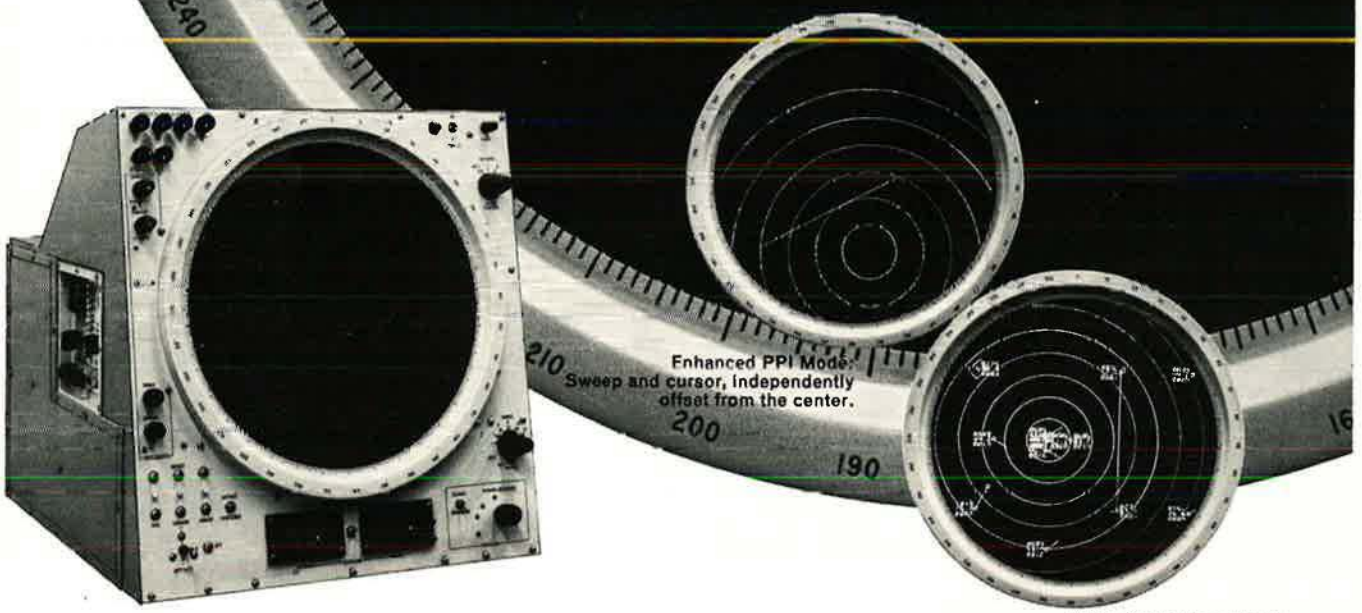

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SOME THOUGHTS ON LEADERSHIP

By Gen. Bruce K. Holloway, USAF

COMMANDER IN CHIEF, STRATEGIC AIR COMMAND

THERE is an old cliché amongst military commanders of the recent and not-so-recent past which echoes a tenet of leadership that is fortunately going out of style. The cliché is: "I'm not here to win a popularity contest," and the tenet is: "Give them the WHAT, WHERE, and WHEN, and so much of the HOW as is necessary to ensure adherence to the basic planning objectives." Nothing whatever is said about the WHY.

I have worked with and for some very fine commanders who took pride in not being popular with the troops. They believed that discipline was degraded unless they were held in a fearful type of respect, and associated closely with such respect was the necessity for never explaining the reasons for their positions, actions, and decisions. Such a policy was strictly one of buttressing a code of adherence to orders and directives, and had nothing to do with the necessity for withholding certain information for security reasons. In the past, such a philosophy has worked for some American military leaders, but I do not believe it has been necessary, or—in most cases—even wise. Today it does, not work very well in the United States.

I don't know whether leaders are principally born or made. As for practically all things, the formula is complex, and full of variables; but I do know that one priceless advantage toward becoming a leader in today's world is being born and raised an American. I do not believe in total regimentation as a mode of discipline, nor do I believe that blind adherence to a kamikaze-type code can ever—for long—be successful in the interactions of those who lead and those who are led in our present society. Neither do I believe that softness, or overextension of a malcontent's so-called rights, or toleration of willful misconduct or disobedience are any more acceptable than they have ever been.

People, however, seem to be getting smarter. Certainly more of them are becoming opinionated. They are deluged with information and conflicting views—including a lot of destructive criticism—on every imaginable issue, big and small. Communications media are massive and instantaneous. Those who do think, think more, and question more. Those who don't are also confused. Machines are more sophisticated, and the whole problem of participation in any subject is becoming more complex, comprehensive, diversified, and mutually associated with the problems of other endeavors. So: The people need to know "WHY."

Responsibility and Authority

I have spent thirty-seven years trying to learn how to be a leader. All of the military commanders, key staff officers, and civilian officials for whom I have worked taught me something valuable in this quest. Some of this was of a negative, or what-not-to-do sort; but most of it has been positive. I do not ascribe

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this favorable ratio to any particular luck on my part, but rather to a strong conviction that the best leadership in the world is to be found in the American armed forces.

Contrary to much criticism, I also believe that our military leadership is progressive, and certainly in tune with the times. I would submit that it *has* to be in the most competitive business in the world, with the uncertainty of yearly budgeting, and the management techniques that must keep pace with the offerings and mandates of spiraling technology. Costs for defenses are indeed frightening, and cost overruns do occur, and hindsight usually shows how something could have been done better. The quest for peace without armaments becomes ever more important, but in the real-life of NOW, there is much to be said on the side of defense management being well performed

General Holloway was the first senior USAF general to check out in the Air Force Mach 3 reconnaissance aircraft, the SR-71. The contrast between the pressure suit he is wearing here, and the baseball cap he wore as a P-40 ace in China during World War II, is symbolic of the revolution in airpower that has put new demands on Air Force leaders.

through competent, dedicated, and tough-hided civilian and military leaders. We must keep it that way.

Most discussions of a broad subject of human performance begin with the fundamentals. Leadership has a long list of them, and they are elemental, well known, and mostly noncontroversial. They include honesty, selflessness, fairness, courage, dedication, tough-mindedness, compassion, and perseverance. Broader adjectives which embrace all of these and still other important personal traits are CHARACTER and INTEGRITY. I have heard it argued that AMBITION is also a broad cardinal requirement, but in the usual connotation of the word, cannot agree. I do believe, though, that a DEVOTION to RESPONSIBILITY, which must stem from the quality of ambition in its most benevolent sense, is a rock-bottom "must" in the makeup of a successful leader.

When I was about six years old, my mother bought me a soldier suit with brass buttons. It absolutely mesmerized me, and my idea of uniforms at that time was really twisted up. To me, a uniform was symbolic of supreme authority without any particular responsibility. Policemen, soldiers, and anybody else who wore this kind of suit had to answer to nobody. It is most unfortunate that a lot of kids (both young and old) are allowed to get this idea about all men in uniform in our society, and to harbor deep and ill-founded resentments which are fostered by such ingrained imaginings. Nowhere in the world is such a postulation further from the truth than it is here, today. I have a personal abhorrence of this attitude, and of its substantial existence amongst our citizenry. It is a dangerous emotional illness that depreciates faith and confidence in the leadership of the biggest and most important tax-supported business of the free world, for the immediate years ahead: The Armed Forces of the United States.

In the civilized world of men and women, AUTHORITY is used to serve RESPONSIBILITY. The usage and extent of authority must always be carefully tailored and metered to suit exactly the needs of par-

Gen. Bruce K. Holloway, a 1937 graduate of the US Military Academy, has been Commander in Chief of Strategic Air Command since August 1968. During World War II, he served in China with the famed Flying Tigers, ultimately commanding all the fighter aircraft of General Chennault's Fourteenth Air Force. General Holloway is the second-ranking surviving ace of that theater.

After the war, he commanded the first Air Force jet fighter unit. Subsequent assignments included Air Force Director of Operational Requirements; Deputy Commander of TAC's Ninth and Twelfth Air Forces; Deputy Commander in Chief of the joint Army/Air Force Strike Command; Commander, US Air Forces in Europe; and Vice Chief of Staff of USAF.

General Holloway has flown all the modern Air Force fighters, the SR-71, and is current in SAC bombers and tankers. Typical of his philosophy of leadership, he completed parachute jump training while a three-star general at Strike Command as a "suggestion" that other key Air Force members of the command volunteer to join their Army colleagues as qualified parachutists. There was no dirth of volunteers after that—and there never has been in any organization commanded by General Holloway.

ticular responsibility. Of all the constants—or rules of application of leadership—I consider this the most important, but unfortunately it is commonly abused. The abusers appear in all walks of life—in schools, in clubs, in street gangs, in business, in the news media, in labor unions, and in the military—everywhere. And wherever it does appear, it causes trouble that is very nearly in direct proportion to the extent and the level of its activity. It is conditionally associated with and nurtured by other human vices that are more universally understood and deplored, such as greed and desire for attention. It is the broadened epitome of these, and it can wreck nations.

If there is a definable common denominator that applies to the downfall of past societies of the world, it is the use of authority to serve other than the responsibilities of established objectives. A leader who understands this, and who has the strength of character to resist the temptations that cause overextensions of authority has a great chance of success—for the probabilities are high that he will have, or will acquire successfully, the other important attributes of good leadership.

People—The Most Important Resource

Leaders are resource managers, and the most important resource will always be people (unless—as some predict—the insects eventually take over). I have heard it argued that, as machines improve and replace people in the functions of calculation and decision (as well as production and distribution), there will evolve a type of technocratic management wherein the distinction between people and machines will get less and less, and that someday there will be no difference at all. This, to me, is monumental nonsense. People have emotions, and complexes that are caused by emotions; and the only thing of commonality in managing men and machines is that both require good maintenance—of entirely different sorts. Thus, to understand people fully for what they are, and to remember always that they are motivated through their emotions and not through spark plugs, voltage regulators, or antenna wave guides is another of the cardinal principles of leadership.

So many things fall under this heading that just to catalog and index them would be voluminous. Praise, pride, punishment, professionalism, discipline, inspiration, example, awards, and recognition are all extensive subjects concerning the management of human performance, and are copiously treated and evaluated daily against the changing demands of the changing times. I do not care to add any thoughts of my own here on any of them, but there is a related axiom of behavior that has always intrigued me, which prompts a few remarks.

I have always heard that with women, it's the little things that count. This is very astute philosophy, although I have never understood why it was just for women. It works with everybody: boys, girls, grandpas and grandmas, dogs, cats, men, AND women. Good leaders understand this, and capitalize on it. Some do it rather clumsily, but most comprehend its high importance and cultivate habits of thoughtfulness and consideration that form a natural pattern of their personality. It extends beyond the fundamentals of simply "taking care of the troops," and it really pays dividends.

There are practically endless examples of the little things, and many of them are quite common—such as learning the first names of key subordinates as soon as possible—but one that I have found to be particularly effective is interest in recreational activities: attending the ball games, working on a project at the hobby shop, and checking personally on the condition and needs of riding stables, youth centers, picnic grounds, and the like. If you play golf, don't always play with the same set of people. Show up occasionally and play with whoever is looking for a game. The only caution in these things—and it is a big one—is not to overdo it.

Some Lessons from World War II

During World War II, I was involved with fighting against the Japanese on the mainland of China. We didn't have much to work with, and, of course, thereby hung a pretty good test of the quality of leadership. General Chennault, the boss airman, met this test as well as anyone I have ever known or read about. He was beset with almost as many problems as Job, and he met them well. Much has been written about this, and Claire Chennault has become legendary as a great tactician, and a leader who got the "mostest out of the leastest." His praise is well deserved.

During World War II, at Kunming, China, Maj. Gen. Claire Chennault decorates Lt. Col. Bruce Holloway who was soon to return to the States as ranking ace of the Fourteenth Air Force. At Holloway's left is Maj. John Alison, also an ace, who's now a Northrop vice president.

Looking at the other side of the equation in China at that time, however, there are two intensely interesting aspects of leadership on the part of the Japanese about which very little has been written. These have their roots in the modern history of Japan itself.

Before 1945, discipline in the Japanese armed forces was probably as hard-lined and uncompromising as it

(Continued on following page)

Some of the author's earliest lessons in leadership were learned in the skies over China, where men like these Fourteenth Air Force pilots shot down ten enemy planes for every US loss. General Holloway attributes that record largely to an absence of Japanese planning flexibility, contrasted to the imaginative leadership, flexible planning, and individual initiative of US airmen.

has been anywhere at any time throughout recorded history. It could well be described as supreme regimentation. As things became tougher and resources depreciated, discipline became even more rigid. And with this rigidity, there was that inevitable companion piece, INFLEXIBLE PLANNING.

Even in my small position in the scheme of things, this was indelibly evident in the manner that an air raid was carried out. Planning detail was meticulous. The Japanese bombers approached in a shallow "V" with wingtips practically overlapping; and the escorting fighters were in a stereotyped formation, always upsun, and always the same distance from the bombers. It never varied, and if a bomber was shot down, the "V" immediately closed in to fill the space vacated.

The fighters always used the same tactics, and they could be "suckered away" from the main bomber force with relative ease. They seemed to lose sight of the objective and redouble their efforts, and never failed to stick around awhile and put on a spectacular show of aerobatics and inaccurate shooting. It was very ineffective, and the weakest link of all concerned the bomb leader. He always flew the number-one position at the apex of the "V"—always; and if he was shot down, everything went to pot. The formation fairly rapidly unraveled, bombers could be picked off one by one, and the fighters seemed to have little concern over protecting the stragglers even after the situation deteriorated to the point of more stragglers than formation.

This brought home to me, as much as any other period of experience in my life, the pricelessness of being an American, and of having been raised as a typical American boy—with the freedoms that are enjoyed under the guidance and discipline of a typical American home, and where everything is all wrapped up in the love and faith and example of a typical American mother and father. Regimentation stifles initiative. In fact, it does even more: It creates a fear of it.

Plans always go wrong. Sometimes they go a little bit wrong and sometimes they really disintegrate, and no program and no operation in any class of endeavor can ever materialize exactly as planned. Any person of responsibility who fully comprehends this—and its importance—and who always thinks ahead on what he will do "if," and who can reason clearly when confronted with an unexpected contingency, and adapt quickly to the best alternative plan of action, and who always has trained another or others to take his place if he is incapacitated, is richly endowed with another of the cardinal attributes of good leadership.

"Planning ahead" is often heard, but the principle is much deeper and is perhaps best described as planning versatility. An environment that emphasizes free competition and decentralization of responsibility and authority helps no end in fostering this quality. Such an environment is America, and, as I have already remarked, there's nothing that comes close to being an American.

Accepting New Ideas

Having said something rather unkind about the Japanese of years past, I would like now to mention another of their characteristics that is a tremendous boon to progress, and one directly associated with good leadership. I refer to their receptivity to ideas. They are, and during my lifetime always have been, voraciously hungry for new ideas and for better ways of doing things. It seems somewhat curious that this quality has been so prominent in a nation that has been associated with the Orient and its resistance to change and its "face," but it is true, and it is a most admirable quality.

This receptivity has no apparent bounds, since it extends to the very roots of their government, its principles and procedures, and even to the Japanese philosophy of life. They are not just willing, but eager to adopt that which analysis shows to be good or progressive on the part of others, no matter who they are. After 1945, Japan adopted much of our form

of government, many of our business and management practices, practically all of our technology, and, of especial consequence, our production techniques and quality control.

We can now learn from the Japanese on matters of quality control. It is more finely developed and universally observed—with pride—in Japan than in any other country of the world today. I really believe that their keen and unbounded receptivity to better ways and means is more responsible than anything else—except perhaps individual industriousness—for the spectacular rise of Japan in the last twenty-five years amongst the nations of the world. This receptivity reflects on another of my favorite attributes of good leadership.

Our own military leaders of the past are noted for many fine qualities, but receptivity to new ideas has not always been one of them. The horse-cavalryman and battleship admirals are examples, and I do not like to think of the times that I have personally deserved this criticism.

In looking back over the past fifteen to twenty years of my own career, I think the big mistake that many military people made was not adapting to the fact of life that their profession had become a many-faceted thing, with every type of person involved that you could name: politician, scientist, economist, diplomat, technician, engineer—everybody. Into this involvement came an elite staff corps that got into everybody's business. There was a great resistance on the part of the people in uniform. It stemmed primarily from the thought that since the specialists had never been shot at, had never been in an airplane, or had never driven a tank, they must be stupid and were to be resisted. That attitude was wrong. The evolution has taken place. It is here to stay.

This characteristic is understandable, and it is largely in the past tense. The competition for funds has helped greatly to eradicate military intransigence, and the ever-increasing costs and lead times for armaments, not to mention the consequences of failing to recognize the best courses for action, have paced it. Receptivity to new ideas, together with an attitude that all ideas are innocent until proved guilty, is more important than ever. This openmindedness, plus an acceptance of the practice that new ideas must be proved through thorough analysis prior to translation into programs or procedures, has emerged importantly as another major requirement of the modern leader.

Ways of Meeting Today's Stresses

Even though we are in an age of rapid technological advance, the processes of decision seem to be slower, and certainly are more laborious and ramified than in the good old days. The stresses on the executive are greater. The demands on his time are greater, his target dates more exacting, and the number of people he must deal with more extensive. This, of course, is brought about by the very necessity for study, analysis, broad staffing, and the multilayered review mentioned above, and it underlines the sixth and last cardinal requirement of leadership which I wish to mention briefly: HEALTH.

Human maintenance is one of the most difficult of all the problems of a modern leader, and it increases in difficulty as the level of responsibility gets higher. During a recent tour on the Air Force Staff, I made a habit of counseling new colonels reporting in, with respect to their health and their recreation programs. Being a firm believer in good exercise, and in recreational pursuits of one's liking (as opposed to those which might be more popular for someone else), I pointed out that it would be up to the individual to schedule his official duties and social obligations, so that he could find the time for exercise and recreation.

I stated, as the voice of experience, that it would be hard to do; that nobody would be particularly helpful; that unscheduled demands on their time would be frequent; but that, if they did not find a formula, they would probably not be able to do a good job. Thirty days of leave per year are authorized for military officers, and it is unfortunate that some commanders do not take overt measures to see that their subordinates avail themselves of it. The policy is designed for the welfare of the individual, but it is there also to protect the investment of the employer.

Most commercial ventures seem to understand this, but in the clamor of activity at the Pentagon, the need for topside attention to enforcing proper rest and recreation for the backbone of staff leadership—the colonels and generals—is acute. Key staff people do not get it, and do not insist on getting it because of their dedication to a job-pattern that is as incessantly demanding and as deadline-frantic as the world perhaps has yet seen. A leader needs good health and proper rest to concentrate, and to make good decisions, which he may have to make under circumstances of sudden and grave proportions, without warning. Like many other things, health is becoming increasingly important to our leaders, from the President on down.

The Elements of Leadership

I have mused on a big subject, and have listed six cardinal elements of leadership as I see them:

- The importance of telling why.
- The trust of responsibility, and the far-reaching penalties of abusive authority.
- The importance of little things in people management.
- The necessity for flexibility, innovation, and farsightedness in planning.
- Receptivity to new ideas.
- Health.

Certainly, there is nothing axiomatic about these, and they are subjectively broad within themselves. In a sense, I consider them time-honored, but have attempted to emphasize wherein today's demands particularly modulate them. As the title indicates, they are thoughts on leadership that are products of my own experience, and are offered as opinions rather than proved treatises of long standing. They are just that—thoughts—and nothing more.

In concluding, I might return to the question of uncertainty as to whether leaders are principally born or made, and offer a brightly oversimplified additional thought that they are born with the will, the common sense, and the intelligence. All other qualities must be acquired.—END

For an operation like Cambodia, airlift was crucial and some of the big C-130 Hercules transports were used. This was the scene at Katum, one of the forward airfields used to supply troops moving against Communist sanctuaries, as the big birds were offloaded.

A Photo Feature . . .

The Air War in Cambodia

The South Vietnamese and American action in Cambodia—designed to destroy enemy sanctuaries built up over the years—featured a massive deployment of airpower, in terms of air strikes and carrying troops, ammo, and supplies to the forward areas. Here is a special **AIR FORCE/SPACE DIGEST** ***report photographically highlighting the airlift and air war in that embattled country.***

A forward air controller (FAC) gets the go-ahead from the ground to take off aboard his OV-10 Bronco for a combat mission over Cambodia. The FACs, ordinarily assigned to Bien Hoa Air Base in South Vietnam, were flying out of Quan Loi on missions over the Fish Hook area of Cambodia.

Underneath all that foliage—an enemy location, under air attack by a barely visible F-4 Phantom jet. This action took place in the Se San base area of northeastern Cambodia, as part of the air support of Allied ground troops sent to move against Communist sanctuaries.

En route in Vietnam to their mission in Cambodia, these US Army troops arrive at Pleiku Air Base from An Khe. They flew in aboard C-130s, which ferried men, ammunition, and supplies to Cambodia. C-7 Caribous and C-123 Providers were also used in the sizable airlift operation.

Capt. James P. Fleming

Sgt. John L. Levitow

A Special Report

The Air Force Association proudly joins the US Air Force, and the nation, in saluting the sixth and seventh Air Force men who have earned the nation's highest award in Vietnam. On Armed Forces Day, President Nixon presented . . .

Medals of Honor to Two Air Force Heroes

ARMED Forces Day 1970 saw two more Air Force men awarded the Medal of Honor for valor in Vietnam, bringing to seven the number of USAF recipients of the Medal in the Vietnam War, and to a total of fifty-three the airman recipients in all armed conflicts dating back to World War I.

President Nixon presented Medals to the two on May 14 in a ceremony at the White House. One Medal went to the lowest ranking airman ever to earn the nation's highest honor—A1C John L. Levitow (later a sergeant), of Hartford, Conn.—a loadmaster on an AC-47 gunship. The other Medal went to 1st Lt. (now Capt.) James P. Fleming of Sedalia, Mo., pilot of a UH-1F troop-carrier helicopter.

The courageous acts for which these latest Medals were presented highlight the bravery and devotion of our airmen in Southeast Asia, who perform under conditions never before experienced in air warfare.

Two-striper John Levitow, who was subsequently promoted to sergeant, was twenty-three years old and had been an airman for a little more than two years when he put his life on the line for his flying comrades on the night of February 24, 1969. On his 180th mission, and filling in for a sick buddy, he was aboard the AC-47 gunship on combat air patrol in support of the Long Binh Army post in South Vietnam, which was under mortar attack.

After sighting enemy mortar-tube flashes, the aircraft commander, Maj. Kenneth Carpenter, of Tacoma, Wash., flew toward the location to attack the enemy gun positions. Just before arriving over the mortar position, the aircraft was racked from nose to tail by a violent, blinding explosion.

An 82-mm mortar round had impacted on top of the right wing, penetrating the skin and exploding inside the wing. The blast left a two-foot hole in the wing and more than 3,500 shrapnel holes in the fuselage. The razor-sharp pieces of metal wounded all the men in the cargo compartment. Everyone in the cargo area was thrown to the floor, and the cockpit crew fought to regain control of the wildly gyrating and rapidly descending aircraft.

At the moment of the explosion, Airman Levitow had been standing near the cargo door, setting the ejection and ignition dials on the magnesium illuminating flares and handing them to another crew member, who pulled the safety pins and tossed the flares out the door upon command from the pilot.

The force of the blast tore an activated flare from

President Nixon stands proudly beside Sgt. John L. Levitow, lowest ranking airman ever to receive the Medal of Honor, during the White House ceremony on May 14. Next to Sergeant Levitow are his wife Barbara; his sister, Mrs. Mary L. Gross; and his mother, Mrs. Lee T. Levitow. His father stands behind them.

the crew member who was launching them. It went forward and landed near one of the Miniguns amid a jumble of spilled ammo storage canisters. The flare was armed and the ejection fuze was burning. In ten seconds it would eject explosively from its casing and in another ten seconds would ignite and burn at 4,000 degrees Fahrenheit.

Airman Levitow, though stunned by the concussion of the blast and suffering more than forty shrapnel wounds in his back and legs, had struggled to his feet and was giving immediate help to the man nearest him, who was bleeding profusely. As he was helping the other man away from the cargo door, Levitow spotted the smoking flare. Fully aware that when the ejection fuze went off, the flare components would separate with lethal velocity, he also knew that the ignited flare could explode the Minigun ammunition and burn through the floor of the aircraft, destroying vital control cables and causing the aircraft to crash.

Levitow had no idea exactly how long the fuze had been burning, but he did know that a flare that has been shaken violently becomes unstable and can ignite or explode any time. With complete disregard for his own safety, he made for the flare.

By then the aircraft was partially out of control, and the flare was rolling wildly from side to side. Suffering from a loss of blood and a partial loss of feeling in his right leg, Airman Levitow struggled to reach the flare. He was unable to grasp it with his hands, so he unhesitatingly threw his body upon it. He hugged it close and dragged himself back to the cargo door. With his last remaining strength, he hurled the flare through the open door. At that instant the flare separated and ignited in the air.

Major Carpenter brought the aircraft safely back to its base at Bien Hoa, and Airman Levitow was air-evaced to Japan, where he recovered from his wounds. He returned to Vietnam and flew another twenty combat missions before coming back to the States, where he served as loadmaster on C-141 StarLifters at Norton AFB, Calif., before his enlistment ended. He is now back in Connecticut as a civilian.

USAF's other new Medal of Honor winner, James Fleming, was a first lieutenant, an ROTC graduate, and twenty-four years old with less than two years as a pilot on November 26, 1968, when he flew his UH-1F chopper to the aid of a six-man Army Special Forces Long-Range Reconnaissance Patrol near Duc Co in South Vietnam. Flying with four other planes of the 20th Special Operations Squadron—two similar helicopters and a pair of helicopter gunships—Fleming was headed back to base after a four-hour combat mission when he received a radio message that the friendly recce team of Green Berets was in hostile territory with their lives endangered.

Although low on fuel, the flight immediately responded to the Green Berets' call for help.

Overhead, a forward air controller (FAC) briefed the helicopter crews on the situation. The patrol was located near a riverbank in a small enclave covered with secondary growth. The clearing was too small for a helicopter landing. About twenty-four yards away was another clearing that appeared large enough for a single helicopter to land.

With the river at their backs, the patrol was receiving enemy fire from the other three sides. The helicopter gunships, armed with Miniguns, immediately began strafing the enemy positions. On the first pass, one of the gunships took a hit, causing the engine to lose oil pressure. That chopper kept on making firing passes until it received additional battle damage and had to crash-land nearby.

One of the other troop-carrier helicopters picked up the downed crew and returned to base.

The helicopter force was now reduced to a single

(Continued on following page)

Here President Nixon congratulates Capt. James P. Fleming after presenting him with the Medal of Honor in the May 14 White House ceremony. Captain Fleming's wife Jennifer is on the right. The couple's two daughters, Rebecca, two years old, and Amy, four, are looking up at dad.

gunship and two troop carriers. The gunship continued to make strafing passes and destroyed two enemy heavy machine guns, but four others remained in operation.

Then the other troop carrier, critically low on fuel, was obliged to retire from the action, leaving only Fleming and the gunship. Although both choppers were also running low on fuel, the decision was made to attempt an immediate pickup of the six-man Special Forces team.

The FAC ordered the team to work their way to the larger clearing, but the enemy fire was too intense and they were pinned down. Then Lieutenant Fleming flew his helicopter along the river toward the Americans who were trying to make their way to the riverbank. As Fleming approached the enclave, he found it was too small and too overgrown to attempt a landing so he placed the helicopter's landing skids against the riverbank, with its tail boom extending over the river. The patrol was not in sight.

Then the enemy launched another attack. The American patrol leader radioed Fleming that the team was unable to move. His voice was nearly drowned out by the crackle of gunfire. Under intense enemy machine-gun fire, Fleming backed out over the water and took off through a barrage of bullets. The gunship pilot later said that it was a miracle that Fleming's helicopter was not shot down during its takeoff.

Once Fleming's transport was out of the way, the gunship made three more firing passes. Now both helicopters were critically low on fuel and the gunship was also nearly out of ammunition. The patrol had been under constant attack for about an hour, and enemy fire was still intense. The men decided to make one final rescue attempt.

The FAC ordered the patrol to detonate all its Claymore mines and make a rush for the river. Realizing that it was now or never, Lieutenant Fleming started down to face the enemy fire once more. Again he nudged his helicopter against the riverbank where he'd been before. The patrol plunged toward him through the undergrowth, killing one of the enemy only ten yards from the riverbank. The enemy knew exactly where the helicopter would land and directed their fire toward it. Bullets shattered the windshield, but neither Fleming nor his copilot was wounded.

As the patrol made its way to the waiting helicopter, the gunship continued its strafing passes, often firing within five yards of the men being rescued. The two gunners aboard Fleming's helicopter were armed with light machine guns and rifles. They continued to fire their weapons with one hand while, with the other, they helped the Green Berets climb aboard. Despite the heavy fire and the bouncing caused by the men scrambling aboard, Lieutenant Fleming continued to hover his helicopter just above the river until the last man was safely aboard.

Finally, for the second time, Lieutenant Fleming backed out over the water and ascended through a hail of bullets. On its last pass over the enclave, the gunship ran out of ammunition. Both helicopters returned safely to Duc Co.

Lieutenant Fleming, who has since been promoted to captain, completed transition pilot training for the C-141 at Altus AFB, Okla., and now is stationed with a StarLifter unit at McChord AFB, Wash.

The seven Medals of Honor awarded to Air Force men in Vietnam are the most for any conflict except World War II, when thirty-eight were presented. The earliest went to four World War I airmen, and four were awarded during the Korean War, all posthumously —making a total of fifty-three (*see accompanying table*). In addition, two special Medals of Honor, authorized by Congress for peacetime achievements, were presented to Brig. Gen. William (Billy) Mitchell and Capt. Charles A. Lindbergh.—END

The Hard Way

John J. Pullen of Old Saybrook, Conn., an authority on the Medal of Honor and author of a book on the subject *(A Shower of Stars)*, says Airman John Levitow's act of throwing himself on a live flare in the AC-47 gunship is the forty-sixth known time that an individual in Vietnam has voluntarily absorbed the blast of a mine, grenade, booby trap, or flare with his own body, or placed himself between a comrade and an impending explosion. In other words, of the 148 men so far awarded the Medal of Honor in Vietnam, nearly one-third have earned it this hard way.

Mr. Pullen says that leading psychologists are on record as stating that self-preservation is man's No. 1 instinct. This makes the act of self-sacrifice even more courageous for those who by sheer instinct take, or expose themselves to, the full force of explosions with their own bodies in order to save those around them.

UNITED STATES AIR FORCE MEDAL OF HONOR WINNERS—1918-1970

NAMES, ALPHABETICALLY BY WARS AND RANK AT TIME OF ACTION	HOME TOWN	DATE AND PLACE OF ACTION	DATE OF DEATH, OR PRESENT ADDRESS
WORLD WAR I			
Bleckley, 2d Lt. Erwin R.	Wichita, Kan.	Oct. 6, 1918, Binarville, France	KIA, Oct. 6, 1918
Goettler, 2d Lt. Harold E.	Chicago, Ill.	Oct. 6, 1918, Binarville, France	KIA, Oct. 6, 1918
Luke, 2d Lt. Frank, Jr.	Phoenix, Ariz.	Sept. 29, 1918, Murvaux, France	KIA, Sept. 29, 1918
Rickenbacker, Capt. Edward V.	Columbus, Ohio	Sept. 25, 1918, France	New York, N.Y.
WORLD WAR II			
Baker, Lt. Col. Addison E.	Chicago, Ill.	Aug. 1, 1943, Ploesti, Romania	KIA, Aug. 1, 1943
Bong, Maj. Richard I.	Superior, Wis.	Nov. 15, 1944, Southwest Pacific	Killed, Aug. 6, 1945, Burbank, Calif.
Carswell, Maj. Horace S., Jr.	Fort Worth, Tex.	Oct. 26, 1944, South China Sea	KIA, Oct. 26, 1944
Castle, Brig. Gen. Frederick W.	Manila, P.I.	Dec. 24, 1944, Liege, Belgium	KIA, Dec. 24, 1944
Cheli, Maj. Ralph	San Francisco, Calif.	Aug. 18, 1943, Rabaul, New Britain	Died as POW, Mar. 6, 1944
Craw, Col. Demas T.	Traverse City, Mich.	Nov. 8, 1942, Port Lyautey, French Morocco	KIA, Nov. 8, 1942
Doolittle, Lt. Col. James H.	Alameda, Calif.	Apr. 18, 1942, Tokyo, Japan	Santa Monica, Calif. (Ret. Lt. Gen.)
Erwin, MSgt. Henry E.	Adamsville, Ala.	Apr. 12, 1945, Korijama, Japan	Birmingham, Ala.
Femoyer, 2d Lt. Robert E.	Huntington, W. Va.	Nov. 2, 1944, Merseburg, Germany	KIA, Nov. 2, 1944
Gott, 1st Lt. Donald J.	Arnett, Okla.	Nov. 9, 1944, Saarbrucken, Germany	KIA, Nov. 9, 1944
Hamilton, Maj. Pierpont M.	Tuxedo, N.Y.	Nov. 8, 1942, French Morocco	Santa Barbara, Calif. (Ret. Maj. Gen.)
Howard, Maj. James H.	Canton, China	Jan. 11, 1944, Oschersleben, Germany	Washington, D.C. (Ret. Brig. Gen.)
Hughes, 2d Lt. Lloyd H.	Alexandria, La.	Aug. 1, 1943, Ploesti, Romania	KIA, Aug. 1, 1943
Jerstad, Maj. John L.	Racine, Wis.	Aug. 1, 1943, Ploesti, Romania	KIA, Aug. 1, 1943
Johnson, Col. Leon W.	Columbia, Mo.	Aug. 1, 1943, Ploesti, Romania	McLean, Va. (Ret. Gen.)
Kane, Col. John R.	McGregor, Tex.	Aug. 1, 1943, Ploesti, Romania	Barber, Ariz.
Kearby, Col. Neel E.	Wichita Falls, Tex.	Mar. 5, 1944, New Guinea	KIA, Mar. 5, 1944
Kingsley, 2d Lt. David R.	Klamath Falls, Ore.	June 23, 1944, Ploesti, Romania	KIA, June 23, 1944
Knight, 1st Lt. Raymond L.	Houston, Tex.	Apr. 25, 1945, Po Valley, Italy	KIA, Apr. 25, 1945
Lawley, 1st Lt. William R., Jr.	Leeds, Ala.	Feb. 20, 1944, Occupied France	Active-duty Col., Maxwell AFB, Ala.
Lindsey, Capt. Darrell R.	Jefferson, Iowa	Aug. 9, 1944, France	KIA, Aug. 9, 1944
Mathies, SSgt. Archibald	Scotland	Feb. 20, 1944, Leipzig, Germany	KIA, Feb. 20, 1944
Mathis, 1st Lt. Jack W.	San Angelo, Tex.	Mar. 18, 1943, Vegesack, Germany	KIA, Mar. 18, 1943
McGuire, Maj. Thomas B., Jr.	Ridgewood, N.J.	Dec. 25-26, 1944, Los Negros Is.	KIA, Jan. 7, 1945
Metzger, 2d Lt. William E., Jr.	Lima, Ohio	Nov. 9, 1944, Saarbrucken, Germany	KIA, Nov. 9, 1944
Michael, 1st Lt. Edward S.	Chicago, Ill.	Apr. 11, 1944, Occupied Germany	Active-duty Lt. Col., Travis AFB, Calif.
Morgan, F/O John C.	Vernon, Tex.	July 28, 1943, Occupied Europe	Santa Monica, Calif. (Ret. Col.)
Pease, Capt. Harl, Jr.	Plymouth, N.H.	Aug. 7, 1942, Rabaul, New Britain	KIA, Aug. 7, 1942
Pucket, 1st Lt. Donald D.	Longmont, Colo.	July 9, 1944, Ploesti, Romania	KIA, July 9, 1944
Sarnoski, 2d Lt. Joseph R.	Simpson, Pa.	June 16, 1943, Buka, Solomon Is.	KIA, June 16, 1943
Shomo, Capt. William A.	Jeannette, Pa.	Jan. 11, 1945, Mindoro, P.I.	Pittsburgh, Pa. (Ret. Lt. Col.)
Smith, SSgt. Maynard H.	Caro, Mich.	May 1, 1943, St. Nazaire, France	Caro, Mich.
Truemper, 2d Lt. Walter E.	Aurora, Ill.	Feb. 20, 1944, Occupied Europe	KIA, Feb. 20, 1944
Vance, Lt. Col. Leon R., Jr.	Enid, Okla.	June 5, 1944, Wimereaux, France	Killed July 26, 1944, near Iceland
Vosler, TSgt. Forrest L.	Lyndonville, N.Y.	Oct. 15, 1943, Bremen, Germany	Poland, N.Y.
Walker, Brig. Gen. Kenneth N.	Cerrillos, N.M.	Jan. 5, 1943, Rabaul, New Britain	KIA, Jan. 5, 1943
Wilkins, Maj. Raymond H.	Portsmouth, Va.	Nov. 2, 1943, Rabaul, New Britain	KIA, Nov. 2, 1943
Zeamer, Capt. Jay, Jr.	Carlisle, Pa.	June 16, 1943, Buka, Solomon Is.	Groton, Mass. (Ret. Lt. Col.)
KOREA			
Davis, Lt. Col. George A., Jr.	Dublin, Tex.	Feb. 10, 1952, North Korea	KIA, Feb. 10, 1952
Loring, Maj. Charles J., Jr.	Portland, Me.	Nov. 22, 1952, Sniper Ridge, No. Korea	KIA, Nov. 22, 1952
Sebille, Maj. Louis J.	Harbor Beach, Mich.	Aug. 5, 1950, Hamchang, Korea	KIA, Aug. 5, 1950
Walmsley, Capt. John S., Jr.	Baltimore, Md.	Sept. 14, 1951, North Korea	KIA, Sept. 14, 1951
VIETNAM			
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	Mar. 10, 1967, Hanoi area, No. Vietnam	Active duty, Vance AFB, Okla.
Fisher, Maj. Bernard F.	Kuna, Idaho	Mar. 10, 1966, A Shau Valley, So. Vietnam	Active duty, Duluth IAP, Minn.
Fleming, 1st Lt. James P.	Sedalia, Mo.	Nov. 26, 1968, Duc Co, So. Vietnam	Active duty, McChord AFB, Wash.
Jackson, Lt. Col. Joe M.	Newnan, Ga.	May 12, 1968, Da Nang area, So. Vietnam	Active duty, Hq. USAF, Washington, D.C.
Levitow, A1C John L.	Hartford, Conn.	Feb. 24, 1969, Long Binh, So. Vietnam	Connecticut (enlistment completed)
Wilbanks, Capt. Hilliard A.	Cornelia, Ga.	Feb. 24, 1967, Dalat, So. Vietnam	KIA, Feb. 24, 1967
Young, Capt. Gerald O.	Ancortes, Wash.	Nov. 9, 1967, Da Nang area, So. Vietnam	Active duty, Peterson Fld., Colo.

As we mark the first anniversary of the first manned landing on the moon, the US manned-spaceflight program is in a kind of limbo. The Apollo moon flights will continue, but at a slower pace, and at the same time planning proceeds for the Skylab space station set of missions only two years from now. In addition, studies of the revolutionary space shuttle for the late 1970s are under way . . .

Tranquility Plus One Year

BY WILLIAM LEAVITT

Senior Editor/Science and Education

THE public mind being occupied with more immediate concerns, it is hardly likely that much notice will be taken of the first anniversary of the spectacular landing by Neil Armstrong and Edwin Aldrin on the moon last July.

So much and yet so little has happened on the US space front since that incredible morning that it is worth taking stock of where we are and might be going in space one year after Tranquility. There is at least one small irony: Neil Armstrong, the first human being to set foot on the moon, has left the astronaut business to go back to where he came from, aeronautics. His new job at the National Aeronautics and Space Administration is as NASA Deputy Associate Administrator for Aeronautics. There he will oversee the space agency's research and development in aeronautics. Interestingly enough, the man he's replacing, Charles Harper, will be joining Dr. Wernher von Braun in planning advanced space missions.

When the announcement of Armstrong's switch was made, he was quoted as saying that the change represented "a move back into the aeronautics side of the business, which has really taken up the majority of my career." The thirty-nine-year-old Armstrong was a noted test pilot for NASA before becoming an astronaut, and had flown the X-15 rocketplane. He also remarked that there was no certainty that there would have been another Apollo flight available to him.

Does Armstrong's descent to lower altitudes symbolize some larger decline of the space program? Some might think so. But it would be premature to write any obituary for the US effort in space. It would be more accurate to say that the program is in a kind of limbo, waiting, really, to be reborn and reconstituted. The excitement engendered by Apollo-11 is but a dim memory now. And the "milk-run" attitude toward manned spaceflight that had been created by Apollo-12 was certainly shattered by the near-disaster of unlucky Apollo-13.

The troubles of Apollo-13 managed to set off two kinds of reactions that tended to cancel each other out. On one side, those who have loudly opposed the manned spaceflight program as a waste of money seized the opportunity to demand an immediate end to, or at least a slowing down and curtailment of, the Apollo program. On the other side, many of the program's enthusiasts tried very hard to convert a serious failure and near-tragedy into a kind of triumph. Both reactions were silly.

As matters turned out, the Apollo program survived. It would have made little sense to kill it after the enormous investment already made. There will be additional flights, although not as many as originally planned. But as Apollo stretches out, NASA space planners are already working toward the first launch in 1972 of Skylab, which is really the unheralded beginning of the long-awaited US manned space-station program.

Skylab

Skylab, the new name for what used to be called the "orbital workshop" phase of Apollo Applications, a term that never pleased anyone at NASA, is a fully approved and on-going manned space program. This summer, according to William Schneider, the NASA Skylab director, will see full design release for Skylab. And by July 1972, if all goes according to plan, a Saturn V booster combination will take America's first empty but ready-for-occupancy experimental space station into orbit. A day later, a Saturn I-B will blast the first Skylab crew into space to rendezvous with and board the space station.

The crew on the first mission of the three planned will spend up to twenty-eight days in Skylab. All three missions will feature a wide assortment of experiments, ranging from long-term observation of the sun to extensive examination of the ability of human beings to function in zero-gravity for periods much longer than

any hitherto experienced. Despite the successful past demonstrations of survivability on manned missions as long as fourteen days, there are still plenty of space-medical questions to be answered aboard Skylab. Doctors are particularly interested in long-term effects of zero-G on the heart and circulatory system and on the mineral content of the bones.

The three-man Skylab crews, on all three missions presently planned, will breathe a mix of oxygen and nitrogen, which not only will increase the safety of the missions but will also provide a closer to normal air content for the Skylab than the 100 percent oxygen that had been used on earlier US manned missions.

Assuming the success of the first twenty-eight-day mission, each of the next two missions will keep crews in the Skylab for up to fifty-six days.

In a number of ways, the coming Skylab operations are more important and will be more productive than the Apollo landings. Apollo, of course, demonstrated human ability to navigate to and successfully land on another celestial body. But Skylab will provide *well over three months* of human operational experience in the space environment. The yield will not only be scientific. There should be a flood of data on everything from day-night biological rhythms to waste management. Skylab's "dining room" will be a far cry from those toothpaste-tube meals of the early days of the spaceflight era. There'll be canned food, frozen food, and fresh food aboard, complete with storage and cooking equipment—refrigerator, deep-freeze, and ovens. Incidentally, one important item salvaged from the defunct Air Force Manned Orbiting Laboratory (MOL) for use aboard Skylab is the waste-management system.

Skylab chief Schneider estimates that the cost of the program will be about $1.25 billion for what he hopes will be "an uneventful kind of mission." The current, Fiscal Year 1971 funding for the Skylab project is some $400 million. And a major array of US aerospace industry skill is involved in hardware development. North American Rockwell will develop the command and service module, McDonnell Douglas the orbital workshop and airlock, and Martin Marietta the docking hardware (*see box, page 64*).

Bits and pieces of the old Air Force MOL project have been inherited by NASA and will be used for Skylab. These include the aforementioned waste-management system, as well as a modified version of the crew trainer that had been developed for MOL, plus various electronic components. Also, many of the military people who had been selected as candidates for MOL flight crews will become part of NASA's Skylab crew pool. Skylab director Schneider also expects that the Skylab crews will include scientist-astronauts, in view of the large number of experiments planned for the missions.

This was the view a year ago from the Apollo-11 landing module as NASA Astronauts Neil Armstrong and Edwin Aldrin prepared to descend to the landing on another world.

As millions watched incredulously, Armstrong and Aldrin planted the flag of the United States of America on the surface of the moon. An automatic camera took this shot.

Among the important experiments scheduled for Skylab are a collection of earth-resource-survey studies, using multispectral equipment. The data will be relayed earthward from the spacecraft.

As to space-rescue techniques—since no matter how many precautions are taken there is always the chance of trouble—the plan for Skylab is for the crew to retreat to the command and service modules in the event of hazard aboard the workshop. Also, according to Mr. Schneider, it would be possible to send up a second command and service module to Skylab for docking and rescue of an endangered crew.

Assuming the success of the first three launches and the proving of man's survivability and usefulness on missions of up to fifty-six days, NASA is looking toward the possibility of a Skylab II program which would fly Skylab I backup equipment. Although funding for such successor missions is in the future, the agency is already examining possible experiments. If Skylab II materializes, there could be a 1974 launch program and a space-station mission lasting up to a full year with overlapping crews.

The Shuttle

As we mark the first anniversary of the Armstrong-Aldrin landing on the lunar Sea of Tranquility, Skylab is not the only manned spaceflight program in the offing. Further off in time but getting started now is the reusable space shuttle, technical details of which have been described in AF/SD's "Letter from Los Angeles" column in recent issues. The orbital space shuttle is an enormous conception, nothing less than a combination of the most advanced aeronautical and space-propulsion techniques. Booster and orbital portions would

(*Continued on following page*)

Out of orbit and back in the airplane business at NASA is the first man on the moon, Astronaut Neil Armstrong. He will direct NASA's research in aeronautics, succeeding Charles Harper, who will work in advanced space-mission planning with Dr. Wernher von Braun.

both be recoverable. The shuttle would have, in the words of L. E. Day, the NASA shuttle-program deputy director, "a launch and flight operational mode approaching an airline-type operation for passengers and payload transport which will provide significant reductions below present operating costs," plus "a flexible capability to support a variety of payloads and missions while at the same time providing a less severe environment for payloads."

Two industry teams, headed respectively by North American Rockwell and McDonnell Douglas, are already involved in preliminary design studies for the program. The shuttle's future, beyond the study stage, admittedly depends on a political willingness to commit the money, which would run into several billions of dollars in hardware. Mr. Day envisions that the shuttle "will eventually replace essentially all of the present-day launch vehicles or their derivatives except for very small vehicles of the Scout class and the Saturn V."

This will be possible, Mr. Day says, because the low operational costs of the reusable shuttle are expected to make the vehicle competitive even if it carries only a fraction of its full payload capability on particular missions.

"In addition to the low launch costs," he adds, "we expect the benign acoustic and acceleration environment in the shuttle to allow significant reductions in the costs of payloads." This is another way of saying that the shake-rattle-and-roll environment of first- and second-generation spacecraft, which has created the need to pamper delicate equipment, may well be obviated. Mr. Day predicts that the acceleration forces aboard the orbital shuttle during ascent and reentry will be less than 3 Gs. He goes so far as to say that payload development costs, as a consequence, could be reduced by twenty-five to thirty percent.

Missions for the orbital shuttle would probably include, among others, logistics support of space stations, the placement of large experiment modules and unmanned satellites into orbit *and* their retrieval for earthbound analysis, and special short-term orbital sorties by the shuttle itself. The potential list is long.

The orbital shuttle is obviously of considerable interest to the Air Force, too, and there is a good deal of joint study going on involving NASA and the Air Force, although NASA is very definitely the program manager.

Despite its complexity, the orbital-shuttle combination of booster and orbiter will be comparable in size to the C-5 and SST aircraft—between 200 and 300 feet long. Booster landing weight will run about the same as the SST and be about 100,000 pounds less than the maximum landing weight of the Boeing 747—at least during the horizontal flight-testing program. The landing speeds of the booster section, about 145 to 155 knots, are expected to be only slightly higher than those of the 747. The orbiter's landing speeds will run somewhat higher, 155 to 170 knots, comparable to the SST's expected landing speeds.

Orbital shuttle—a giant step in spaceflight—will involve a giant amount of testing. The current preliminary design and definition phase is geared, according to Mr. Day, to the development of a plan for the flight-test program. "Because the initial number of shuttle vehicles produced will be small, probably less than five," he says, "those vehicles allotted to flight test will represent a significant portion of the 'fleet cost.' Hence our desire not to plan for prototypes which can have no operational use."

NASA plans a "progressively more difficult flight-test program, which will parallel to some extent the ground testing," according to Mr. Day.

He says the first phase of testing would involve horizontal subsonic flights of the orbiter and booster separately under jet power, with an option of testing at higher altitudes and at supersonic speeds, using rocket propulsion. Next would come vertical launches of the orbiter and booster using both jet and rocket

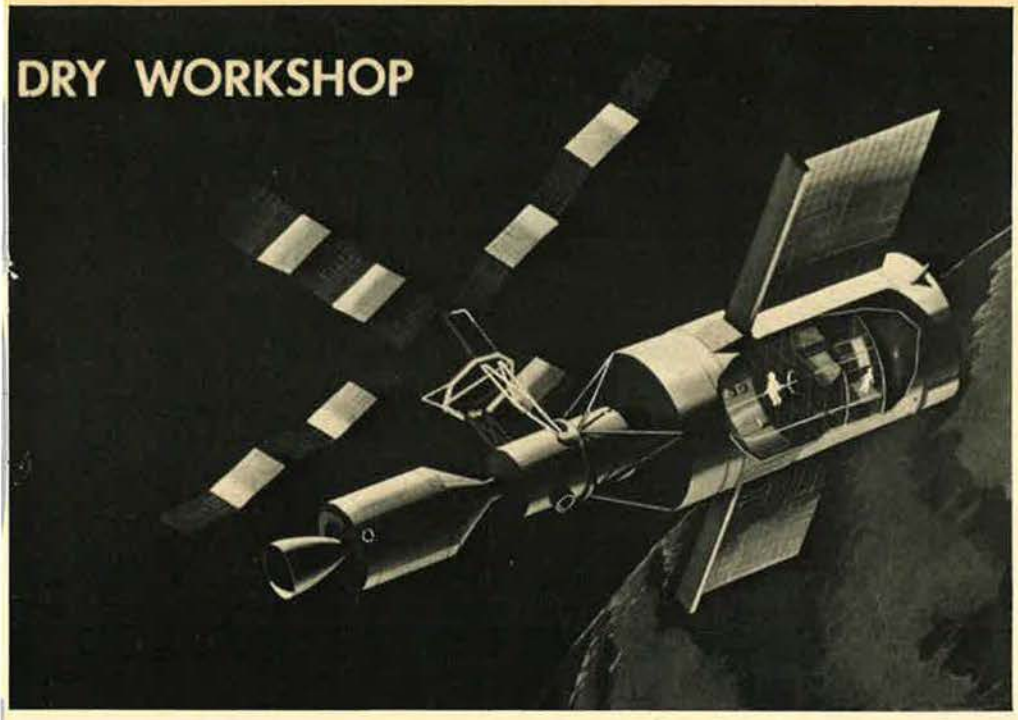
SHUTTLE AT A GLANCE

Shuttle is a current NASA study program, with hope for later hardware funding, to develop a reusable booster-orbiter combination vehicle that could transport men and materials to future operational space stations, perform other space missions, and be able to return both components to earth in conventional airplane-landing style. Operational dates are in the late 1970s. Two contractor teams are currently running parallel studies. One team, headed by **North American Rockwell,** includes:

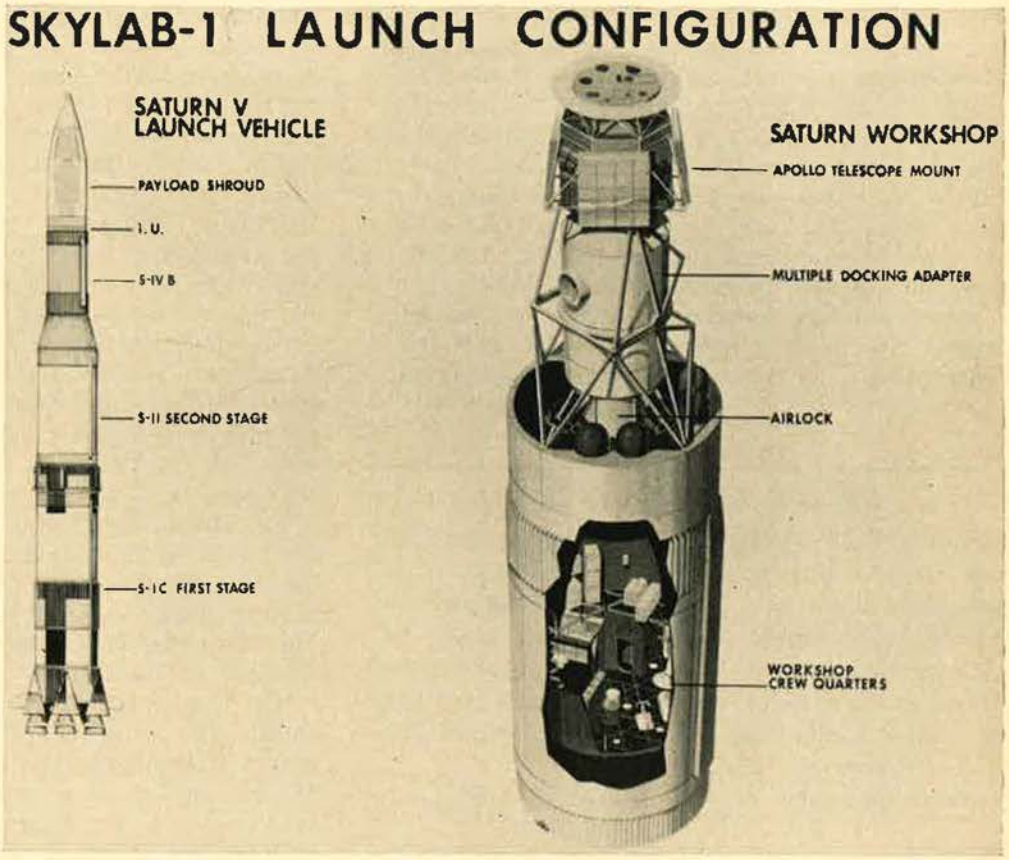
Convair Div., General Dynamics	booster
IBM	data systems
Honeywell	guidance
American Airlines	airline-operations applicability to the system

The other team, headed by **McDonnell Douglas,** includes:

Martin Marietta	booster
TRW	avionics and guidance
Pan American	airline-operations applicability to the system
Raytheon	onboard computers
Sperry Rand	flight control system
Norden Div., United Aircraft	displays



This is an artist's conception of the components of the NASA "workshop" space station planned by NASA for 1972 launching. The "dry" designation refers to the fact that under an earlier plan the workshop was to have been a booster stage that would have been sent up carrying fuel and then emptied out. The present plan allows launching of the empty lab, ready for occupancy by rendezvousing crews.



Another NASA artist's sketch, this one is of the launch configuration of Skylab. At left, the giant Saturn V booster and its various components, including the Skylab workshop. At right, a breakout of the workshop and its various components, showing the crew quarters at the bottom, the airlock, the docking device, and, on top, the Apollo telescope mount, which will be used to study the sun.

propulsion. Next would come vertical launch of the combined booster and orbiter into suborbital and orbital paths.

One question being explored is whether the orbiter section will need powered or unpowered landing capability. There is a sizable tradeoff here, since powered landing would make it necessary for the orbiter to carry into orbit a set of air-breathing engines, which would probably be powered by on-board liquid hydrogen. Despite the added complexity and weight, there would be obvious military advantages to powered landing for the orbiter section.

In any case, the on-going Skylab program and the nascent orbital-shuttle effort together represent a sizable future US thrust into space—in the manned mode. How deeply the thrust will extend will depend very much on what happens here on earth in terms of dis-

(Continued on following page)

Deep in the drink to simulate zero-gravity, a researcher at NASA's Marshall Space Flight Center, Ala., explores space-repair techniques for Skylab. The water is forty feet deep.

MIT Instrumentation Lab's Dr. Charles Stark Draper visited the Air Force Academy recently to receive an award. With him is Academy Superintendent, Lt. Gen. Thomas Moorman.

engagement from Southeast Asia and the sorting out of nagging domestic questions.

MIT's I-Lab—Set Adrift

The lengthy struggle over the fate of the prestigious Instrumentation Laboratory at the Massachusetts Institute of Technology at Cambridge, Mass. (*see "The Dethronement of Dr. Draper."* AIR FORCE/SPACE DIGEST, *December '69*) appears to be over. MIT has announced that it will divest itself of the facility. The expectation is that the lab, more recently known as the Draper Laboratory, will be incorporated, after a period in limbo as a "division" of MIT, as a separate entity.

MIT's divestiture represents the latest triumph of campus critics who have been denouncing so-called "war research" at colleges and universities. Under Dr. Charles Stark Draper's several decades of leadership of the Instrumentation Laboratory, which he founded, enormous advances in the field of guidance, for both military and civilian systems, have been made. Among the lab's more recent technical triumphs was the development of the guidance system for the Apollo moon-landing program.

The lab—and Dr. Draper himself—in recent months had become the focus of heavy attacks by MIT on-campus and off-campus militants, some of whom demanded that the lab and its facilities transfer their efforts over to research into nonmilitary public problems, and others of whom had further insisted that *in no case* should the university allow the Draper Lab to be separated from MIT because it might, elsewhere, continue military-sponsored research to which they objected. The latter group will be disappointed by the divestiture.

In the face of the controversy, MIT's leadership last year decided that an effort should be made to convert the lab to "civilianized" research. Dr. Draper lost his job as director. But he was allowed to continue the supervision of those military programs still current at the lab. At the time, he predicted failure of the experimental conversion of the lab. He put it this way in AIR FORCE/SPACE DIGEST: "The weakness of all these gentlemen who talk [about technology and environmental problems] is that they are completely devoid of ideas. They're not about to do anything. They're only making noises about how other people should do it."

Dr. Draper denounced those who insisted on conversion of his lab. He declared that it was foolish "to say that by destroying a lab of advanced technology you are somehow going to fix these other problems." He called that "a premise that doesn't hook up with the facts of the world."

Dr. Draper turned out to be right. The conversion failed. The sponsorship money for urban research wasn't forthcoming. The question now is whether the lab can survive as an independent contributor to defense research. Dr. Draper is confident it will survive and succeed on an independent basis. He hopes to convert the lab to a profit-making corporation. Meanwhile, he has told AF/SD "morale is good" and "we're going to do all right."

From all appearances, there was a kind of compromise involved in the divestiture. While the Draper Lab was set adrift by MIT, the Lincoln Lab, a world-renowned sister lab specializing in electronics and a facility that has also done considerable classified research and had also been under attack, will remain part of MIT—at least for the moment.—END

SKYLAB AT A GLANCE

Skylab is a NASA program to deploy an experimental space station, starting in 1972. Three three-man crews, each relieving its predecessor, would perform experiments on board. The first mission would be for up to twenty-eight days; the second and third missions would each last up to fifty-six days. Modified Saturn and Apollo hardware would be used. The principal contractors are:

McDonnell Douglas	orbital workshop and airlock
Martin Marietta	multiple docking adapter; experiment management; payload integration
North American Rockwell	modification of Apollo command and service modules
Boeing	first stage of Saturn V
Chrysler	first stage of Saturn I-B

A new graduate of the Air Force Academy speaks out . . .

The Responsibilities of Youth

By 2d Lt. Charles R. Reed, USAF

Reed as an Academy Cadet.

The Air Force Academy Cadet Wing Commander, Charles R. Reed, recently addressed the April meeting of the Kansas Press Association, in Salina, Kan., on the subject of the responsibilities of youth. We found it an unusually lucid statement. Excerpts from his remarks appear here. In June, Cadet Reed was commissioned a second lieutenant on graduating from the Air Force Academy, second in order of merit among 737 members of his class. He will do graduate work in international relations, at Princeton University, before entering flight training.—THE EDITORS

I VIEW the responsibility of youth as basically twofold. The first part is QUESTIONING. It is the responsibility of youth to question the existing order.

Socrates once said, "The belief unquestioned is not worth having." Begging forgiveness from Socrates, I would like to include in that statement not only beliefs, but also policies, organizations, and actions. In other words, youth must not accept things *a priori*. They must not categorically accept or reject anything without first questioning it and then deciding, as rationally as possible, to adopt or reject its tenets. Admittedly, that is a difficult task. It is far easier and far less painful to hang out a placard that says I'm a "liberal," a "conservative," a "radical," or a multitude of other groups and "isms," and to follow blindly along a path blazed by others.

If this is such a difficult task, why do I place the onus on youth? Basically, it's because the young are idealistic. They still possess their fervor for "changing the world." They still believe in their capabilities to "make the world a better place to live." They did not create the existing order, so they have fewer vested interests in it. This often makes them a little difficult to live with, but it does give them a peculiar ability to ask the unaskable and to doubt the undoubtable.

A man who I think captured the essence of the value of this was John Stuart Mill. He said that there is a peculiar evil in the suppression of opinion because it robs the human race, posterity as well as the existing generation, of the opportunity for improvement through the clash of opinion. . . . We can and must question the existing order because once we accept as inherent poverty, crime, war, and other chronic ills, we will begin to crumble. I lay the burden of nonacceptance and questioning upon youth because they are particularly capable of doing so.

The second part of the responsibility of youth is PREPARATION. Youth, as much as they would sometimes like to believe, do not hold the reins of power in the United States. But youth *will* hold the power someday, and we must be prepared to accept it and use it wisely. That means that youth must seek the best education and experience they can find in order to develop the knowledge and expertise that will be demanded of them in the future. . . .

Talking and demonstrating about a problem does not teach one how to solve that problem. It may focus attention on the situation, but it alone will not eliminate the problem. Expertise does not happen by chance. It requires long hours of study and work. . . .

It does not take a particularly astute individual to realize that we have problems, and the youth of our country are going to be forced to deal with them. We are not going to be allowed to take the seemingly easy way out by "destroying our corrupt society." We must accept what we are given and work from there. It is our responsibility to be prepared.

The key to accepting both of the responsibilities I have mentioned is COMMITMENT. I fully believe that the United States today faces a crisis that encompasses all others. That is the crisis of COMMITMENT. If we are ever to solve any of our problems, the youth of our country must be willing to pay the price. They must be dedicated to work for the good of our country. The difficulties we face are not going to be solved by working from nine to five. Our problems know neither rest nor vacation, and we must be committed to working incessantly on those terms. . . .

The youth of our nation must ask questions, but, more than that, we must be committed to the elimination of our ills. We should not condemn the older generations for giving us problems. We should be glad that they have given us the resources and skills to cope with those problems. We must recognize our country for the great nation that it is, but we must never accept it as good enough. We must be committed to making it better.—END

Minuteman Missiles at Vandenberg AFB

The Missile Flight Safety Officer, a meticulously trained engineer, must analyze a torrent of data on each missile test launch, and in a few brief seconds decide whether to . . .

Delay, Destruct, or Deliver

By Kent Nickerson

A STACCATO voice, precise as a metronome, penetrates the silence of the Space and Missile Test Center's Range Safety complex on a lonely hilltop at Vandenberg Air Force Base, Calif.

"Eight . . . Seven . . . Six . . ."

Miles away, beneath a vacant stretch of scrub brush and sand, a Minuteman III missile stands in its silo.

"Five . . . Four . . . Three . . ."

In an underground Launch Operations Facility, hands prepare to turn the two keys that will hurl the ICBM skyward.

"Two . . . One . . ."

The keys turn, and with a shattering roar and burst of flame, the missile vaults from its silo and rumbles away from the California coastline, leaving an arc of billowing white smoke behind. Its destiny now lies in the hands of the Missile Flight Safety Officer (MFSO). In a series of split-second judgments, he must determine whether the bird will streak on to its target or be destroyed in a flaming, spectacular blast.

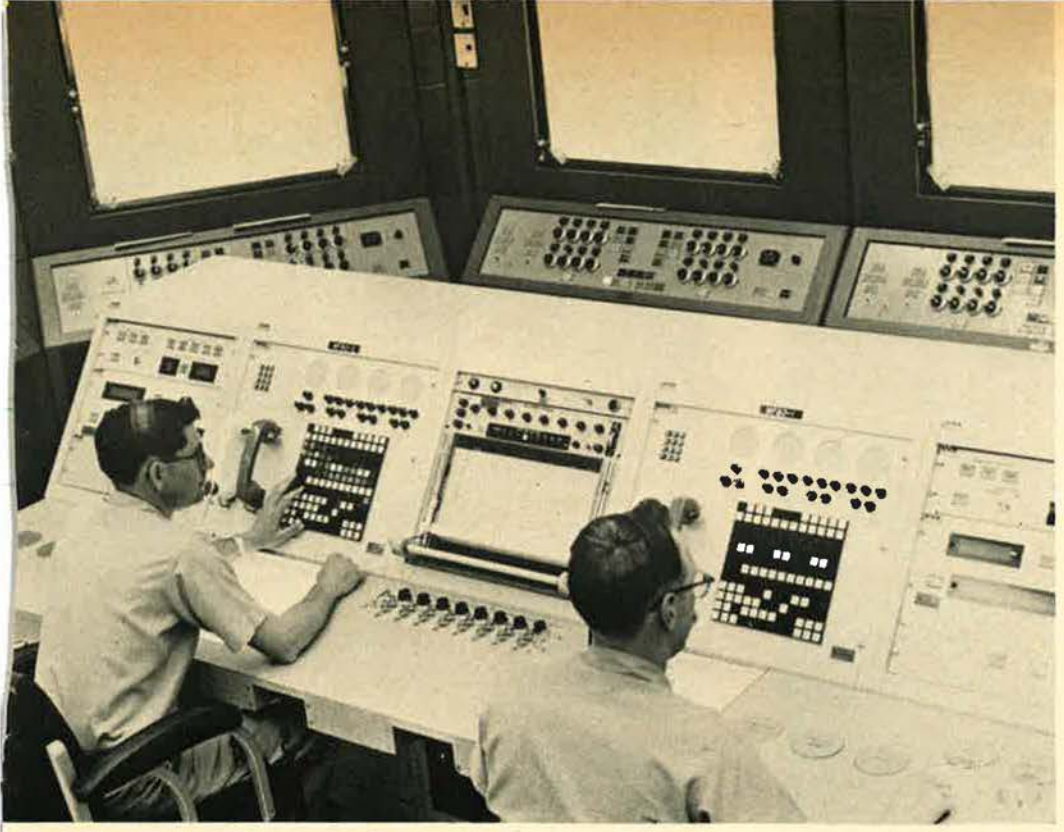
As the missile leaves its silo, the console in front of the MFSO comes to life. Data pours in from many sources, reporting every aspect of the missile's flight. Until the final impact point in a distant target area has been established unequivocally, the MFSO must regard the roaring, fiery monster as a potentially deadly bird of prey. If it strays off course in the boost phase, it is he who must push the "destruct" button, disintegrating an extremely expensive missile in the greater interest of protecting lives and property.

Four major sources feed to the MFSO the data he must have to monitor the missile's flight path. The first, called "Back Azimuth," is an optical tracking device using a "Vertical Wire Sky-Screen" placed a safe distance behind the point of launch. An observer stands behind two parallel, vertical wires, watching the missile climb into the sky. In the short time immediately following launch, the missile must remain in the space, or "corridor," formed by the two wires. If it crosses a wire, it becomes a "bad bird," and the MFSO is alerted to impending danger.

The "Program" observer, a second source of data, tracks the missile from the side, using another Vertical Wire Sky-Screen. His observations, as well as those of the Back Azimuth operator, are checked at the Safety Center by a closed-circuit television system.

A third data source is telemetry. The telemetry operator sits beside the MFSO during a launch, checking eight to sixteen channels of performance data radioed back from the missile. This is often the first indication of a missile malfunction.

Wall-mounted Plot Boards are the fourth source of data. There are eight of them in two groups, all using



During a launch, the Missile Flight Safety Officer sits at a console, facing a series of Plot Boards that show the missile's position and predict where it would land in case of a "destruct" command or a malfunction. The MFSO also receives data from ground observers and telemetry from the missile itself. The missile is never allowed to stray from its assigned safety corridor.

line maps of varying scale. Together, they give a complete view of the geography the missile will cross to reach its target.

The first four Plot Boards are "Present Position" charts on which a moving pen traces the missile's progress. On Plot Boards five through eight, the ink trail moves ahead of the missile, predicting the point where impact would occur if the missile should fail at any given moment of the flight. A computer takes readings ten times a second to make this determination. Even prevailing winds are factored into the predictions flowing steadily onto the boards.

The Range Safety Data Controller, sitting at a computer console just behind the MFSO, is responsible for ensuring that the Plot Boards present the clearest possible information for the MFSO's evaluation. From a series of as many as twelve tracking radars, the Data Controller can choose up to six that will give the best quality data on the missile's progress.

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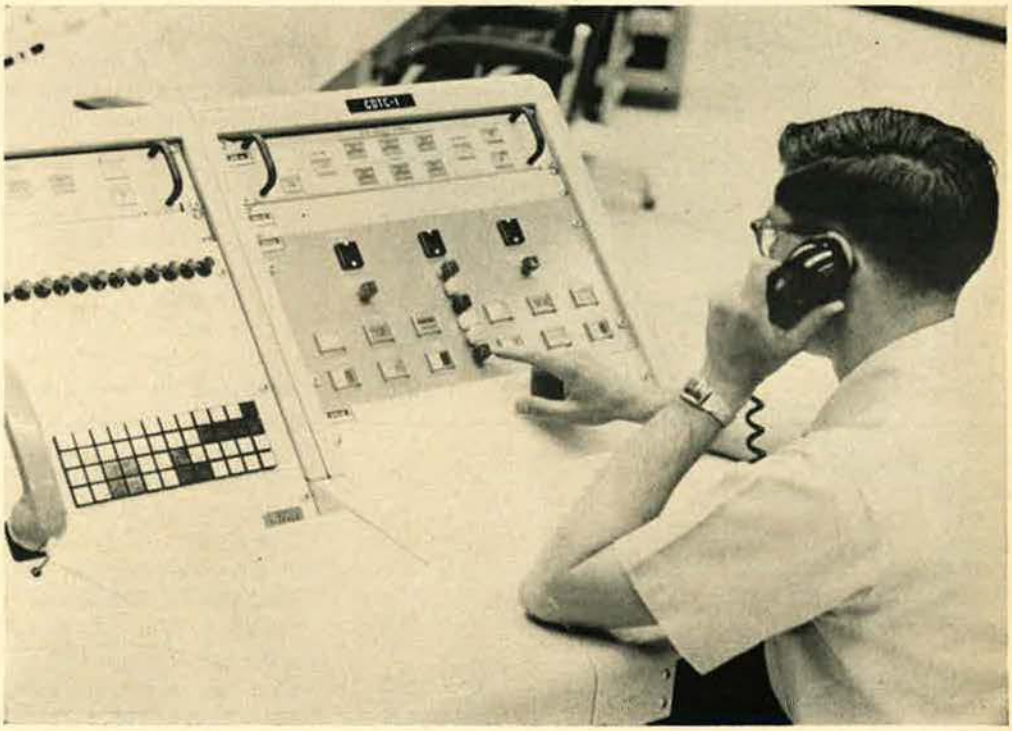
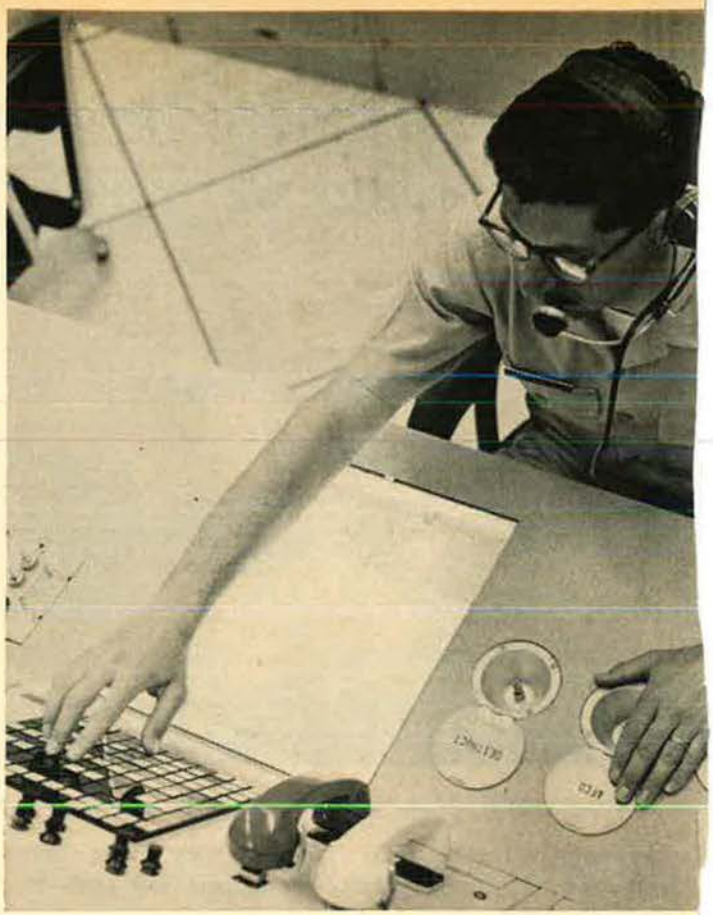


From this panel, the Command Destruct Transmitter Controller can select a destruct transmitting site from a series of sites located throughout the Western Test Range. This ensures that the missile is in range of the destruct signal through its entire boost phase. If the bird becomes a hazard to life or property, it is the MFSO's responsibility to hit the destruct switch.

A Minuteman missile roars out of its silo at Vandenberg AFB, Calif. Human and electronic observers report every detail of its progress to the MFSO and his team.



Capt. W. J. Craft is one of eight MFSOs on duty at the Space and Missile Test Center. Throughout any test launch, his hand is never far from the destruct switch.

Aircraft flying in and around the West Coast Test Center are followed by this X-Y Recorder and are monitored by operators who are in constant contact with the MFSO.

But it is the MFSO alone who is responsible for reviewing and acting on the volumes of information coming into the Safety Center. He may have only a few seconds to make a decision that could affect both lives and property.

Before the launch takes place, the MFSO also must be sure that all those in the immediate launch area are safe from possible harm. While the countdown is approaching its fiery climax, he keeps track of air and ground traffic in the vicinity through reports from surveillance radars, helicopters, and Security Police. Any unauthorized presence is reported to the MFSO, who can put a "hold" on the launch.

The MFSOs who shoulder this array of responsibilities are selected and trained with great care. To be eligible for Missile Flight Safety training, an officer must be at least a captain, hold an engineering degree—preferably at the master's level—and complete six months of intensive training before he is qualified to monitor an actual launch.

Today, eight certified Missile Flight Safety Officers cover the launches at Vandenberg's Space and Missile Test Center. They and their predecessors have played an important part in establishing SAMTEC's unblemished missile flight safety record.

And to the Air Force MFSOs goes much of the credit for making our entire missile flight-testing program one of the safest, most carefully supervised ventures in aerospace history.—END

LETTER FROM LOS ANGELES

By Irving Stone

WEST COAST EDITOR, AIR FORCE/SPACE DIGEST

Lunar Base Synthesis

It's estimated that when the last of the currently planned Apollo missions is completed, fewer than a thousand man-hours on the moon will have been achieved. And the lunar experiments performed and samples returned to earth will probably have generated more new questions than answers to old questions. NASA believes that since only a few previously identified, desirable investigations will have been conducted, the stimulus for lunar exploration, and possibly exploitation, could be as great after Apollo as before the first set of manned landings.

Against this background, NASA's Marshall Space Flight Center will support a ten-month synthesis study for semipermanent lunar-surface bases, to be funded at approximately $320,000. These surface bases would be capable of supporting men, equipment, and operations for extended periods beginning early in the 1980s. Individual study tasks will relate to missions, mission-support equipment, surface-shelter design, and cost and resource estimates.

Lunar-surface missions will be classified into such groupings as on-site exploration, reconnoitering, and solar observations, among others. Complete mission packages requiring periods of weeks or months will be prepared and used as base lines in the study. Missions will be described, analyzed, and, where necessary, time-lined to determine operational requirements.

Optimum types of mission-support equipment will be derived, and operational limitations resulting from space-suit constraints will be shown. The usefulness of mobile shelter/laboratory systems for long traverses will be considered. Various types of surface drills will be examined, and capabilities of flyers and rovers will be related to the needs of different missions.

Conceptual designs of at least two lunar-surface shelters will be prepared. One shelter concept will be derived from a specified space-station module. The second shelter will be designed to function only on the lunar surface and will be optimized for a spectrum of missions. The study also will analyze operations of a semipermanent lunar-surface base without the support of a lunar-orbit space station (LOSS).

The following will be among the assumptions used in the analyses:

- An earth–moon transportation system would provide a maximum cargo diameter of twenty-two feet. Maximum delivery capability of the lunar-landing stage would be about 50,000 pounds. The largest, nondivisible payload would not exceed 35,000 pounds.
- Normal crew complement at the base would not be less than three or more than twelve men.
- A lunar-surface base would be able to operate with a full crew for 180 days without resupply. The base could be located at any latitude or longitude and perhaps even on the far side of the moon.
- Shelters associated with base concepts would be capable of autonomous operation. Shelter subsystems would

(*Continued on following page*)

At the left are shown models of space escape-vehicle system concepts that North American Rockwell Corp.'s Space Division has studied for the Air Force's Space and Missile Systems Organization (SAMSO). Here NR's Burt Barnett (center) discusses model features with SAMSO's Capt. Dennis Labriola and Tom Shiokari of Aerospace Corp., which serves as technical coordinator for SAMSO. The NR study identified escape systems for use with next-generation spacecraft.

have a lifetime of at least two years, with five years as a design goal.

• The use of lunar soil for radiation shielding and meteoroid protection would be considered.

Space Escape Concepts

Since 1965 the Air Force's Space and Missile Systems Organization (SAMSO) and its predecessor organization have been studying potential problems of manned spacecraft, including orbital hazards, their frequency, and desired characteristics of escape vehicles. NASA also has supported studies on this many-faceted subject. A general wrap-up of philosophy and approaches relevant to this critical aspect of future operations in space was presented in AF/SD, October '68, page 74.

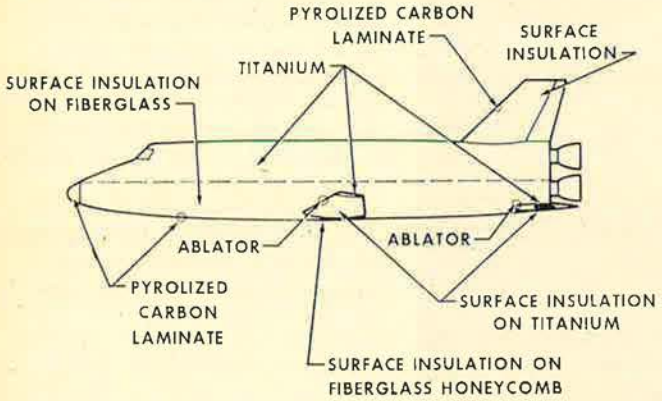
Based on the Air Force investigation, North American Rockwell's Space Division has revealed three escape-capsule concepts developed in a nine-month study recently completed for SAMSO. The concepts might be applicable to three typical next-generation spacecraft—a reusable shuttle for near-earth-orbit operations and two- and six-man orbiting space stations. The NR study identified the technology required to produce the escape vehicles in time to support manned spacecraft operations in the 1975–1985 period. The escape vehicle would be used as a last resort for earth return, the primary escape vehicle being the basic logistics vehicle servicing the orbiting spacecraft.

The concepts proposed by NR included:

• A rigid structure slightly more than seven feet in diameter to accommodate one or two astronauts. An eight-foot diameter configuration would house three men. Bottom, spherical surface would be an ablative heat shield. The vehicle would be integral with the mother spacecraft, doubling as a pilot station or other quarters. In an emergency, the crewmen would enter the escape vehicle and separate from the spacecraft for oriented reentry. Supplies would permit twenty-four hours in orbit before return and forty-eight hours after splashdown.

• A second system, an inflatable, cone-shaped configuration for two men, would have a metal-fabric skin covered with a flexible heat shield. It would be stowable in the spacecraft as a seventy- by sixty-five- by fifty-inch package. Inflated and deployed, the escape capsule would have a diameter of about nine feet and a height of about four feet.

• A third concept, mechanically rigid, would open into an umbrella shape with ribs for stiffening, and assume a shape similar to the inflatable configuration, eight feet in diameter and five feet high. It could be stowed in a forty-four- by sixty-seven-inch area and activated in about fifteen minutes.



Concept of a thermal protection system for the proposed space-shuttle orbiter indicates the many ramifications involved in designing a system to survive 100 earth orbital missions. The system will be designed to operate at maximum surface temperature of 2,500 degrees Fahrenheit.

Rounding Out the Shuttle Effort

NASA will support collateral studies on the basic space-shuttle orbiter as part of a continuing effort to coordinate the numerous facets of this revolutionary logistics vehicle.

One such study will investigate handling qualities applicable to the space shuttle during manual control of the descent, approach, and landing flight phases, following reentry from its space-station logistics mission. This will be a twelve-month study expected to be funded at approximately $95,000. It will be under the cognizance of NASA's Ames Research Center, Moffett Field, Calif.

Criteria will be derived from different levels of flying qualities similar to those listed in military specifications for piloted aircraft. They will apply to longitudinal- and lateral-directional dynamics in powered and unpowered flight, encompassing all the maneuvers performed during the terminal flight phases. Handling criteria will be derived for two specific configurations as well as for a general class of vehicles appropriate to a space-shuttle orbiter.

One specific configuration will be a lifting-body vehicle. The second vehicle is to be a wing-body configuration as formulated by NASA's Manned Spacecraft Center. The flight-time history will be defined for the orbiter during descent, approach, and landing, with the assumption that descent would be initiated at 100,000 feet. The analysis will assume that the reentering vehicle will have but a single go-around capability.

Flight simulation during the study will be conducted at Ames Research Center, to analyze and validate handling qualities and pilot options. NASA will fabricate at Ames a fixed-cockpit, piloted-flight simulation of the two specific configurations, and Ames will be responsible for integrating the latest design changes of each configuration.

Shuttle Thermal Protection

In another effort related to the space shuttle, NASA's Houston Manned Spacecraft Center will support a twelve-month effort leading to development of a rigidized, surface-insulative, thermal protection system for the orbiter. The plan is to fund two contracts at $215,000 each for a program involving the planning of all major material-development efforts; fabrication, tests and analyses; the documentation of processes required in the formulation of compacted, insulative-fiber, composite materials; and the formulation of a test program to obtain statistical data over the range of conditions anticipated for the shuttle-orbiter missions.

After this effort, it is expected that one contractor will be eliminated and that the other will be funded for demonstration of a heat-shield design concept.

The goal is to develop a low-cost, lightweight, thermal protection system that can operate successfully for 100 reuse cycles with minimum refurbishment. The system would be designed to operate at a maximum surface temperature of 2,500 degrees Fahrenheit.

The complex nature of the advanced manned orbiter vehicle will involve consideration of thermal protection aspects in various phases, including ground handling, launch, abort situations, earth orbit, transfer orbits and docking, mission duration, earth atmospheric reentry, and subsonic flight return to base.

Guidelines indicate that loads to be encountered during operation in the ascent phase would involve a factor of three Gs with passengers and four Gs with cargo missions. During the entry phase, a two-G load factor would be involved. These load factors would increase significantly in the event of aborts. The effects of radiation, temperature, hard vacuum, micrometeoroid bombardment, ground handling, and weather will also have to be considered in determining the structural integrity of the thermal protection system.

Maximum consideration will be given to the problem of cumulative deteriorating effects of repeated exposure to such critical environmental conditions as temperature, creep, and fatigue. The protection system will be designed to permit easy refurbishment upon landing. The design will have to provide sufficient strength and thermal capacity to withstand limit loads, applied temperatures, and other environmental phenomena for each design condition, without the system experiencing excessive elastic or plastic deformation.

In the materials phase, an optimized, reliable, high-emissivity coating will be developed for the low-density, insulative, substrate material that will provide protection during ground-handling operations against rain, dust, humidity, and during exposure to launch, space, entry, and subsonic flight environments. Reliable bonding or fastener methods for attaching the surface insulation material to supporting substructures will have to be developed, allowing for easy and dependable refurbishment.

In the test-criteria phase, runs will be conducted over a nominal temperature range from minus 150 degrees to plus 3,000 degrees Fahrenheit. The contractor will have to deliver at least three prototype test panels complete with substructure to permit an early feasibility demonstration of the concept prior to the initiation of the final phase to be conducted by a single contractor.

The heat-shield design concept demonstration, conducted by the single contractor, will involve studies on the application of surface insulation thermal-protection materials to the full-size shuttle-orbiter spacecraft. Cost analyses will be conducted on providing sufficient heat-shield material for a fleet of ten shuttle-orbiter spacecraft with operational lifetimes of fifteen years.

Cryogenics for Shuttle

One critical effort in development of the space-shuttle orbiter is the engineering of the cryogenic storage system. An industry optimization study for this task, to be supported by NASA's Manned Spacecraft Center, is scheduled to span eighteen months and be funded for approximately $300,000. The study will cover system design factors, determination of operational parameters, modes, and characteristics.

The cryogenic storage systems to be analyzed will include those associated with orbital injection and maneuvering, fuel-cell reactant supply, environment, jet engine liquid-hydrogen supply, attitude control, auxiliary power, fuel-inerting system, and miscellaneous ground-support cryogenic tankage systems.

Coupled with a broad analysis of shuttle-vehicle mission requirements, the study will provide selected cryogenic system concepts for meeting these requirements and will include an in-depth analysis of tankage configuration, pressurization, insulation, fluid dynamics and thermodynamics, engine feed-line soak-back, instrumentation, and other significant factors.

From these initial system analyses, the study contractor will discard approaches considered marginal and recommend a design approach for a shuttle base line cryogenic storage system.

Touchdown Tactics for Shuttle Orbiter

The landing flare and runway alignment maneuvers are critical phases in the landing of a space-shuttle orbiter. Demands on the automatic flare and runway alignment control system are particularly severe if the shuttle is an unpowered configuration. Accordingly, NASA's Ames Research Center is sponsoring a nine-month, 4,000-man-hour study to define the automatic flare and runway guidance and control laws for a candidate configuration of the orbiter vehicle—a low lift/drag configuration. A performance evaluation of the proposed system will be made for various levels of gust disturbances, wind shear, instrumentation errors and noise.

The guidance and controls laws will be structured for efficient mechanization which assumes an advanced airborne, digital computer system. The flare and alignment

Artist's view of a space-shuttle orbiter with twelve passengers and two-man crew entering the earth's atmosphere following a visit to a space station. North American Rockwell's Space Division received an $8 million, eleven-month contract to carry out a preliminary design study that may lead to development of a reusable space-shuttle system.

maneuvers will be close to those that would be flown by the vehicle when under piloted control. Minimization of weight and complexity will be a prime requisite for the space-shuttle systems. Accordingly, there will be investigation of the possible elimination of the radio altimeter, and use of the inertial navigation system for attitude and altitude rate of information during the flare.

The candidate system concepts developed in the study will be defined by means of a preliminary performance evaluation. NASA will make available to the study contractor a definition of the flare window range of vehicle states at flare initiation), a six-degrees-of-freedom digital program coded in Fortran IV, and a definition of the allowable range of vehicle states at touchdown.

After selection, a specific system concept will be evaluated by computing the probability of a successful landing. Monte Carlo techniques will be used in conjunction with a wind-and-gust model, an integral part of the digital program to be supplied by NASA. The effect of initial state, knowledge of the state, and the associated sensor noise will be included in the study. The overall study is expected to be funded at approximately $95,000.—END

Marauder against Messerschmitt jets

What should the odds have been against a B-26 in combat with jet-powered ME-262s, the deadliest interceptors in the Luftwaffe's arsenal during the closing days of the air war in Europe twenty-five years ago? Lengthen the odds, since the B-26 was out of formation and had one engine shot out. And then stretch them again, since the pilot's leg had just been shot off by enemy cannon fire. On that April day in 1945, Jim Vining and his crew played the long shot—and it paid off . . .

How Jim Vining Took on the Luftwaffe's Finest

By Jack Taylor

ILLUSTRATION BY GORDON PHILLIPS

JIM Vining may be unique in the annals of the United States Air Force. A quarter century ago, on April 20, 1945, during the closing days of the air war over Europe, he was the pilot of the first—perhaps the only—bomber of World War II to shoot down an enemy jet fighter in combat.

There was more. He and his B-26 crew got a second jet. And possibly two others. During this time Vining's B-26 was crippled, with one engine shot out. And Vining himself was struggling against the pain and shock of a cannon-shattered leg.

It was quite a day for Jim Vining and his crew—a day Vining still remembers vividly. But whether or not his exploit was unique, whether or not it set a combat record that still stands, cannot really be determined. There is, apparently, no official account of Vining's history-making flight other than the citation that accompanied his Silver Star.

The Korean War, which ushered in the era of jet vs. jet in combat, saw at least one instance of enemy jets downed by bomber fire. On April 21, 1951, Sgt. Billie Beach, a twenty-one-year-old gunner on a B-29 of the 19th Bomb Group, based on Okinawa, shot down a pair of MIG-15s within five minutes while in combat over North Korea, earning for himself the Distinguished Service Cross and a footnote in the history books.

But Vining's feat—one war earlier and in an already-crippled plane—and bagging one of the famed and feared Messerschmitt ME-262s . . . *that* was really something to remember!

The ME-262 was the only jet the Germans produced in significant numbers. It had probably its best day the month before Jim Vining tangled with his flock of ME-262s. On March 18, 1945, hordes of the German jets tore into an AAF 1,250-plane raid on Berlin and shot down most of the twenty-four bombers and five escorting P-51s that were lost that day.

Vining's plane, a Martin B-26 Marauder, was part of the 323d Bomb Group (Medium), based at Valenciennes, France, one of the first AAF organizations in Europe equipped with the Martin bomber. Though largely unsung, the twin-engine plane racked up an excellent combat record, ending the war with the lowest combat-loss rate, on a percentage basis, of any bomber in the war.

The B-26 was dubbed the "Widow Maker" and the "Flying Prostitute" because of trouble experienced from the first delivery of the "hot" stub-winged bird in 1941. At one point, Jimmy Doolittle of Tokyo-raid fame was called upon to demonstrate the B-26's exceptional capabilities for near-mutinous aircrews at Tampa, Fla. Despite its reputation for having no visible means of support, the B-26 more than proved its worth after

the aircraft was given a little bigger wing and after intensified training taught the pilots how to handle it.

Jim Vining's memorable April 20 began on a bright note. The then twenty-year-old Vining had completed an easy mission over southern Germany the previous day, and he was looking forward to a day off. His spirits soared when he read in *Stars and Stripes* that the "air war [was] over." April 20 was Hitler's fifty-sixth (and last) birthday. The Russians were in the suburbs of Berlin. Patton was "somewhere" in Czechoslovakia. Vining had thirty-nine missions under his belt. No sweat. He had it made.

His hope of surviving combat was rudely threatened when his crew was called on to support an all-out mission against the railroad marshaling yard at Memmingen, Germany. He perked up, though, when the Group intelligence officer reported that all Nazi resistance to air strikes had apparently collapsed.

But then Vining's day began going sour.

He was assigned a Marauder that should have been on the scrap heap. Its mechanical defects caused him to be one of the last off the ground instead of number three, and as the forty-eight-plane formation crossed the Rhine, heavy flak roared up from a valley where no batteries had previously been detected.

But this was only for starters.

The 323d was scheduled to make its turn over the Bavarian city of Kempton, the IP for the four-minute bomb run to Memmingen. Each of the eight flights of six planes was to fly down the run individually. Vining's flight was last. Halfway down the corridor they were jumped by an estimated twenty ME-262 jet fighters. Light flak added to the confusion.

With almost incredible speed, the sharklike German jets slashed at Vining's formation. The first jet almost collided with Vining's flight leader. The second passed even closer. Then the third German struck. The right propeller of the flight leader's B-26 chewed off a chunk of the fighter's tail. The German drifted in front of Vining who fired his four-package .50-calibers.

"I felt like a fighter pilot," Vining says. The fixed machine guns were seldom used by B-26 pilots. Vining's first attempt drew blood, but the jet dove out of sight before he could complete the kill.

As Vining climbed back up into formation, a tremendous explosion threw him forward against the control column. Pain seared his right leg. A fourth German had sneaked in behind Vining's B-26, and one of its cannon shells tore through the cockpit floor, severing Vining's right leg below the knee, and damaging the controls of the right engine. The Marauder swerved sharply to the right and fell out of control.

Though gravely wounded, Vining managed to chop

(Continued on following page)

From his own archives came this picture of Jim Vining, taken during the time he was flying B-26s in combat in Europe.

Today's Jim Vining has not lost his love of flying, and spends much of his free time in lightplanes over northern Virginia.

power to the right engine. He signaled the bombardier to jettison the payload, and then, grasping the stump of his leg with both hands to lessen the flow of blood, he "talked" his copilot into righting the stricken bomber and feathering the prop.

Vining recalls that terrifying moment when he realized that his bomber was alone in the sky. The rest of his flight had disappeared. He was now at the mercy of the jets.

Vining believes that the German pilots were so eager to shoot down an obvious sitting duck that they threw away the rule book. That was their first mistake. Instead of attacking the bomber from astern and banking left as they usually did, the Germans launched a frenzied attack from all quarters. This was their undoing.

To avoid colliding with each other, the jets turned sharply away, exposing their wide, flat bellies and making them easy targets for Vining's gunners.

"It was like shooting fish in a barrel," he says.

Surprised and hurt, the jets withdrew. Vining's crew compared notes and agreed that at least two had been shot down with two others as probables.

But the jets returned to the attack. Thanks again to Vining's quick thinking, they were again unsuccessful. Vining knew his tail gunner could fire a split second before the jets did, so as soon as he heard the racket from astern, Vining had his copilot immediately turn right. He figured the Germans would break left. They did.

"I guess we were lucky, because we outfoxed them every time," says Vining. "We took a terrible chance though, turning into a dead engine. That can be fatal. But we made it and that's what counts."

Throughout the twenty-minute running battle, Vining continued to grip his right knee. The flow of blood had slowed to a trickle. When the jets finally turned away, Vining's radio operator placed a tourniquet on his shattered leg. But Vining refused a morphine injection to deaden the pain because he wanted to stay alert as long as possible.

The damaged bomber was now too low to climb safely over the mountains bordering the Rhine. Vining knew that they could not reach the nearest Allied airfield, at Trier, so he told his copilot to look for a long flat field in which to crash-land their B-26.

The copilot chose a field next to a railroad track. A town lay not far off. A doctor, even a German one, was what they required immediately, and they reasoned that where there was a town there might be a doctor.

Seconds before touching down, Vining was horrified to see a camouflaged tank trap dead ahead. That was the last thing he remembers. The plane bellied into the grass, caromed off the deep ditch, and came to rest with its fuselage broken in half.

Vining regained complete consciousness later that same day in a US Army hospital in Metz, France. He learned then that his plane had landed close to an Allied hospital train. The medics arrived at the wreckage even before the dust had settled. They had immediately taken him by jeep-litter to Metz.

Vining and four others survived. The tail gunner was fatally injured in the crash.

A lengthy postwar convalescence and disability retirement from the Army led Vining to eventually return to college in Louisiana. After completing graduate school at Louisiana State University, he attempted unsuccessfully to enter politics and then moved north to the Washington, D.C., area, where he lives today and is a government management system analyst.

Jim Vining has not lost his love of flying. Far from it. He has a commercial pilot's license and spends as much time as he can flying lightplanes in northern Virginia.

The loss of his right leg has had no ill effect on his flying skill. Nor does it affect his ambitions for the stage.

After participating as an amateur actor for several years, Vining last January finally made the grade. He appeared in a leading role in the Alexandria, Va., Catacombs Theater production of Pirandello's "Right You Are—If You Think You Are."

"Now *that* was an experience," he says.—END

The author, Jack Taylor, is a retired Air Force lieutenant colonel. A native of Allentown, Pa., he enlisted in the AAF in January 1942 and later served as a B-26 pilot in the ETO. Recalled to active duty in 1952 from his civilian job as a news writer-editor, he served continuously as an Information Officer until his retirement last March. His post-Korean conflict tours have included Lowry AFB, Colo.; Hq. Iceland Air Defense Force; Harrisburg, Pa., Air Reserve Center; AFIT (Boston University); 81st Tactical Fighter Wing, Bentwaters, England; Hq. Air Defense Command, Ent AFB, Colo.; Hq. Sixth Allied Tactical Air Force (NATO), Izmir, Turkey; and the Pentagon's Command Services Unit (SAFOI). He is now employed as a free-lance writer.

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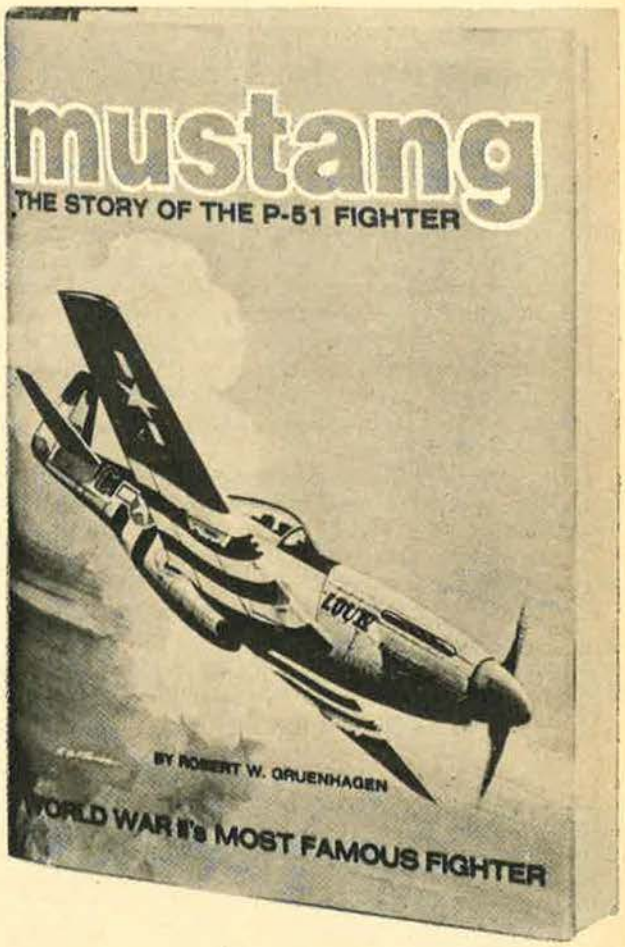

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News and Comment about Air Force People . . .

By Jackson V. Rambeau

AFA DIRECTOR OF MILITARY RELATIONS

Helping Retirees Find Second Careers

The Defense Department's Referral Program, designed to meet the major difficulties that face service personnel who have served a full career in the armed forces and seek a meaningful second career, has begun.

Active-duty personnel about to retire may voluntarily register their post-service employment objectives with the referral facility.

Some 65,000 to 70,000 servicemen leave the armed forces annually after careers of twenty to thirty years.

A need for the Referral Program is apparent from statistics gathered by the Defense Department which show:

- The great majority of military personnel are forced to retire with either twenty or thirty years of total service. For most military personnel, this means retirement comes at about age forty-one or fifty-one, respectively. This forced retirement comes at a time when family obligations are most likely to be heavy and when the retiree cannot live solely on his retirement pay. Many retirees face long periods of unemployment.
- The retiree is often stationed thousands of miles away (sometimes overseas) from his planned retirement home, and has no effective way of knowing what the job opportunities are in the area or how to communicate with prospective employers.
- The man who has served a full career in uniform is out of touch with the civilian job market, and has difficulty in equating his military experience to civilian job opportunities, and in organizing and conducting his job hunt.

While "Referral" participation does not guarantee a job for a retiring serviceman, it is designed to meet some of his unique problems by providing communication with the civilian labor market.

Officials pointed out that the Referral Program is not designed as a means for servicemen to obtain Civil Service employment. Retiring personnel seeking a Civil Service position with the federal government will be referred to the nearest Federal Job Information Center, the Base Civilian Personnel Office, or other appropriate activity where detailed information and application forms can be obtained. Federal employers may submit job vacancies to the Referral computer to obtain names of potential employees, but any hiring must be accomplished in accordance with appropriate Civil Service Commission regulations and other governing directives.

The elements of the program have been carefully worked out. For example, there will be preretirement counseling, as resources permit.

We in AFA have encouraged DoD to set up such a program.

How Some Students Protest

It is no news that many students throughout the nation have been protesting the Southeast Asian war. It is no news either that a few have resorted to violence.

Students at the University of Maine, however, have taken a different approach. Desiring to make their anti-war views known, they contacted the nearest SAC base, at Loring, Me. They advised that, although opposed to the war, they believed in supporting our fighting men in South-

AF Chief of Staff Gen. John D. Ryan hands his donation for the new Air Force Museum to former Chief of Staff Gen. John P. McConnell, now Executive Director of the Air Force Museum Foundation. Other senior commanders contributing to the off-duty fund campaign are, first row, from left, Gen. James Ferguson, AFSC; Gen. John C. Meyer, Vice Chief of Staff; Gen. Bruce K. Holloway, SAC; Gen. Joseph J. Nazzaro, PACAF; standing, left to right, Gen. Jack J. Catton, MAC; Gen. William W. Momyer, TAC; Gen. Horace M. Wade, Chief of Staff, Supreme Headquarters, Allied Powers Europe; General McConnell; General Ryan; Gen. Jack G. Merrell, Air Force Logistics Command; Gen. Joseph R. Holzapple, USAFE; Gen. Seth J. McKee, NORAD; and Gen. George S. Brown, of 7th AF.

east Asia and wanted to express that belief by giving much-needed blood. Twenty-three hundred students volunteered to be donors.

The next day, medics from Loring AFB, and from Westover AFB, Mass., appeared on the campus and, in coordination with the American Red Cross, worked from 8:00 a.m. to 9:00 p.m., obtaining 750 pints of blood. Two days later the blood arrived in South Vietnam.

Food Stamps for the Military

A total of 312 military commissary stores in the United States have been authorized to begin participating in the Department of Agriculture Food Stamp Program, beginning July 1, 1970.

The Defense Department recently made a survey in the fifty states and the District of Columbia of military families eligible for welfare assistance. The survey indicated that approximately 50,000 such families may be eligible to participate in the stamp program. Although the survey did not include families of military retirees, they also may benefit from the program if they qualify.

Commissaries certified for acceptance of food stamps include 156 Air Force, seventy-five Army, sixty-seven Navy, and fourteen Marine Corps stores.

Eligibility of families for food stamps is determined by the county or city officials who operate the program. Since standards of need vary from one state to another, persons who believe they qualify should contact the local offices, which usually are listed in the city or county government section of the telephone directory under "Welfare," "Social Services," or "Public Assistance." Eligibility depends on the size of family income and number of members of the family.

Food stamps may be used to purchase only "eligible food." This excludes alcoholic beverages, tobacco products, imported foods, and such household items as soap. Only the presently authorized patrons of military commissary stores will be able to use food stamps in those stores. In an area where there is no commissary store, military families and retirees who have obtained food stamps may redeem them for food at commercial food stores that are participating in the food-stamp program.

Retiree Boost to Exceed Five Percent

Defense officials have said that the retiree pay raise coming August 1 will be at least 5.1 percent. The extra money will show up in checks received in September.

The Defense estimate is figured on the April Consumer Price Index of 134, which is 4.11 percent over the basic index on which the raise will be calculated. A law passed last year says future raises will be one percent higher than otherwise indicated on the basis of the CPI alone.

May's CPI, which was to be released about June 20, will determine the precise amount of the retiree pay hike. We think the raise will be about 5.4 percent.

Project Transition for Medics

If you're an enlisted Air Force medic who's retiring or getting out after four years of service, you'll be interested in DoD's MEDIHC (Military Experience Directed Into Health Careers) program. It's designed to help you continue working in the health-related field that coincides with your Air Force training and experience. At the same time, it will help solve what President Nixon has called "current and projected demands for quality health care" in civilian communities. It also will help you locate in the area of the US where you wish to reside.

Initially, the program will be open only to those blue suiters who want to make their permanent home in Texas, but every state is expected to join the program soon. If you are interested in taking advantage of the program, contact the Transition Office serving your base. They have the particulars. The Veterans Administration is very much interested in this group of trained medical personnel.

(Continued on following page)

The Gen. Curtis E. LeMay Personnel Services Award, a Daedalian trophy recognizing superior base-level programs for USAF personnel, is presented by Lt. Gen. A. J. Russell, Deputy Chief of Staff, Personnel, to McConnell AFB, Kan. Receiving the trophy, from left, Col. James V. Hartinger, Commander, 23d Tactical Wing at McConnell; Col. Cecil N. Liles, Deputy for Personnel, TAC, Langley AFB, Va.; and V. E. Norman, base recreational director.

Lt. Gen. Sam Maddux, Jr., Commander of ATC, left, presents the Maj. Gen. Benjamin D. Foulois Memorial Award, a Daedalian award for accident prevention, to Lt. Gen. Thomas K. McGehee, accepting on behalf of ADC.

Ingenuity and initiative of maintenance personnel of the 4780th Air Defense Wing won the award of the Maj. Gen. Clements McMullen Weapon System Maintenance Trophy to Perrin AFB, Tex. Gen. Jack Merrell, AFLC Commander, presents the trophy at the Daedalian annual meeting to, from right, Col. Vermont J. Garrison, Perrin AFB Commander; Col. Jimmie L. Nichols; and CMSgt. G. C. Belcele.

This is what Lubbock, Tex., looked like after a tornado slammed through the city recently. Twenty-four people were killed and more than 300 injured, with damage estimated at $110 million. In response to an urgent request, aerial photos were delivered to the Pentagon within eight hours by the 188th Tactical Recon Group, Arkansas ANG.

At Last!

Maybe the Reserve Forces will amount to something in the eyes of the active force after all. Following is a letter to the major commands, signed by Lt. Gen. John W. Carpenter, III, USAF's Assistant Vice Chief of Staff. It is a letter we never expected to see leave the Pentagon:

"1. The mission of the Air Reserve Forces (Air National Guard and Air Force Reserve) is to develop, maintain, and provide to the Air Force, in either partial or general mobilization, or at any other time needed, those trained and operationally ready units and individuals to:

"a. Augment the Air Force;

"b. Replace attrition or combat losses;

"c. Build new combat and support forces;

"d. Expand the training base, in such numbers and kinds as are required for any foreseeable operation.

"2. The Department of the Air Force document, *USAF Planning Concepts, 1969–1984*, provides a basis for reasoned change within the Air Force and should serve as a foundation for Air Staff and Command planning and programming actions. The concepts and guidance provided throughout this document apply equally to the active Air Force and the Air National Guard/Air Force Reserve forces. Part II of Annex A of this document states that strong, viable Air Reserve Forces are an important and integral segment of total Air Force capability. It is essential that the total force concept be applied in all planning for both active-duty and Reserve Forces. The total force concept is the concurrent consideration of the total force, both Regular and Reserve, to determine the most cost-effective mix which will support the strategy and meet the threat. This concept should be applied to all aspects of planning, operations, programming, manning, and equipping.

" 'Force structure development, programming actions, and plans for employment of the Air Reserve Forces should take into consideration . . . the lower peacetime sustaining costs of Reserve Forces units, compared to similar active units, [which] could result in a larger total force for a given budget or the same size force for a lesser budget. . . . Insofar as is practical, units should be organized using the same criteria for structure and size as similar units of the active Air Force. . . .'

"3. The USAF Objective Force and the programmed force structure are developed annually using the total force concept as guidance. Changes to the approved program are also made within this context.

"4. The current series of budget exercises in progress in the Air Staff and those which might follow, with their attendant review of current programs, will result in new force structures, developed within the total force concept. As fiscal constraints cause reductions in the active Air Force, these result in new missions for the Air National Guard and Air Force Reserve, changes in the force mix within some mission areas, and accelerated modernization of the Air Reserve Forces.

"5. In his memorandum of 3 April 1970, *Policy Guidance on National Guard and Reserve Base Closures*, the Assistant Secretary of Defense stated: 'The Defense Department Policy concerning National Guard and Reserve Forces is that the readiness of these forces will be strengthened and improved as reductions in the Active Forces occur.' To carry out this policy with maximum effectiveness, each major gaining command is requested to work as closely as possible with those Air Reserve Forces units for which it has the responsibility for inspection and supervision of training. This should produce not only an improved state of readiness but also enable the commands to take full benefit of the peacetime contributions available from Air National Guard and Air Force Reserve units."

Parting Shots

★ Eighty-seven percent of the Air Force Academy's

Sen. Barry Goldwater (R-Ariz.) is greeted on his arrival at Sheppard AFB, Tex., by Maj. Gen. Jerry D. Page, Commander of the Sheppard Technical Training Center. The Senator was the featured speaker at the May 11 Armed Forces Day dinner sponsored by the Air Force Association.

1970 Class who were qualified to do so elected to take pilot training, according to preliminary figures.

★ The VA's annual report says veterans, their families, and survivors of deceased veterans account for nearly 96,000,000 of America's population of just over 200,000,000.

★ Approximately 940,000 servicemen were separated from military service during Fiscal Year 1969, according to the Veterans Administration's annual report.

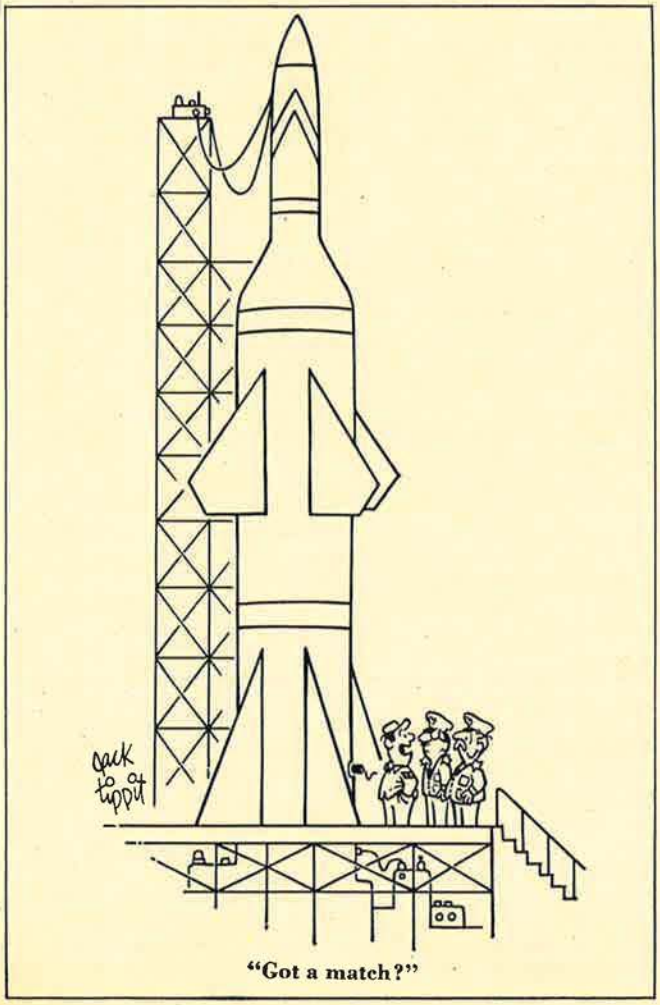
★ The Air Force Village will open its doors in San Antonio, Tex., in November 1970. The number of applications received to date has been "phenomenal," according to a Village Foundation spokesman, who urged interested, eligible individuals not to delay making up their minds lest they be disappointed. Applications and information can be obtained from the AF Village Foundation, Bolling AFB, D. C. 20332.

★ Being trained in C-119 Flying Boxcar aircraft and airframe maintenance at the Air Force Reserve's Clinton County AFB, Ohio, are several groups of South Vietnamese and Imperial Ethiopian Air Force airmen. Following classroom training, the airmen are assigned to aircraft maintenance shops of the USAFR's 302d Tactical Airlift Wing for on-the-job training in their specialty.

★ The Air Force Academy has been selected to receive the Gen. Thomas D. White Conservation of National Resources Award for 1969 for their continuing program of preservation and for enhancing the natural beauty of wildlife on the Academy's 18,000 acres.

★ Careful management on the part of the USAF Military Personnel Center continues to pay off for NCOs vulnerable for involuntary second SEA tours. In February, the estimated number for calendar year 1970 was revised downward from 5,105 airmen in twenty specialties to 3,558 airmen in fourteen specialties. By the first of May, the Air Force was able to lower its estimate still further, to 2,065 airmen in eleven specialties.

Cadet Col. (now 2d Lt.) Richard J. Knapp, Commander of the AFROTC Group at the University of Maryland, took most of the honors at the Group's Awards Ceremony May 13. In addition to AFA's Medal for the Outstanding Senior Cadet, Knapp received the American Legion ROTC Scholastic Award; the Air Force Times Award; the PAS Award for Excellence; AFROTC Superior Performance Ribbon; AFROTC Outstanding Commander Ribbon; and AFROTC First Honors Ribbon.



"Got a match?"

SENIOR STAFF CHANGES

B/G Earl O. Anderson, from Dep. Chief, AFRES, Hq. USAF, reverts to Reserve status . . . **Col. (B/G Selectee) Frederick C. Blesse,** from Cmdr., 474th Tac. Ftr. Wg., Nellis AFB, Nev., to Cmdr., 831st Air Div., TAC, George AFB, Calif. . . . **Col. (B/G Selectee) Marion L. Boswell,** from Cmdr., 4th Tac. Ftr. Wg., TAC, Seymour-Johnson AFB, N.C., to Dep. Dir., Legislative Liaison, OSAF, Hq. USAF, replacing B/G (M/G Selectee) John C. Giraudo . . . **B/G Earl W. Brannon, Jr.,** remains assigned as Cmdr., David Grant USAF Med. Ctr., MAC, Travis AFB, Calif. (previously announced to be Cmd. Surgeon, Hq. MAC, Scott AFB, Ill.) . . . **Gen. George S. Brown,** from Dep. Cmdr., MACV for Air Ops., PACOM, and Cmdr., 7th AF, PACAF, Tan Son Nhut Airfield, Vietnam, to Cmdr., Hq. AFSC, Andrews AFB, Md. . . . **M/G John H. Buckner,** from Vice Cmdr., 12th AF, TAC, Bergstrom AFB, Tex., to DCS/Ops, 7th AF, PACAF, Tan Son Nhut Airfield, Vietnam . . . **Col. (B/G Selectee) John J. Burns,** from Cmdr., 58th Tac. Ftr. Tng. Wg., TAC, Luke AFB, Ariz., to Dep. Dir., General Purpose and Airlift Forces, DCS/R&D, Hq. USAF.

M/G (L/G Selectee) Sam J. Byerley, from Dir., Ops, DCS/P&O, Hq. USAF, to Cmdr., 8th AF, SAC, Andersen AFB, Guam, replacing L/G Alvan C. Gillem, II . . . **B/G Donald J. Campbell,** recalled to EAD, to Dep. Chief, AFRES, Hq. USAF, replacing B/G Earl O. Anderson . . . **M/G William B. Campbell,** Asst. DCS/P&R, Hq. USAF, to Chief, Army-AF Exchange Service, Dallas, Tex., replacing retiring B/G George E. McCord . . . **M/G William S. Chairsell,** from Vice Cmdr., ADTC, AFSC, Eglin AFB, Fla., to Vice Cmdr., 9th AF, TAC, Shaw AFB, S.C., replacing M/G Carlos M. Talbott . . . **Col. (B/G Selectee) Kenneth R. Chapman,** from Dep. for RAND/ANSER, Dir. of Opr. Rqmts. & Dev. Plans, DCS/R&D, Hq. USAF, to DCS/Dev. Plans, Hq. AFSC, Andrews AFB, Md.

L/G (Gen. Selectee) Lucius D. Clay, Jr., from Vice CinC, Hq. PACAF, Hickam AFB, Hawaii, to Dep. Cmdr., MACV for Air Ops, PACOM, and Cmdr., 7th AF, PACAF, Tan Son Nhut Airfield, Vietnam, replacing Gen. George S. Brown . . . **M/G (L/G Selectee) Robert J. Dixon,** from Vice Cmdr., 7th AF, PACAF, Tan Son Nhut Airfield, Vietnam, to DCS/P, Hq. USAF . . . **B/G Harvey W. Eddy,** from Cmdr., OAR, Arlington, Va., to DCS/P, Hq. AFSC, Andrews AFB, Md. . . . **B/G Edmund B. Edwards,** from Chief, Middle-East, Africa, South Asia Div., J-5, Jt. Staff, OJCS, to Dep. Dir., Plans,

(Continued on following page)

President Nixon in May announced the appointment of Lt. Gen. Albert Clark as the new Superintendent of the Air Force Academy. He currently is Commander of the Air University, Maxwell AFB, Ala. He will succeed retiring Lt. Gen. Thomas S. Moorman, Academy Superintendent for five years.

Brig. Gen. Donald J. Campbell, Commander of the USAFR's 302d Tactical Airlift Wing, Clinton County AFB, Ohio, has been called to extended active duty to serve as deputy to the Chief of the Air Force Reserve, Hq. USAF. General Campbell has served in USAF more than twenty-five years.

Lt. Col. Pearl E. Tucker, a nursing consultant in the Office of the Air Force Reserve, has received the annual Flight Nurse Award sponsored by McDonnell Douglas Corp.'s Douglas Aircraft Division. She recently received an honorary doctorate from Capital University in Columbus, Ohio.

DCS/P&O, Hq. USAF, replacing retiring B/G Richard L. Ault . . . **M/G (L/G Selectee) Richard H. Ellis,** from Cmdr., 9th AF, TAC, Shaw AFB, S.C., to Vice CinC, USAFE, Lindsey AS, West Germany, replacing L/G George B. Simler . . . **L/G Alvan C. Gillem, II,** from Cmdr., 8th AF, SAC, Andersen AFB, Guam, to Cmdr., AU, Maxwell AFB, Ala. . . . **B/G (M/G Selectee) John C. Giraudo,** from Dep. Dir., Legislative Liaison, to Dir., Legislative Liaison, OSAF, Hq. USAF, replacing M/G John R. Murphy.

M/G Lee V. Gossick, from Cmdr., ASD, AFSC, Wright-Patterson AFB, Ohio, to DCS/Systems, Hq. AFSC, Andrews AFB, Md. . . . **M/G Augustus M. Hendry, Jr.,** from DCS/Plans, Hq. TAC, Langley AFB, Va., to Cmdr., 9th AF, TAC, Shaw AFB, S.C., replacing M/G (L/G Selectee) Richard H. Ellis . . . **B/G Robert J. Holbury,** from Cmdr., USAF, Tac. Air Recon. Ctr., TAC, Shaw AFB, S.C., to DCS/Plans, Hq. TAC, Langley AFB, Va., replacing M/G Augustus M. Hendry, Jr. . . . **B/G Roger Hombs,** from Dep. Asst. SG for Dental Svcs., to Asst. SG for Dental Svcs., OSG, Hq. USAF . . . **M/G John B. Hudson,** from DCS/Ops, Hq. AFSC, Andrews AFB, Md., to Vice Cmdr., SAMSO, AFSC, Los Angeles AFS, Calif., replacing M/G Louis L. Wilson . . . **M/G James M. Keck,** from Asst. DCS/Ops, Hq. SAC, Offutt AFB, Neb., to Dep. Dir., Ops, DCS/P&O, Hq. USAF . . . **M/G Clifford J. Kronauer, Jr.,** from Cmdr., USAF Space & Missile Test Ctr., AFSC, Vandenberg AFB, Calif., to Chief of Staff, Hq. AFSC, Andrews AFB, Md., replacing M/G Paul T. Cooper.

L/G John D. Lavelle, from Dir., Defense Communications Planning Group, DCA, Naval Observatory, Bldg. 56, Washington, D.C., to Vice CinC, Hq. PACAF, Hickam AFB, Hawaii . . . **B/G Herbert A. Lyon,** from Dep., Engineering, ASD, AFSC, Wright-Patterson AFB, Ohio, to Asst. DCS/Systems, Hq. AFSC, with addl. duty as Asst. for SEA, Andrews AFB, Md. . . . **M/G Sherman F. Martin,** from DCS/Plans, Hq. SAC, Offutt AFB, Neb., to Asst. DCS/P&R, USAF, replacing M/G William B. Campbell . . . **Mr. William E. Munves,** from Asst. Gen. Counsel (Procurement), GS-17, to Dep. Gen. Counsel, GS-17, Office of the Gen. Counsel, OSAF, Hq. USAF.

M/G John R. Murphy, from Dir., Legislative Liaison, OSAF, Hq. USAF, to Vice Cmdr., Hq. ATC, Randolph AFB, Tex. . . . **Mr. Thomas W. Nelson,** from GS-15, to GS-16, Dep. Admin. Asst. to the Secy. of the AF, Office of the Admin. Asst., OSAF, Hq. USAF . . . **Mr. Riner C. Payne,** from GS-15, to GS-16, Asst., Management Control Systems, Office, Asst. Secy. of the AF (Financial Management), Hq. USAF . . . **M/G Chesley G. Peterson,** DCS/P&O, PACOM, Camp H. M. Smith, Hawaii (previously announced to be Sr. AF Member, Mil. Studies and Liaison Div., WSEG, OSD, Hq. USAF), will retire . . . **M/G Richard D. Reinbold,** from Dep. and C/S to US Rep., NATO Mil. Comm., Belgium, to Vice Cmdr., 15th AF, SAC, March AFB, Calif. . . . **B/G (M/G Selectee) Roger K. Rhodarmer,** from Dir., Recon. & Electronic Warfare, DCS/R&D, Hq. USAF, to Cmdr., USAF Tac. Air Recon. Ctr., TAC, Shaw AFB, S.C., replacing B/G Robert J. Holbury.

L/G Austin J. Russell, from DCS/P, to Asst. Vice C/S, Hq. USAF, with addl. duty as Sr. Air Force Member, Mil. Staff Comm., United Nations . . . **M/G Richard F. Shaefer,** from ACS/Plans, J-5, USMAC, Saigon, Vietnam, to Dep. Dir., J-5, Jt. Staff, JCS, Hq. USAF . . . **M/G Albert R. Shiely, Jr.,** from Vice Cmdr., Hq. AFCS, Scott AFB, Ill., to Vice Cmdr., Richards-Gebaur AFB, Mo. . . . **L/G George B. Simler,** from Vice CinC, Hq. USAFE, Lindsey AS, West Germany, to Cmdr., ATC, Randolph AFB, Tex. . . . **B/G Maxwell W. Steel, Jr.,** from Cmdr., Malcolm Grow USAF Med. Ctr. and Surgeon, HQ COMD USAF, Andrews AFB, Md., to Cmd. Surgeon, Hq. MAC, Scott AFB, Ill. (previously announced as being Cmdr., David Grant USAF Med. Ctr., MAC, Travis AFB, Calif. . . . **M/G Paul R. Stoney,** from Cmdr., Hq. AFCS, Scott AFB, Ill., to Cmdr., Hq. AFCS, Richards-Gebaur AFB, Mo. . . . **M/G Carlos M. Talbott,** from Vice Cmdr., 9th AF, TAC, Shaw AFB, S.C., to Dir., Ops, DCS/P&O, Hq. USAF, Washington, D.C.

Col. (B/G Selectee) Kenneth L. Tallman, from Asst. for Col. Assignments, DCS/P, Hq. USAF, to Cmdr., 836th Air Div., TAC, MacDill AFB, Fla. . . . **M/G Louis L. Wilson, Jr.,** from Vice Cmdr., SAMSO, AFSC, Los Angeles AFS, Calif., to Cmdr., USAF Space & Missile Test Ctr., AFSC, Vandenberg AFB, Calif., replacing M/G Clifford J. Kronauer, Jr. . . . **Mr. Harold M. Wright,** from P.L. 313, Technical Dir. (Systems Management), Electronics Systems Div., to P.L. 313, Chief Technical Advisor (Electronic Systems), AFSC, Hanscom Field, Bedford, Mass. . . . **Dr. Michael I. Yarymovych,** from P.L. 313, Dep. for Rqmts., Office, Asst. Secy. of the AF (R&D), Hq. USAF, to P.L. 313, Dir., Advisory Group for Aerospace R&D, NATO, Paris, France.

PROMOTIONS: Nominated to **General:** Lucius D. **Clay,** Jr. Nominated to **Lieutenant General:** Sam J. **Byerley;** Robert J. **Dixon;** Richard H. **Ellis.**

Air National Guard: To be **Major General:** Charles W. **Sweeney.** To be **Brigadier General:** James W. **Carter;** William H. **Pendleton;** Robert S. **Peterson;** George H. **Taylor.**

RETIREMENTS: B/G Richard L. **Ault;** Gen. James **Ferguson;** B/G Spencer S. **Hunn;** B/G George E. **McCord;** B/G William L. **Mitchell,** Jr.; M/G Franklin A. **Nichols;** M/G Chesley G. **Peterson.**—END

At Anaheim, Calif.

A star-studded guest list, addresses by some of the top figures from USAF and the Air Force Association, pageantry, and patriotism were some of the highlights of . . .

The Arnold Air Society's Annual Conclave

A STAR-STUDDED guest list; addresses by AFA President George D. Hardy, Assistant Secretary of the Air Force (Financial Management) Spencer J. Schedler, and Lt. Gen. A. P. Clark, then the Air University Commander and recently named to replace retiring Lt. Gen. Thomas Moorman as Superintendent of the Air Force Academy; the coronation of the 1970 "Little General"; and a rousing performance of patriotic songs by Brigham Young University's "Footprints of Freedom," a chorus composed of AFROTC cadets and Angels, were a few of the highlights of the twenty-second Arnold Air Society (AAS) and fifteenth Angel Flight National Conclave held recently in Anaheim, Calif.

The annual meeting of outstanding Air Force ROTC cadets and members of their coed auxiliary, Angel Flight, was opened with a ringing defense of the "establishment" by General Clark, who began his remarks by saying: "No one can join with you here without becoming aware of the fact that, despite the imbalance in publicity, there is a large group of students in all our colleges across the country which identifies itself proudly with law and order, respect for our country's flag, and freedom with responsibility." General Clark commended the cadets and Angels for "stepping forward, out of the comfort and security of the ranks of the silent majority."

Brig. Gen. Howard T. Markey, Commander of the 126th Air Refueling Wing, Illinois Air National Guard, a former AFA President, and a permanent AFA National Director, served as the master of ceremonies for the conclave awards banquet. He called for ". . . all those over thirty at the banquet to stand and applaud the outstanding young Americans in the audience."

Rising to applaud the AFROTC cadets and Angels was a host of Air Force leaders, past and present, including Lt. Gen. and Mrs. James Doolittle, USAF (Ret.), one of the founders of AFA and its first president, who led his famed "Tokyo Raiders" in B-25s from the deck of the carrier *Hornet* before most of the cadets and Angels in the audience were born; Gen. John P. McConnell, USAF (Ret.), former Air Force Chief of Staff, an AFA National Director, and this year's Arnold Air Society honorary National Commander; Gen. James Ferguson, Commander of the Air Force Systems Command; Lt. Gen. Sam Maddux, Jr., Commander of the Air Training Command; Dr. Theodore C. Marrs, Deputy Assistant Secretary of Defense (Reserve Affairs); Maj. Gen. Winston P. Wilson, Chief of the National Guard Bureau; Brig. Gen. W. C. McGlothin, Commander of the USAF Recruiting Service; Brig. Gen. Daniel "Chappie" James, Jr., Deputy Assistant Secretary of Defense (Public Affairs); and Mrs. H. H. Arnold, widow of General of the Air Force Henry "Hap" Arnold.

Major award recipients at this year's conclave included Senator Henry M. Jackson (D-Wash.) (Paul T. Johns Trophy); General Ferguson (Gen. H. H. Arnold Award); General Maddux (Gen. Muir S. Fairchild Award); the Apollo-11 astronauts (President John F. Kennedy Trophy).

(Continued on following page)

Beth Jones and Patrick C. Hayashi, standing, of the Horace M. Hickam Angel Flight and Arnold Air Society Squadron at the University of Hawaii, have just presented leis to head-table guests. From left, Brig. Gen. Earl O. Anderson, Deputy to the Chief of the Air Reserve; Brig. Gen. B. B. Cassiday, Commandant, AFROTC; Angel Flight National Commander Marjorie Erwin; Lt. Gen. A. P. Clark, Air University Commander; and AFA President George D. Hardy.

Also, General James (Eugene M. Zuckert Award); Col. John R. Boyd, AFSC (Gen. Hoyt S. Vandenberg Trophy); Maj. Eddie C. Norrell, an education and training staff officer at the Air University's Squadron Officer School (Lt. Theodore C. Marrs Trophy); and Mrs. James H. Doolittle, who was named Angel Flight honorary National Commander. Col. Haynes M. Baumgardner, Professor of Aerospace Studies at Texas Tech, was honored as the nation's outstanding Angel Flight adviser.

James C. McDaniel, Jr., of the University of Virginia, received three of the top AFROTC awards—the Air Command and Staff Award, the Benjamin D. Foulois Trophy, and the Aerospace Education Foundation's W. Randolph Lovelace Medallion, which is awarded to the outstanding cadet in each of AFROTC's nine national areas. The other eight recipients were: Robert R. Noel, University of New Hampshire; Michael D. Kennedy, Mississippi State University; Glen D. Shaffer, Otterbein College, Ohio; Gregory S. Parnell, State University of New York at Buffalo; Douglas J. Shadle, State University of Iowa; James J. Walsh, Washington University, St. Louis, Mo.; Donald W. Bauman, University of Portland, Ore.; and Emanuel M. Honig, Texas Tech University.

Cadet Frank Taylor of the University of Notre Dame was selected the outstanding AAS area commander, and Miss Lynn Cutler, from Brigham Young University, was named the outstanding Angel Flight area commander.

Scholarships and fellowships totaling more than $3,000 were awarded to deserving AFROTC cadets and Angel Flight members during the conclave. Recipients were Gerald S. Knoke, University of Washington; Dean P. Hayden of Washburn University; Thomas A. Megeath of the University of Wyoming; Miss Cynthia Schmidt, Washburn University; Miss Debbie Jones, University of Tennessee; Miss Ophelia Barron, Arizona State University; Charles D. Beckenhauer, Kansas State University; and Michael G. Williams, Colorado State College.

The Maryland Cup, awarded to the outstanding AAS squadron in the nation, was presented to the Thunderbird Squadron of Oklahoma State University. Other unit awards and recipients were: the Capt. Frank S. Hagan Trophy, the Eagle Trophy, and the Samuel E. Anderson Award to the Brig. Gen. Everett R. Cook Squadron, Memphis State University; the Gen. Claire Chennault Trophy to the Joyce Johnson Squadron, University of Nebraska; the Capt. Samuel A. Woodworth Trophy to the Joseph J. Foss Squadron, University of Missouri; the USAF Recruiting Service Trophy to the Iven C. Kincheloe Angel Flight, Purdue University; and the Purdue Cup to the Lewis C. Ellis Angel Flight, Texas Tech University.

Dr. Theodore C. Marrs, center, Deputy Assistant Secretary of Defense (Reserve Affairs), visits with Mary Lynn McCarthy, left, newly elected Angel Flight National Commander from Univ. of Maryland, and Marjorie Edwin outgoing Angel Flight National Commander, from Ohio State.

During the Military Ball, Miss Lynn Mobley, a member of the Angel Flight from Auburn University, was selected "Little General" for 1970. Brig. Gen. B. B. Cassiday, Jr., Commandant of the AFROTC, presented the "Little General" a dozen red roses and, as is the custom, had the honor of the first dance. The Military Ball concluded formal activities for the more than 2,000 AFROTC cadets and Angels attending the conclave at the Anaheim Convention Center. —DON STEELE

Gen. John P. McConnell, former Air Force Chief of Staff and now a permanent AFA National Director, receives a standing ovation when introduced at the Arnold Air Society/Angel Flight National Conclave Banquet. General McConnell, Executive Director of the Air Force Museum Foundation, is 1970's AAS honorary National Commander.

Among the honored guests at the AAS/Angel Flight National Conclave were, from the left, Mrs. James H. Doolittle; Mrs. H. H. Arnold, widow of General of the Air Force "Hap" Arnold; Lt. Gen. James Doolittle, USAF (Ret.), one of the founders and first President of AFA; and Brig. Gen. B. B. Cassiday, Commandant of the Air Force ROTC.

1970 ANNUAL NATIONAL CONVENTION AND AEROSPACE BRIEFINGS AND DISPLAYS

Washington, D.C.—September 21-22-23-24

LAST CHANCE TO EXHIBIT!

Companies desiring to participate in AFA's 1970 Aerospace Development Briefings and Displays may still reserve booth space. Only eight booths are available at press time, so quick action is suggested for those firms desiring to present their equipment and services to some 10,000 key personnel from government agencies, the military services and industry.

This briefing concept was pioneered by AFA in 1964 and combines displays of equipment with company presentations in the booth to audiences of key military, government and industry personnel. Morning attendees are assembled into parties of 15 to 20 persons each and escorted on schedule to briefings in the group of companies selected. Afternoon attendees may select any of the presentations offered in any order of preference.

Top military and government leaders attend this event annually. Last year, 6,080 attended the Briefings and Displays, with 2,359 escorted to the morning presentations and 3,721 attending in the afternoons. They represented 54 government and military agencies and some 51 companies. With AFA's National Convention being held at the same time this year, the attendance is expected to double. Special attention will be focused on the 1970 Briefings and Displays with a reception in the exhibit halls the evening of September 22, honoring the Secretary and Chief of Staff of the United States Air Force.

A minimum of 300 square feet of booth space is required to conduct briefings. No minimum is required to exhibit only. Companies interested in reserving space should contact AFA as quickly as possible.

TO RESERVE BRIEFING/DISPLAY SPACE, WRITE OR CALL:

AFA Briefing & Display Office
1040 Shoreham Building
Washington, D.C. 20005
Telephone: (202) 347-0425

COMPANIES PARTICIPATING IN '70 BRIEFINGS

The following companies have reserved space in the 1970 Aerospace Development Briefings & Displays. The majority of these companies will exhibit hardware and make presentations in their booths; other companies will exhibit only.

AC Electronics Div., GMC
Aerojet Solid Propulsion Co.
Astronautics Corp. of America
AT&T and Associated Companies
Avco Corp.
Beech Aircraft Corp.
Bell Helicopter Co.
The Boeing Co.
Bunker-Ramo Corp.
Coca-Cola USA
Conference Book Service
Control Data Corp.
Fairchild Hiller Corp.
General Dynamics Corp.
General Electric Co.
Hercules, Inc.
Howell Instruments, Inc.
Hughes Aircraft Co.
IBM Federal Systems Div.
Jet Craft, Ltd.
Litton Industries
  Data Systems Div.
  Guidance & Control Systems Div.
Lockheed Aircraft Corp.
LTV Aerospace Corp.
Martin Marietta Corp.
McDonnell Douglas Corp.
North American Rockwell Corp.
Pan American World Airways
Pepsi-Cola Co.
Raytheon Co.
RCA - CSD
Sperry Rand Corp.
  Flight Systems Div.
  Gyroscope Div.
  Univac Div.
Standard Manufacturing Co.
Stresskin Products Co.
Teledyne CAE
Teledyne Ryan Aeronautical Co.
TRW Systems
United Aircraft Corp.
Westinghouse Electric Co.
Williams Research Corp.
Wyman-Gordon Co.
XYZYX Information Corp.

Make sure that your company is among this distinguished group at AFA's 1970 Briefings.

THIS IS AFA

The Air Force Association is an independent, nonprofit airpower organization with no personal, political, or commercial axes to grind; established January 26, 1946, incorporated February 4, 1946.

Objectives

• The Association provides an organization through which free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principles of freedom and equal rights for all mankind.

Membership

Active Members: US citizens who support the aims and objectives of the Air Force Association, and who are not on active duty with any branch of the United States armed forces—$7 per year.

Service Members (nonvoting, nonofficeholding): US citizens on extended active duty with any branch of the United States armed forces—$7 per year.

Cadet Members (nonvoting, nonofficeholding): US citizens enrolled as Air Force ROTC Cadets, Civil Air Patrol Cadets, or Cadets of the United States Air Force Academy—$3.50 per year.

Associate Members (nonvoting, nonofficeholding): Non-US citizens who support the aims and objectives of the Air Force Association whose application for membership meets AFA constitutional requirements—$7 per year.

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ALABAMA (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **Dr. Boyd E. Macroy,** 3721 Princeton Rd., Montgomery, Ala. 36111 (phone 293-6871).

ALASKA (Anchorage, Fairbanks, Kenai, Nome): **Gordon Wear,** Box 777, Fairbanks, Alaska 99701 (phone 452-4411).

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THE BADGER STATE, WISCONSIN, CHAPTER . . .

cited for effective programming in support of the missions of the Air Force Association and the Aerospace Education Foundation.

The sixth annual Girl Scout Aviation Badge Clinic, cosponsored by AFA's **Badger State Chapter** and the **440th Tactical Airlift Wing,** AFRES, was held recently at the General Billy Mitchell Field in Milwaukee, Wis., with more than 400 Milwaukee-area Girl Scouts participating in the day-long program.

Brig. Gen. Joseph J. Lingle, Wing Commander and an AFA National Director, opened the program with welcoming remarks, after which the girls were divided into seven smaller groups for briefings and demonstrations in various specialized fields.

The program included a **fire-fighting demonstration** by the Base Fire Department; a briefing on "Navigation and the Principles of Flight," by **Maj. Denis E. Bay;** a briefing and demonstration of survival equipment by **Sgt. William Ross** and parachute shop personnel; a movie on Aerospace Nursing, and a briefing on the advantages of an Air Force nursing career, given by **Capt. Louise Tremblay,** a flight nurse with the 933d Tactical Hospital.

There were static displays of **C-119 and KC-97 aircraft** from the **Wisconsin Air National Guard,** and a helicopter from the Wisconsin Army National Guard Flight Activity at West Bend. Also, the Milwaukee Area Radio Control Model Airplane Club displayed several models of their aircraft and explained how to fly the planes via radio control.

Miss Carol Keierleber, Program Services Director, Milwaukee Area Girl Scouts, Inc., praised the members of the Badger State Chapter for

(Continued on following page)

During the Badger State Chapter's sixth annual Girl Scout Aviation Badge Clinic, Capt. Louise Tremblay, left center, flight nurse with the 933d Tactical Hospital, explains the Air Force nursing program to, from left, Carol Keierleber, Program Services Director, Milwaukee Area Girl Scouts, Inc.; Chapter President Tommy J. Treat; Eileen Quinlan; Janet Christensen; and Wisconsin AFA Vice President Dick Downing, a chief master sergeant in the AF Reserve.

Alabama AFA President Dr. Boyd Macrory, right, presents the AFA Charter to Dr. Lloyd Robison, President of the newly organized War Eagle Chapter of Auburn, Ala. The Montgomery Chapter hosted the Charter dinner, and South Central Regional Vice President Jack T. Gilstrap installed the officers of the new Chapter. The guest speaker at the dinner was Lt. Col. Donald L. Clark, who had been stationed at the US Embassy in Moscow for a two-year tour.

During the Seventh Annual Space Congress and Indialantic Art Festival, Cocoa Beach, Fla., AFA's Cape Canaveral Chapter obtained some 4,000 signatures petitioning humane treatment for American POWs in North Vietnam. Manning the booth are, from left, George J. Burrus, III, Chairman of Florida AFA's POW Signature Campaign, which has secured more than 30,000 signatures on petitions; Mary Burrus; and Florida AFA Secretary Jerry Frewer.

an outstanding effort in presenting an interesting and informative program. In closing the program with thanks to the girls for their interest in the program, Chapter President **Tommy J. Treat** said, "We are proud of our program. Since its inception, we have helped more than 2,100 Girl Scouts in the Milwaukee area earn their Aviation Badges."

AFA, also, is proud of this fine AFA Chapter. In recognition of the Chapter's outstanding efforts in bringing aerospace education to the youth of its area, we are happy to name the **Badger State Chapter** AFA's "Unit of the Month" for July.

* * *

The **Michigan AFA** observed the twenty-fourth anniversary of AFA at a black-tie dinner dance in the Selfridge AFB Officers' Club, hosted by the **Mount Clemens Chapter.**

AFA President **George D. Hardy** gave the principal address. In his remarks, Mr. Hardy discussed the decline in America's R&D program, as compared to the buildup in Russia's program, and blamed the decline on a "small vocal minority" within the United States.

During the program, Michigan AFA President **Marjorie O. Hunt,** Lt. Col., USAF (Ret.), presented an AFA Citation to **Lawrence M. Carino,** Vice President and General Manager of WJBK-TV, for his television editorials supporting the **ROTC program.** To commemorate his visit, Colonel Hunt presented Mr. Hardy with a Selfridge AFB fiftieth anniversary commemorative plate.

Mount Clemens Chapter President **C. K. "Zeke" Vogt** presented an AFA Past President's pin to **Colonel Hunt** in recognition of her five years of service as President of the Chapter. Also, an AFA Associate membership was presented to **Col. Leonard Baldock** of Windsor, Ontario, Senior Reserve Adviser to the Department Chief of Operations and Reserve, Canadian Armed Forces, and a past president of the Royal Canadian Air Force Association. Colonel Baldock is a frequent visitor to AFA affairs in the Great Lakes region.

A delegation of thirty from the Canadian Armed Forces, including **Colonel Baldock** and **Maj. Robert LaVigne,** Commander of the 39th Technical Squadron, Royal Canadian Electrical and Mechanical Engineers, attended the program.

Other honored guests included **Brig. Gen. John W. Dean,** Deputy Commander, 2d ARADCOM Region, Selfridge AFB; and Great Lakes Regional Vice President **W. M. Whitney, Jr.**

AFA leaders who were special guests included State Vice President **Richard Hoerle;** past State President and former AFA National Director **Frank Ward;** past State Presidents **Irving Kempner, Jerry Green,** and **Norman Scott;** Vandenberg Chapter President **Richard Mossoney;** and Chennault Chapter President **Dorothy Whitney.**

* * *

IN SYMPATHY . . . The **Florida AFA** recently suffered the loss of two most effective and dedicated AFAers. On Sunday, April 26, **Jacksonville Chapter** President **Walter D. Loughridge,** his son, **Alan,** a freshman at the University of Georgia, and two of his son's college friends were killed when the small airplane piloted by Mr. Loughridge fell apart during a severe thunderstorm and crashed near Dublin, Ga. AFA extends its deepest sympathy to his widow and his daughter. . . . Then, early in May, **Jerome A. Waterman,** a former Southeast Regional Vice President, one of the organizers of AFA in Florida, and a staunch AFA supporter, suffered a fatal heart seizure. AFA extends its deepest sympathy to his daughters.

* * *

COMING EVENTS . . . Another reminder—that **AFA's 1970 National Convention,** now combined with the **Annual Aerospace Briefings and Displays,** will be held in Washington, D.C., **September 21-24.** All major activities will be conducted at the Sheraton-Park, Shoreham, and Washington Hilton Hotels. Plan now to attend. Write for hotel accommodations to the AFA Housing Office, 1129 20th St., N.W., Washington, D.C. 20036, and note the Briefings information on page 85 of this issue.

Texas AFA Convention, Big Spring, July 17-19 . . . **New York AFA Convention,** Syracuse, July 17-18 . . . **Massachusetts AFA Convention,** Hanscom Field, September 11-12 . . . **Pennsylvania AFA Convention,** Erie, October 9-10 . . . **Michigan AFA Convention,** Detroit, October 16-18 . . . **New Jersey AFA Convention,** Teterboro Airport, October 16-18 . . . **Washington AFA Convention,** Spokane, October 16-17 . . . **Virginia AFA Convention,** Langley AFB, November 21.

—DON STEELE

Principal participants in the Michigan AFA's dinner dance observing the twenty-fourth anniversary of AFA were, from left, Brig. Gen. John W. Dean, Deputy Commander, 2d ARADCOM Region; AFA President George D. Hardy; Michigan AFA President Marjorie O. Hunt; and Lawrence M. Carino, Vice President and General Manager, station WJBK-TV in Detroit.

At a black-tie dinner meeting, hosted by the Charleston Chapter, the newly organized South Carolina AFA was chartered. Principals in the program were, from left, Charleston Chapter President E. K. Burdette; AFA President George D. Hardy, speaker; Southeast Regional Vice President Lester C. Curl; and State AFA President Maj. Gen. James C. Hackler, USAF (Ret.).

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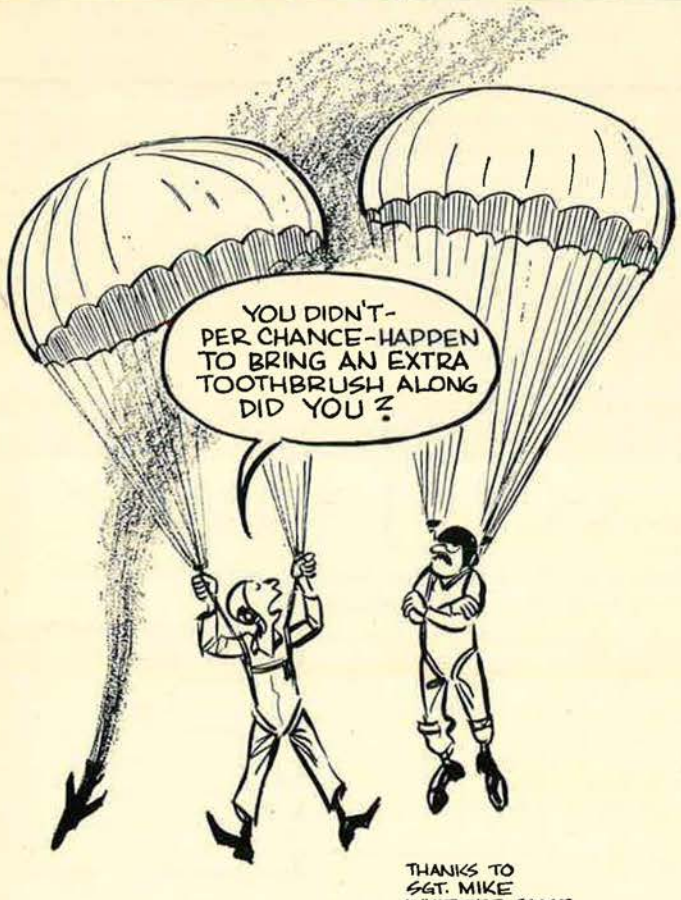
7/70

Bob Stevens'

"There I was..."

While all airmen perforce belong to that elite brotherhood of the noble, a heroic stance is difficult to maintain once the winds of adversity begin to blow, and you find yourself shot down in flames—or in conversation . . .

THE SQUADRON HOTSHOT (EVERY OUTFIT'S GOT AT LEAST ONE) IS MOUTHING OFF-



THANKS TO SGT. MIKE WHITTIER, CALIF.

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