

NOVEMBER 1962 / 50¢

AIR FORCE

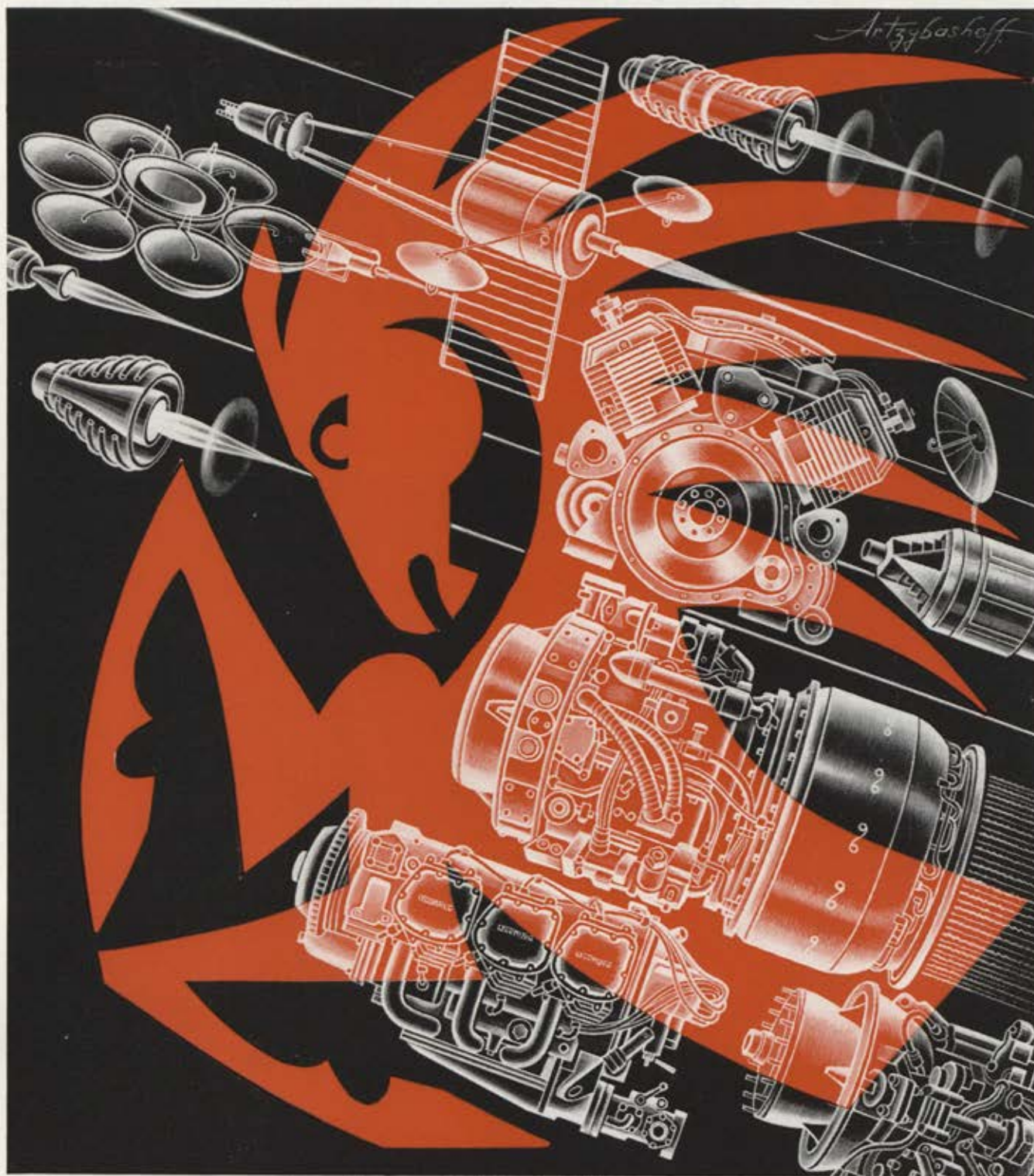
and **SPACE DIGEST**

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



THE 1962 CONVENTION

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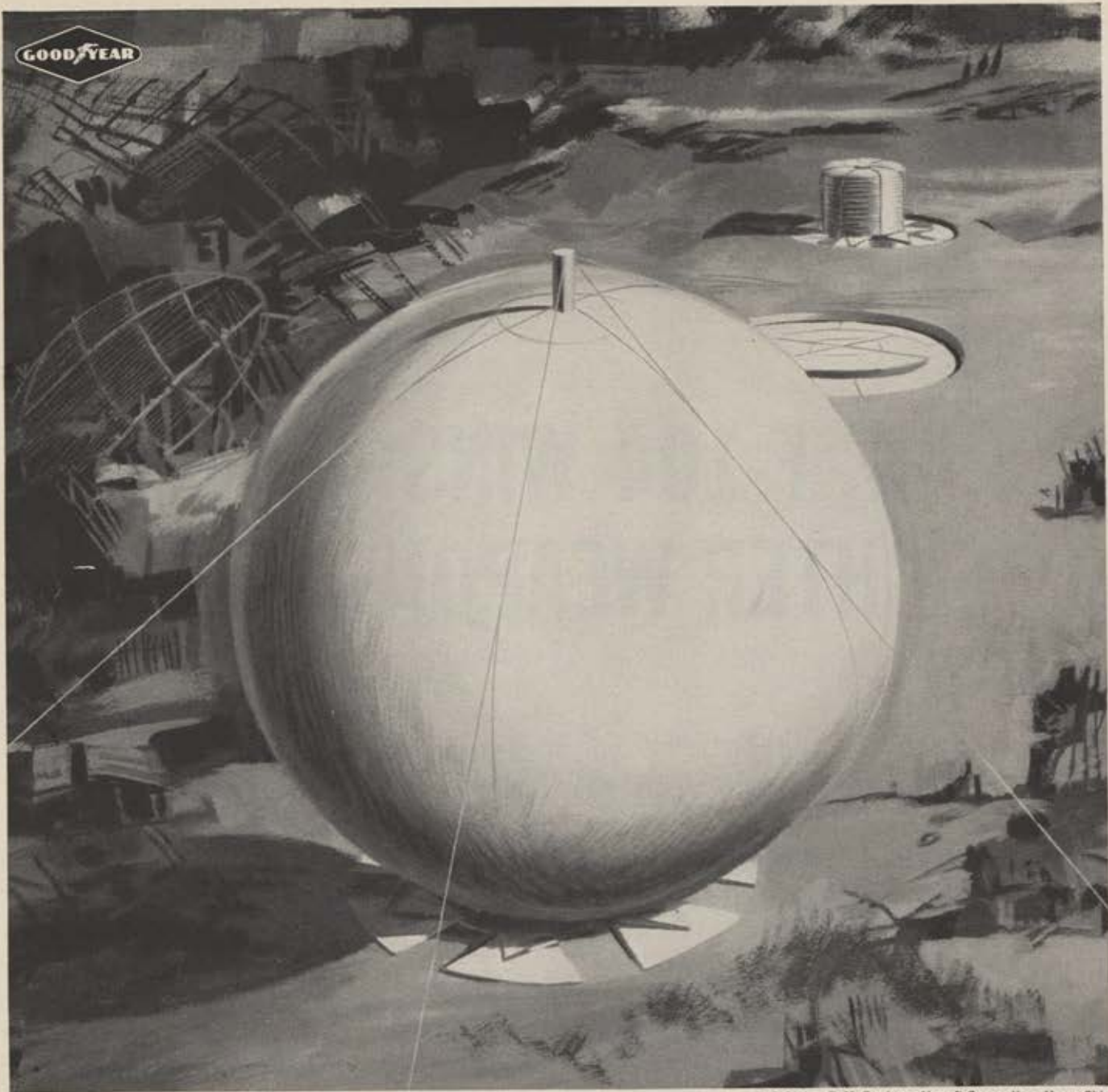


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The F-104 pilot, Captain Charles E. Tofferi, of the 479th Tactical Fighter Wing, cinched his victory with 3 perfect scores in such vital events as straffing, air-to-ground rockets, and napalm drops. In the single air-to-air event, he set a new record, completely destroying his target in 63 seconds. His winning total for all events was 19,018 points — out of a possible 24,000.

Captain Tofferi's brilliant performance

proved what the F-104 can do. F-104 pilots all over the world know *the F-104 is a most effective all-around fighter*. It meets the TAC mission of close ground support and interdiction, with the same mastery it shows in air superiority missions.

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Captain Tofferi has demonstrated once again the reasons for this overwhelming vote of confidence.

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AIR FORCE



The Magazine of Aerospace Power
Published by the Air Force Association



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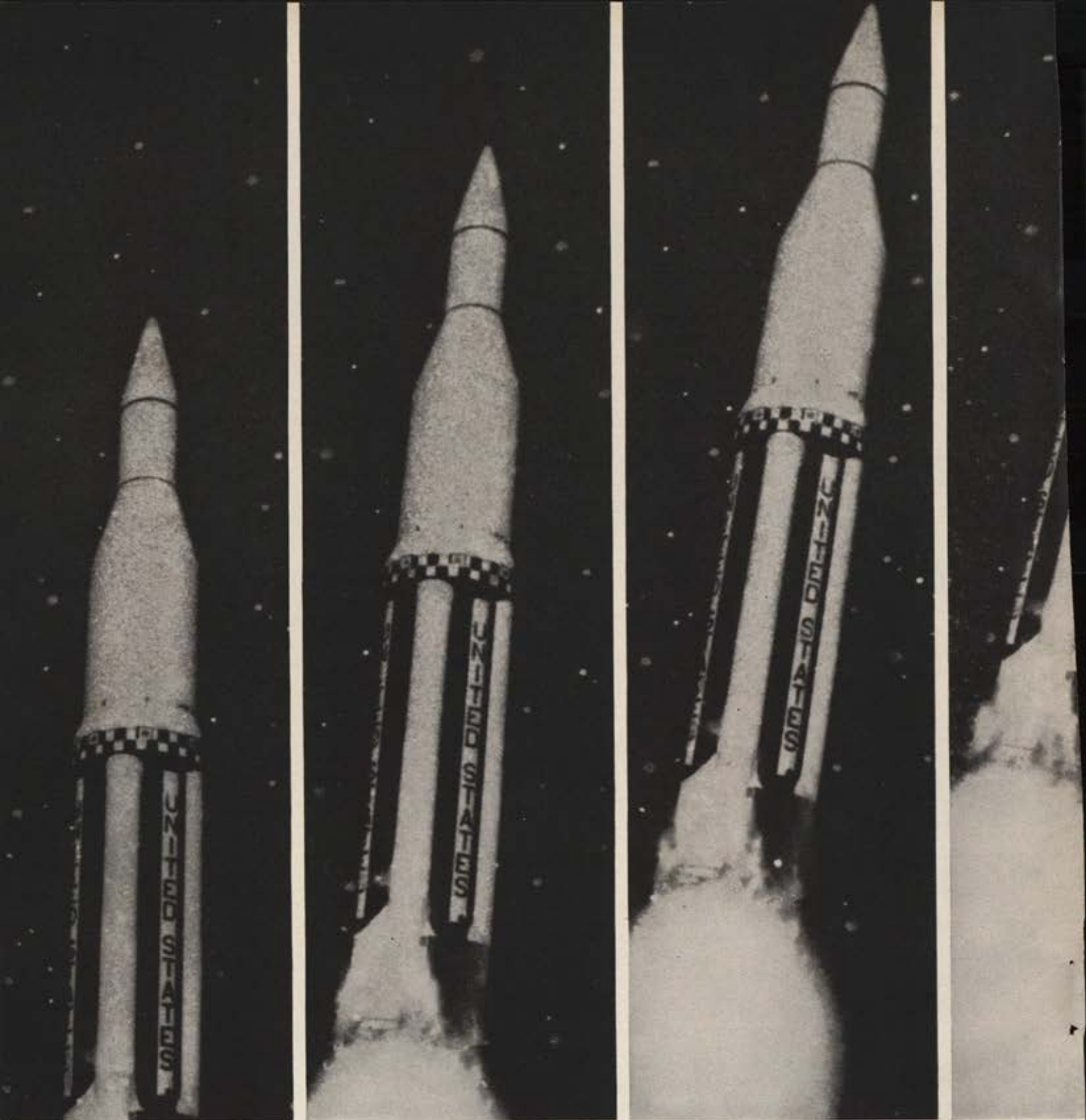
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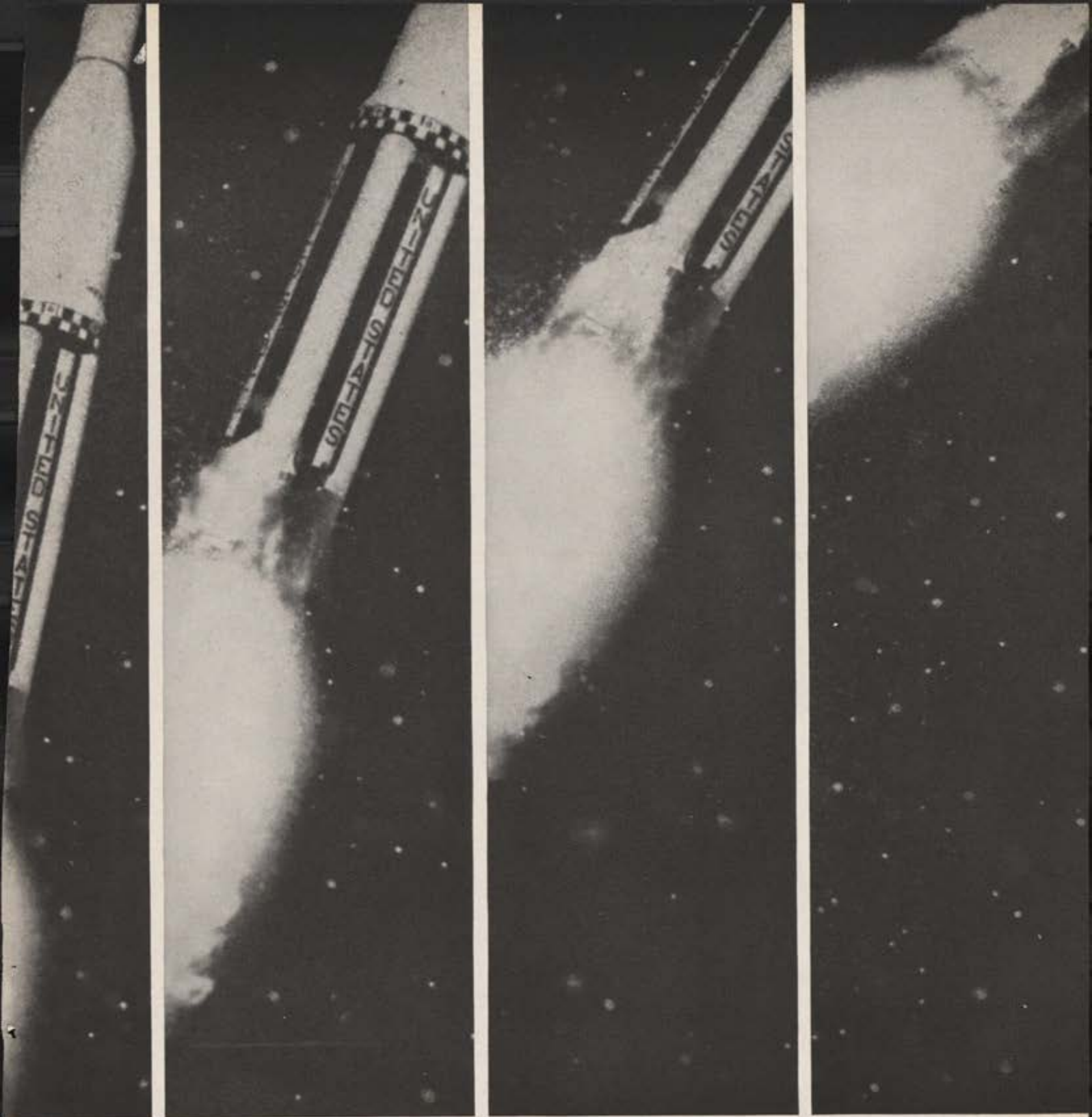
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SPACE: THE NEW PIVOT OF MILITARY CAPABILITY

Following is the text of the Air Force Association's 1962-63 Statement of Policy, as adopted by delegates to AFA's Sixteenth Annual National Convention, in Las Vegas, Nev., September 19, 1962.

SOVIET space achievements, with their military implications, make it clear that we cannot satisfy the national security requirement in space with by-products from our civilian space program.

Space will provide the new pivot of military capability—between those who would use their power to defend and extend individual dignity and personal freedom, and those who would use power aggressively to expand a totalitarian system.

Our present national space policy was born in a defensive climate, as a reaction against Soviet initiatives. We have a stated national goal of going to the moon in this decade. But our goals for military space capabilities are not clear, nor is our national commitment to them. The time for clarification is now.

In dealing with aggression we must be practical and not emotional. We must face up to the hard realities of Communist capabilities and intentions, and put aside wishful thinking.

Our military space capability must be developed so that Communist aggression can be confined to the cold war arena of political, technological, and economic competition, with armed conflict kept at a low level of destructiveness.

Space must be used to preserve our deterrent capability, to protect the future against the agonies and miseries of war, and thus to provide the climate required for the growth of freedom. Our national space effort must be continually measured against this goal.

It is unthinkable to concentrate on space exploration if this means the abdication or loss of the military posture necessary to make our national policy of deterrence effective.

This policy of deterrence requires a counterforce strategy—concentrating on the ability to destroy an enemy's military forces rather than his cities and his people. We endorse the recent public statements of the Secretary of Defense and other national officials enunciating such a strategy for the United States.

We believe that, to support our counterforce strategy, we must develop those systems, offensive and defensive, which enhance our ability to survive a surprise attack and then go on to defeat the enemy's forces—wherever and in whatever manner they may be deployed.

A counterforce strategy must rest on the combined superiority of the United States and its allies in the decisive areas of military confrontation. In the future, one of these decisive areas will be space.

The lack of an adequate United States military space capability may make it possible for the Soviets to deny access to space for our exploratory vehicles. More important is the possible hostile use of space by the Soviets—against which we may not be able to apply military strength either to deter or retaliate.

Technology makes it imperative that man find a more satisfactory means than the use of armed force to settle disputes among nations.

Likewise, the exploitation of technology makes it possible to achieve those conditions of stability which alone offer opportunities for mutually advantageous negotiation of differences. But even more important is the fact that tyrants and dictators now can exploit technology to achieve world domination.

This is why the free world must retain the strength and determination essential to convince aggressors that they cannot gain through war—that peace is the only practical environment for human existence. This strength and determination must be exhibited on land, at sea, and in the air—and must also be exhibited in space.

The need for the United States to develop a military capability in space transcends partisan politics and questions of agency roles and missions. It calls for a searching reappraisal of our entire national space program. All of our space efforts, including the lunar program, must be measured first against the yardstick of national security.—END

Incomplete September Issues?

Several readers have written in to report that pages 129 and 130 were missing from their September issues. The bind-in membership card that appears in the midst of the TAC article in September constitutes these two "missing" pages. The confusion results from a printer's error that caused the two words "professional caliber" to be dropped off the last paragraph on page 128. The last sentence should read: "It was an unprecedented feat of the highest professional caliber."—THE EDITORS

More on Private Enterprise

Gentlemen: In regard to Claude Witze's passionate defense of "Private Enterprise and the Public Interest," [September 1962 issue], I find myself confounded on several points.

If, indeed, the significant factor is that of private initiative, there is no necessary reason that this cannot be found within the military (arsenal or elsewhere) as well as without.

Nor am I as sanguine as Mr. Witze that the virtues of private industry will on balance, and in the end, exceed its shortcomings. My brief experience with weapon system development programs impressed me, among other things, with the propensity of contractors for pushing future developments (*i.e.*, possibilities) as though they were here-and-now—a seeming obsession with "sophistication"—with the consequence that "sophisticated" modifications were introduced before deficiencies in the older systems (fire control systems, for example), on which they were based, were corrected. The consequence, in turn, was that combat efficiency was reduced rather than enhanced. As others have put it: "Why is there never enough time to do it right, but always enough time to do it over?"

But, more fundamentally, perhaps, I find myself at a loss to understand—taking Mr. Witze's article as a whole—where the "private" factor is any longer to be found. That is, in suggesting how the relationship between military requirements and industry's response thereto may (if not, ought to) be made more intimate and

organic and therefore more adequate and efficient, Mr. Witze appears to be reconstructing in another guise the straw man of the arsenal concept he had just demolished. Except for not having his men of industry in uniform, the new relationship might just as well be that of the arsenal.

The foregoing is not intended as denial of the virtues of private initiative in the field of military technology, but it does indicate, I think, that Mr. Witze needs a new concept (not that of "private enterprise") to properly describe or symbolize the new relationship he sets forth.

MAJ. CHARLES KONIGSBURG
USAF Academy, Colo.

Officially NASA's

Gentlemen: To quote William Leavitt on NASA-USAF Interface [September 1962 issue], "There is little doubt USAF is heavily supporting NASA goals." You could have augmented this in your FY '62 highlights with four Ranger launches on a schedule made two years ago. The last of these, Ranger IV, launched April 23, 1962, was the first United States hardware to impact the moon. This was pretty much an Air Force accomplishment. Unfortunately, the radio link with the spacecraft was lost after injection and the mid-course correction command and returning space and lunar data were unobtainable.

In twelve unmanned NASA programs which have forty launches scheduled through FY '65, utilizing both the Atlantic and Pacific Missile Ranges and five distinct launch vehicle systems, NASA has bought from the USAF a prescribed velocity vector at a specific time and place in space. Providing this constrained velocity vector to NASA includes vehicle procurement, launch services, and system integration, all are under AF supervision.

I believe putting the first United States payload on the moon without the preplanned mid-course maneuver warrants mention as a FY '62 highlight in the US Air Force. How about you?

MAJ. CHARLES A. WURSTER
Hawthorne, Calif.

● Since Ranger and other space probe programs are officially under NASA management, they were not included as USAF highlights, although, as reader Wurster points out, USAF has played a major role in most such efforts.—THE EDITORS

Osage Indian

Gentlemen: In the September 1962 "Air Force Almanac," in the "Guide to Air Force Bases," I note this statement concerning Tinker AFB: "Named for Maj. Gen. Clarence L. Tinker, a Pawhuska Indian, bomber and fighter pilot; CG, 7th AF, killed in raid on Wake Island, June 1962."

General Tinker was a personal friend of mine. He told me, and in the presence of others, that he was an Osage. He was very proud of being a member of the Osage tribe, and told many stories of his early life on the Osage Reservation.

I called an Indian friend for further information. I was informed that Pawhuska was a famous Chief of the Osages, and was not a tribe.

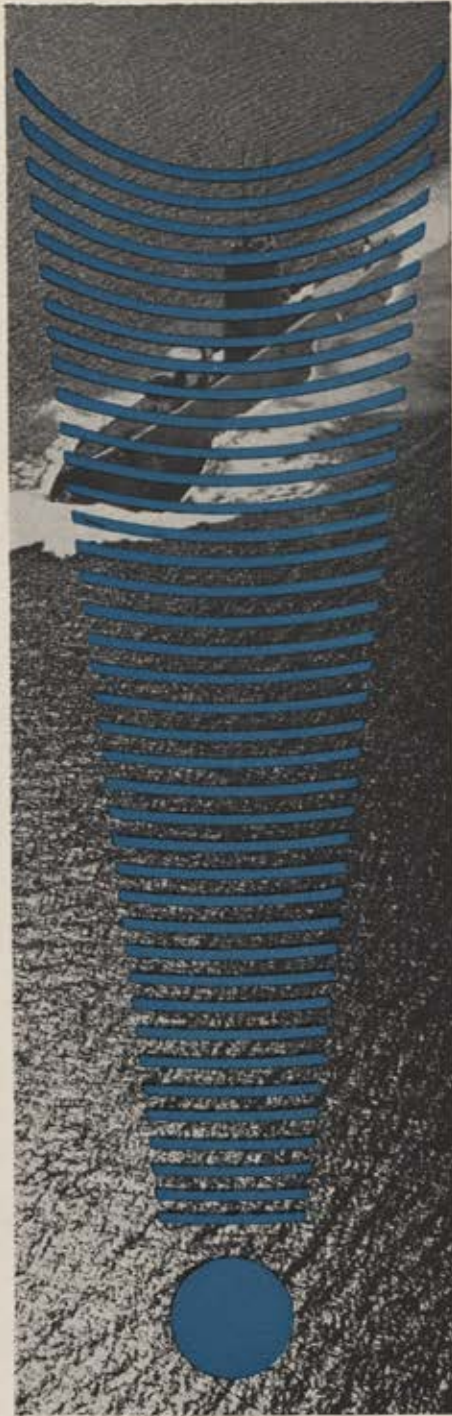
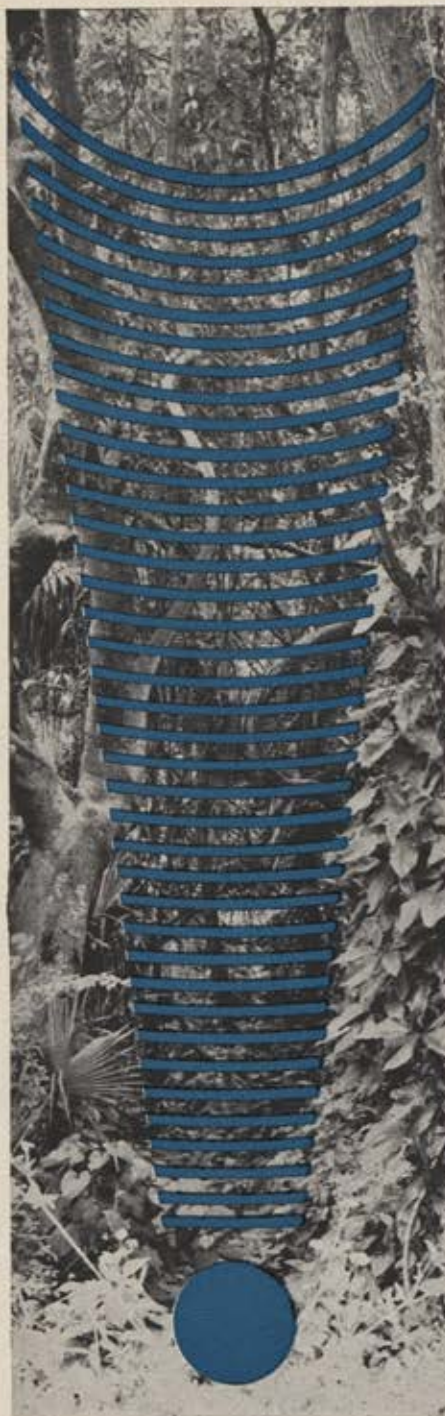
COL. ARTHUR G. HAMILTON,
USAF (Ret.)
Editor, *Daedalus Flyer*
Kelly AFB, Tex.

● The Osage tribe formerly lived on the Osage and Arkansas Rivers in Missouri and Arkansas. Pawhuska, a city of northeastern Oklahoma, at the foot of the Osage Hills, is the county seat of Osage County. It is the seat of the Osage Indian agency and a government school and trading center. Pawhuska (meaning "white hair") was named after a famous and respected chief of the Osage nation. We've corrected our records.—THE EDITORS

Swift Strike's C-119s

Gentlemen: The caption to the picture of a Reserve C-119 aircraft on page 19 of your October issue does not reflect the credit due the Air Force Reserve Forces participating in Exercise Swift Strike II.

To set the record straight, the Reserves had over 200 C-119 aircraft in the employment phase of this exercise (Continued on page 15)



UNDETECTABLE DETECTION

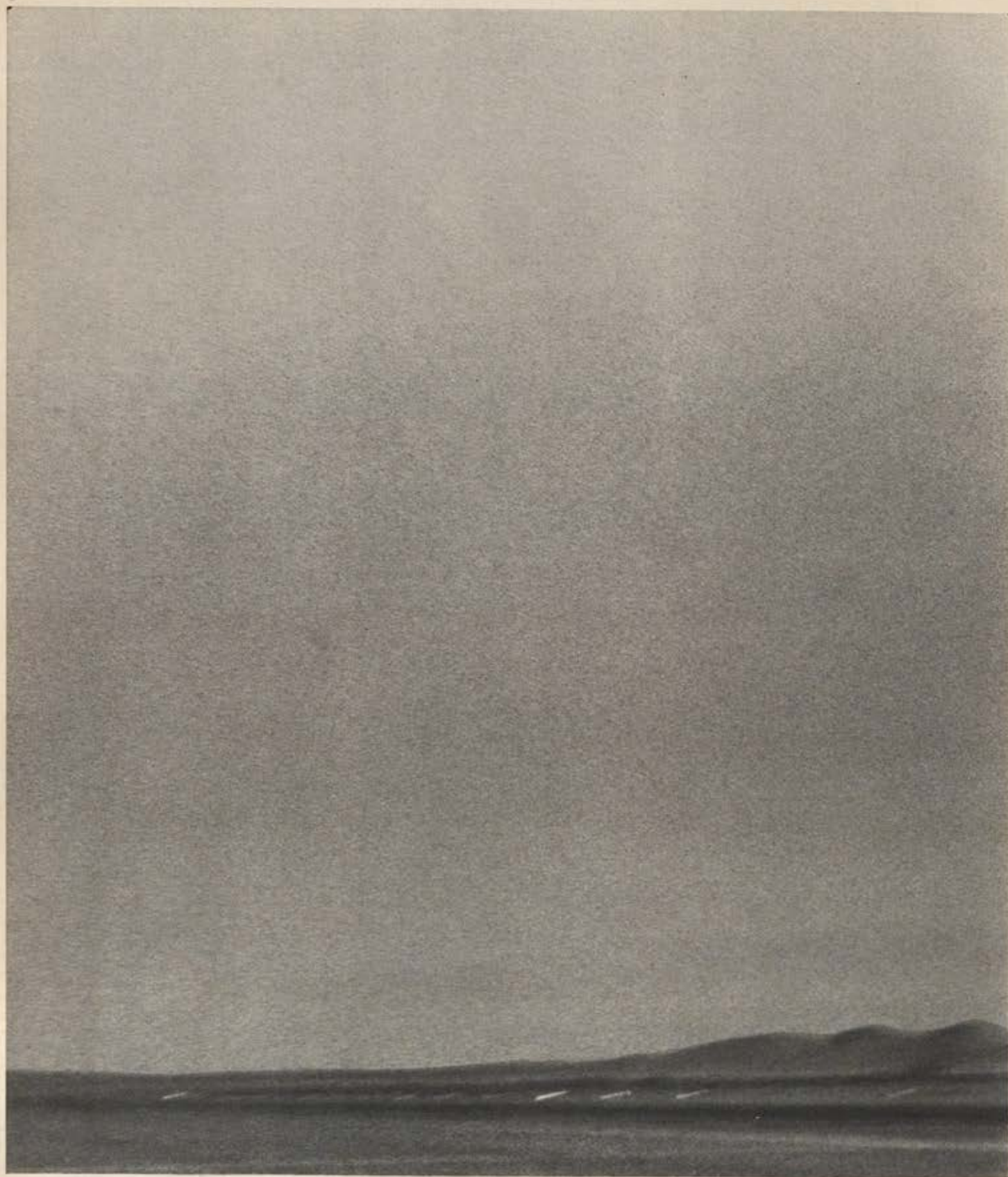
Advances in microwave radiometry, through 15 years of Sperry research and testing, are astounding! Completely passive, thermal sensing devices—light in weight and low in power consumption—are now possible for detection on land and sea, in the air or aerospace environments under all weather conditions.

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wake detection are but a few of the unlimited applications now feasible. Sperry has pioneered in the field of radiometry, developing and testing specific devices for various defense groups.

Long concentration on passive radiometric systems has advanced capabilities of Sperry Microwave from a promise to the positive. Its complete staff of experienced and highly qualified physicists and engineers, many recognized experts in their specialized fields, are equipped to further explore the unlimited potentials of radiometry.

SPERRY



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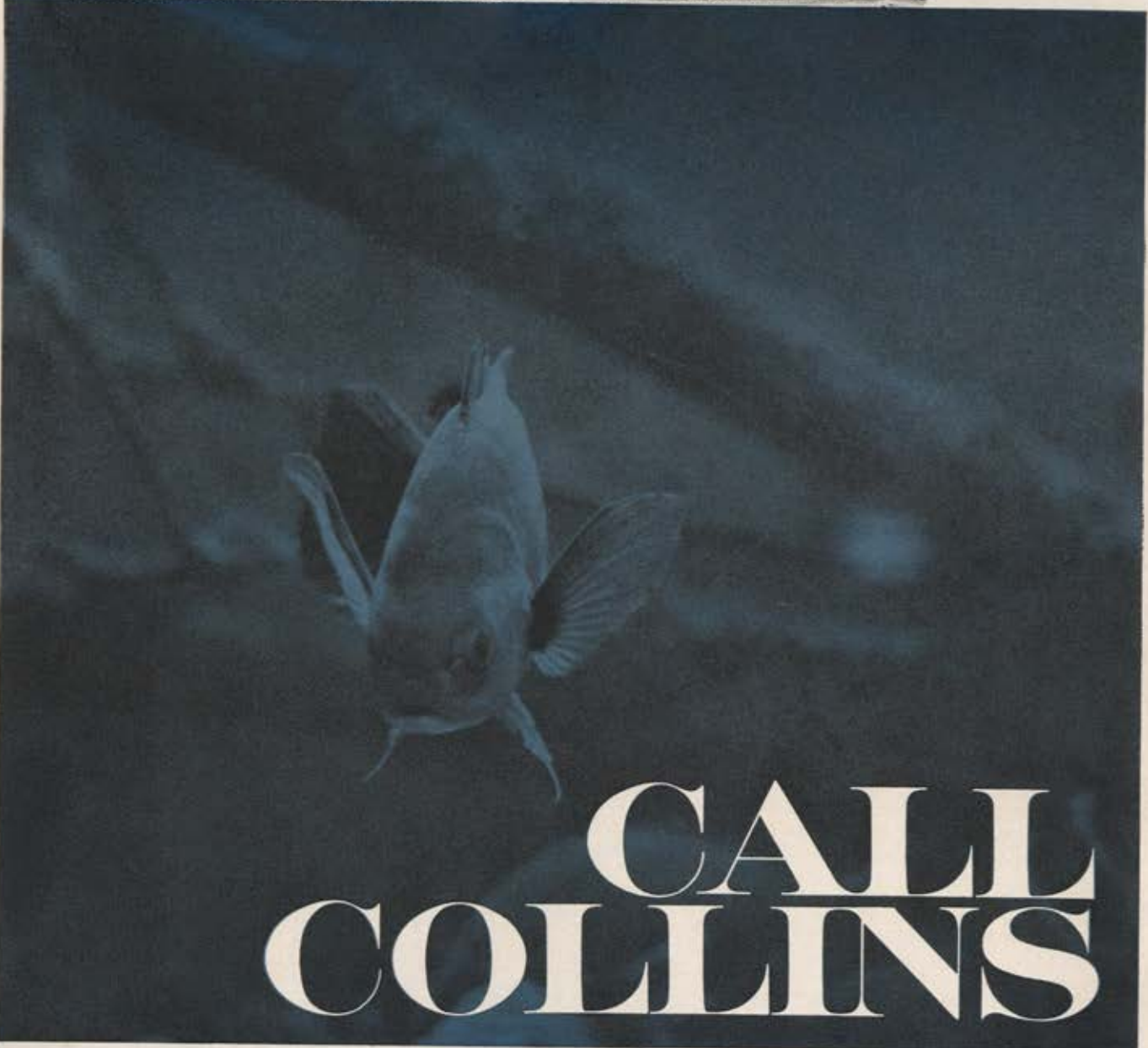
*Based on world time-to-climb records set in February, 1962.

Northrop T-38 will be 6 miles high*

The supersonic T-38 trainer can reach operational altitude faster than most high-performance fighter aircraft. And it can operate above 55,000 feet. This rapid rate of climb can give instructor and student far more training time at

high altitudes — at least 55 minutes out of every flight hour. High-performance characteristics such as this enable the T-38 to materially cut the total training time of pilots for advanced supersonic aircraft.

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alone plus a substantial increase during the deployment and redeployment phases.

MAJ. ROBERT H. GEDDIS
Robins AFB, Ga.

• *We're happy to receive this correction, to give full credit to all AF Reserve crews who joined in Swift Strike II.*—THE EDITORS

Montgolfier First

Gentlemen: In the "Awards" section of the October issue's "Aerospace World" column, you list Connie Wolf as receiving the first Montgolfier Diploma. Actually, the FAI has been presenting this award for a number of years. Mrs. Wolf was the first woman to receive this honor.

Also, "DeLaVaulz"—the medal awarded to Astronaut Shepard and Marine Corps pilot Robinson—should be properly spelled DeLaVaulx.

TONY MAHLMAN
Washington, D. C.

Brothers-in-Arms

Gentlemen: Your September 1962 "Almanac" issue, as always, was a "chockful" issue. Wouldn't miss it!

CONAC got a couple of pages—and a chart—under which is shown the "AFR Base Support Groups."

The flying units and Recovery organization received the real writeup—which they deserve. A lot of flying guys hopped into the Berlin crisis and proved their worth. After all, they are of primary importance—the first of our endeavor. And the Recovery's are a tough, hard-working crew. Real backup forces on civilian airfields, making do with everything they can talk their civilian neighbors out of.

Among ground support Reservists, the "Base Support Group" has always been considered as an unknown under the "Recovery" title.

Up here in Massachusetts, at a SAC and 8th AF base called Westover, there's been a hard working, self-sufficient Base Support Group (the 8334th) whacking away at the ball, getting super training, doing productive jobs, with all the facilities of a live, ready-to-go organization. This has been since October 1960.

The first year was rough; working in over a dozen Base sections, we needed orientation, a helping hand. This posed a training burden on the SAC people—but they put up with us. We are now coworkers, a second shift, brothers-in-arms. They deserve a lot of credit carrying us from the "swearing-at" to the "swearing-by" stages. We are now well able to walk in as

individual replacements, or as a nucleus Base Group, if called. Some of us were fillers in the Berlin crisis.

The ball still bounces—we are a frozen-strength thing, reduced to twenty-four-pay but fighting tenaciously.

Are we groundling support people, to be misplaced, just when we thought we'd found a real place, with the best skilled training ever?

LT. COL. ROBERT E. WILSON, AFRes
North Grafton, Mass.

Airlift Developments

Gentlemen: . . . I would like to compliment you and your staff on a most excellent magazine. With the many facets of aerospace activity developing at such a rapid pace, AIR FORCE/SPACE DIGEST fulfills the need to publicize the Air Force's activities. Your selection of material presented should be of interest to everyone concerned with today's aerospace activities.

One aspect of national interest which would be most appropriate is the modernization of our airlift forces. We in the Aeronautical Systems Division, C-141/Materials Handling SPO, are developing systems that should provide major breakthroughs in air transportation. The C-141A "StarLifter" is a long-range jet transport being developed to modernize the MATS fleet and to provide commercial carriers with a modern, efficient cargo vehicle. Capable of operating from short runways, the StarLifter will transport over 60,000 pounds 4,000 miles. This payload-range capability, along with low-level airdrop features, will provide a quick reaction capability for counterinsurgency operations that does not exist today.

The 463L Materials Handling System is the first truly integrated system for handling air cargo from its arrival at the terminal until it reaches the user, regardless of whether the user is a prime depot or an Army division in a forward area. When fully operational, cargo handling methods and equipment will have reached a state-of-the-art comparable with the associated air vehicles.

CAPT. JOHN F. SWEARENGEN
Wright-Patterson AFB, Ohio

UNIT REUNION

Pearl Harbor and South Pacific Veterans

A reunion of World War II veterans who were at Pearl Harbor, or in the South Pacific, on December 7, 1941, will be held in Dallas, Tex., December 7-9, 1962. Even if they cannot attend, veterans are requested to write to Pearl Harbor Veterans P. O. Box 3902, Station A Dallas 8, Tex.

AIRPOWER in the news

By Claude Witze

SENIOR EDITOR, AIR FORCE/SPACE DIGEST

Technology vs. Abstractions

WASHINGTON, D. C.

Congress has gone home, for which a great number of people are thankful, and it remains to be seen what the Russians will do before Congress reconvenes early next year. The public attention is torn between Cuba, which the Republicans say is an election issue, and that wall in Berlin, which President Kennedy is convinced will be the site of the next international crisis. Nobody knows what the Russians think. In the circle that is most concerned with the military aspects of the security of the free world, there are eyes looking apprehensively up into space as well. Both Cuba and Berlin involve issues that could be rendered academic by some new Soviet space achievement.

This preoccupation with the possibility that space will be used for aggressive purposes is looked upon by the Department of Defense as an "abstract doctrinal concept." And, in the Department's view, system decisions cannot be made in response to the requirements of such a concept. This has been put clearly in the record, on the eve of the closing of Congress, by John H. Rubel, who is an Assistant Secretary of Defense and Deputy Director of Defense Research and Engineering. At a Washington luncheon speech before aerospace industry representatives, Mr. Rubel is credited with giving the current and definitive Administration attitude on the adequacy of his department's space program. Because of his position in the Administration and the probability of a major national debate on the subject in 1963—a year in which the Russians are not expected to be inactive—his remarks are essential to the record.

Mr. Rubel argues that "abstract doctrinal concepts" have been outmoded by technology. He cites the Polaris and Minuteman missile systems and observes that they do not augment "seapower" and "airpower" in the conventional sense. He added:

"Doctrinal abstractions such as 'seapower' or 'airpower' or 'aerospace power' are often useful for analysis and discussion of the patterns of power as history reveals them. But these doctrinal abstractions do not translate well into new programs and projects. Here technology takes over and technology . . . tends to obsolete such concepts and abstractions rather than the reverse."

The Assistant Secretary then acknowledged the intense interest aroused by the mysteries of space and the effort put into understanding them. This effort, he declared, has resulted in a "host of new concepts" and "notions," and he listed a few of them:

"Sometimes it is asserted that space will represent the next great stride in man's control over the external world, corresponding somewhat to his emergence from the state of a land-bound creature to one who today masters much of the sea and most of the air.

"Sometimes it is said that space will be the battleground of the future where decisive battles will be fought to de-

cide the fate of the earth-bound people below.

"Sometimes it is asserted, although none of these assertions can be proved, that not only the space around the earth but the moon and other celestial bodies will be of great importance to our welfare and our safety. Which-ever nation can get to the moon first with the capability of returning to any spot on the earth will, it is said, possess an overwhelming military and psychological advantage over have-not nations who cannot.

"And it is asserted that space, after all, is merely an extension of the air with which it blends imperceptibly. It is said that 'the aerospace is an operationally indivisible

John H. Rubel,
Assistant
Secretary of
Defense and
Deputy Director
of Defense
Research and
Engineering.



medium consisting of the total expanse beyond the earth's surface."

"Often it is asserted that the weapons that will operate and the missions that will be performed in space will, therefore, be extensions of those with which we are familiar.

"The statement that this is so is a doctrinal abstraction, but the belief that it is so comprises an important element in that larger set of notions that might be called the 'mystique' of space.

"Sometimes, in fact, it is asserted further that these weapons and these missions will be involved in the 'control of space' and that space will be 'controlled' in somewhat the sense that airspace is. This concept of 'control' is sometimes expanded to include the extension of national sovereignty into space, although international law, of course, does not recognize this extension of national sovereignty beyond national airspace to outer space or celestial bodies."

It was not necessary for Mr. Rubel to name the authors of these "doctrinal abstractions" and "notions." They are
(Continued on page 19)



ADVANCED SATURN, shown in artist's concept above, will be the free world's largest rocket, standing some 350 feet high and measuring 33 feet in diameter. Takeoff weight will be approximately 6,000,000 pounds. A National Aeronautics and Space Administration program, Saturn will be used to power orbital and space

flights, including the three-man Apollo vehicle's lunar flight. Saturn will be able to place 100 tons in earth orbit, or transport several tons of instruments to Mars. Boeing holds NASA contract to develop, build and test the S-IC first-stage booster, comprising five engines developing thrust equal to about 160 million horsepower.

Capability has many faces at Boeing



AIR CARGO enters jet age with new 707-320C cargo jets. Already ordered by two carriers (Pan American and World Airways) -320C can carry 45 tons at 575 mph, providing "next morning" deliveries across an ocean or continent.

HOT SHOT wind tunnel tests winged research model in re-entry attitude, part of extensive Boeing space vehicle research. Test was made at simulated speed of 12,000 mph and altitude of 215,000 feet, at temperature of 5300 degrees F.



MISSILE LAUNCH. U. S. Air Force photo shows Boeing B-52H launching a hypersonic Skybolt, the nation's first air-launched ballistic missile, now under development. Versatile B-52 missile bombers also carry and launch supersonic Hound Dog missiles, as well as bomb-bay weapons, enabling it to strike a number of military targets on a single mission.

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found in uniform and out of uniform and on both sides of the Iron Curtain. The American believers in this "mystique" of space widely hold the opinion that trouble may well begin with a Soviet attack on one of our satellites. Mr. Rubel assumes that international law does not recognize the extension of national sovereignty into space. But, writing in this magazine last February, Professor John Cobb Cooper said the problem is not a legal one. "The question," he said, "is rather one of scientific progress, military strategy, and national policy. If a state determines that the conditions are present justifying action, and if effective means are available, action can be taken in self-defense on land, at sea, in the air—or in outer space." It is difficult to see why Russia would hold the legal rights of an American satellite to be any different from the legal rights of our U-2 airplane, once they had a capability to intercept one of our satellites and knock it to pieces. Certainly the flights of Vostok III and IV indicate that this kind of "doctrinal abstraction" is not as remote as Mr. Rubel seems to believe. "If you are going around with your head in the clouds," he told his sophisticated Washington audience, "you'd better keep your feet on the ground."

Pointing to the ground, the Assistant Secretary laid out some facts of life that presented a more reasonable case for his viewpoint than did his attack on the "notions" that he feels make up a "mystique" of space. There is a wide gap between his discussion of concepts and his presentation on the state of the art.

In this area, Mr. Rubel holds basically to the Kennedy Administration thesis that flexibility is essential to meet the threat of war at a number of different levels. Space efforts, he says, cost a lot of money. And, in his opinion, they "may not contribute heavily or directly" to a flexible military capability, an opinion that in itself appears to be based on a "doctrinal abstraction." Mr. Rubel says that the Defense Department has been working on the military application of space systems for a long time and cites RAND Corporation studies for the Air Force that date back to 1946.

"Many tens of millions of dollars have been spent," he said, "either directly or indirectly in studying military applications for space in the past five years. . . ."

"One of the most interesting aspects of this effort is that no really new ideas for the military utilization of space have been evolved as a result of these efforts. New techniques have been evolved or postulated, of course, but the list of system proposals under active consideration shortly after Sputnik I is remarkably similar to today's list.

"Many of these are being heavily supported, but others are not. This does not prove, of course, that new ideas will not be forthcoming. It does not prove that all the decisions to proceed or not to proceed have been correct. Nor does it prove that we have studied the problem sufficiently; we are still studying. But it does suggest that our development efforts are not lagging behind the good ideas."

The Assistant Secretary then pointed out that about half of the total Defense Department space effort is devoted to projects that involve "clear, identifiable military needs and requirements." This at least marks progress far beyond the attitude of five years ago, when President Eisenhower could see nothing of significance to our security in the first Russian Sputnik.

Mr. Rubel cited expenditures of \$300 million on communications satellites, \$150 million on navigational satellites, and \$400 million on a satellite system for ballistic missile warning. In deciding to spend this money, he said, the factors to be weighed include feasibility, cost, and the applicability of new technologies and devices. The other

half of the effort, he said, "is aimed at evolving new opportunities, at creating a vigorous and broad base of new technology and even of devices and systems for possible future application, even though the requirements for these are incomplete or altogether absent. These undertakings represent insurance against an uncertain future, a resolve to be prepared even though we often must be uncertain about how to prepare, or what to prepare for."

At this point he turned to the example of Titan III, the "workhorse" space booster which is urgently needed for several applications in the national space program. As reported here last month, the Martin Company has been selected as prime contractor, but the last thirty days have seen no change in the basic situation so far as procurement is concerned: no funds have been released, and the contracts have not been finalized. Mr. Rubel did not examine the inordinate delays in the Titan III program or the Rube Goldberg contraption through which the Defense Department processed decisions on this project. He did say that Titan III will cost \$1 billion for development and "is not being developed to fill a specific military mission requirement that adequately justified its development."

He said that Titan III, which will be the booster for the USAF X-20 Dyna-Soar project, among others, fits no specific military requirement. Mr. Rubel said, "We are supporting its development nevertheless because we are confident that it will be an important 'building block' upon which future military space missions and operations, should they materialize, will be heavily dependent."

The "building-block" approach, which has been discussed before at congressional hearings by Defense Department witnesses, was described by Mr. Rubel as an effort "to ensure the availability of space technology for application to new military systems as their characteristics and the need for them are clearly established."

Then he brought this approach as close as it can get to the "doctrinal abstractions" of those with a mission in the military establishment:

"Many of the applications that have been contemplated seem to us today to be unlikely, if not infeasible," Mr. Rubel said. "Most manned military missions in space still, after years of study, seem little or no more viable than they ever did. The same may be said of many unmanned systems, especially systems employing offensive weapons in space. Nevertheless, we are anxious to build a base on which future systems could, if needed, be constructed. We are not yet ready to design the building, but we want the building blocks at hand."

US airmen have worked before with building blocks, going as far back as the first World War, when we knew how to build airplanes and operate them but made no substantial contribution to Allied airpower with planes of our own design. When signs of hostility appear, whether over Flanders fields or up in space, building blocks that have not been put together make weak weapons, if they make weapons at all.

The observation has frequently been made that the basic argument over military space is not a competition for funds with the National Aeronautics and Space Administration, as so many people suspect, but an argument "between the Air Force and the upper echelons of the Department of Defense." Mr. Rubel has confirmed this opinion and clarified it by saying that the heart of the Defense Department case is its unwillingness to accept the basic concept of space as a military arena. In his comments on "doctrinal abstractions" he has, like Defense Secretary Robert S. McNamara in expressing his distaste for the RS-70 pro-

(Continued on following page)

posals, based his case on an implied lack of technological capability in the Air Force.

When the issue is joined, probably in early 1963 if the Russians do not force an earlier decision, USAF must be prepared to reply on all fronts. The fact that no really new ideas for the military utilization of space have come from five years of effort is the sort of thing that might surprise Mr. Rubel, but not a veteran in the field of military technology. When the first military airplane was delivered by the Wright brothers, it was not possible to foresee a B-52 weapon system or even a B-17. What happened in the intervening years, in addition to technological advances, is that men and machines recorded operational and training time in log books and thereby learned how to exploit technology in support of the national needs.

The pattern will be repeated in space, once the logbooks are started. The real menace in the Defense Department's scorn of "doctrinal abstractions" and the people who advance them is that the logbooks perforce will remain empty until men and machines get into space to explore military possibilities. In the meantime, there is another menace in the threat that the Russians, who prepared for nuclear testing under the cloak of a testing ban, will repeat the performance in developing military space systems. If they do, there will be a sudden end to the idea that military experience in space is merely a costly way to satisfy an abstract doctrinal appetite.

If Mr. Rubel has performed a service in so firmly defining the Defense Department attitude, that service is a fall-out product. What he has called to public attention is that our military space program is handicapped by the fact that our technical knowledge, to which the civilian space program is contributing so much, is being amassed faster than it is being absorbed into military plans and programs. For the most part, this has been overlooked by USAF's critics. It is not overlooked by our potential enemies, nor is it a weakness of the USSR.

Defense Is a Requirement

The 1962 Air Force Association Statement of Policy, printed on page 9 of this issue, calls attention to the national requirement for military space capability to ensure the credibility of our counterforce posture. The free world's dependence on counterforce, which in case of war would direct our military effort at military targets instead of population centers, was enunciated a few months ago by Defense Secretary McNamara. The AFA viewpoint is that it can be made workable and credible only if our force remains impregnable in all theaters, including that of space.

Air Marshal C. R. Slemon, Deputy Commander in Chief of the North American Air Defense Command, told the AFA Convention, "We have no active space defense system in sight if the enemy should elect to mount a threat in space. . . . We need the ability to detect, to identify, and to intercept in space those vehicles that could be launched against us with hostile intent.

"These are the traditional roles of air defense. They are as applicable in space as they are in the present air defense mission. And there is nothing aggressive in the air defense mission."

A few weeks later, addressing the Association of the United States Army at its convention in Washington, General John K. Gerhart, NORAD Commander in Chief, reiterated the warning:

"The United States," the General said, "has openly stated that it has nothing but peaceful aims insofar as the utilization of space is concerned. I wish the same could

be said for our potential adversary. Although to date the Soviet Union has made no clear-cut military moves in space, we must recognize his capability. We must develop our own capability for responding militarily if he turns from peaceful uses of space."

Like Air Marshal Slemon, General Gerhart cited the flights of Vostoks III and IV and said, "There is no question that had the Soviets had a hostile intent during these orbits they could have posed a terrific threat to the United States."

A third authority in this area is General Laurence S. Kuter, General Gerhart's predecessor, now retired from NORAD and the Air Force. Delivering a swan song before a luncheon of the Night Fighters Association during the AFA Convention in Las Vegas, General Kuter reviewed some of the ups and downs of the support afforded for the air defense mission and put the emphasis on time and money.

He pointed out that the SAGE system for interceptor control, completed in 1962, was conceived and initiated in 1950, twelve years earlier. The requirement for the F-102 was laid down in 1948; contracts were let in 1951; the program was completed in 1958. SAGE represents an investment of \$1.6 billion and the F-102 a cost of \$2.3 billion. General Kuter said he believes we all should remind ourselves of these figures when we think of the urgency of meeting new threats. The demand for time and money is overwhelming.

Looking to the future, General Kuter called attention to the space threat that started with Sputnik, to the ICBM threat, and to the Russian bombers equipped with air-to-surface missiles. Our defense against these systems, he said, is nonexistent. The closest approaches were in the F-108, killed two years ago for budgetary reasons, and in the Army's Nike-Zeus, which has been withheld from production. So far as space is concerned, NORAD is the only command in existence with a space mission, and its work in this area is confined to tracking things it cannot identify or intercept.

USAF Secretary Eugene M. Zuckert has said, "If the aerospace is to remain free, somebody must keep it free," and he has listed an improved interceptor among his future needs. This airplane, which can be built within the state of today's art, must be a manned interceptor with a range of 1,000 to 1,500 miles. It must be able to loiter for several hours on aerospace patrol. It must carry its own detection, tracking, and fire-control systems which can operate from the surface to high altitudes. It must operate at more than Mach 3. With the F-108 counted out, the time and cost factors to achieve this new system are close to the maximum.

What all of these experts are saying is that, for the first time in the current military effort, there is nothing new in the pipeline for aerospace defense in the category of either weapons or major equipment. And they fear that without adequate defense our policy of deterrence and the utilization of counterforce strategy is placed in peril.

In fact, it can be argued that the neglect of aerospace defense weaponry is in direct conflict with the McNamara concept of counterforce. While the AFA Statement of Policy emphasizes the space threat, the requirements for meeting the menace of ICBMs and air-to-surface missiles is equally pressing.

"No potential aggressor will ever launch a major military effort against this continent unless he is convinced that he can achieve the necessary degree of surprise and a decisive effect," Air Marshal Slemon said. "Anything less than an adequate defense may invite the attack we are trying so hard to deter."—END



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AEROSPACE WORLD

By Allan R. Scholin

ASSOCIATE EDITOR, AIR FORCE/SPACE DIGEST

Studies of detailed readings on Astronaut Walter Schirra's six-orbit flight October 3 confirm the preliminary indications that it was a near-perfect mission from blastoff at Cape Canaveral to splash only four miles from the rescue carrier *Kearsarge* in the mid-Pacific. Accordingly, NASA is now targeting an eighteen-orbit mission for USAF Maj. Leroy G. Cooper for early next year. A picture story on Navy Commander Schirra's 160,000-mile, nine-hour flight appears on page 48.

NASA is having very little luck, however, in its attempts to acquire moon pictures and surface data through its Ranger series, which continues to be plagued by failures of the complex payload mechanism.

Ranger V, latest in the series, was dispatched via Atlas-Agena-B booster at 12:59 p.m. EDT, October 18. The Atlas and two-stage Agena apparently worked perfectly to put Ranger V into 24,500-mph escape velocity thirty-five minutes after launch on a trajectory toward the moon.

After that Ranger V was supposed to activate a pair of devices to stabilize it along two axes—the sun and the earth—and unfold its wings of solar cells to generate power. Something went wrong. When it didn't respond to mid-course correction signals, the silent Ranger V missed the moon.

Ranger III, launched January 26, also missed the moon because a malfunction of the Atlas booster gave the vehicle too much speed. Ranger IV, sent up on April 23, achieved a perfect trajectory but crashed blindly onto the moon sixty-four hours later, sending back no TV pictures of the moon. Loss of power caused failure of its sequencing "brain," and almost no information was relayed back to earth.

NASA has programed three more Ranger vehicles, and will try again in a few months.

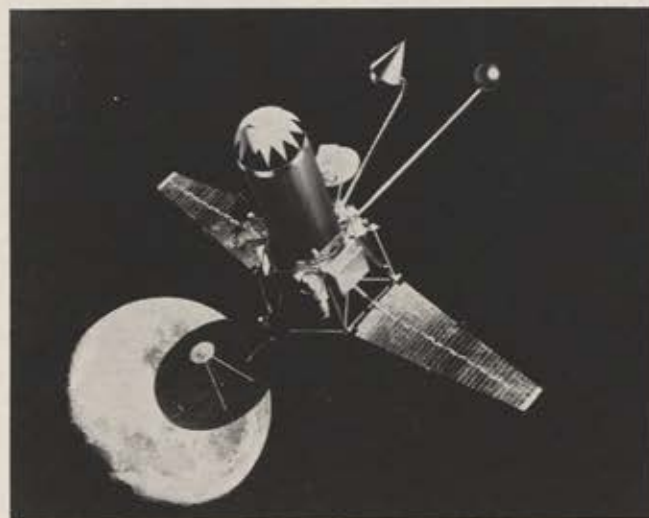
In one of NASA's more successful

programs, Tiros VI was launched from Cape Canaveral on September 18. It was the sixth successful launching in six attempts in the government's weather satellite program. While designed life of each of the Tiros vehicles is ninety days, several stayed in useful orbit much longer. Tiros V, launched June 19, is still operational.

Meanwhile, the most successful US space probe, Mariner II, continues on course toward a near-rendezvous with Venus on December 14. NASA's latest

The US once again failed to pull off a high-altitude nuclear weapon test when a Thor booster rocket malfunctioned over Johnston Island on October 15. It was the fourth failure in five attempts, but test officials upped their average by succeeding with a smaller shot October 19, and planned one more a few days later.

In other launchings during the month, USAF carried out three Thor-Agena classified shots from Vandenberg AFB, Calif., on September 17,



Drawing of Ranger V shows ball on top containing devices that were intended to measure moon quakes and meteor impacts. Wing blades hold solar cells, but somewhere the complex system failed.

tracking data indicates Mariner II will pass within about 21,000 miles of Venus, instead of the hoped-for 10,000 miles, but still well within range to acquire useful information.

As it moves through space at an absolute speed of more than 60,000 miles per hour in relation to the sun, Mariner II is transmitting some 90,000 measurements a day on solar wind, magnetic fields, radiation, and cosmic dust. Most readings confirm previous space theories, others are producing some minor surprises. But nothing turned up so far, its sponsors say, indicates any hazards which might rule out manned spaceflight.

September 29, and October 9. The Soviets launched three Cosmos satellites—Cosmos IX on September 27, Cosmos X on October 17, and XI on October 20, all reportedly to gather data for further manned spaceflights. USAF also launched a Canadian Alouette ionosphere probe shot from Pt. Arguello, Calif., on September 28, using a Thor-Agena-B.



The new Boeing VC-137C Presidential transport has been delivered to USAF. The new jet, fourth assigned to the White House, is larger and
(Continued on following page)

longer ranged than the other three VC-137As, powered by Pratt & Whitney JT3D-3 turbofans, each developing 18,000 pounds of thrust in comparison to 13,000 pounds each in the "A" models. The "C" also carries improved communications gear.

Although the Congress was unsuccessful in getting Secretary of Defense Robert McNamara to release results of his RS-70 "restudy" before adjournment, plans for the first flight of the Valkyrie are moving ahead. Rollout of the first prototype was scheduled to

Among nine new Astronauts selected by NASA in September are four Air Force pilots—Maj. Frank Borman, Capt. James A. McDivitt, Capt. Thomas P. Stafford, and Capt. Edward H. White, II.

Three Air Force men are among the original seven Astronauts—Maj. Leroy G. Cooper, Maj. Virgil I. Grissom, and Maj. Donald K. Slayton.

Secretary of the Army Cyrus R. Vance told the Association of the US Army convention in Washington last month that the Army "will move



—Wide World Photos

Honorary life memberships in the Air Force Association and other service organizations were presented to President John F. Kennedy at the White House in Washington on October 9. AFA's President John B. Montgomery is at extreme right. Others, from left, are Lt. Gen. Milton G. Baker (Ret.), President of the Association of the US Army; Harold E. Wirth, National Vice President, Navy League of the US; and Raymond B. Butts, President, Marine Corps League.

occur in late October, and it may possibly fly before the end of the year. Col. Guy M. Townsend, veteran SAC pilot, heads a five-man flight-test team which includes Lt. Col. Joseph F. Cotton and Maj. Fitzhugh Fulton of the Air Force and Al White and Van H. Shepard of North American. White will probably be the first to fly the Valkyrie. Colonel Cotton and Major Fulton have been flying B-58s at Carswell AFB, Tex. For more news on Major Fulton, see "Records" below.



Formal introduction of the six Dyna-Soar pilots—five USAF and one civilian—by Undersecretary Joseph V. Charyk and Gen. Bernard A. Schriever during the AFA Convention brings to twelve the number of AF pilots engaged in manned orbital programs.

USAF's five Dyna-Soar pilots are: Capt. Albert H. Crews, Jr., Maj. Henry C. Gordon, Capt. William J. Knight, Maj. Russell L. Rogers, and Maj. James W. Wood.

strongly into the air—with its men, its doctrine, its weapons, and its equipment." But, he added, the Army won't infringe on Air Force missions. "We do not intend to take over anyone else's job," he said, "but simply to do our own better."

Gen. Paul D. Adams, Commander in Chief, US Strike Command, said at the same meeting: "I have done everything I can to promote airlift, both in the Army and the Air Force. I have also done everything I could think of which might reduce mass, or weight. I have been playing both ends against the middle—reduction of mass on the one hand and increasing means of mobility on the other."

He added that Strike Command has now evolved an air-ground support system approved by commanders of both the Tactical Air Command and Continental Army Command. "Without any fuss or furor, or blood on the floor, we now have a recommended air-ground support system," the General said. "We plan to field-



From Brunswick, Me., headquarters, Air Commodore Frederick R. Sharp commands defense area over Maine and slice of Canada, first Canadian to head NORAD sector from post in US.

test this system with Exercise Three Pairs during the latter part of October, and to continue practical tests until late spring of FY 1963."

Intercontinental missiles entering USAF's rapidly expanding ICBM force represent only a small part of the total cost of the program, Gen. Bernard A. Schriever told a group of civil engineers in Detroit last month.

"Most people think of the ICBM weapon system in terms of the missile that leaves the ground," he said. "They seldom think of the massive, extremely complicated structures that make up some eighty percent of the cost of the entire ICBM force. Yet these are the facilities that . . . ensure that our missiles can be launched—if the need should arise—with speed and precision."

A mammoth new radar to improve NORAD's ability to detect and track satellites will be erected at Eglin AFB, Fla., under a multi-million dollar contract awarded to the Bendix Corporation. Using the phased array radar technique, which scans electronically without moving antenna, the new 150-foot high SPADATS facility will be able to track man-made objects in space up to an altitude of several thousand miles. Engineering and construction will take about two years, followed by a nine-month evaluation and testing period.

USAF civilian employees received a pay raise in October, the second since the last military pay boost in 1958, and Secretary of Defense McNamara promises to ask Congress for a military pay raise early next year. An interservice group has completed a study on military compensation, intended to bring military pay in line

(Continued on page 27)



there's a ship on the way to the moon

There will be many interim steps, but every shot on the Atlantic Missile Range puts the U.S. closer to its goal of a lunar landing in this decade.

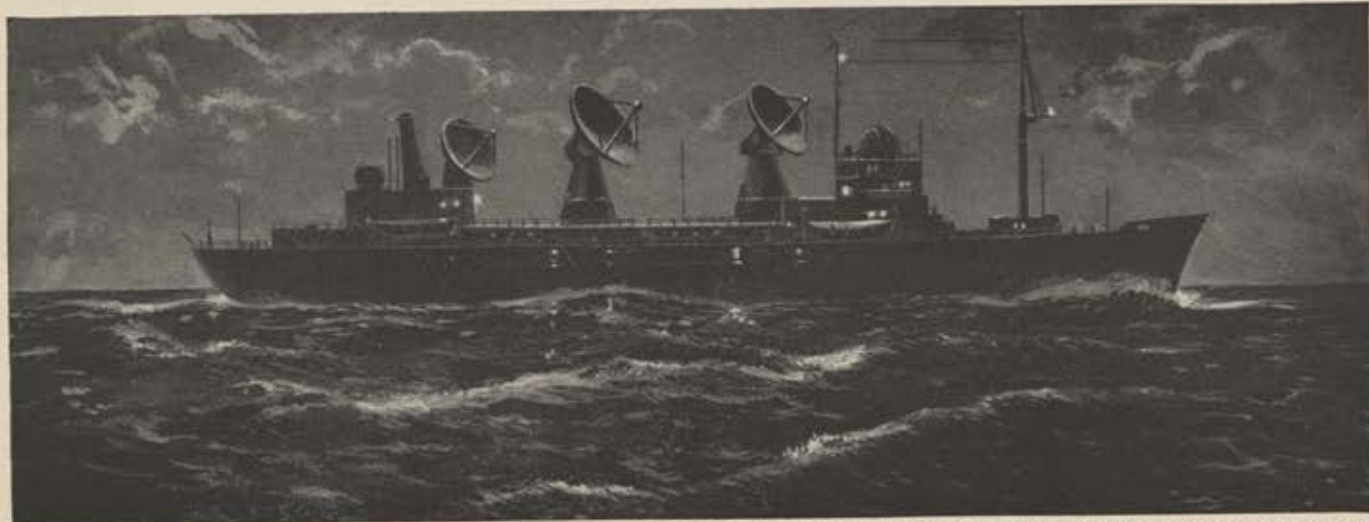
Soon our capabilities on the range will be sharply increased as Advanced Range Instrumentation Ships (ARIS)—large transports converted to seagoing range stations under direction of the Sperry System Management Group—go into service. The highly accurate terminal trajectory and re-entry data the ships collect will greatly advance the system support capability of AMR.

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Test Center, AFSC, the ARIS ships will incorporate every advanced technique of data acquisition and handling, integrated instrumentation radar, telemetry, inertial navigation, weather forecasting. With mobility and precision they will move to any aim-point in thousands of miles of ocean and take measurements with all the precision of a land-based station. They will provide refined study of space vehicles during the critical terminal phase of flight. Sperry's job is to obtain the finest instrumentation available and integrate it to do the job . . . on schedule and at minimum cost.

The ARIS ships will help fulfill AMR's responsibility with NASA for range instrumentation supporting our exploration of space. The capabilities developed will be steadily advanced in pace with the program. Team members with Sperry include Bethlehem Shipbuilding, Ford Instrument, Gibbs and Cox, IT&T and UNIVAC Division of Sperry Rand.

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RECORDS—Seven US world records in various aircraft categories, five of them previously held by the USSR, were reported during the month.

Two world records for lifting payloads to altitude were claimed September 18 at Edwards AFB, Calif., by an Air Force B-58 bomber piloted by Maj. Fitzhugh L. Fulton of Talladega, Ala. He flew the Hustler to a height of 85,360.84 feet with a payload of 5,000 kilograms (11,023 pounds), shattering marks set in 1959 by the USSR of 50,252.52 feet with 5,000 kilograms and 66,170.72 feet with 2,000 kilograms.

In Major Fulton's crew were Capt. William R. Payne, navigator, of Trent, Tex., and Charles R. Haynes, a civilian flight-test engineer from Colorado City, Tex.

For the exploit, the three received awards from Gen. Bernard A. Schriever, AFSC Commander, at the AFA Convention. Major Fulton, who has been selected as one of the RS-70 pilots, won the Distinguished Flying Cross. Captain Payne received the Air Medal, and Mr. Haynes a special civilian award (*see cut*).

Lt. Cmdr. Donald E. Moore, USN, flew a Grumman Albatross to 29,460 feet at Floyd Bennett Field, N. Y., September 12, topping the old world mark for amphibians of 23,406 feet set by the USSR in 1940. On the same day in the same plane, Lt. Cmdr. Fred A. W. Franke carried a 2,000-kilogram load to 27,380 feet, breaking the former amphibian weightlifting record of 20,617 feet set by the USSR, also in 1940.

Meanwhile, the Army announced that three of its pilots set world records for helicopters last April. Maj. William F. Gurley, flying a Bell Iroquois YHU-1D from the Bell plant in Fort Worth, Tex., covered a 1,000-km. closed course at an average speed of 134.9 miles per hour, easily topping the previous world mark for helicopters in the 3,800-to-6,600-pound class of 87.856 miles per hour set by the USSR in an MI-1 in 1960.

The other two records were for time to climb, breaking marks set in October 1961 by Air Force Lt. Col. F. M. Carney in an H-43B. Lt. Col. Leland F. Wilhelm reached 3,000 meters (9,843 ft.) in two minutes, 17.3 seconds, while Maj. Boyce B. Buckner climbed to 6,000 meters (19,686 ft.) in five minutes, 51 seconds.

For his role in B-58 development, Robert H. Widmer, General Dynamics VP, will receive Spirit of St. Louis Medal from American Society of Mechanical Engineers.



Gen. B. A. Schriever, center, greets B-58 altitude record crew. Others, from left, Brig. Gen. I. L. Branch, Edwards AFB Commander; C. R. Haines; Capt. W. R. Payne; Maj. F. L. Fulton.

Capt. C. E. Tofferi of George AFB, Calif., named USAF's "top gun" in winning fighter phase of TAC weapons meet, talks with newsmen during the AFA Convention.



Army Chief of Staff Gen. Earle G. Wheeler awarded DFCs to all three at the Association of US Army honors luncheon in Washington, October 11.

AWARDS—To Dr. John R. Pierce and Alton C. Dickieson of Bell Telephone Laboratories, AFA's H. H. Arnold Trophy as "Aerospace Men of the Year" for leading development of the Telstar satellite. For a complete report on AFA awards presented at the Sixteenth Annual Convention in Las Vegas, Nev. (*see page 43*).

To Sir Geoffrey I. Taylor, renowned

British scientist and World War I test pilot, the Franklin Medal, top award of Philadelphia's Franklin Institute, for his "manifold contributions to the knowledge of the natural sciences." The Institute presented awards also to twenty-two other scientists and engineers, including an Elliott Cresson Medal to Dr. Wernher von Braun; Stuart Ballantine Medals for work on optical masers to Dr. Charles H. Townes, MIT Provost; Dr. Arthur L. Schawlow, Stanford physics professor; (*Continued on following page*)

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AEROSPACE WORLD

CONTINUED

Dr. Theodore H. Maiman, President, Korad Corp., Santa Monica, Calif.; and Dr. Ali Javan of MIT; and the Howard N. Potts Medal to Dr. Wilbur H. Goss, Assistant Director of Johns Hopkins' Applied Physics Laboratory, for development of ramjet combustion systems for military vehicles.

To Daniel J. Kenneally, Rome (N. Y.) Air Development Center; Dr. B. E. Welch, School of Aerospace Medicine, Brooks AFB, Tex.; and Dr. J. F. Lindsey, Jr., Air Proving Ground Center, Eglin, Fla., AFA Aerospace Education Foundation Awards for the three top papers presented at the Air Force annual Science and Engineering Symposium at Brooks AFB, Tex. Presentations were made by AFA President John B. Montgomery. The AFSC Award for Scientific Achievement at the same event was won by Capt. James A. Roman, Chief of the Biodynamics Branch at the School of Aviation Medicine. An engineer, doctor, and jet pilot, Captain Roman has just been selected to attend USAF's Aerospace Research Pilot School.

To Walter S. McConnell of the Boston Air Traffic Control Center, the "Controller of the Year" Award of the Air Traffic Control Association. The Seattle, Wash., Air Route Traffic Control Center was named "Facility of the Year," and Sen. George Smathers of Florida and Rep. Oren Harris of Arkansas received awards for legislative leadership in air safety. . . . To Robins AFB, Ga., first place in USAF's Fire Protection Competition. The 7101st Air Base Wing, Wiesbaden, Germany, was second, and Myrtle Beach AFB, S. C., third. . . . To the Martin Company, Baltimore, Md., citations from the Secretary of the Air Force and the Governor of Maryland for "its most unusual and valued contribution" in making available its Middle River airport and facilities to squadrons of the Maryland Air National Guard. . . . To Robert H. Widmer, Vice President-Research and Engineering at the Fort Worth plant of General Dynamics Corp., the Spirit of St. Louis Medal of the American Society of Mechanical Engineers, for "meritorious service in the advancement of aeronautics" in design and development of the B-58 bomber. Widmer was a co-winner of AFA's Science Award in 1949 for his work on the B-36.

To Capt. Charles E. Tofferi, 479th Tac Fighter Wing, George AFB, Calif., the Gen. Jesse H. Auton Trophy for over-all high score in the 1962 USAF fighter weapons meet at Nellis AFB, Nev. Captain Tofferi also won the Hoyt S. Vandenberg Trophy for

high explosives events. Capt. Anthony Gardecki of TAC's 4th Fighter Wing won the John L. Mitchell Trophy in radar bombing; Capt. Roger D. Tucker of the 48th Fighter Wing, USAFE, took the Maj. Thomas B. McGuire Trophy in nuclear weapons delivery; a team from the 66th Tac Reconnaissance Wing, USAFE, led by Maj. Ray M. Schrecengost, Jr., won the Polifka Trophy for reconnaissance missions; and Lt. Charles M. Summers, 50th Tac Fighter Wing, USAFE, won the Martin Trophy in the GAM-83 Bullpup event.

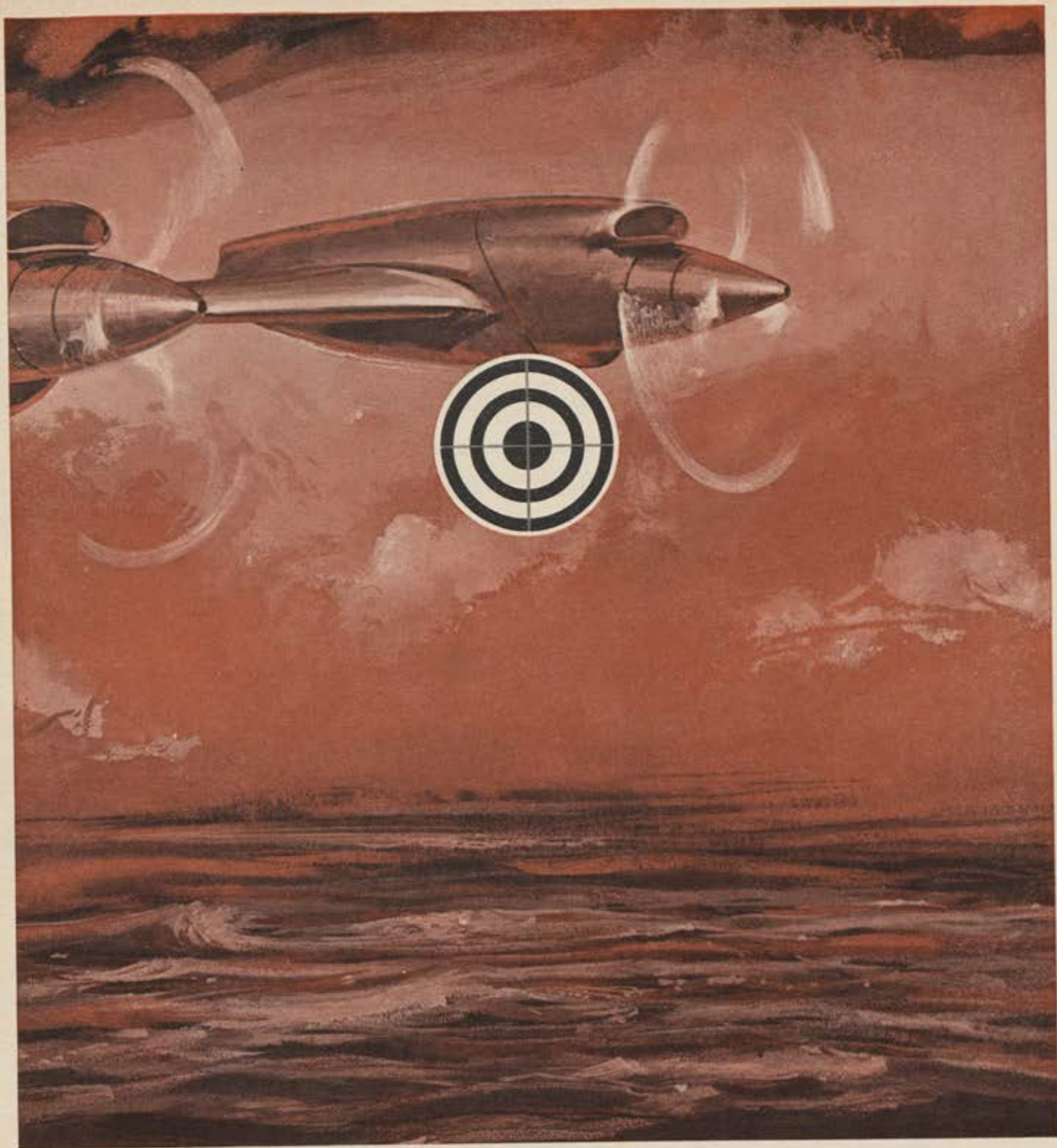


STAFF CHANGES. . . . Brig. Gen. Julian H. Bowman, from Assistant Comptroller of the Air Force to Deputy Assistant Secretary of Defense (Military Personnel Policy), Office of Assistant Secretary of Defense (Manpower), DoD, Washington, D. C. . . . Lt. Gen. Howell M. Estes, Jr., from Deputy Commander for Aerospace systems and additional duty as Commander, Space Systems Division, AFSC, Inglewood, Calif., to Vice Commander Hq. AFSC, Andrews AFB, Washington, D. C. . . . Maj. Gen. Ben I. Funk, from Commander, San Bernardino AMA, AFLC, Norton AFB, Calif., to Commander, SSD, AFSC, Inglewood, Calif. . . . Brig. Gen. Louis B. Grossmith, Jr., from Director, Data Services and Statistics, to Director of Data Automation, Office, AF Comptroller, Washington, D. C. The new directorate was formed by combining the Office of the Assistant for Data Automation and the Office of the Director of Data Services and Statistics.

Brig. Gen. Elbert Helton, from Assistant for Data Automation, to Assistant Comptroller of the Air Force, Hq. USAF. . . . Brig. Gen. Harold Kelley, from Assistant Deputy for Site Activation, BSD, to Deputy for Civil Engineering, BSD, AFSC, Norton AFB, Calif. . . . Brig. Gen. William G. Lee, Jr., from Director for Military Personnel, Office, Assistant Secretary of Defense (Manpower), DoD, to Deputy Commander, 1035 USAF Field Activity Group, Hq. Command, Washington, D. C. . . . Maj. Gen. Clyde H. Mitchell, from Vice Commander, Hq. AFSC, Andrews AFB, Washington, D. C., to Commander, San Bernardino AMA, AFLC, Norton AFB, Calif.

PROMOTIONS. . . . To the rank of major general: Maurice C. Harlan; Paul T. Preuss. To the rank of brigadier general: Michael J. Ingelido.

RETIRED. . . . Maj. Gen. Render L. Braswell.—END



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porting ICBMs whole and carrying freight in bigger chunks than any other aircraft...the magnificent performance of C-47s flying "the hump" during World War II...the workhorse dependability of C-54s and C-118s during the Berlin airlift. And take note that the new DC-8F "Jet Trader" can be converted to any of 12 configurations in less than 2 hours.

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A provocative and packed agenda, the tireless efforts of the many people who charted the programs and aided in the logistics, and the largest attendance in AFA history combined to ensure the success of the 1962 Convention and Aerospace Panorama. Participants and observers agreed Las Vegas '62 was . . .

AFA's BIGGEST and BEST YET



A Las Vegas fireman reaches high to rinse desert dust from a 103-foot Titan missile set up before the Convention Center as the kingpin of a USAF weapons display.

By Allan R. Scholin

ASSOCIATE EDITOR, AIR FORCE/SPACE DIGEST

THE steady growth of AFA's National Conventions in size and program scope is apparently as limitless as space. In Las Vegas, Nev., September 18 to 23, AFA conducted its Sixteenth Annual Convention, once again reaching new levels in attendance and activity.

It was the biggest both in terms of the people who registered and in events on the program.

More than 4,600 people signed in—ten percent more than the record set last year in Philadelphia. But registrations don't tell the whole story. At the peak of Convention activities, Las Vegas hotels were completely sold out, and hotelmen estimated the Convention drew at least 10,000 people to the city.

The program of events was designed to attract and hold people at the Convention Center. And it did. At times Convention guests had to choose from as many as three simultaneous events on a standing-room-only basis.

This kind of three-ring schedule kept registrants

alert and on the go. The fact that all AFA events took place within the magnificent Las Vegas Convention Center made it possible for the more energetic to acquire an extraordinary range of information.

"In no time at all," said one registrant, "we learned to pick out the typical symposium-hopper. You checked how much lint his shoes picked up from the Convention Center rugs and measured the charge of static electricity he gave off when he shook hands."

When AFA's Convention Committee met many months ago to pick the site for the 1962 Convention, the point that carried the day for Las Vegas was that the Tactical Air Command had scheduled its 1962 Worldwide Fighter Weapons Meet at nearby Nellis AFB, making it possible for AFA Convention guests to see by far the biggest tactical air demonstration of the year.

The opportunity to join hands with TAC—to link AFA's seminars, symposiums, and Panorama exhibits
(Continued on following page)

Key factors in the success of AFA Convention in Las Vegas were Senator Howard W. Cannon, left, General Chairman, and the Military Host, Brig. Gen. Boyd Hubbard, Jr., Commander of Nellis AFB, shown here accompanied by Mrs. Hubbard.



USAF's newest tactical fighter, the McDonnell F-4C, is towed down Paradise Road from McCarran Field to Las Vegas Convention Center for display with other Century series planes.



with the Tactical Air Demonstration—was too good to pass up.

Apparently a record number of AFA members agreed.

Much credit for the Convention's success must go to Senator Howard W. Cannon of Nevada who not only accepted the post of General Chairman but worked at it skillfully and tirelessly.

Assisting Senator Cannon in running the Convention were Mrs. H. H. Arnold, Honorary Chairman; a fifty-two-man Nevada Advisory Council covering every aspect of Nevada public affairs; and eleven committees under Barney Rawlings as General Committees Chairman.

Individual committee chairmen were: THEODORE (PAT) CROSS, Honors Night; WINDSOR DeCRANE, Information Desk; ART FORCE, Newsroom; JAKE GAREHIME, Transportation; DR. ROBERT KITTREDGE, Education; JAMES MOSS, Special Services; ART OLSEN, Airport Dedication; DICK RODMAN, Flying Clubs; JAMES C. SMITH, Special Activities; CLIFTON SPEER, Motor Pool; and JOHN WAWERNA, Reception.

Military Host to the Convention was BRIG. GEN. BOYD HUBBARD, JR., Commander of Nellis Air Force Base. USAF Project Officer was COL. WILLARD E. WOODBURY.

Many elements combined to make the 1962 Convention memorable. For five days, a record 500-plus newsmen and information officers made Las Vegas the aerospace capital of the world, filing an estimated

100,000 words a day. Attractive and comfortable hotels grouped within a short distance of the Convention Center, the excellent features of the Center itself, the bright desert sun and low humidity, and the variety of restaurants and entertainment available, all added up to a pleasant and rewarding experience.

AF's 15th Anniversary Celebrated

The Convention program was filled with significant and dramatic events. One, of course, was the address by Secretary of the Air Force Eugene M. Zuckert, marking the Fifteenth Anniversary of the Air Force as a separate service.

"We commemorate with gratitude the work of the thousands of people who have served the Air Force, and particularly the great men who laid the foundation of the Air Force, such as Arnold, Lovett, Spaatz, Vandenberg, Symington, Twining, and White," he said. "Their vision and achievements are a source of both pride and inspiration.

"It is what they and hundreds of others have done in the past that makes the Air Force what it is today. What we do today will determine what the Air Force is in the future."

He commented on Air Force efforts in three fields:

- **Limited War:** "The Air Force is concentrating immense power in [STRICOM] for air superiority and interdiction, for close ground support, and for rapid air movement of the forces."



Women like Shirley Thomas are always welcome in the Airman's World, says Gill Robb Wilson, who made keynote address before the opening of Miss Thomas' Women in Space Symposium.

Gen. William F. McKee, USAF Vice Chief of Staff, spoke at Aerospace Luncheon, warned that "we must be able to deny any potential enemy the use of space for military aggression."



Twice during the Convention, the floor of the auditorium was packed with luncheon guests. Secretary of the Air Force Eugene M. Zuckert delivered USAF fifteenth anniversary address on Friday, USAF Vice Chief of Staff McKee spoke a day earlier. With chairs replacing tables, this was also scene of Honors Night.



● **Strategic Deterrence:** "Our primary role is the maintenance of the strategic deterrent. Its strength is growing. The combination of strategic systems, one manned, one unmanned, assures continuing control of the action—strike, reconnaissance and evaluation, and restrike."

● **Space:** "Paramount, of course, in the future of the Air Force is space. . . . The United States is dedicated as a matter of national policy to the peaceful exploitation of the space medium. . . . We are, however, taking the steps to enable us to protect ourselves in the event the Soviets or any other nation were to undertake missions in space that would endanger our security."

With USAF Chief of Staff Gen. Curtis E. LeMay tied down in Washington in a DoD global communications test, Gen. William F. McKee, Vice Chief of Staff, spoke in his place.

He listed prime US resources for aerospace power—intellectual resources, industrial capacity, national economy, knowledgeable manpower, a well-informed public.

With these resources, he said, "we can and must continue to produce aerospace power second to none—and by as wide a margin as we can reasonably attain. . . ."

"We cannot allow ourselves to be placed in a position where an enemy can deny us the use of space for our own interests and those of the free world. We have to protect our own interests in space, and we

must be able to deny any potential enemy the use of space for military aggression."

Details of aerospace programs outlined by Secretary Zuckert and General McKee were covered in four major seminars and symposiums.

"Space and National Security" was discussed by AFSC's General Bernard A. Schriever; Dr. Edward C. Welsh, Executive Secretary of the White House's National Aeronautics and Space Council; Dr. Arthur Kantrowitz, Vice President of Avco Corporation and Director of Avco-Everett Research Laboratory; and Air Marshal C. Roy Slemon, Deputy Commander in Chief of the North American Air Defense Command. These presentations appear in this issue, beginning on page 62.

This group was impressive but hardly as photogenic as the leaders of a second space meeting at the same time elsewhere in the Convention Center. This was the "Women in Space" Symposium, led by Miss Shirley Thomas, noted author on space subjects, and sponsored by the Aerospace Education Foundation. Her speakers included Gill Robb Wilson; Dr. Albert Piltz, a science specialist from the US Office of Education; and three distinguished aerospace career women—Mrs. Laurel Van Der Wal Roennau, a bioastronautics specialist from the Space Technology Laboratories; Dr. Beatrice A. Hicks, President and Director of Engineering, Newark Controls Company; and Miss Jerrie Cobb, who is employed by Aero Commander, Inc., and

(Continued on following page)



Principals in symposium on Limited War and Counterinsurgency were Gen. Walter C. Sweeney, Jr., Commander of Tactical Air Command; Army Gen. Paul D. Adams, Commander in Chief, US Strike Command; and Brig. Gen. Gilbert L. Pritchard, Commander of Special Air Warfare Center. Moderator for the session was AFA's Joe Foss.



Maj. Bob White, X-15 pilot, congratulates SMSgt. Elliott C. Phelps of CONAC, one of USAF's twenty-two outstanding airmen for 1962, at dinner in airmen's honor. Joining White in salute to airmen were Undersecretary Joseph Charyk, Vice Chief of Staff, Gen. William F. McKee, and writer Bob Considine.



Undersecretary of Air Force Joseph V. Charyk greets ADC's outstanding airman, MSgt. Lawrence G. Seckley and Mrs. Seckley, at reception preceding Outstanding Airmen dinner. Partly hidden behind the Undersecretary is Lt. Gen. Robert Lee, Commander of Air Defense Command. The Seckleys are based at McChord AFB.

is the first woman to pass the physiological tests administered to prospective astronauts.

Still another vital aspect of space developments was covered in a two-day USAF-industry seminar on "Space Communications and Electronics," led by Prof. William H. Radford of MIT and Maj. Gen. Charles H. Terhune, Jr., Commander of AFSC's Electronic Systems Division.

A more complete report on space aspects of the Convention begins on page 51.

Lt. Gen. Hunter Harris, Jr., Vice Commander in Chief, Strategic Air Command, headed a symposium on "Strategic Deterrence," joined by Gen. Charles P. Cabell, for nine years Deputy Director of the Central Intelligence Agency, and Dr. Herman Kahn, Director, Hudson Institute, and the author of *On Thermo-nuclear War*, and other studies on deterrent strategy.

A symposium on "Limited War and Counterinsurgency," rounding out the spectrum of Air Force mission areas, had as its panel Gen. Walter C. Sweeney, Jr., Commander of the Tactical Air Command; Gen. Paul D. Adams, Commander in Chief, US Strike Command; and Brig. Gen. Gilbert L. Pritchard, Commander of USAF's Special Air Warfare Center.

7 Outside Groups Meet with AFA

Seven outside groups contributed to the record attendance at this year's Convention.

- The Defense Orientation Conference Association, composed of leading civilians in various professions who share an interest in US military readiness, con-

vened in Las Vegas on the first leg of a worldwide tour of free world military installations.

- The Fighter Aces Association, made up of pilots of all services who have downed five or more enemy planes in combat, met with AFA this year on a schedule that calls for them to rotate their annual meetings among the three service associations.

- Once again, the colorful Night Fighters were on hand.

- Key committees of the Aerospace Medical Association met during the week.

- Educators from thirty-eight countries joined in the Aerospace Education Workshop sponsored by the US Office of Education and AFA's Education Council.

- Twenty journalists from NATO nations visited the Convention for three days during a US tour.

- And air attachés from twenty-five countries saw TAC's weapons meet and the Convention under USAF auspices.

More than sixty foreign nations were represented in all.

Once again, the honored guests who drew the most attention everywhere they went were USAF's twenty-two outstanding airmen and their wives. They came from each of the major commands, plus the Air Force Reserve and Air National Guard. At the exclusive—invitation only—Outstanding Airmen Dinner, they were saluted by Undersecretary of the Air Force Charyk, USAF Vice Chief of Staff General McKee, Senator Cannon, and X-15 pilot Maj. Bob White.

And again, Air Reserve Forces participation in
(Continued on page 39)



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Modern electronic countermeasures are an important deterrent and intelligence tool for the military services. "Ferretting" ECM systems—for the detection, location and analysis of foreign electromagnetic radiation associated with radar, missile command and communications—are a demonstrated capability of Babcock's Military Products Division, where operational ferreting systems are in production for the Navy. Babcock's skilled team, with an established reputation for providing field-ready reliability in a wide range of military-qualified electronic systems and components, is conducting advanced research and development to provide solutions to new problems in ECM.

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AFA's new Chairman of the Board, Joe Foss, listens as Secretary George Hardy conducts AFA business meeting. Under Hardy's practiced gavel, delegates stayed on schedule to carry out agenda on voting, resolutions, other functions.



John B. Montgomery, elected AFA President for 1962-63, served as moderator in symposium on "Deterring General War." When he resigned from regular Air Force in 1955 he commanded SAC's Eighth Air Force. Now president of a New Jersey manufacturing firm, he is an Air Reserve major general.



Capt. Wallace M. Green, Jr., Air Guard pilot from Jacksonville, Fla., who was second in Ricks Trophy event, receives Ryan plaque from Maj. Gen. Winston P. Wilson, Deputy Chief of National Guard Bureau, for shooting down Firebee drone in the interceptor phase.

Convention events was extensive. An overlap between the National Guard Association Conference at Denver, Colo., and the AFA Convention delayed the arrival at Las Vegas of many State Adjutants General and top Air Guardsmen until Friday morning, just in time to see the finish of the Ricks and Reserve troop carrier competitions at McCarran Field.

That afternoon came the annual Reserve Forces Seminar, covered in detail in this month's "Ready Room," page 102, followed by a reception for Reserve Forces personnel.

Fast-Paced Business Sessions

Delegates from AFA Wings and Squadrons, in a series of fast-paced business sessions, drafted AFA's 1962 Statement of Policy, elected national and regional officers, approved a number of resolutions—including a more liberal membership policy—and received invitations from several cities seeking the Convention in future years.

In its Statement of Policy, AFA asserted that "we cannot satisfy the national security requirement in space with by-products from our civilian space program. . . . The need for the United States to develop a military capability in space transcends partisan politics and questions of agency roles and missions." For the complete text of the Statement of Policy, see page 9.

John B. Montgomery of Murray Hill, N. J., was elected President for 1962-63. Joe Foss, Sioux Falls, S. D., last year's President, moved up to Chairman of

the Board, George D. Hardy, College Park, Md., was reelected Secretary, and Paul Zuckerman, New York, N. Y., was named Treasurer.

Montgomery is president of Daystrom, Inc., a manufacturing firm with headquarters in New Jersey. A former Air Force officer, he was promoted to major general at the age of forty-one, and was Commander of SAC's Eighth Air Force when he resigned his commission to enter private business in 1955. He has since regained two-star rank in the Air Force Reserve.

Details on election of the Board of Directors and Regional Vice Presidents are reported by Gus Duda in "AFA News," page 108.

Resolution Considers JCS Structure

A recommendation that the Joint Chiefs of Staff be freed from the responsibility of running their individual services so that they can provide more "objective and timely" advice to the President and the Secretary of Defense was approved by a resolution of the Convention. Delegates directed that AFA's President bring it to the attention of President Kennedy, the Secretary of Defense, and appropriate congressional committees.

The present structure, in which members of the Joint Chiefs are also responsible for running their individual services, inevitably produces JCS decisions which are a compromise among individual service positions, the report noted.

Faced with conflicting views within his Joint Chiefs, (Continued on following page)



Bob Hope, who as Honors Night Master of Ceremonies made numerous award presentations, was the surprise recipient of a special AFA award, made by Joe Foss, citing Hope's many holiday tours to faraway places to entertain troops.



A colorful Boeing P-26 pursuit fighter, built in 1934, offers a vivid contrast with the Douglas Skybolt airborne ballistic missile on display at AFA's Aerospace Panorama.

the Secretary of Defense tends to rely on civilian advisers instead, the report said.

But now that combat forces are entirely under direction of the Joint Chiefs rather than the individual services, it should be possible to relieve JCS members of service responsibilities, the report said, thus enabling the JCS to provide "objective and timely" advice to the Secretary and the President, and perform staff planning for the organization and direction of unified commands.

The committee which prepared the report was headed by AFA Board Member James H. Douglas, former Secretary of the Air Force and Deputy Secretary of Defense. His committee included Lyle Garlock, former Assistant Secretary of the Air Force (Financial Management); AFA President John B. Montgomery; Edward P. (Ted) Curtis, one of the founders of AFA; Prof. W. Barton Leach of the Harvard Law School; and three former USAF Chiefs of Staff—Generals Carl Spaatz, Nathan F. Twining, and Thomas D. White. Twining also served for two years as Chairman of the Joint Chiefs of Staff.

Private Enterprise System Upheld

In another strongly worded resolution, AFA reaffirmed its support of the private enterprise system for the design, development, and production of equipment essential to national security.

Because "aerospace power is most effectively employed through a concentrated and centrally controlled effort," AFA reemphasized its "support of the assignment of manned military space activities" to AF.



The "Outstanding Airman" from USAF's Headquarters Command, SMSgt. Arthur E. Cole, and Mrs. Cole talk things over with Bob Hope after the Air Force Honors Night program. Sergeant Cole was one of the twenty-two Outstanding Airmen saluted at the AFA Convention. The others, listed with their command, included: CMSgt. Chester O. Bergath, AF Communications Service; SMSgt. Charles H. Campbell, TAC; MSgt. Robert F. Donaldson, Office of Aerospace Research; CMSgt. Marion S. Dyches, AF Security Service; CMSgt. Joseph L. Ekiss, Air University; MSgt. James M. Gardner, AF Reserve; SMSgt. Robert A. Gillham, SAC; SMSgt. Merritt M. Green, Air Force Academy; MSgt. Jason D. Holt, Caribbean Air Command; MSgt. Ernie L. Juenger, Aeronautical Charting and Information Center; SMSgt. Thomas W. Linam, Air National Guard; MSgt. Edward J. Matus, AFLC; CMSgt. Ross McEuen, USAFE; MSgt. Leon H. Nichols, PACAF; SMSgt. Gene T. Outland, Air Training Command; SMSgt. Elliott C. Phelps, CONAC; CMSgt. Wallace B. Rudolph, USAF Accounting and Finance Center; MSgt. Lawrence G. Seckley, ADC; MSgt. John O. Smith, Alaskan Air Command; TSgt. Lenote M. Vigare, Military Air Transport Service; and SMSgt. Joseph F. Welch, Air Force Systems Command. Hope greeted all the airmen.

It urged the Department of Defense to authorize full development of the RS-70, called for increased national attention to the need for developing other new weapon systems, and gave its support to an FAA-USAFA-NASA program to develop a supersonic transport.

In four resolutions affecting Air Force personnel, it called for a military pay raise; additional family housing to overcome a shortage of more than 200,000 USAF family units; an increase in cadet strength at the Air Force Academy and equalization of field grade officer authorizations among the services. It also suggested that the Air Force Academy develop a curriculum to permit highly qualified cadets to earn a master's degree within the four-year span of their Academy enrollment.

Delegates passed five resolutions pertaining to the Air Reserve Forces, covered in "Ready Room," page 102. The resolution approving a change in membership rules to permit any US citizen who supports AFA's objectives to become a member is discussed in "AFA News," page 108.

Invitations for future Convention sites were formally extended by delegates on behalf of Dallas, Tex.; Dayton, Ohio; Detroit, Mich.; Mobile, Ala.; New Orleans, La.; San Antonio, Tex.; and, *Señores*, of Mexico City-Acapulco as well. *Olé!*

An even one hundred exhibitors—industry and military—joined in the 1962 AFA Aerospace Panorama in the Convention Center and on the approaches to the flying saucer-shaped building.

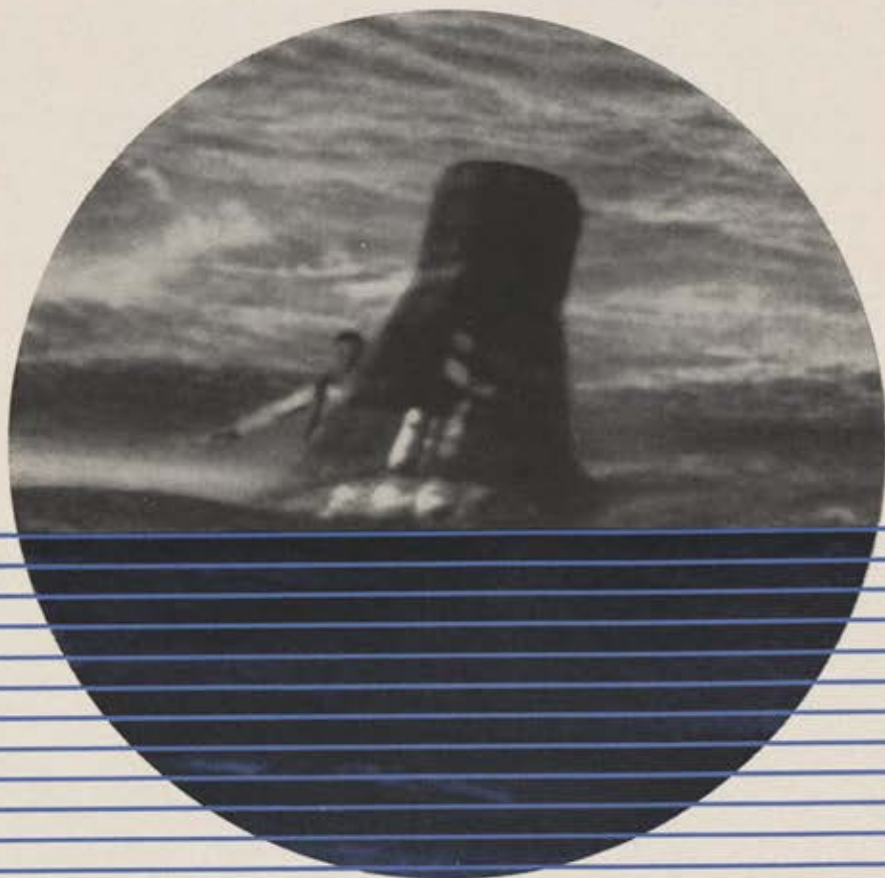
Probably the biggest hit of the show was USAF's
(Continued on page 42)

Kel-O-Rad — communications where it counts

A ten foot space craft bobbing in the vast Pacific Ocean makes a very small ripple. But when that space craft contains Astronaut Walter M. Schirra, Jr., the ripple laps the shores of the world. From countdown to splashdown a vast communications network links Astronaut Schirra with his earthbound colleagues. A unique Kel-O-Rad Radio Transceiver installed in the Astronaut's survival kit was available to keep him in constant voice communication with nearby rescue aircraft if he elected to leave the space craft. The microminiaturized Kel-O-Rad unit permits hands free communications in a host of operations—flight line maintenance, warehouse areas and special test and fire fighting teams—where people work in hazardous or extremely noisy surroundings. Kel-O-Rad's two basic units—the portable transceiver and base station—are compact battery-powered packages. The 12-ounce transceiver contains a crystal controlled transmitter and receiver powered by two rechargeable batteries. Two base stations are available—a small unit operating from an internal battery pack and a slightly larger unit powered by a battery or an AC power supply. With a wide selection of operating frequencies, Kel-O-Rad puts reliable voice communications where they count—in any military or industrial environment.

ITT KELLOGG COMMUNICATIONS SYSTEMS DIVISION

A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION • 500 NORTH PULASKI ROAD, CHICAGO 24, ILLINOIS



X-20 Dyna-Soar model, introduced to the public for the first time, along with the five Air Force officers and one NASA civilian pilot who have been selected to fly Dyna-Soar missions.

Undersecretary of the Air Force Joseph V. Charyk pushed a button to slide open the doors unveiling the Dyna-Soar to AFA Convention guests.

"Today we stand on the threshold of a new experience with a new potential," he said. "The X-20 . . . is designed to explode the explored narrow band of speed and altitude into a complete corridor to space—a corridor within which man will be able to exit and reenter from space under his own control, using

the atmosphere to arrive and land at a place of his own choosing."

Near the Dyna-Soar display stood a scale model of the Martin Titan III which will propel the X-20 into global orbit and provide booster power for other manned space vehicles. On exhibit, near the entrance to the hall, were the Mercury capsule of the type which Commander Walter Schirra was soon to fly in six flawless orbits, and the Gemini, expected to carry a pair of Astronauts in the first US space rendezvous attempt.

There were other "names" too, in the equipment and instrument world—for example, Telstar, the orbiting communications satellite soon to be joined in space by more satellites to make possible continuous global television and greatly expanded communications traffic in general.

PRESIDENT KENNEDY'S MESSAGE TO AFA

THE FOLLOWING MESSAGE FROM PRESIDENT JOHN F. KENNEDY WAS RECEIVED DURING "AIR FORCE HONORS NIGHT" HELD DURING THE SIXTEENTH ANNUAL AIR FORCE ASSOCIATION CONVENTION, IN LAS VEGAS, NEV., ON SEPTEMBER 21. THE MESSAGE WAS BEAMED TO LAS VEGAS VIA THE TELSTAR COMMUNICATIONS SATELLITE.

"Good evening, Governor Foss, Secretary Zuckert, Senator Cannon, and all who are attending the Sixteenth Annual Convention of the Air Force Association. I am sure your discussions this year will be as beneficial to your country as your discussions and services have in the past. It is very appropriate that I speak to you through the medium of spaceborne communications. My voice and image are coming to you via Telstar, our American satellite, almost as easily as I might have talked with you on the phone a year or two years ago.

"I commend the Air Force Association for selecting as 'Aerospace Men of the Year' Dr. John R. Pierce and Mr. Alton C. Dickieson of the Bell Laboratories, for their leading roles in the development of this outstanding symbol of America's space achievements. I am happy to note that you have selected my good friend, Howard Cannon, as your Convention Chairman.

"I want to commend all of those of you who have devoted so much of your lives to the service of your country. The Air Force has played a significant part in World War I, a great role in the Second World War and in Korea, and today, even though we are at peace, we are heavily engaged in many parts of the world, and the Air Force once more is rendering its services as the shield of the United States and the cause of freedom. The planes which stand on a fifteen-minute alert at the SAC bases around the country and around the world protect the freedom of countries thousands of miles from the United States.

"The Air Force has a great role to play in the future struggle against insurrection and guerrilla war, in the maintenance of our strategic force and strength, in the increasing responsibilities and burdens which will be placed upon the Air Force in the field of space, to make sure that space is maintained for peaceful purposes, and that no nation secure a position in space which can threaten the security of the United States and the free world.

"We count on the Air Force today and in the future as we have in the past, and we count on you who serve the Air Force and our country in peace and in war.

"Gentlemen, I congratulate you, and ask of you the same kind of dedicated service in the future that we have had from you in the past."

Century Series Aircraft on Display

Outside the Convention Center were displayed all of USAF's Century series fighters, its operational ballistic missiles, three modern jet trainers, and the new Lockheed C-140 JetStar transport (*see front cover*).

The Atlas, Minuteman, and Thor shared attention with the McDonnell F-4C Mach 2 fighter, newest of USAF's Century jets. They were surrounded by the North American F-100, McDonnell F-101, Convair F-102 and F-106, Lockheed F-104, and Republic F-105. Jet trainers were the Cessna T-37 primary trainer, Northrop T-38 basic trainer, and North American's T-39 Sabreliner, radar trainer for F-105 pilots.

Several thousand AFAers got their first look at the Panorama when it was the scene of the annual General Officers' Reception. In the next two days it was visited by school groups, foreign attachés, local clubmen and women, weapons-meet crew members, and others. The Panorama provided a "laboratory" for the giant aerospace education workshop, attended by US and foreign educators.

On the week end, when Panorama doors were opened to the public, more than 60,000 streamed through the Exhibit Hall. In the vast parking lot were school buses displaying licenses from California, Arizona, Utah, New Mexico, and Colorado, as well as many from Nevada, and cars were there from literally all parts of the nation.

It proved, if any proof were necessary, that aerospace vehicles and paraphernalia hold a greater attraction than ever for the youth of America—and their parents.

Honors Night Climaxes the Week

Honors Night, judging by the reaction of the 5,000 people who attended in the Convention Center auditorium, was a big success and may well take its place as a regular highlight of AFA Conventions.

Bob Hope and NBC reporter Roy Neal made a highly effective team. Hope using his celebrated wit as a counterpoint to the impressive list of accomplishments cited by Neal about the men being honored.

The complete record of AFA awards, presented to more than a hundred individuals in all, appears in the box below.

For the second straight year, Maj. Bob White won the David C. Schilling Trophy for flight achievement. He shared the award last year with Scott Crossfield of North American and Joe Walker of NASA. But the

awards committee found that his achievements in piloting the X-15 to a speed of more than 4,000 miles per hour and an altitude of 59.7 miles this year clearly merited him the Schilling Trophy again.

The AFA Science Trophy went to Dr. Charles H. Townes of MIT for his work on masers, which focus
(Continued on following page)

AIR FORCE ASSOCIATION AWARDS AT THE 1962 NATIONAL CONVENTION

AIRPOWER AWARDS

H. H. Arnold Trophy—Dr. John R. Pierce and Alton C. Dickieson, both of Bell Telephone Laboratories, designated "Aerospace Men of the Year" for their work on the Telstar communications satellite.

David C. Schilling Trophy—Maj. Robert White, USAF, X-15 pilot, first winged Astronaut.

AFA Science Trophy—Dr. Charles H. Townes, Massachusetts Institute of Technology physicist, for his work on masers.

AFA Arts and Letters Trophy—Bob Considine, syndicated newspaper columnist, author, radio and TV commentator.

Hoyt S. Vandenberg Memorial Trophy—Dr. Lindley J. Stiles, Dean of the School of Education, University of Wisconsin, named "Top Aerospace Educator of the Year."

AFA President's Trophy—Fort Worth, Tex., Squadron of AFA, designated the "Top AFA Unit of the Year."

RESERVE FORCES AWARDS

Earl T. Ricks Memorial Trophy—Capt. Earl A. Mead, 146th Fighter-Interceptor Squadron, Pittsburgh, Pa., Air National Guard.

AFA Air Force Reserve Troop Carrier Trophy—Capt. V. W. Moore and his crew, 440th Troop Carrier Wing, Minneapolis, Minn., Air Force Reserve.

Outstanding Air National Guard Unit—104th Tactical Fighter Squadron, Maryland Air National Guard, Baltimore, Md.

Outstanding Air Force Reserve Unit—jointly to 349th Troop Carrier Wing, Hamilton AFB, Calif., and 433d Troop Carrier Wing, Kelly AFB, Tex.

CITATIONS OF HONOR

Air Rescue Service (MATS), Hq., Orlando AFB, Fla.

Air Weather Service (MATS), Hq., Scott AFB, Ill.

Maj. Jacob T. Battenberg, Jr. (posthumously).

Lt. Col. Roderick G. Darelus, SAC information officer.

Col. Donald C. Foster, SAC Director of Information.

Max Golden, General Counsel of the Air Force.

Malcolm H. Holloway of General Dynamics Corp.

Donald R. Jackson, Deputy Assistant Secretary of the Air Force for Materiel.

Lt. Gen. Joe W. Kelly, Commander of the Military Air Transport Service.

Col. John A. McCann, Vice Commander of the War College, Air University.

John J. McLaughlin, Administrative Assistant to the Secretary of the Air Force.

Gen. Lauris Norstad, retiring Supreme Allied Commander in Europe.

Aaron J. Racusin, Deputy for Procurement Management to the Assistant Secretary of the Air Force for Materiel.

Congressman L. Mendel Rivers, Democrat from South Carolina.

George S. Robinson, Deputy Special Assistant for Installations, Office of the Secretary of the Air Force.

Robert W. Smart, Chief Counsel of the House Armed Services Committee.

Gen. Walter C. Sweeney, Jr., Commander of Tactical Air Command.

Dr. Edward Teller, Professor at Large, University of California, The Thunderbirds, official USAF aerobatic team.

Lloyd L. Turner of General Dynamics Corp.

John A. Watts, Director of Civilian Personnel, DCS/Personnel, Hq. USAF.

AFA-AFLC MANAGEMENT AWARDS

Executive Management Award—Col. William L. Hamrick, Norton AFB, Calif.

Middle Management Award—Barrett H. Fournier, Kelly AFB, Tex.

Junior Management Award—Capt. Raymond M. Finney, Wright-Patterson AFB, Ohio.

AFA-AFSC MANAGEMENT AWARDS

Distinguished Award for Systems Management—Brig. Gen. Harry L. Evans, Space Systems Div., Los Angeles, Calif.

Meritorious Award for Program Management—Col. John S. Chandler, Ballistic Systems Div., Los Angeles, Calif.

Meritorious Award for Contract Management—Col. Bobbie J. Cavnar, Martin-Marietta Corp., Denver, Colo.

TOP USAF UNIT AWARDS

SAC Bomber Unit—92d Strategic Aerospace Wing, Fairchild AFB, Wash.

SAC Tanker Unit—46th Air Refueling Squadron, K. I. Sawyer AFB, Mich.

TAC Fighter Pilot—Capt. Charles E. Tofferi, 479th Tactical Fighter Wing, George AFB, Calif.

TAC Reconnaissance Crew—Maj. Ray M. Schrecengost, Jr., and crew from 66th Tactical Reconnaissance Wing, Laon Air Base, France.

TAC Troop Carrier Crew—Capt. Francis Podlesnik and crew from 314th Troop Carrier Wing, Sewart AFB, Tenn.

Air Defense Unit of the Year—444th Fighter-Interceptor Squadron, Charleston AFB, S. C.

USAF Recruiting Group—3502d USAF Recruiting Group, Olmsted AFB, Pa.

AFA UNIT EXCEPTIONAL SERVICE PLAQUES

Membership—Ak-Sar-Ben Squadron, Omaha, Neb.

Community Relations—Syracuse, N. Y., Squadron.

Programing, Squadron Level—San Diego, Calif., Squadron.

Programing, Wing Level—Utah Wing.

Aerospace Education—Boise, Idaho, Squadron.

AFA INDIVIDUAL EXCEPTIONAL SERVICE PLAQUES

Carl C. Alford, Glendale, Calif.

John L. Beringer, Jr., Pasadena, Calif.

N. W. deBerardinis, Shreveport, La.

Maxwell A. Kriendler, New York, N. Y.

W. Randolph Lovelace II, Albuquerque, N. M.

Ronald B. McDonald, San Pedro, Calif.

M. L. McLaughlin, Dallas, Tex.

AFA MEDALS OF MERIT

Lawrence A. Fargher, Lompoc, Calif.

James P. Grazioso, West New York, N. J.

Edwin T. Howard, Jr., St. Ann, Mo.

Nathan Lane, Paterson, N. J.

Maj. James C. Laulis, Barksdale AFB, La.

Truman E. Mellies, St. Louis, Mo.

Martin M. Ostrow, Los Angeles, Calif.

Richard L. Painchaud, Los Angeles, Calif.

Earle N. Parker, Fort Worth, Tex.

Joseph L. Shosid, Fort Worth, Tex.

Gordon E. Thiel, DeWitt, N. Y.

SPECIAL AWARDS

Special AFA Citation—Jack B. Gross, Harrisburg, Pa.

Special AFA Citation—Arthur C. Storz, Omaha, Neb.

Gold Life Membership Card—Julian B. Rosenthal, New York, N. Y.

extremely high energy in a needle-ray of light, offering promising possibilities in spaceflight, in communications, and in many other fields.

The Gen. Hoyt S. Vandenberg Trophy for the top aerospace educator of the year was awarded to Dr. Lindley J. Stiles, Dean of the School of Education at the University of Wisconsin, for his work in stimulating interest and action in educational R&D.

AFA's Arts and Letters Trophy was won by Bob Considine for his efforts as author, newspaper columnist, and radio and TV commentator.

One of AFA's newest units, the Fort Worth, Tex., Squadron, was awarded the AFA President's Trophy as the top AFA unit of the year for its community and military relations programs.

AFA's highest award, the H. H. Arnold Trophy for the "Aerospace Man of the Year," was shared this year by two men who led the Telstar communications satellite project from the drawing board to space—Dr. John R. Pierce and Mr. Alton C. Dickieson of the Bell Telephone Laboratories.

The significance of their achievement was emphasized moments later by President Kennedy, whose image and voice were relayed by Telstar from Washington and projected on a huge screen in the auditorium. The President's message appears on page 42.

TAC Demonstration, a Fiery Finale

How do you get more than 6,000 AFA registrants and wives from Las Vegas to TAC's Indian Springs weapons range fifty miles out in the desert? This might have been a tough problem, except for a resourceful Las Vegas AFA member named Jake Garehime, chairman of the local transportation committee. Jake and his aides enlisted the entire population of Las Vegas in "Operation Firepower Cavalcade" to drive AFA people in private cars from hotels to the range. Not

only was transportation more than ample, but on the hour-long ride out and back AFA registrants discovered that, behind the glamorous neon façade of the Strip, Las Vegas is largely made up of substantial, friendly people who work days, sleep nights, and raise kids.

USAF's tactical air demonstration—thunderous, fiery, and awesomely precise—provided a spectacular finale to the 1962 Convention. When AFA holds its 1963 Convention in Washington, D. C., September 11-15, that finale will be a tough one to top. Still, those who know AFA and its Conventions aren't betting it won't be done.—END

WHO TOOK THIS PICTURE?



Did you take this picture of Van de Kamp's Bakery? Whoever did left his camera at the main Registration Desk at the AFA Convention in Las Vegas. This is one of several pictures that were on the roll of color film. The owner may claim his camera by writing this magazine and (1) identifying the type and make of the camera and (2) identifying some of the other pictures on the same roll of film. Address all inquiries to Editor, AIR FORCE Magazine, 1901 Pennsylvania Avenue, NW, Washington 6, D.C.

1962 AFA NATIONAL CONVENTION SPONSORS

The Air Force Association is deeply grateful to the following firms for their support to the success of AFA's Sixteenth Annual National Convention in sponsoring the events and activities listed below:

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Tactical Air Demonstration Caps

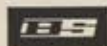


Watchdog for 4 nations

This is the Bristol/Ferranti Bloodhound surface-to-air guided missile, adopted by the United Kingdom, Australia, Sweden and Switzerland as an integral part of their defence systems. Bloodhound is powered by two Bristol Siddeley Thor ramjets which have proved their reliability during hundreds of test firings in the missile's development programme. Bristol Siddeley have more than twelve years experience in the design and development of ramjets and are the only European company to have a large ramjet engine in quantity production.

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RAMJETS • ROCKET ENGINES • MARINE AND INDUSTRIAL GAS
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If you could move a bit closer, you could see what these technicians in Lenkurt's San Carlos plant find so remarkable about the performance of the new 76C microwave system.

You'd discover that the typical 76C diversity terminal being tested above exhibits average channel noise of only 13 dba (idle+intermodulation) when loaded for 600 channels (+12.8 dbm0 per CCIR/EIA). That's better than the design engineers had called for.

The value of such exceptional performance is in the volume of information, particularly data, that can be transmitted with

complete fidelity. In fact, the 76C carries more data, more information of all types (up to 960 channels) than any other comparable system, and with a noise level found only at lower channel loading. Up 'til now.

Furthermore, with three different bandwidths to choose from, you can specify the optimum bandwidth for the application — make longer or quieter hops by filtering out much extraneous noise. And the new waveguide permits selection of all frequencies between 7125 mc and 8400 mc.

From all other aspects the 76C is an ideal military system.

**From Lenkurt:
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solid state
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Solid-state construction makes it rugged. Modular design permits quick replacement of parts. And since all the essential wiring for a sophisticated system is already installed, you can purchase just the basic terminal (transmitter, receiver, power supply) and whatever auxiliary equipment you need; later on add other assemblies without costly modifications.

For high performance and flexibility, the 76C microwave system is unmatched. Contact us for full particulars. Lenkurt Electric Co., Inc., San Carlos and Los Angeles, California; Washington, D. C., Rome, New York.

Note also these important additional features of the 76C:

BUILT-IN METERING AND TEST FUNCTIONS • COMPLETELY SOLID STATE EXCEPT FOR KLYSTRONS • IF AMPLIFIERS NEVER REQUIRE TUNING • LOW POWER CONSUMPTION (ONLY 240 WATTS PER SINGLE CHANNEL TERMINAL).

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Astronaut Walter M. Schirra's "moment of truth"—liftoff from Cape Canaveral aboard his Sigma 7 Mercury space capsule. Launch time was 8:15 a.m., EDT, on October 3.

**Astronaut Schirra's
Big Day . . .**

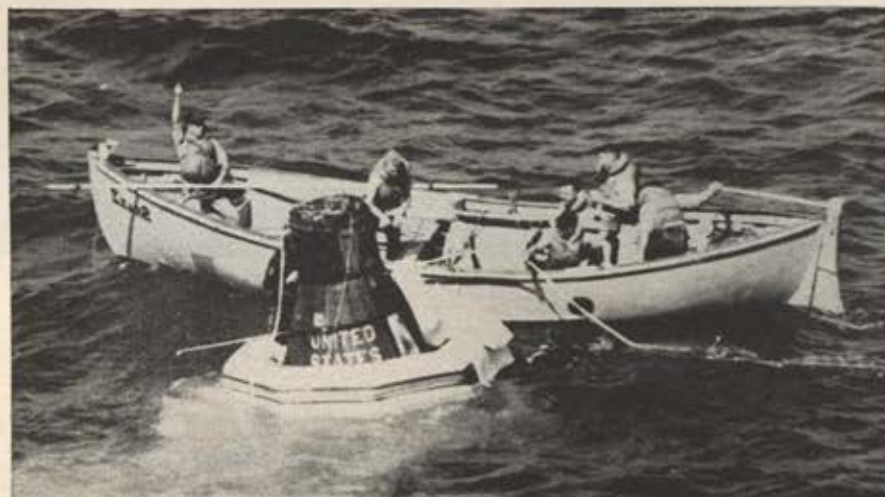
SIX TIMES AROUND . . . AND A SMOOTH LANDING



Six smooth orbits later, Commander Schirra's chute-borne capsule lands in the Pacific, 270 miles northeast of Midway Island.

With aplomb that was almost as newsworthy in itself as his feat, Mercury Astronaut, Navy Commander Walter M. Schirra, Jr., earned his place in the space hall of fame October 3, 1962, by successfully and smoothly orbiting the earth six times aboard his Atlas-boosted Mercury capsule. Launch from Cape Canaveral, Fla., the flight in space, and the splash-landing within sight of the waiting Navy carrier *Kearsage* some 270 miles northeast of Midway Island in the Pacific all went with barely a hitch. The only difficulty—and it turned out to be minor—was the spacesuit temperature control. Astronaut Schirra, acting on lessons learned during predecessor Scott Carpenter's flight (too much control jet fuel was used up that time), spent much more time in drifting flight, conserving fuel. He seemed delighted with the capsule's performance, dubbed it "sweet little bird."

Commander Schirra's flight, third orbital success in the Mercury series, was a happy prelude to an expected eighteen-orbit Mercury effort in early 1963.—END



As frogmen from the waiting Navy carrier secure the bobbing Sigma 7 capsule, Astronaut Schirra elects to stay inside his space vehicle and be hoisted aboard the carrier by helicopter. Flotation collar does the job of securing the capsule.



Congratulatory phone calls from President, Vice President, and a happy Mrs. Schirra add to postflight cheer.

THE SPACE AGE IN PERSPECTIVE



SPACE

DIGEST

VOLUME 5, NUMBER 11 • NOVEMBER 1962

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maneuverability

PROPULSION SYSTEMS FOR ATTITUDE CONTROL

Tomorrow's spacecraft will need highly sophisticated reaction control systems to perform complex maneuvers...rendezvous, planetary landings, re-entry, course correction, and orbital stabilization. To meet this need, the Space Propulsion Division of Aerojet-General's Liquid Rocket Plant is carrying out extensive research and development on attitude control. Now in development: bipropellant systems using storables or cryogenics...storable-propellant pulse rockets with $\frac{1}{2}$ to 500 pounds thrust, capable of being operated continuously or pulsed at intervals as short as 20 milliseconds with good repeatability...ablative and radiation cooled chambers...valves and components cycled repeatedly up to 1,000,000 times under 10^{-9} Hg...and positive-expulsion light-weight tankage. **LIQUID ROCKET PLANT**, Sacramento, California.



Not only hardware, but ideas, a flood of them—ranging from the role of women in the space age to new challenges of electronics—featured the 1962 AFA Convention, and the emphasis was on . . .

SPACE AND ITS IMPACT ON AMERICA

By WILLIAM LEAVITT

ASSOCIATE EDITOR, AIR FORCE/SPACE DIGEST

THE throngs of delegates, participants, and newsmen who attended the 1962 AFA Convention and Aerospace Panorama at Las Vegas, Nev., September 18-23, everywhere saw evidence of space and its impact on America—not only in the gleaming aerospace hardware displays (including the first public showing of the USAF Dyna-Soar X-20 mockup and introduction of its pilots, *see pages 52-53*) that illustrated the technological ingenuity of the new age's artisans, but also in the flood of ideas expressed by the speakers who took part in the symposiums that provided the sturdy intellectual underpinnings of the five-day meeting.

Space and national security, the impact of space technology on education and culture, the role of women in the space age, the space-age challenge to electronics and communications. These subjects were covered by top panelists who went out on limbs to express their views and submit their theses to questions from sophisticated audiences.

A featured and provocative event was the an-

nual Space and National Security Symposium.

Panel moderator was US Senator Howard W. Cannon, Democrat of Nevada and General Chairman of the 1962 Convention. Panelists were Gen. Bernard A. Schriever, USAF, Commander, Air Force Systems Command; Air Marshal C. Roy Slemon, Royal Canadian Air Force, Deputy Commander in Chief, North American Air Defense Command; Dr. Edward C. Welsh, Executive Secretary of the National Aeronautics and Space Council; and Dr. Arthur Kantrowitz, Vice President of the Avco Corp., and Director of its research laboratory.

The audience heard calls for attention to the potential Soviet space threat (Air Marshal Slemon); a more critical attitude toward vaunted defense "fallout" from civil space programs (Senator Cannon); a stress on orbital-assembly know-how (Dr. Kantrowitz); public understanding of the potential values, military and civil, of space advances (Dr. Welsh); and imaginative recognition of the national-security potential of space tech-



At the Space Symposium for Women: Dr. W. Randolph Lovelace, II, center, makes opening remarks. Left to right, Laurel Van Der Wal Roennau, Space Technology Laboratories; Dr. Beatrice Hicks, Newark Controls Co.; Gill Robb Wilson, publisher, Flying magazine; Shirley Thomas, moderator; Dr. Albert Piltz, US Office of Education; and Jerrie Cobb, woman pilot associated with Aero Commander, Inc.

Dyna-Soar X-20 pilots introduced at press conference at AFA Convention. Left to right, Capt. William J. Knight, Milton C. Thompson of National Aeronautics and Space Administration, Maj. Henry C. Gordon, Capt. Albert H. Crews, Maj. James W. Wood, and Maj. Russell L. Rogers.



nology and vehicles as extenders of US deterrent strength (General Schriever). Formal presentations by panelists were followed by a lively question-and-answer period. (A slightly condensed version of this Symposium begins on page 62.)

The Convention stress on space and its significance in terms of national security had already been emphasized by the unanimously adopted 1962-63 AFA Statement of Policy, which in strong words asserted:

"The lack of an adequate United States military space capability may make it possible for the Soviets to deny access to space for our exploratory vehicles. More important is the possible hostile use of space by the Soviets—against which we may not be able to apply military strength either to deter or retaliate. . . .

"The need for the United States to develop a military capability in space transcends partisan politics and questions of agency roles and missions. It calls for a searching reappraisal of our entire national space program. All of our space efforts, including the lunar program, must be measured first against the yardstick of national security."

The increasingly important question of the role

of women in our burgeoning technological age was explored at a special Space Symposium for Women, also sponsored by the AFA-affiliated Aerospace Education Foundation. Moderator of the Women's Symposium was Miss Shirley Thomas, author of the *Men of Space* book series. Participants included Dr. W. Randolph Lovelace, II, famed aeromedical specialist, and head of the Lovelace Clinic; and Gill Robb Wilson, publisher of *Flying* magazine, both of whom made introductory remarks. The audience included many students.

Featured speakers were Laurel Van Der Wal Roennau, bioastronautics specialist, Space Technology Laboratories, and a member of the Los Angeles Board of Airport Commissioners; Dr. Beatrice A. Hicks, president and director of engineering, Newark Controls Co.; Dr. Albert Piltz, science specialist, US Office of Education, Department of Health, Education, and Welfare, Washington, D. C.; and Miss Jerrie Cobb, famed woman pilot and assistant to the vice president of Aero Commander, Inc.

The speakers had important things to say. Mrs. Van Der Wal Roennau stressed her belief that the basic roles as a woman and mother are in no way



Among the dignitaries on hand for the unveiling of the mockup of the shark-like Dyna-Soar X-20 aerospace research craft was Secretary of the Air Force Eugene M. Zuckert.

Air Force Undersecretary Joseph V. Charyk describes future research role of Dyna-Soar X-20 at this crowded news conference.



compromised by an extensive schedule of professional and civic activities, that indeed activities beyond the home enhance and enrich women's lives.

"First of all, both in time and importance, I am a woman," she told her audience, "and I intend to keep on being more and more so for the rest of my life. Last year, I also became a wife. . . . There are any number of women who are wives and mothers in this room. . . . These factors, although of prime importance to the fulfillment of any woman as a person, should [not] and need not interfere in any way with a full and gratifying schedule of activities in the professional, civic, and cultural fields. The majority of people these days 'live' only about ten percent of the time; that is, they contribute about ten percent of their full potential to the society in which they live. . . . This particularly applies to women, who continue—even in this space age—to drag around the Victorian chains which have limited the areas of 'acceptable' female occupations."

Mrs. Van Der Wal Roennau told her listeners that curiosity and a willingness to learn are the keys to women's playing important roles in advancing space technology.

"We need your help in expediting America's

space effort," she told her audience. "If I were to give you my advice, it would be this: Pursue the course of study which interests you most even if it has no immediate or obvious application in our current space efforts. Above all, be curious, be skeptical, be flexible and discriminating. . . ."

Dr. Hicks told the Symposium audience that a devastating shortage of topflight scientists and engineers will develop in this country if woman-power is not utilized. "At a time when the United States is experiencing a chronic shortage of scientists and engineers, women—the best potential source of talent—have barely been sampled, and more often than not, [are] shamefully overlooked."

"Women having a high degree of engineering ability must be recruited today if we are to avoid a tacit acceptance of lower and lower scientific and engineering standards," she added. "Considering the high number of new engineers we require each year, mediocrity cannot be avoided unless the young women of America, among whom one half of our potential scientific talent lies, recognize and accept the responsibility to develop their engineering capabilities."

"If women are not actively encouraged to enter engineering, our nation will be weakened at a time



Delegations of foreign educators who attended aerospace education meetings tour Aerospace Panorama for a leisurely look at the latest in aerospace hardware on display at Convention Center at Las Vegas. Educators from thirty-eight countries were on hand.



Lt. Gen. James E. Briggs, Commander, Air Training Command, addresses Convention Aerospace Education meeting in Las Vegas.



Dr. Frank E. Sorenson, University of Nebraska, speaks at Aerospace Education Workshop. Seated, left to right, Brig. Gen. Benjamin G. Holzman, Dr. Robert Laidlaw, Dr. Charles H. Boehm, all panelists at the session.

when it requires new strength and vitality," Dr. Hicks asserted. Men cannot do the job alone, she said.

Dr. Piltz, the sole male on the panel, expanded on the themes of Mrs. Van Der Wal Roennau and Dr. Hicks and commented on the cultural attitudes that have barred women from strong participation in space activities.

"The common misconceptions of protecting women from rigorous activities, for example, of division of labor . . . 'the cheer leaders are the girls, the players are the men' sort of thing, must be eliminated," he said.

"This stereotype—of women relegated to doing 'women's' things—is deeply ingrained in our culture and with few exceptions will require the concerted efforts of parents, counselors, teachers, and friends to overcome. We may be slightly behind the USSR in our rocket program, but there is an even greater lag in equality of the sexes. Tour-

ists returning from abroad are invariably impressed with the great number of women doing 'men's' jobs—of course they are really women's jobs there. We are way behind in producing women scientists for our space programs. It is estimated that twenty-five percent of Russian space scientists are women. They are dominating the fields of astronomy, chemistry, and medicine, and are numerous in the areas of satellite tracking, computer work, and telemetry."

Dr. Piltz commented, too, on the vital need for scientific literacy among the people of America and offered some definitions:

"What do we mean by scientific literacy? We mean chiefly an understanding of what science is. Modern science is more than new knowledge. It is also a way of thinking and working. Modern science demands that students know how to solve problems. This means gaining an understanding of basic principles, the habits of curiosity, the skill

SOFTWARE

The hardware for space travel is coming along nicely. The software for space travel is people, about whom a great many issues are clear and some are not. Clear: a man can survive a few hours out there. (Nikolayev, 96½ hours, no known after-effects.) To be determined: can a man survive in space for weeks, or months? (On a round-trip to the moon, for example. Or in an orbiting space station.)

The most versatile and valuable component of any space system is man. His welfare out there is going to depend (in part) on the environment inside his vehicle. And the composition and pressure of that environment will depend on engineering requirements: weight, power, reliability. Suppose a pure oxygen, low-pressure environment were selected. How would our Astronauts function during a two-week mission?

NASA needs to know. They assigned us to find out. We're doing it right now.

The theory is simple enough. The procedure is not. It starts with our Environmental Test Chamber, a steel cylinder 30' x 18' in which we can

produce various combinations of temperature, pressure, humidity, vibration and atmospheric composition. Inside, in groups of 6, go healthy young men to breathe pure oxygen for two weeks. For each group the pressure is changed. Pure oxygen at 5 psi for the first group, 7.4 psi for



the second and 3.8 psi for the third. A fourth group, breathing air at 14.7 psi, serves as control.

Outside the chamber are specialists in aerospace medicine, physiology, psychology, microbiology, biochemistry and environmental testing. During each two-week period this team performs 683 specific tests on each man (mental, sensory, motor, pulmonary, hematological and microbiological.) The group is assisted by instruments (polygraphs, oscillographs and the like) that automatically monitor and record each subject's reactions.

Probably the most significant oxygen pressure in the test program is 5 psi. That's the environment currently used for Project Mercury. It is also under consideration for Project Gemini, a planned two-week orbit for two Astronauts. Long before they go up, the "unknowns" of living in an oxygen environment will have become knowns. And the hazards thereof, if any, will have been pinned down, studied and eliminated.

This research, supported by NASA, is being carried on in our Space Environment and Life Sciences Laboratory, to determine the effects of space travel upon the software as well as the hardware.

Why our storable liquid motors outperform some others



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"Standing room only" was the rule for latecomers at the packed Space Electronics and Communications Seminars. Audience had opportunity to read preprints of papers, "meat" of which was reported on by Air Force specialist panel chairmen, then to question authors of papers in person.



Dr. Lawrence G. Derthick opens Aerospace Education Seminar, introduces speakers, left to right, Drs. Donald Michael and Edward Teller, questioners Drs. Irby Carruth and Lindley Stiles. Subject was impact of space technology on education, culture.

of observations, the attitude of questioning and exploring, the knowledge of experimentation, the ability to work out relationships, the patience to test and retest, the persistence to try again and again when efforts fail. The students of modern science must realize that no matter how clearly the results of an experiment point to a conclusion, scientific problems are seldom conclusively answered. . . .

"The number-one requirement of scientific literacy is, therefore, for everybody. . . . For many, there are two other educational requirements in science in the space age. These are, first, specialized scientific training for those who will become scientists and technologists and, second, basic research and development for those who will discover new knowledge. . . ."

Final speaker at the Women's Symposium was Miss Jerrie Cobb, noted woman pilot, associated with Aero Commander, and an advocate of feminine participation in space programs.

Miss Cobb reported on Project WISE (Women in Space Earliest), an effort she spearheaded some three years ago to demonstrate the capability of women to undergo the psychophysiological rigors of astronaut assignments. Under Project WISE, a team of women volunteers successfully passed with flying colors a series of tests similar to those taken by the original seven Mercury Astronauts. Miss Cobb was among them.

Miss Cobb asserted that the placing of women astronauts in orbit by the US would have rebounded to the international prestige of this country. She said that although WISE did not get off the ground "the time will come when [it] will be fulfilled—by the Soviet Union if not the US.

"No one doubts," she said, "women will be needed to go into space—it is just a matter of time—and the time is now.

"If we let Russia capture this next scientific first in space, then we shouldn't blame the world for its opinions about democratic leadership. After

all, isn't this the country that gives women every equal opportunity—where there's no discrimination against women?" she said.

The space-age theme of the 1962 Convention was also underscored by an Aerospace Education Workshop session at which US and a delegation of foreign educators heard analyses of needs and programs for upgrading educational techniques for the space age. Workshop panelists included DR. CHARLES H. BOEHM, Commissioner, Pennsylvania Department of Public Instruction; LT. GEN. JAMES E. BRIGGS, Commander, Air Training Command; BRIG. GEN. BENJAMIN G. HOLZMAN, Commander, Air Force Cambridge Research Laboratories; DR. MARTIN KAPLAN, Director, Weston Instruments Division, Daystrom, Inc.; DR. DONALD F. KLINE, Director, Educational Research, F. E. Compton, Inc.; DR. ROBERT LAIDLAW, Director, Advanced Design, North American Aviation, Inc.; BRIG. GEN. ROBERT F. McDERMOTT, Dean of Faculty, US Air Force Academy; LT. GEN. TROUP MILLER, JR., Commander, Air University; DR. KNOX MILLSAPS, Chief Scientist, USAF Office of Aerospace Research; DR. CRAIG MINEAR, Executive Secretary, Colorado Education Association; DR. CALVIN H. REED, Associate Professor, University of Nevada; DR. WAYNE O. REED, Deputy Commissioner, US Office of Education; DR. FRANK E. SORENSON, Director, Aerospace Education Division, University of Nebraska; and DR. HUBERT WHEELER, Commissioner, Missouri Department of Education.

Educators also attended a special seminar on the Impact of Space Technology on Education and Culture, at which the featured speakers were Dr. Edward Teller, Professor at Large, University of California, and Dr. Donald Michael, Director of Planning and Programs, the Peace Research Institute, Washington, D. C. Panel moderator was Dr. Lawrence G. Derthick, Assistant Executive Secretary, National Education Association. Panel questioners were Dr. Irby Carruth, Superintendent of Schools, Austin, Tex.; and Dr. Lindley Stiles, Dean, College of Education, University of Wisconsin.

Dr. Michael told the seminar he believed that "The contributions of space to education and culture during [the next twenty years] will occur in processes not unlike those which are leading to the growing public understanding of . . . the new physics . . . and psychiatry . . . that is, the impact will be selective, both in terms of the specific information introduced and retained by particular

groups and in terms of the particular distortion and folklore which developed in others. . . . Most of this impact will come about chiefly as a result of face-to-face contacts and the resulting by-products of such contacts. . . .

"I think we will see more . . . growing awareness of the cosmic," he said, "at least to begin with, among the highly educated avant-garde groups who enjoy new ideas . . . and in much the manner in which Freudian ideas filtered . . . to the rest of the population through schools, magazines, social service agencies. . . . We can expect over this time period that certain ideas and values about space will become crude and popular and commonplace at some levels and subtle stimulants at other [levels]."

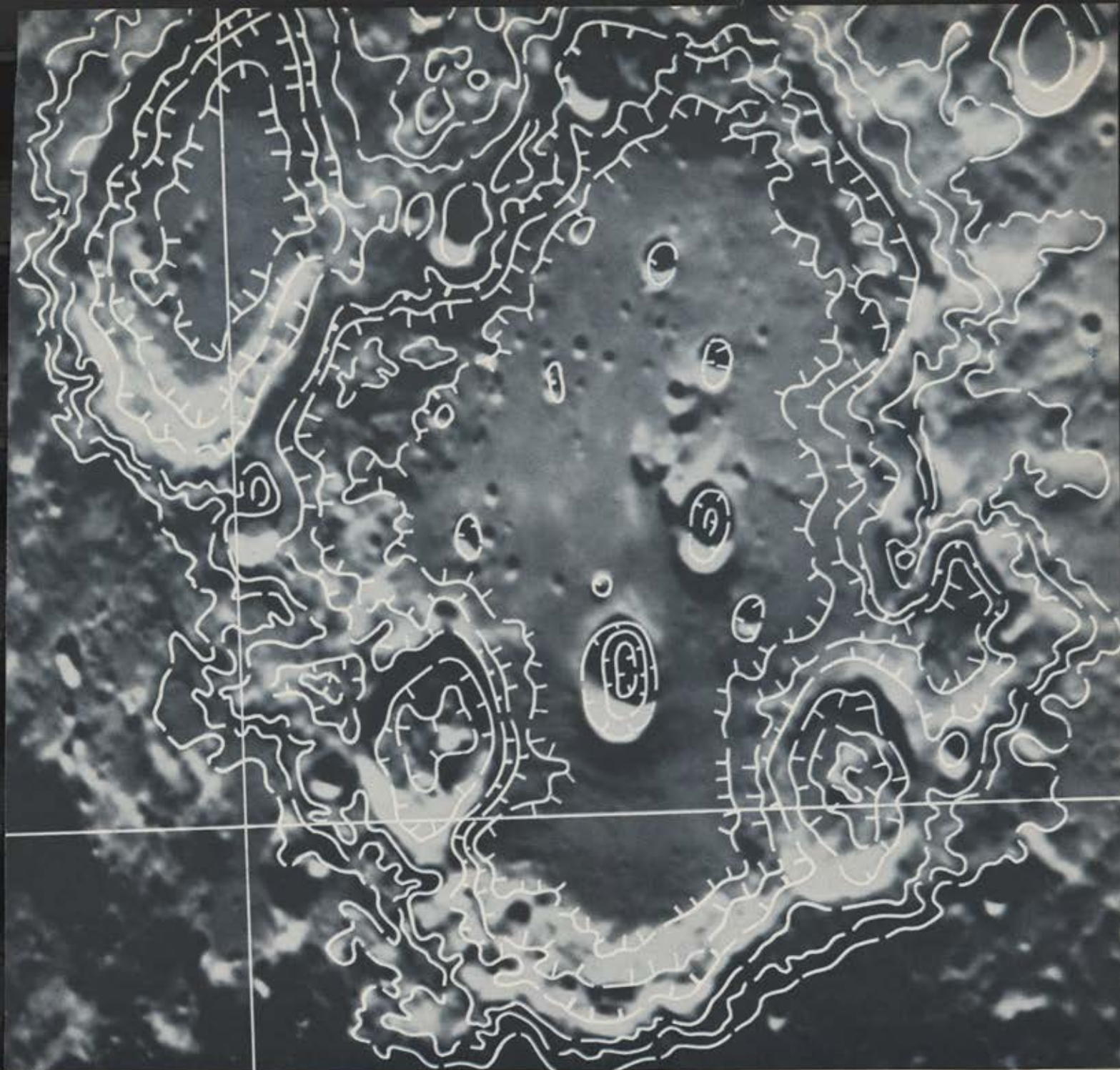
Dr. Teller called for a devotion to excellence in all aspects of education among the young and suggested that space might enhance that aim:

"Space, perhaps, is the best method of stimulating their initial interest in . . . science," he said. "That we need more scientific education, there can be no doubt. The question is how? The Russians do it by the whip. . . . Shall we use the whip too? I think not."

He listed new methods he thought would help upgrade educational methods of the space age: better pay for the best teachers; the use of industry and university volunteer instructors in educating youngsters; and introduction of scientific material as early as possible in the educational process, to excite the curiosity of bright youngsters.

Another major space-oriented event was the two-session Industry Seminar on Space Communications and Electronics. The first session had a new twist that earned plaudits from registrants and press alike. The "meat" of a series of technical papers was reported on by a battery of expert Air Force officers. The officers then served as panel moderators while the authors of the industry papers submitted to questions from a technically sophisticated audience that had already read pre-prints of the papers. The second session featured presentations of full texts of technical papers by another group of experts. Both sessions, held on successive days, were lively and stirred fruitful question-and-answer periods.

The program was keynoted by Maj. Gen. Charles H. Terhune, Commander, Electronic Systems Division, AFSC, Laurence G. Hanscom Field, Mass. Chairman was Prof. William H. Radford, Massachusetts Institute of Technology.—END



HOW TO MAP THE MOON

An electronic imaging system designed by Fairchild can survey the lunar surface with resolutions up to one meter. Charts of this precision can help our first moon explorers locate themselves with pinpoint accuracy. But how to make them? Fairchild studied the problem in depth, designed a system that can acquire terrain data from a lunar satellite, receive and process the data on earth, then convert it to highly detailed maps. The system can also provide high resolution photos of potential landing sites.

Advanced systems like this illustrate Fairchild's unique combination of capabilities in electronics, photography and in cartographic and data processing technologies. Other examples are outlined in a brochure, "Facilities and Capabilities—an Eye to the Future." For your copy, write Dept. 32, 750 Bloomfield Ave., Clifton, N.J.



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MIRROR

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by FRITZ LEIBER

Hooking his thumb to the mirror-bright panel to provide a fulcrum for his weightless maimed finger, Wolfe pushed the final button. Ions swirled invisibly around the transparent sphere holding Barr and himself.

While the ions built the field, he looked out at the globe of Earth, about as big to his eye as a breakfast grapefruit, but this grapefruit was powdered with clouds and set before him on a black tablecloth of stars.

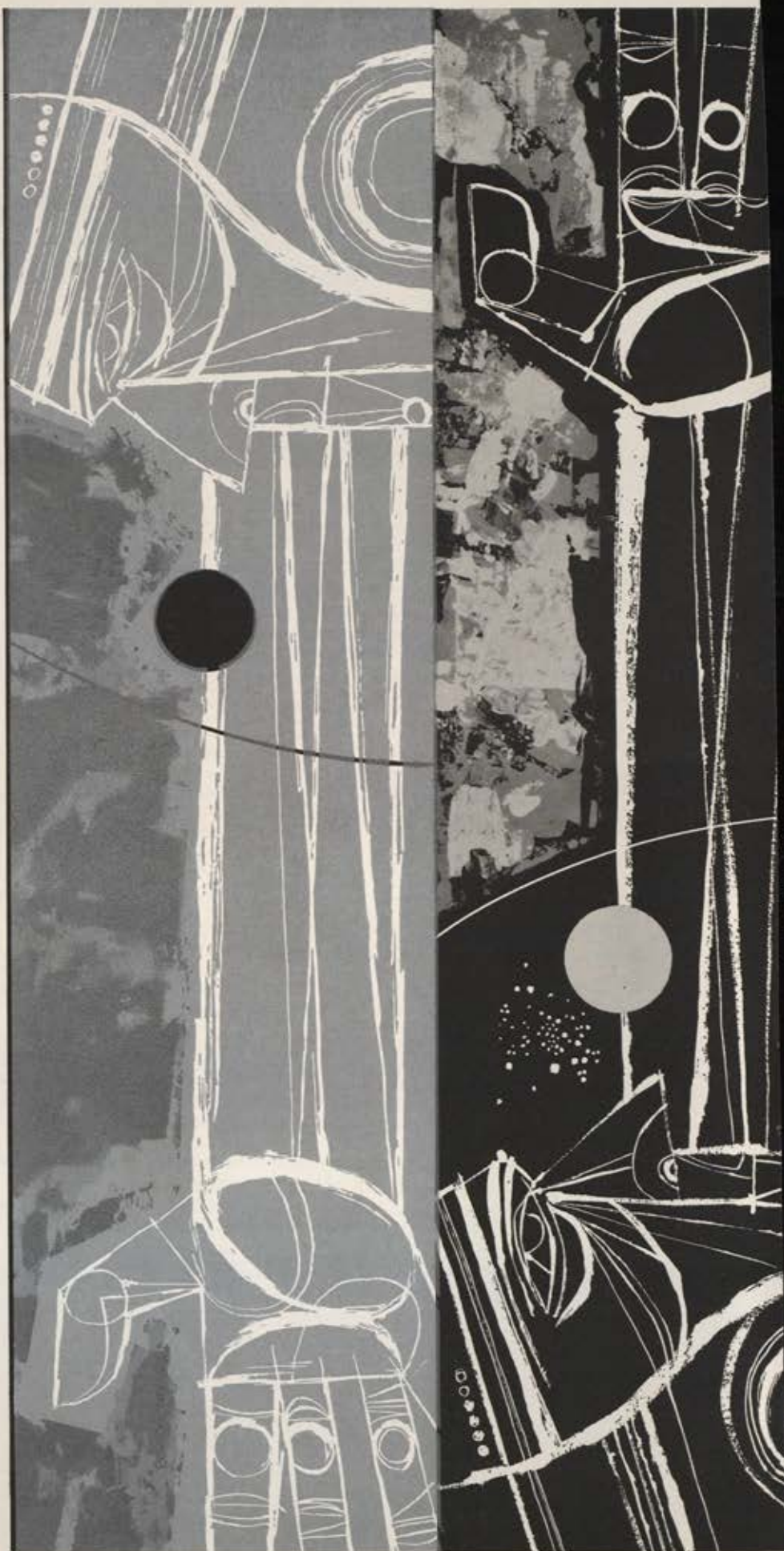
Barr said, "Twenty thousand miles of hard vacuum should be enough insulation." Wolfe nodded absently at Barr's reflection in the panel.

If the new equations had been read rightly, the climax field would plunge them into the hypothetical spherically-curved, four-dimensional world wherein our whole universe is only a quivering globular surface. Then it would whisk their thin three-dimensionality through the hypersphere as a crack speeds across glass and as swiftly as a man can swing a flashlight from one star toward another.

Finally it would pop them out of the Riemannian hyper-continuum into unoccupied space two light years from the solar system and in the direction of the tiny constellation of the Pleiades. After they had made brief confirmatory observations, a simple reversal of the process would bring Wolfe and Barr back near their starting point—if the new equations had been rightly read.

As the ionic swirl became a blizzard, a dull black, dense monomolecular layer built up from the positive to the negative pole of the transparent sphere. This opaque outer plating was an unavoidable side-effect of the process. First Earth, then Luna, then Sol was blotted out and the stars around them. The last constellation to be obscured was the Pleiades. Wolfe said a silent farewell to the Seven Sisters, though out here he and Barr could see sixteen.

The field neared climax. Wolfe gently rubbed the lopped-off first joint of his right forefinger—which was his



only outward expression of tension.

A nervous grin quirked Barr's lips in the mirror. He said, rather loudly, "I don't care how confident the math boys are, we still must be prepared for any species of disorientation. Did you ever read about the German psychologist who wore lenses that turned everything upside down? After a couple of days his brain accommodated and he saw everything—still through the same lenses—as right-side up. Then when he finally took off the lenses..."

A gust of cosmic change swept through Wolfe and Barr with no immediate perceptible effect on them or their vehicle except that two tell-tales on the panel flashed green, one of them blinking.

Wolfe touched another button. The blinking ceased as deplating of the opaque layer began, the molecules flying off in exact reverse of the order in which they had been laid down. The two men watched the spot where the stars would first show.

"The Pleiades!" Then Barr's voice changed. "But something's happened to them." He laughed oddly. "They're not upside down, at any rate!"

"No, but they're reversed right-to-left," Wolfe said quietly. "The translation effect seems to have been somewhat greater than anticipated. We appear to be not two light years away from Earth, but 440—twice the distance of the Pleiades—and we are seeing them from the opposite side."

When Barr did not reply, Wolfe continued methodically to spell out the obvious, to steady his comrade. He said, "This is possible with the Pleiades since they are an actual group of stars, physically close to one another. It would not be true of most other constellations, whose member stars differ widely in their distance from Earth. For instance, there is no place on the other side of Ursa Major or Orion whence one can see the Dipper or the Hunter reversed."

Deplating continued. The agelessly familiar constellation of Orion appeared, but to the right of the Pleiades, not to the left as one sees it looking southward from Earth's northern hemisphere, and Bellatrix and great yellow Betelgeuse were reversed, and the Sword hung the wrong way from the Belt.

Barr said softly, "This sight is impossible in our home continuum. We appear to have been translated along a diameter of the great Riemannian hypersphere to the mirror-image universe which Muawiya hypothesizes as lying at the fourth-dimensional antipodes." And now it was Wolfe's turn not to reply.

Deplating went on. Fierce Sol appeared, and Luna, and then quickly Earth showing the Americas—but Florida hung from the west coast and Baja California from the east, while by the narrow, near-invisible twig of the Isthmus of Panama, South America hung to the left of the northern continent, and the Caribbean opened

into what should have been the Pacific.

"Since the mirror universe duplicates ours in detail," Barr said, "our twins must just now have materialized near our home planet—a mirror you and a mirror me!"

"Wait," Wolfe said sharply. He was staring at himself in the mirror-bright surface of the panel and holding out his hands. At first he thought all was as it had been: his right forefinger was the one lacking a joint. Then he reminded himself that plane mirrors give a reversed image, and he looked down directly at his hands. His left forefinger was the lopped one.

"Wait," Wolfe repeated to Barr and pointed to the maimed forefinger. "Since we've been mirror-reversed ourselves, we can't be in a mirror universe, because if we were, it would appear normal to us."

"The new equations were misread completely: they don't refer to translation but to reversion. We have only moved through the fourth dimension enough to accomplish a dextro-levo reversal in our bodies—yes, and in our vehicle too, since—look!—the panel's console pattern is still normal to us. But with respect to the Earth we haven't moved a fourth-dimensional micron."

He took a breath. "Besides," he added more coolly, "it better satisfies the Law of the Conservation of Reality to assume a mirror-reversed microcosm than a similarly reversed macrocosm."

Barr sighed, possibly with relief. "And so all we have to do to unkink ourselves," he said, "is to make our 'return journey' as planned."

"Yes," Wolfe allowed, "but I for one don't approve of running needless risks. Besides, I fancy it would be wise to present the math boys with some more physical proof of the mirror-reversal than our unsupported word. They were so positive about their reading of the equations. Barr, what happened to your German psychologist when he took off the lenses?"

"Why, he'd got so used to them that the world looked upside down again. But it straightened out, I mean inverted back to normal, after a couple of days."

Wolfe nodded. "We ought to be able to stand mirror-image people and a mirror-image environment for a couple of days, don't you think? He waited a moment, then turned to the panel's communication sector to raise Earth. He added, "If adjustment proves too troublesome we can come out here and unkink—though I'd enjoy always having a complete right hand."

Barr said, "We'll have to remember to tell our doctors our hearts lie to the right now. I'll spend a bit of the next two days simply being thankful I'm not a virtual man in a virtual world."

Wolfe nodded and said, "Let's shake on that." The two men automatically gripped left hands. And a voice came from the panel, saying: "snoitalutarg-noC!"

HOW SCIENCE FICTION BECOMES SCIENTIFIC FACT

The Advanced Military Projects Group at Hoffman Science Center is busy turning fiction into fact using, among their many advanced research tools, one of the first new gaseous-type lasers. Their work in this particular area is directed towards future space and other point-to-point communications systems.

Laser communications, of course, are dependent on a means of modulating and de-modulating the beam. So, the business of developing such means is getting particular attention at the Hoffman Science Center.

To date, Hoffman scientists have come up with an original technique for direct quantum electronic modulation, among other ideas. It is one of the several they are proving out.

The Advanced Military Projects Group has just completed an engineering model of a parametric converter for inclusion in the head end of a wide dynamic range receiving system. One interesting aspect of the converter is that it includes a new parametric diode developed by our own semiconductor specialists. Neat fit, it seems to us.

A solid-state traveling wave device, lighter, smaller and more rugged than current vacuum tubes, is another on the list of goals at the Science Center. This development, while still in the embryo stage, shows promise. Our people are using the piezo-electric and semiconducting properties of cadmium sulfide in developing a solid-state traveling wave amplifier for both electrical and acoustic signals.

This, then, is the sort of thing our scientists are doing in the process of converting science fiction into scientific fact. They lend strength to, and gain strength from, Military Products Division's extensive background in communications, reconnaissance, navigation and surveillance systems and devices.

If you have a problem that might relate to what we do, drop us a line.



Hoffman scientist inserts KDP crystal in cavity resonator to produce electro-optical modulation of laser beam.

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SPACE and NATIONAL SECURITY

... Symposium at Las Vegas

An important highlight of the 1962 Air Force Association Convention at Las Vegas, Nev., was the Symposium on Space and National Security, held at the Las Vegas Convention Center September 21 under the auspices of the Aerospace Education Foundation. Panel moderator was Sen. Howard W. Cannon, Democrat of Nevada, who also served as Convention General Chairman. Panelists included Dr. Arthur Kantrowitz, Vice President of the Avco Corp., and Director of the Avco-Everett Research Laboratory, Everett, Mass.; Air Marshal C. Roy Slemon, Royal Canadian Air Force, Deputy Commander in Chief, North American Air Defense Command; Dr. Edward C. Welsh, Executive Secretary, National Aeronautics and Space Council; and Gen. Bernard A. Schriever, Commander, Air Force Systems Command. Panelists' formal presentations were followed by a lively question-and-answer period. Following is a slightly condensed version of the Symposium proceedings.—The Editors

"Let us not explore the heavens at the risk of our survival as free men on earth. Let us agree that shooting at the moon, like disarmament, is a means to an end, not the end in itself."

Can We Afford Medieval Thinking in the Space Age?

By US SENATOR HOWARD W. CANNON



THE other day I ran across a bit of satire pertinent to a symposium on space and national security, a parody on a proposal for a new anti-ICBM system. It is called the "turnabout technique." It is described as follows:

"Consider a large array of rigidly fixed rocket engines, uniformly distributed in a band about the earth's equator. All are pointed tangent to the earth's surface, parallel to the equator, and pointed in the same direction. Then, when an incoming enemy warhead is detected by the DEW Line, these rocket engines are all turned on. This applies a large torque to the earth about its axis of rotation, accelerating its rotation. By suitable control of the rocket thrust, the earth can be rotated 180 degrees between the time of detection and the time of impact. This missile would, therefore, land on the enemy's own territory and contribute to his own destruction. . . ."

Funny? I guess we can agree on that . . . Ri-

diculously impossible? Well, yes, I suppose it is, if anything can be called ridiculously impossible. I suppose this turnabout technique probably would qualify. Yet who can say how and where the last laughs will fall as man pushes the state of the art?

Historically, a lot of people have eaten the words "ridiculously impossible." So consider, for example, the old controversy regarding relative movement of earth and the sun. Copernicus, the great astronomer of the Middle Ages, was convinced from his research that the earth was not the center of the universe, as was popularly believed, but that the earth revolved around the sun. But the intellectual climate of his time was such that Copernicus feared to publish his discovery lest he be persecuted or perhaps burned to death as a heretic. The fears of Copernicus were not unfounded.

Giordano Bruno was burned at the stake for supporting the Copernican thesis on earth and

sun, and the intellectual conflict continued over the years. Galileo was condemned by the Inquisition for his insistence that Copernicus was right. Obviously, to many people, an earth moving around a sun was ridiculously impossible. I am not suggesting that the turnabout technique may take its place in history among these classics, but I cite it only to underscore the need for more open-mindedness in evaluating the military space requirement.

I am going to take off my moderator's cap for a moment, for a few observations. . . .

- At the moment, it seems to me the military space mission is a confused mish-mash of emotion and scientific method.

- Too many people neglect to evaluate the peaceful uses of space in the same context that they view the peaceful uses of sea and air. They accept military forces in these three conventional media for the stated national purpose of preserving peace. But then they apply a different equa-

tion or different definition when they talk about peace in space.

- Too many people judge every proposal for the utilization of space in terms of how it will help to put a man on the moon, as if that were the only space mission to be considered.

These observations seem almost juvenile as I mention them, yet it is surprising how many people of influence in this space business are guilty of fuzzy thinking on this point. They refuse to acknowledge that there might be many approaches to the use of space in pursuit of goals that will benefit, rather than destroy, mankind. Let us not explore the heavens at the risk of our survival as free men on earth. Let us agree that shooting at the moon, like disarmament, is a means to an end, not the end in itself. And let's come to grips with the fact that the far side of the earth—not the far side of the moon—presents the immediate threat to peace and freedom as we know it—
END

"It is my conviction that the most likely way that this [missile] stalemate will be broken is by space-based weapons which we cannot now clearly foresee. . . . We [must] explore . . . all available avenues for increasing the breadth of our vision. . . ."

Space: Newest Arena for Military Breakthroughs

By DR. ARTHUR KANTROWITZ



THE ability to send instruments and men into space is a tremendous expansion of the perspectives open to mankind.

This expansion has naturally created great concern about its meaning for national security. I want to talk . . . about those aspects of the visible environment in space; that part which we can now see, those aspects which seem to be especially important for the national security.

I want, secondly, to point out what, in my opinion, is the most urgent task at this time in the preservation of our security, and particularly I want to call attention . . . to one area which I feel is badly missing from the national program.

To my mind, the most striking aspect of space from a defense point of view still remains its immensity. One way of illustrating the significance of that for defense is to consider, for example, the

situation where one explodes a large weapon in space, and makes it uninhabitable for people, let us say, and for instruments, and all objects . . . , within a radius of 100 miles. That is a large weapon, if you consider protected instruments and protected men. However, that means that you make unusable . . . or . . . destroy everything in a volume that may add up to several million cubic miles. This, however, is much less than one part in a billion of that tiny portion of space that lies between ourselves and the moon. This illustrates that there lies in the immensity of space the possibility of developing some kind of resistance to the enormous power of nuclear weapons.

Another—to my mind—striking aspect of space, for defense purposes, is the easy possibility of very effective decoys. This arises because of the well-known fact that the trajectory of an ob-

ject in deep space is quite independent of its mass. This restricts very sharply the weighing of objects in space. One has very few opportunities for deciding whether an object in space is really a light balloon, whose surface is designed to simulate that of a weapon, or is in fact a heavy weapon itself. This leads to the possibility of creating enormous numbers of very light decoys in space, which will make it again very hard to destroy space weapons. These two phenomena and combinations—the immensity of space and the ease of making very light and very effective decoys—will to my mind greatly enhance the survivability of weapons in deep space.

I would like to mention one other property of deep space, that I think is . . . one of the obvious things, but . . . deserves emphasis. Space has extremely good properties for the propagation of electromagnetic radiation. We know from the primitive facts of astronomy that radiation can be propagated through millions of miles through deep space without disturbance of any sort. This uninhibited propagation of electromagnetic radiation and some other forms of radiation provides a tremendous opportunity for radiation weapons, which in the atmosphere face great difficulties. The recent achievement in the extension of our abilities to generate coherent electromagnetic radiation, the recent achievement of the laser, which makes it possible to extend the region of the electromagnetic spectrum, the optical region where we can make coherent radiation, and thus get sharply focused beams that can go over immense distances—this multiplies the possibilities for radiation weapons.

Now these are three of the obvious things about space—so obvious that you can see them now: that we knew long before the beginning of the space age. They mean to me that there are tremendous opportunities there for imaginative thinking in weaponry. At the present time we are approaching a period in which the United States and the Soviet Union will possess ballistic missile strength sufficient to produce intolerable devastation. The maintenance of our ballistic missiles invulnerable to enemy action can lead to a stalemate which would provide a period of tense stability. It is my conviction that the most likely way that this stalemate will be broken is by space-based weapons which we cannot now clearly foresee. It is vital for us during this period to maintain our ability to visualize, and if necessary to build, weapons equal to those of our adversary. This requires two things. In research, it requires that we explore all avail-

able avenues—the emphasis is on the word “all”—all available avenues for increasing the breadth of our vision, and the depth of our knowledge of the space environment. Our unmanned space probes, our manned space developments, will contribute to the broadening of this vision. We must also create the capability to rapidly develop operational weapons—when their feasibility and their need are apparent.

The development of boosters of increased reliability and size will be helpful in these directions. I want, however, to emphasize that there is one area—and to my mind a very important area—in which we are not now exploiting our capabilities for the early achievement of the research and development objectives set forth above. We are not exploiting the potentialities of manned orbital assembly. Manned orbital assembly can be undertaken with the boosters which we now have. The Titan II, for example, is capable of launching a man into space with a great deal of weight to spare; enough weight to spare so that the gear needed for rendezvous can be included. If these boosters were utilized, and there are other combinations which can also do this, if these boosters were utilized to achieve an early orbital assembly capability, we could, in a few years, assemble a manned laboratory in a low earth orbit. This laboratory could pursue many exciting research and development projects in the space environment, and would give us our chance to achieve the broader vision and the deeper knowledge, and the potentiality of space which is so vital to our future security.

The achievement of earth orbital assembly would give America the opportunity to utilize its unexcelled production capabilities for launching huge masses into space. If we had earth orbital assembly capability, then the payload . . . we could put in orbit could be limited *not* by the largest booster that we had operational, but by the *numbers of boosters* we could produce. Under such conditions, America could very easily so far outrun the Soviet Union that the space race would be won, and very definitely. . . .

Earth orbital assembly would seem to be the immediate Russian objective. Their recent coordinated launching of two vehicles which came within three kilometers of rendezvous undoubtedly brings them close to that achievement.

It is dangerous to us to allow a glaring asymmetry to develop in the capabilities for orbital rendezvous. We must begin this program quickly and on an urgent basis.—END

"We need to create systems which will fill out our initial warning and defense capability against the missile threat. . . . Beyond this, we need . . . the ability to detect . . . identify, and . . . intercept in space those vehicles that could be launched against us with hostile intent."

Meeting the Potential Soviet Threat from Space

By AIR MARSHAL C. ROY SLEMON, RCAF



THE Soviet offensive capability against North America includes manned bombers, intercontinental ballistic missiles, and submarine-launched ballistic missiles. Russia has at least the potential for military weapons in space.

I said that the Soviet Union has the *potential* for creating offensive military systems for use in space. Let me emphasize that as of today, so far as we know, there is no Soviet operational space weapon system in existence. But a comparison of what such a system would have to be, with what the Soviet Union already has done in space, indicates quite clearly to us that the potential is there. Should such systems be developed and put into operation, they could constitute a very real threat in the future.

For example, the Soviet Union recently presented a space achievement which deserved applause and commanded respect, and it certainly received both. It also generated in many of us a strong feeling of uneasiness. Two space vehicles, each weighing about five tons, were launched within twenty-four hours. They orbited in tandem; approximated a space rendezvous pattern. In due time they were brought back to earth with remarkable precision to predetermined landing sites. Cosmonaut Andrian Nikolayev, in command of Vostok III, was aloft longest. He completed sixty-four orbits of the earth, flying 1,625,000 miles, and was in space for one hour short of four full days. Nikolayev and his fellow Cosmonaut, Pavel Popovich, during their orbits around the earth, crossed and recrossed North America a total of seventy times. . . .

We cannot lightly disregard the military potential of a technology that has achieved such a level as this. Obviously, Soviet orbital systems could perform a number of tasks. They could be used

for meteorological, navigation, or communications aids. Other applications might be evolved in the more distant future. Thermonuclear weapons of large size could be orbited and de-orbited at will. We hope, of course, that the Soviet Union shares our determination not to extend the arms race into space, while at the same time acknowledging that it has the potential to do so.

So we see that the threat we must defend against is a threefold one. By aircraft and various missiles, it could come from the air and the sea. And in the future it could come from space. With this array of present and future threats, the aerospace defense problem becomes complicated, and that is the understatement of the day.

As things stand today, we have a good defense against the manned bomber portion of the threat. A hostile bomber force approaching the United States or Canada from any direction has little or no chance of penetrating our air space without being detected.

And, once detected, such a hostile force would be brought under attack. NORAD would attack and attempt to knock down such a force as far from our industrial population centers as possible. We would try to destroy the force before it could launch air-to-surface missiles or release its bombs. The bomber that might escape our longest-range interceptors would be brought under attack by other interceptors of shorter range and by Bomarc missiles. If there were still survivors, these would finally be engaged by our point-defense weapons. . . .

This resumé of the defensive air battle is not just a theoretical recital. Our assessments of our defense capability, stated here, are derived from a great number and variety of exercises carried out by all the regions and all the sectors of NORAD. . . .

We cannot say the same for the threats posed by the intercontinental ballistic missile and by the submarine-launched missile.

We have built an electronic wall of warning around this continent, which enemy bombers would penetrate only at the risk of their own destruction. We have extended this wall to provide us with the maximum possible warning time against the missile threat. But as yet, defense against enemy missiles is far from the effectiveness we have reached against the manned bomber. It is as if we had built the walls of our house, but we have yet to put the roof on it.

Our ballistic missile early warning system, which we call BMEWS, now extending out over the entire Arctic from three huge radar installations in Alaska, Greenland, and England, could detect a missile attack and give us a minimum of about fifteen minutes' warning. But this ballistic missile early warning system looks only to the north, and provides no warning against an extended ballistic missile raid, which conceivably could be launched against us by way of the south polar region.

Mr. Khrushchev in a public address has taken note of this. He said, . . . "Our scientists and engineers have created a new intercontinental rocket which they call global. This rocket can fly around the world in any direction and strike a blow at any set target. As the people say, you expect him to appear at the door, but he climbs through the window." On another occasion this gentleman said in an impromptu address to the American Society of Newspaper Editors, . . . "You can say our rocket hits a fly in outer space."

In view of what we know of Soviet military achievements, it would be unwise indeed to dismiss these words of the Soviet premier as mere bombast. The limitations of our BMEWS system, which I have mentioned, constitute serious deficiencies in our deterrent posture and must be corrected.

Active defense against the ballistic missile is being developed by the United States Army. At this time the most advanced project is the Nike-Zeus system. In long- and short-range firing tests against both live and simulated targets, the Nike-Zeus has been able to meet its test objective.

As for the possible future space portion of the threat, we are in much the same position. We have a detection and tracking system, but no active defense that could be deployed against possible space systems.

The space detection and tracking system—we

call it SPADATS—collects and reads data from objects in space. The system consists of a number of radars and other sensors, located in various parts of the world, which collect and transmit information to the NORAD Combat Operations Center at Colorado Springs. Here it is received, refined, catalogued, and displayed. . . .

In summary, we have adequate defense against the manned bomber threat. We are progressing with defense against missiles but still have far to go. And we have no active space defense system in sight if the enemy should elect to mount a threat in space.

At NORAD, therefore, we are in the position of being customers for new defensive systems to put a solid roof on our house. We are not the creator of these systems, but we are able to say what we need to do the aerospace defense job.

We need to create systems which will fill out our initial warning and defense capability against the missile threat. And beyond this we need, we think, the ability to detect, to identify, and to intercept in space those vehicles that could be launched against us with hostile intent.

These are traditional roles in air defense, but they are as applicable in space as they are in the present air defense mission. If an interceptor (one of our NORAD interceptors) goes aloft over the United States or Canada, its military capability is limited to intercepting an intruder.

I would not attempt to say what these space defense systems would look like or how they would be developed. These things are the province of the scientists and the engineers, and I hope they are on an accelerated schedule. . . .

Dr. Kantrowitz mentioned, and I am going to remention by referring to some remarks made recently by General LeMay, when he said that progress—much progress—has been made in the field of focused-radiation energy. He said that in time we may see these new developments lead to focused energy weapons. Let me quote his words:

"The energy directed by such weapons could travel across space with essentially the speed of light. This would be an invaluable characteristic for the interception of ICBM warheads and their decoys. And, if a new generation of armament operating in space could neutralize an aggressor's ICBM, warfare as we know it would be outmoded by the advance of technology.

"The neutralization of ICBMs by a system deployed aboard a maneuvering space vehicle is no irresponsible escalation of an arms race.

"People who say that we have an unstable mili-

tary environment do so because they feel the offense has overwhelmed the defense. A weapon such as I have described would return that offensive/defensive balance. And it would move the world into a new era of warfare. More importantly, it would move the world into a new era of *preventing war*. Assuming, of course, that it was in the proper hands."

We at NORAD feel the impact of space developments sensitively and immediately. It is natural, I think, that there would be a sense of urgency on these matters in a defense command concerned with aerospace. The problems are great; they are with us . . . now.

"... A satellite does not have to contain a weapon to possess military significance. The Soviets' feats have indicated a space competence which has a direct bearing upon what is necessary to defend our country and to protect our rights in space and on earth."

Space Dollars, Sense, and Defense

By DR. EDWARD C. WELSH

LAST year in Philadelphia, I was privileged to participate in an Air Force Association forum similar to this. . . . At that time I stated that we are in a space race for our survival; that we should have a vigorous space program, even if no other nation were doing anything in space; and that the values received from our space efforts would exceed the costs many times over.

Also, I enunciated a thesis which has received a lot of mileage since. I refer to the quotation, "We have space missions to help keep the peace and space missions to help increase our ability to live well in peace." This year, before an American Rocket Society meeting, I stated that . . . national security missions are a major portion of our national space program, at least as important as any other phase in space. I concluded with the observation, "If we do not take adequate care of our national defense, we will not have a chance to do any of the other things in space—at least as free men."

We also believe that no potential aggressor will ever launch a major military effort against this continent unless he is convinced that he can achieve the necessary degree of surprise and decisive effect. He will be deterred just so long as he knows that his attack cannot achieve surprise and be decisive, and will trigger an overwhelming retaliatory attack force against him.

It goes without saying that we must maintain a defense which is adequate. Anything less than adequate may invite the attack we are trying so hard to deter. The adequate will be expensive, but certainly not as expensive as the loss we could suffer without it.—END



I see no reason for modifying any of the statements just referred to. In fact, I mention them again for emphasis. . . .

Panel members are entitled to make brief statements and are privileged to answer questions . . . I will jump the gun a bit and ask myself some questions and see if I can answer them. . . .

● QUESTION: *Why should we spend so much money and effort on a manned trip to the moon?*

There are political, economic, defense, scientific, sociological, and a number of other reasons for a moon trip. I will not go through all of these reasons now, but I can assure you that, taken together, they comprise overwhelming evidence of the merit and the necessity for the project.

First of all, as to the choice of the moon as a space objective, I would simply comment that there is no other place so near in space where we can test the equipment and the men for future space travel.

Second, the lunar trip calls for the development of powerful rocket engines, sophisticated

spacecraft, trained and carefully selected astronauts, extensive tracking systems, and protection of man against the multiple hazards of space. In fact, the decision and the schedule to go to the moon make mandatory the development of a competence which we must have and which we might well not obtain without such an ambitious goal.

Third, if we do not develop this competence and others do, we would lose prestige so essential at the negotiating table, and hence could, in a short time, become a second-rate nation in influence or, even worse, a first-rate satellite of a space-conquering nation.

Fourth, the skills, the products, and the scientific and engineering advances resulting from this effort will have a great impact upon our economy in higher standards of living, in an impetus to education and employment, and in new methods and components for productive processes.

Last, any competence which strengthens the country politically and economically is certain to contribute to its ability to deter aggression. The development of large rockets, the ability to rendezvous in space, the development of life-protective measures, and the refinement of control and guidance systems all have high defense values. The defense spin-off from the lunar project is very substantial since much of the technology necessary for keeping the peace must be developed and used in traveling to the moon.

I would conclude this too-brief answer by saying that the lunar trip is not a substitute for military competence in space, but it helps develop that competence. While the moon is not a particularly useful military base for operations against earth targets, the absence of a moon objective would be, in a real sense, an abdication of our world leadership position.

● MY SECOND QUESTION: *Does the moon program divert funds from more urgent uses?*

No, it does not, although the intricacies of government budgets are such that a case might be made that the moon program has discouraged money demands for some individual projects. However, this is not an either/or proposition. I defy anyone to make a convincing argument that a nation which spends in excess of \$20 billion a year on recreation alone can't spend \$5 to \$10 billion a year on space without decreasing the number of yachts or even the number of golf clubs in use. It is worth noting, moreover, that we were not spending enough on schools, or medicine, or housing even before we had a space program and

there is no assurance that we would be doing even as much on those essentials if it weren't for the space program. In fact, the space program generates and stimulates the use of funds for those other essentials.

● THE THIRD QUESTION: *What are we spending on space, and can we afford it?*

The space budget for this year is about \$5.5 billion. The expenditure estimates are about \$3.8 billion. A clearer picture, however, may be obtained if we compare the budget this year with what it was just a short time ago. The over-all space budget for this year is three times what it was in 1961. This shows a tremendous rate of acceleration.

I might add that the space budget for fiscal year 1964 is not yet in final form, but it is reasonable to conclude that the amount will be substantially larger than for fiscal year 1963. Increases are expected in both the defense space activities as well as the nondefense space activities. If we continue to build up the space program as we have been doing, it will not be long before it will be costing us, per capita, more than fifty cents per week. That is an investment which can readily be afforded, particularly since it is reasonable to assume that, over the same period of time, the average income in the US will increase much more than fifty cents per capita per week.

Yes, we can afford this expenditure and more, if necessary. Space programs do cost money, but they do not cause a strain on the economy. What does place a strain on the economy is wasting resources—not spending or directing those resources into productive methods and productive activities. The facts are that the space program will increase scientific knowledge, increase production, and cause the employment of more personnel, thereby strengthening our progress across a broad economic spectrum. The space program will increase both the size and the gross national product and its rate of growth.

Certainly, we can afford to engage in activities that will make us stronger and wealthier. Moreover, we cannot afford not to engage in these activities from an international point of view, from a national survival point of view, and from the point of view of assuming our proper responsibility in making use of our natural resources, inherent capabilities, and exploding technology.

It is a source of great amazement to me to find persons who believe that we cannot afford an energetic space program while assuming that the USSR can—and that country with only half as

great a gross national product as we now have.

● QUESTION FOUR: *Is there a space gap like the missile gap we heard so much about a short time ago?*

First of all, I would point out that there was a missile gap, but it did not translate itself into the numbers previously predicted. Moreover, the threat of such a gap dissolved some of the lethargy in the US and caused us to get busy and help offset the predictions. There is a space gap in the sense that the Soviets have larger rocket engines now operational and are able to place larger payloads into orbit. They have also made substantial strides in other aspects of space technology. Our leadership in satellite applications to weather, communications, and navigation is all noteworthy, but it is not sufficient to fill in the gap in its most crucial aspects.

The numerical aspect of the gap is in size rather than in quantity of satellites as, in the latter, we have placed nearly four times as many into orbit as they have. A significant thing about the space gap is that it has military potential, as did the missile gap. Moreover, it is having some of the same effect on the US as did the missile gap; namely, it is stimulating us to do more faster. When one is behind in any important aspect of a race, it is foolish and dangerous to pretend otherwise.

● QUESTION FIVE: *What are we spending on space for defense purposes and why are we not doing more?*

The portion of the defense budget attributed to space for fiscal year 1963 is \$1.5 billion. That is less than three percent of our total defense budget, but if properly applied it can get a lot of space accomplishment. It is often cited that the defense space budget is relatively small when compared with NASA's budget of \$3.8 billion, but the difference is primarily due to the one large mission; that is, the lunar project, which involves so much in facilities, development and performance.

In addition to giving consideration to more money for defense in space, serious attention needs to be given continuously to getting more space competence from each dollar in the budget.

There are several reasons why we are not devoting more to space spending by the Department of Defense: (1) Many in this country as well as abroad fail to understand that US expenditures to keep the peace are as peaceful as any other expenditures; (2) Many civilians and military officials have wide divergences of views as

to what the defense missions in space should be; (3) Defense advantages can and do come from space expenditures made by other agencies; and (4) Many haven't learned the lesson that blueprints and studies alone cannot meet aggression.

I would add that we should not minimize what is being done by Defense in space, just as we should not be satisfied with the rate of accomplishment.

● QUESTION SIX: *Why is there confusion as to what the United States is doing in space?*

First of all, there is a tendency on the part of those who think more should be done to play down what is being done in order to make their point. I would also add that there are those who hold the mistaken belief that classification and secrecy conceal our activities from potential enemies, while what really happens is the concealment of the facts from our own people. It is also worth noting that a US failure in a space shot gets almost as much attention as a success, and would get even more attention if a fatality were involved. The Soviets have failures, but only their successes are advertised. I see no reason why, as general policy, we should not reveal the space failures of others as well as our own. I believe we could do a lot to clarify what we are doing, and I think we are competent to handle international issues should they arise from a frank and open policy on our part. Anyone who is critical of our space projects is, of course, free to engage in similar endeavors if he so chooses and has the ability to do so.

● QUESTION SEVEN: *Do we have a national space policy, and if so, what is it?*

Yes, we have such a policy. It has been expressed in legislation and in presidential messages and statements. The objective of our policy is to obtain and maintain leadership in space activities for the benefit of man's freedom, man's well-being, man's understanding, and man's scientific progress. The details of the policy are not quite so clear, as those who have studied our budgets and public documents have reason to know. It is clear, however, that our policy includes going to the moon during this decade. It includes developing an operational communications satellite system as well as navigation and meteorological systems on a worldwide basis. The specifics are less clear as to the roles of man in space and what can and should be done to maintain peace in outer space. This lack of clarity, however, is partly due to the difficulty of knowing what can be done and what cannot be done. Continuing efforts will be

made to clarify policy, while keeping it necessarily flexible.

● QUESTION EIGHT: *Do the space accomplishments of the Soviets have military significance?*

While I would not pretend to know what the Soviets will do with their growing space competence, I find several guidelines which are pertinent: (1) Never underestimate your opposition; (2) Never forget the Soviets' objective of world domination; (3) Do not minimize the military value of placing heavy objects in orbit and keeping men as well as devices in orbit for long periods; (4) Do

not overlook the blackmail possibilities of weapons in space. The obvious conclusion is: A satellite does not have to contain a weapon to possess military significance. The Soviets' feats have indicated a space competence which has a direct bearing upon what is necessary to defend our country and to protect our own rights in space and on earth. . . .

I conclude with this thought: We have better uses for our sand than to use it like the proverbial ostrich. The realities of the situation demand that we face the facts and meet fully the challenge that has been thrust upon us.—END

"The Air Force responsibility for US military space development is only a logical extension of its traditional mission and capabilities. . . . Many of the strategic concepts that apply to operations in the atmosphere also apply in space."

USAF's Job in Space

By GEN. BERNARD A. SCHRIEVER, USAF



I THINK it is obvious today that scientific, political, and military strength are more closely related than ever before. As long as the Soviets continue their drive toward world domination, their space capabilities will represent a real danger to free men everywhere.

The Air Force bears a clear responsibility for the planning and development that will enable the US to meet this threat. The Air Force task is to build and operate aerospace forces that are necessary for national security. These forces range all the way from the tactical weapons required for counterinsurgency operations to the strategic bombers and missiles of the Strategic Air Command. This mix of weapon systems enables us to make precise application of force wherever it may be directed by the President.

At one end of the scale the Air Force must be able to conduct operations only a few feet off the ground. At the other end of the scale, the Air Force must be able to conduct regular operations

as far out in space as the national security requires. In today's panel we are concerned with this latter aspect of the Air Force mission, but it would be a mistake to view it in isolation.

The Air Force responsibility for US military space development is only a logical extension of its traditional mission and capabilities. . . . Many of the strategic concepts that apply to operations in the atmosphere also apply in space. As the advance of technology allows us to go farther onward and outward, many of the traditional Air Force missions will probably follow. We must be prepared to explore this new realm and to be able to cope with any new military challenge there.

Based on our present knowledge, certain satellite systems are feasible now, such as communications, weather prediction, navigation, early warning and similar functions, and they are under development. Additional military capabilities in space may prove desirable as technology and experience unfold.

This is the pattern that prevails in the pro-

Space and National Security symposium panel moderator, Sen. Howard W. Cannon, at dais, receives flood of questions from audience after formal presentations by panelists. Seated and ready to field the queries, left to right: AFSC Commander, Gen. Bernard A. Schriever; National Aeronautics and Space Council Executive Secretary, Dr. Edward C. Welsh; NORAD Deputy Commander in Chief, Air Marshal C. Roy Slemmon, RCAF; and Avco Corporation Vice President, Dr. Arthur Kantrowitz.



gress of military aviation. Early pilots began simply by learning to fly and land airplanes. Only as they became skilled in flight did they learn the specific tactical and strategical application of the airplane. Spaceflight, I think, will evolve in the same manner. For this reason, the Air Force is concentrating much of its space effort on the development of basic space technology, such as structures, propulsions, guidance and control, maneuverable reentry vehicles, and aeromedical requirements for life support in the space environment.

These efforts are built on the scientific and engineering base created by the Air Force during many years of research and development. The materials, designs, and instrumentation used in space vehicles are often an outgrowth of work done in developing high-performance aircraft. . . .

Perhaps few realize the increased pace of our military space activities; for example, so far during this calendar year, the Air Force alone has placed more earth satellites into orbit than have the Soviets since the first Sputnik five years ago. Also, much of the Air Force experience has been utilized directly to support the scientific efforts carried out in space under the direction of NASA, and in practice there is close cooperation at all levels between the Air Force and NASA. They use much of the same technology, many of the same facilities and basic hardware, and many of the same people. However, by its nature, the military portion of the space program has three distinctive aspects, and it would be well to keep them in mind. The first is a matter of urgency. If a potential Soviet military space threat does

exist—and I am firmly convinced that it does—then our first duty is to provide for the security of our country.

The Soviet obsession with secrecy does not make it easy for us to know just what military hardware they are developing. But their basic intentions and their technical achievements are both evident. These alone justify the continued pursuit of an extensive and vigorous military space program.

Now, the second is a matter of operating requirements. Military requirements in space are properly oriented toward an operational capability. For example, military operations will demand reliable, relatively low-cost boosters that are capable of rapid launch and on a routine basis.

The third difference is technological. Space offers a unique environment for developments in technology of military usefulness. It may give the possibility for entirely new techniques of defense against ballistic missiles. This has already been mentioned.

And also, as Dr. Kantrowitz mentioned, space may provide the opportunities for new ways of controlling and directing energy. In fact, we do not begin to know the possibilities it may offer.

Space is an entirely new kind of environment, and for that reason has great promise and potential for national security. These are some of the promising developments which may evolve as space devices are designed and further tested.

We, in the Air Force, must continue to fulfill our responsibilities to provide for the national security needs, in the new realm in which we now live.—END

Can we really afford a vigorous space program? . . . Will "fallout" from the moon effort benefit national security? . . . How can we meet the potential Soviet threat from space? . . . What effect would multimegaton blasts in near space have on earth? . . . Is there a space gap?—These were some questions from the "Space and National Security" Symposium audience fielded by the panel . . .

Questions from the Audience & Answers from the Panel

QUESTION: What is General Schriever's reaction to Dr. Kantrowitz' top-priority for manned orbital assembly?

GENERAL SCHRIEVER: Well, I don't know that I would necessarily assign that number one priority, but we feel from a development point of view that a manned orbital station is a very important program for testing techniques, subsystems, and certainly developing the environment for man to operate usefully in space. I think such a station might well be assembled through the means that Dr. Kantrowitz mentioned. I firmly support the rendezvous, docking, transfer and assembly techniques that he has been a strong advocate of for a good many years.

QUESTION: Has NORAD presented specific requirements for passive and active defense against possible Soviet space systems?

AIR MARSHAL SLEMON: I think a brief answer to that is that very definitely we have presented some requirements which we think can be specifically stated with our present knowledge of the threat.

QUESTION: How much trouble is Midas experiencing and when can we expect a workable operational Midas system?

GENERAL SCHRIEVER: That's an easy one to answer. We have experienced difficulty in Midas in respect to sensors and with respect to stability control. We have made a number of detailed studies during the past year and a half—aimed toward simplifying the Midas system. We feel

very strongly concerning a warning system, and there isn't any question in my mind about feasibility of it, and as far as the operational dates are concerned, I am not free to give that information.

QUESTION: Will the Congress continue to support a large budget for purely scientific effort if there is no military benefit, or if the military requirements can be better satisfied in other ways?

DR. WELSH: I do not draw any distinction between a military space activity and a scientific space activity. I consider the military space activity just as scientific as those that are being conducted by other agencies. Therefore, with the type of definition I have used, I feel that there will be definitely considerable support for an increased budget in space; both for the civilian activities and for the defense of military activities.

SENATOR CANNON: I might add a little to that. I think that the taxpayers would not be inclined to continue and consistently maintain a large budget for purely scientific effort if it were clear that there was no military benefit or if the military requirements could be satisfied in other ways, because the enormity of our budget in this day and age is such that the taxpayers, while they are willing to support scientific effort, certainly are concerned first with national defense. That is evident by the large budget which we presently carry on, or presently appropriate and use for national defense purposes.

DR. WELSH: Might I just add that I certainly agree with what you say. I was drawing, however,

The Panelists

SEN. HOWARD W. CANNON, panel moderator, was elected to the US Senate as a Democrat from Nevada in 1958. He is a member of the Senate Space and Armed Services Committees, a brigadier general in the Air Force Reserve, and a decorated World War II air veteran. A lawyer and native of Utah, he served in important civic, professional, and service posts in Nevada prior to his election to the Senate.

DR. ARTHUR KANTROWITZ is Vice President of the Avco Corp. and Director of the Avco-Everett Research Laboratory at Everett, Mass. A native New Yorker, he received his doctorate in physics from Columbia University. He is known for his research in physics of gases and for his pioneering applications of shock tubes to gas problems.

AIR MARSHAL C. ROY SLEMON, Royal Canadian Air Force, is Deputy Commander in Chief, North American Air Defense Command, and former Chief of Staff of the RCAF. Air Marshal Slemmon has served continuously with the RCAF since its creation in 1924. During World War II, he organized the all-

Canadian Bomber Group and was Deputy Air Officer and Commander in Chief of the RCAF overseas.

DR. EDWARD C. WELSH is Executive Secretary of the National Aeronautics and Space Council, top advisory policy group on space policy to the President, chaired by the Vice President. A native of New Jersey, Dr. Welsh holds a Ph.D. in economics from Ohio State University. He has held a number of high government economic posts and is recognized as a leading architect of the postwar Japanese recovery. He has also taught economics on the university level. For a number of years he was associated with Sen. Stuart Symington, and played significant roles in congressional inquiries into defense posture.

GEN. BERNARD A. SCHRIEVER, USAF, German-born and Texas-raised, is Commander of the Air Force Systems Command, and was chief of the Air Force ballistic missile development program during the mid- and late-fifties. He holds a degree in aeronautical engineering from Stanford University and served in the Southwest Pacific during World War II.

a distinction between defense and security uses of space as against the nondefense and nonsecurity uses in space—rather than scientific and non-scientific, as I think you will get the greatest support for what the country thinks is absolutely essential—and I think that all the taxpayers feel security is essential.

QUESTION: Are the Soviets constantly reconnoitering the US with unmanned satellites?

AIR MARSHAL SLEMON: As we know, there are satellites going around up there as of now. We don't believe that now, with the state of the art, they are collecting information that would be too vital.

GENERAL SCHRIEVER: Well, I don't know if they are or not. I don't see that they necessarily need to, because in an open society such as ours, we are pretty much of an open book.

SENATOR CANNON: The answer I would give to constituents is, consistent with a speech I made on the Senate floor last year, that you can buy all that information for a dollar. I don't know why they would want to put a satellite up there to reconnoiter.

QUESTION: Do you believe that fallout from the lunar program is the best way to assure the security of this country from and in space?

DR. KANTROWITZ: Well, I would agree with most of the things that Ed Welsh has said about there being a very substantial fallout. However, I think that our program . . . suffers somewhat from the intense concentration on the one goal,

and the one goal, as Dr. Welsh has said, is not so clearly military as it might be.

QUESTION: What happens after the successful lunar landing? In other words, what is the next thing we're apt to see?

GENERAL SCHRIEVER: We ought to have someone from NASA here. I don't know what they plan next. They have the deep-space probe plan, and other planets will be investigated, first by unmanned vehicles, and then by manned vehicles. But exactly what is in the plan beyond the lunar landing, I am not sure.

DR. WELSH: The answer that General Schriever gave is the best answer that you can give. There are programs, of course, for exploration of planets, for space stations, and for deep-space probes. I would think that there would be an effort to increase our capability as far as our booster strength is concerned.

The moon is just one target and the closest one at hand, but there are efforts and programs that will be planned to go to the other planets as well.

QUESTION: What happens to the US program if the Soviets get to the moon first?

DR. WELSH: Then we'll get there second. But if we do get there second, we ought to get there as soon as possible after the Soviets. It would be serious if there were a long period between their landing and ours. That would show a lack of capability which the Russians would have shown they had. But we would continue with the pro-

gram whether we are the first or the second.

QUESTION: The statement was made by Dr. Kantrowitz that it is urgent to commence earth orbital assembly programs. Is this not already under way with the Gemini program?

DR. KANTROWITZ: It is under way. It has been talked about for a long time, but it is not under way on what I would call a priority basis. We are not preparing now, for instance, for the multiple launching of the boosters we now have and could put into large-scale production. We are not building multiple launch bases that are necessary for this program.

We are not developing the capsules which would be needed to provide an orbital manned laboratory—an orbiting assembly station. We are behaving in a cautious manner. We are going to be sure that we can do this rendezvous, that we can do all these things—before we commit any substantial funds to this program—to this rendezvous program. But if we had been that cautious about the ICBM program we would not, today, have an ICBM.

QUESTION: In view of experience with Advent and Midas, shouldn't the military space program put less emphasis on quick achievements of operational hardware and more on advancing the necessary technology for possible future application?

DR. KANTROWITZ: In view of the experience with Advent and Midas—I think when you can see a piece of hardware that would be useful, an attempt to achieve it at an early date is one of the best ways to rapidly advance this technology. In other words, the setting of realistic goals is the thing to do. I have no objection to any of these things. The thing that I tried to call attention to is a technique which I believe to be very powerful and which is missing essentially in our program.

QUESTION: Is manned orbital assembly confined only to low orbits of earth?

DR. WELSH: No. This is where it will be initially practiced and used, but I believe it has a value to be projected into higher orbit and into deeper-space explorations. We should be in a position to assemble in fairly low earth orbit as a launching base for further deeper-space probes so you will assemble and move farther, and you will move farther and assemble again.

QUESTION: What damage on earth would be done by exploding a 100-megaton weapon in orbit.

DR. KANTROWITZ: That is a very interesting question, of course. There is a clear military point

to be made here. By the time you get to 100 megatons you do get to the point where an explosion in space would do damage on the surface of the earth. That means that we have to be prepared to defend against such explosions. This requires study of new defense systems.

QUESTION: What is the status of the Aerospace Plane and the Manned Satellite Interceptor?

GENERAL SCHRIEVER: The Aerospace Plane is really just a concept. It is a concept initially of taking off with a machine that looks like an airplane and actually goes into orbit with a single phase. We are not confining our thinking at the moment to this possible approach. We are also thinking of it possibly as a two-stage vehicle giving us reusable hardware. There is no such program as Aerospace Plane, although we have identified a great many applied research and advanced technology projects which have a direct application to advancing technology to the point where such a vehicle, either one-stage or two-stage, might be feasible from a technical standpoint.

We are very interested in such a program, and such a concept, but it certainly is not something that is just around the corner.

As to the Manned Satellite Interceptor, we have never had such a program. Of course, we have had many studies and plans that involve using a man in the satellite inspection role—but we have not had such a program beyond the study and planning stage.

SENATOR CANNON: That does not mean that it could not be conceived?

GENERAL SCHRIEVER: No, we think that there would be normal evolution to that type of system.

QUESTION: What is the timetable for the establishment of an adequate space defense system and isn't it imperative that we accomplish this objective in this decade?

DR. WELSH: To give a very quick answer—it should be done just as soon as it possibly can be done. There should be funds made available for it, and it should be given priority. It's not a question of this decade or the next decade. It should be this decade if we can.

AIR MARSHAL SLEMON: I might add an observation in regard to the ICBM threat. Sometimes people do not include the ICBMs as a space vehicle. It does come to us through space, however, and we have the opportunity to destroy it, or attempt to destroy it, in space or as it enters the earth's atmosphere.

With respect to the need of time to deal with the threat—it is urgent, it is imperative, and if

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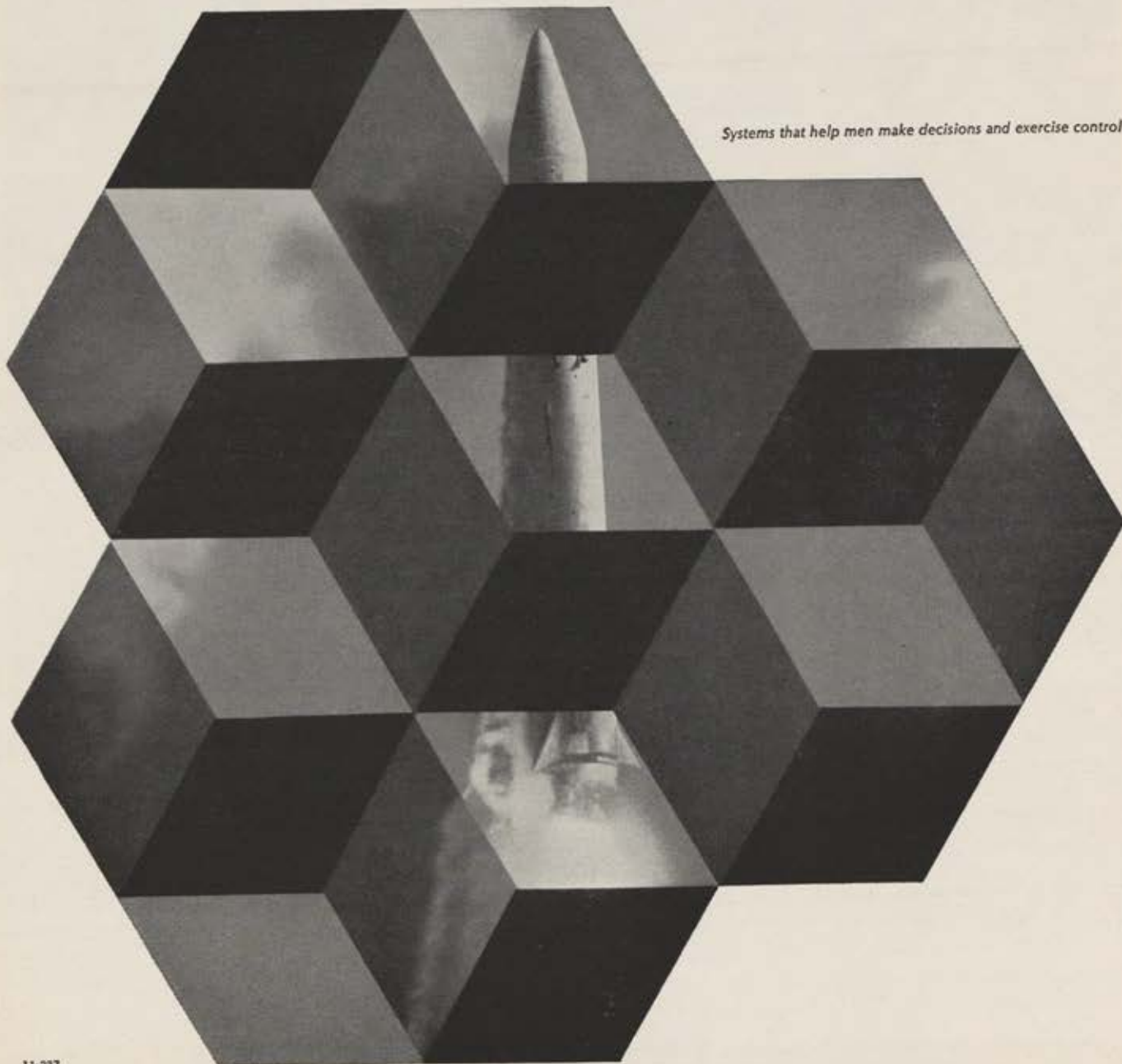
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we had it today we would feel happier than if we had it next week. Our great fear is that the Russians would inform us in the not-too-distant future that they have a defense against the ICBM; whereas we have not, and this would place us in a very delicate position. The need is urgent—it is certainly not a question of the next decade, but as soon as possible.

GENERAL SCHRIEVER: I think the question implies that there is a static situation—that you have a particular threat and it stays that way, and that you build a defense capability to it and respond to that threat, and then you are all set.

From a military standpoint we will have to continue, and perhaps accelerate, a vigorous program to stay abreast of the threats that may be developing in space in the future. But it is a dynamic situation, and certainly it does not involve just this decade or the next twenty years, but involves the next twenty, thirty, fifty years.

QUESTION: What about the claim of Dr. Jerome Wiesner [Presidential science adviser] and others that too many scientific resources and too many people may be used in space and military programs to the detriment of the economy?

DR. KANTROWITZ: I believe that space and military programs have given our science, and our technology especially, tremendous impetus. We find that the source of our real strength in this area, our educational system, has been sharply and effectively upgraded as a result of the ICBM and the space program. We find that technology that has been developed, particularly in the ICBM program, has already spread to large segments of our economy. It is greatly increasing our gross national product in a way that it can support a larger scientific and technological development.

QUESTION: Why isn't more being done to accelerate the Saint and the Dyna-Soar programs?

GENERAL SCHRIEVER: During the past year the Dyna-Soar, now X-20, has stabilized to a very great degree. We have moved from what was to have been a suborbital system to an orbital system. We have settled on a booster, the Titan III, to be used with the Dyna-Soar, and I think at the moment we have a balanced program to be used with the Dyna-Soar where all the elements should come out at about the same time. We are paced at the moment by the Titan III booster, and if everything goes well we should initiate our first flight with the Dyna-Soar in 1964. So I think the Dyna-Soar program is proceeding as well as I would expect it to.

On the Saint program, that is a terminology

that is no longer used for the satellite inspector system. This has been under constant review for the last year, and I can assure you that there are an awful lot of questions about this program that make it legitimate for reviews of the kind that we have had.

I would like to see the satellite inspector program proceed more vigorously, and I know that such proposals will be given due consideration in the very near future.

QUESTION: Air Marshal Slemon discussed the problems of defending the North American land mass against attacks from space. It would also seem appropriate to consider ways and means of defending our Midas and Samos satellites from possible enemy attack.

DR. KANTROWITZ: I think it is worth mentioning—and this was something that I tried to bring out obliquely in my talk—that the great emphasis that has been placed on the high vulnerability of satellites, and I believe they are vulnerable when they operate at low altitudes, does not take into account the immensity of space.

When you have objects in low orbit around the earth, it is very easy to reach that vicinity. It does not require the same velocity. For example, the kind of missiles that have been used in air defense applications would be capable of intercepting low-altitude satellites. They do not need the velocity of the satellite, they only need the altitude.

This situation changes radically when you go to thousands of miles in space, where the achievement of these altitudes requires energies comparable with satellite energy. At that point, defensible satellites become a possibility.

QUESTION: Could Dr. Welsh give several specific examples of the lunar program, and how it has been useful to military space activities?

DR. WELSH: Well, the lunar program is of course just under way, but I have seen that it has become a basis for developing a bridge between the Department of Defense and NASA where there is increasing cooperation between those two important agencies, as might not have been taking place were it not for this major lunar program, and I think that General Schriever is quite well aware of this. In fact, he has been instrumental in encouraging this high degree of cooperation.

I think the technology that is being developed in the large boosters will have value to the military missions as well. The exchange of scientific information and the exchange of actual experience in communications satellites, for example, will be

of benefit to the military, with NASA being first, in the actual experiment because of the much more complicated requirements the communications satellites will have for defense purposes.

But you can list a whole series of examples of growing exchange, and increasing exchange of information, increasing coordination, and increasing use of actual personnel between NASA and the Department of Defense, all of which I think have been stimulated by the lunar program.

QUESTION: Does the Air Force contemplate a need for escape velocity missions, or missions to high lunar altitude orbit, in support of the objectives in space or national security?

GENERAL SCHRIEVER: I certainly do — not in the immediate future—but I would say in a decade from now we would perhaps be interested in escape velocities and orbits that are quite a bit outside of the earth orbits which we are considering now. And I even consider the twenty-four-hour orbit of roughly 24,000 miles of synchronous satellite to be a low earth orbit.

QUESTION: Do we know anything of significance of Russian propulsion systems other than those using chemical, liquid or solid fuel resources? Do we know anything of their work with laser systems?

DR. KANTROWITZ: I really am not such a good source of information here. But I do know that they have work in progress on electrical propulsion systems. I don't know whether they have work in progress on nuclear propulsion systems. I do know that they have been working actively in lasers and they have laid claims to the achievement of very powerful lasers, and they have come out with some interesting new ideas about laser systems, which indicate that it is an active source of study over there. The fact that these ideas were not held secret by them is interesting in itself, and perhaps means that they have not as yet taken these developments very seriously from a research point of view.

GENERAL SCHRIEVER: I don't know anything concerning their work with nuclear-rocket propulsion, and I can't add anything to what Dr. Kantrowitz said concerning the others. But I do think that it is worth adding that where we don't know, or where we are not in a position to report, it is well to assume that they are working on advanced systems, and we ought to push ours for that reason, as well as for other reasons.

QUESTION: If there never was a bomber gap and there never was a missile gap, why should Americans believe the Air Force about a poten-

tial space gap? Isn't this crying wolf once too often?

DR. KANTROWITZ: I don't know that there is evidence now that there never was a missile gap. I believe there was a time when the Russians were closer to an ICBM than we were. To that extent there was a missile gap. About the bomber gap, I don't remember too much. Others may remember more about that.

DR. WELSH: In my little statement I asserted that I had thought that there had been a missile gap—in fact, my language was quite clear. There definitely was one. I said that it did operate to an advantage in a sense, because it stimulated us to work a little faster than we otherwise would have. I also said that there is a space gap particularly in the sense of the confidence that they have which we do not have at this point to send large objects into orbit. There is a space gap in some respects, and I see no reason why anyone should be confused by either one.

GENERAL SCHRIEVER: I definitely think there was a missile gap. They were way ahead of us when we started in earnest on our missile programs. Because numbers apparently haven't materialized, that doesn't mean that back in '57 or '58 there was not a gap. I can assure you that those of us who were out on the firing line and developing those missiles certainly got enough pressure, and I think that pressure helped to develop our missiles a lot sooner than otherwise might have been the case.

As far as the space gap is concerned, I have heard no Air Force officer say that there is a space gap. I think that what we are really saying is that we ought to do those things necessary in the interest of national security. I don't know that anyone has mentioned "space gap." I certainly have not, and I haven't heard anyone else mention that.

SENATOR CANNON: I, for one, believe that there was a definite missile gap. I think there is a space gap in certain areas. I don't think we can evaluate it over-all and say that because we are ahead in certain areas and they are ahead in others, that there may not be a gap. If we have an unequal capability in certain areas of importance, then, to me, that means a gap. And that is the reason that I disagree a little on the terms. But certainly I don't think that any of us do not claim that they do not have a greater capability than we have in certain specific areas.

DR. KANTROWITZ: May I make a point here? If the presumption that I made—that the Russians are close to a rendezvous capability—



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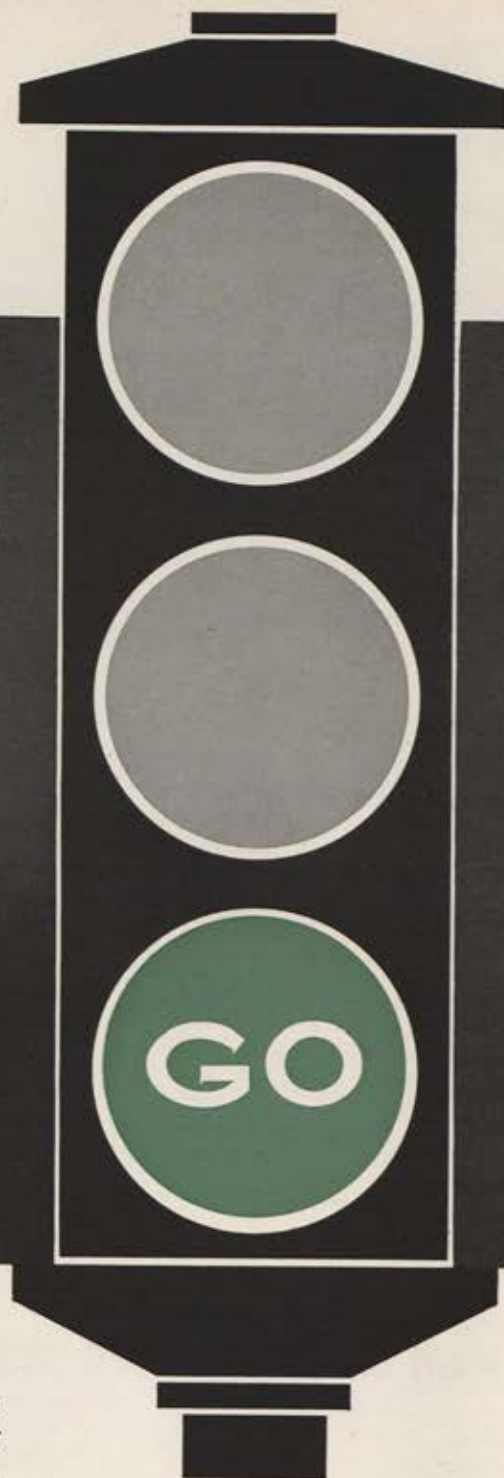


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proves to be correct, they will, on achieving the rendezvous and the orbital assembly capability, have thereby achieved a larger ability to put payload into orbit than any of the boosters that we now are even thinking about. That is a gap.

SENATOR CANNON: I would like to throw in a question of my own here at this point. It would seem to me that the fact that they have demonstrated a very capable rapid-fire technology, which would permit them to do just the thing that Dr. Kantrowitz has talked about, tends to indicate that they are considerably ahead of us. Now, would any of the panel care to comment on our respective positions with relation to rapid-fire capability, which, of course, would be the first essential element of the problem that Dr. Kantrowitz has raised.

DR. KANTROWITZ: I would like to comment that if you set up the orbits to the best advantage, it doesn't require any fantastic accuracy in launching to achieve rendezvous, say, in one day. The numbers I worked out once turned out to be some 4.7 hours' accuracy, which you must have in order to achieve rendezvous within one day.

SENATOR CANNON: Well, may I follow that up by saying—do we have anything near that launch capability today?

DR. KANTROWITZ: I think that the Titan II is nearly capable of doing that sort of thing—wouldn't you say?

GENERAL SCHRIEVER: Well, we, of course, have a very good capability of launching missiles on time on operational systems. We do take longer on our R&D countdowns, but we have been very successful on our operational countdowns. I don't think there is any question but that the Soviets are ahead of us in certain areas. I think that was expressed by everyone, following their recent Vostok III and IV. But I have just chosen a little different terminology in regard to the gap question—or, definition to the gap, than the other people have. In the missile business we were really talking about operational capability and numbers and I haven't quite in my own mind established the analogy that applies to the space business.

But I don't want to give anyone the impression that I am complacent and that they are not ahead of us in certain areas. They certainly are.

SENATOR CANNON: What is your position regarding recoverable first-and/or second-stage boosters?

GENERAL SCHRIEVER: I think it is one of

the most important aspects of our space program. I think we have got to pursue this in a very vigorous way, and this is one of the areas where what I term "advancing technology," or getting fundamental capability, is most important. I think from a military standpoint, the ability to reuse hardware is very, very important indeed.

QUESTION: Is the Russian early warning system anything like as good as our own?

AIR MARSHAL SLEMON: The Russians have made great strides in improving their warning capability during the last eight years. They have made tremendous strides in improving their radar, even in the five years that I have been in NORAD. Their radars at the outset were relatively unsophisticated, their communications system likewise. But it is significant, we believe, that they have put a tremendous amount of effort into improving their over-all air defense system—into improving it very significantly.

QUESTION: Is a more powerful booster the only factor of Soviet superiority in our space competition?

DR. KANTROWITZ: I would like to make just one statement about that. It is my conviction that the cliché that has gained such wide currency in this country that the only thing we are lacking is more powerful boosters—that this cliché has been very damaging to us, and that it has prevented us from looking carefully and candidly at the boosters which we now have. If we had started a manned orbital assembly program three or four years ago, we would not be worrying now about booster thrust. We would be in a position now where we could use something like the country's capability for producing boosters which in a year or two will amount to something in the area of millions of pounds per year in orbit, which is far beyond the capability of any single booster.

SENATOR CANNON: Carrying that just a little farther, would you feel that it is too late to emphasize [orbital assembly] now, and have it come in, in a concurrent time frame, for example, with the larger boosters?

DR. KANTROWITZ: It is still possible to reach the level, say, the kind of level needed for a moon vehicle; that is, two to three hundred thousand pounds, in low orbit. It is still possible to reach that level of payload in a low orbit by 1964 or 1965—several years before it will be reached with the large boosters.

QUESTION: Is NASA-Air Force interface a two-way street—that is, are military requirements being fed into NASA planning?

GENERAL SCHRIEVER: Military requirements per se are not fed into NASA requirements. We do have an interface with NASA. We have recently established the Deputy for Manned Spaceflight. He is deputy to me—General Ritland. And he has an office that is located, physically, with NASA in Washington. And one of his functions and responsibilities is to participate in NASA's programing and planning activity, and in so doing there is a complete interchange in Air Force and NASA, so I would say that for practical purposes our requirements are fed into NASA, but not in the form of military requirements, and that is the form in which I have interpreted the question to be stated.

QUESTION: Is NASA planning its own logistics system apart from that which would support military space systems?

DR. WELSH: NASA does plan to rely on logistic support from the Defense Department, and is so doing at the present time.

QUESTION: We have been told throughout the meeting about the horrible consequences if the Russians grab control of space, yet all the hardware systems suggested in this connection sound like something out of the Land of Oz, and not the 1960s. How can the Air Force justify a large military role in space on the basis of such tenuous notions particularly in comparison with such ground delivery systems as Polaris and Minuteman?

DR. KANTROWITZ: I said, during my remarks, that I don't now see a space weapon capable of upsetting the ballistic missile stalemate. However, I think that it is incumbent upon us to recognize, at this vital time, something which has not been recognized enough in the past—namely, we are very restricted in our ability to see the future. The importance of the ICBM was not visible to us in 1950. Its vast importance as a weapon was not then visible. In a similar way, I think that it is incumbent upon us to recognize now that our ability to respond quickly when the ideas become clear, and our ability to achieve the really new concepts, as quickly as our adversary, is going to be the key to survival. For these reasons the Air Force, as part of its responsibility to the country, needs to very carefully see to it that we do everything we can to understand this vision and to expand it, and to develop the capabilities rapidly to respond.

QUESTION: Is the American public being told enough about our military space activities?

DR. WELSH: I would just simply comment

that my answer would be "No." I think that we sometimes go a little far on this business of keeping information from the American public. I am not talking about specific detailed information, but keeping information on just what we are doing. It is my judgment that our allies and so-called neutral nations would be much more impressed with us if they were aware as to just how much we are doing. And I think the American public would be much more impressed and eager to support us if they thought there were vigorous programs under way. So my broad general answer is that the American public needs to know even more than it is getting.

QUESTION: Do those who are well informed on Russian technology feel that their instrument capability compares either better than, or equivalent, to our own with that of our allies?

DR. KANTROWITZ: I think that the general impression that we can gather of Russian technology is that it is only in the areas on which the Russians have decided to concentrate, that they even come close to matching us. Now these areas, as you all well know, are hydrogen bombs, missiles, and space.

If you look across the board at other areas of technology the areas where there is any real comparison are very few and far between.

QUESTION: When the Russians orbited the two Vostoks last month, Americans were told that the feat was fraught with grave military implications. Yet, when the Jet Propulsion Laboratory adjusted the course of the Venus probe at 1.5 million miles, nothing was said of the military implications. What is the reason for the double standard in evaluating American versus Russian space shots?

DR. WELSH: Well, I am not sure I recognize the double standards in that particular illustration. I think that we did give a fair amount of attention to the significance of our ability to adjust the Venus shot. But since the United States does not have an aggressive space program, in the sense of threatening the peace or security of other nations in the world, there really wasn't any effort made nor was there any need to assign military meaning to the Venus shot.

On the other hand, the Soviets do have a record of being very interested in aggression, and therefore their conquests in space need to be associated with that possibility. I think that there isn't very much of a comparison on what we did in the Venus shot and the almost-rendezvous activity of the Soviets with their Vostoks.—END



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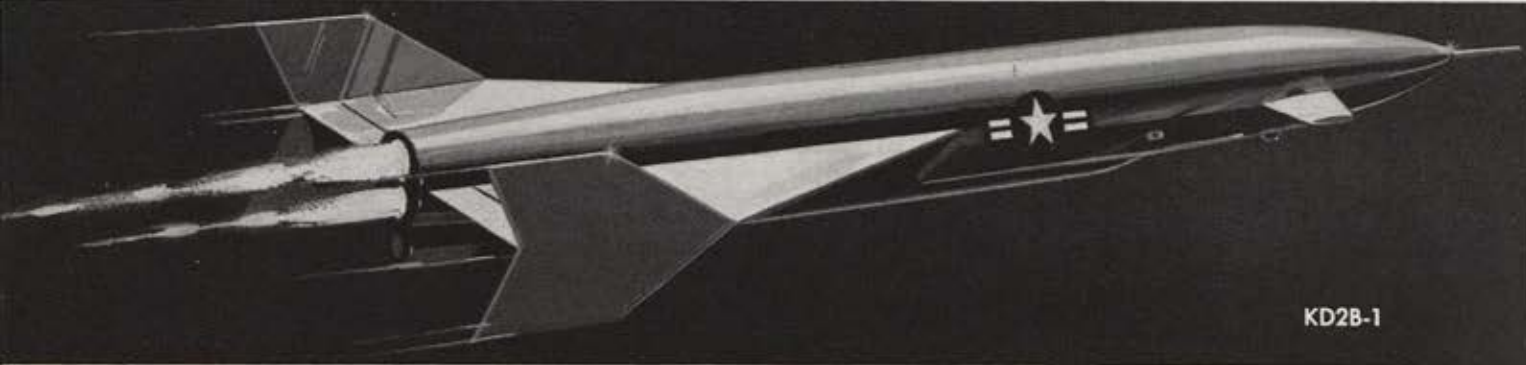
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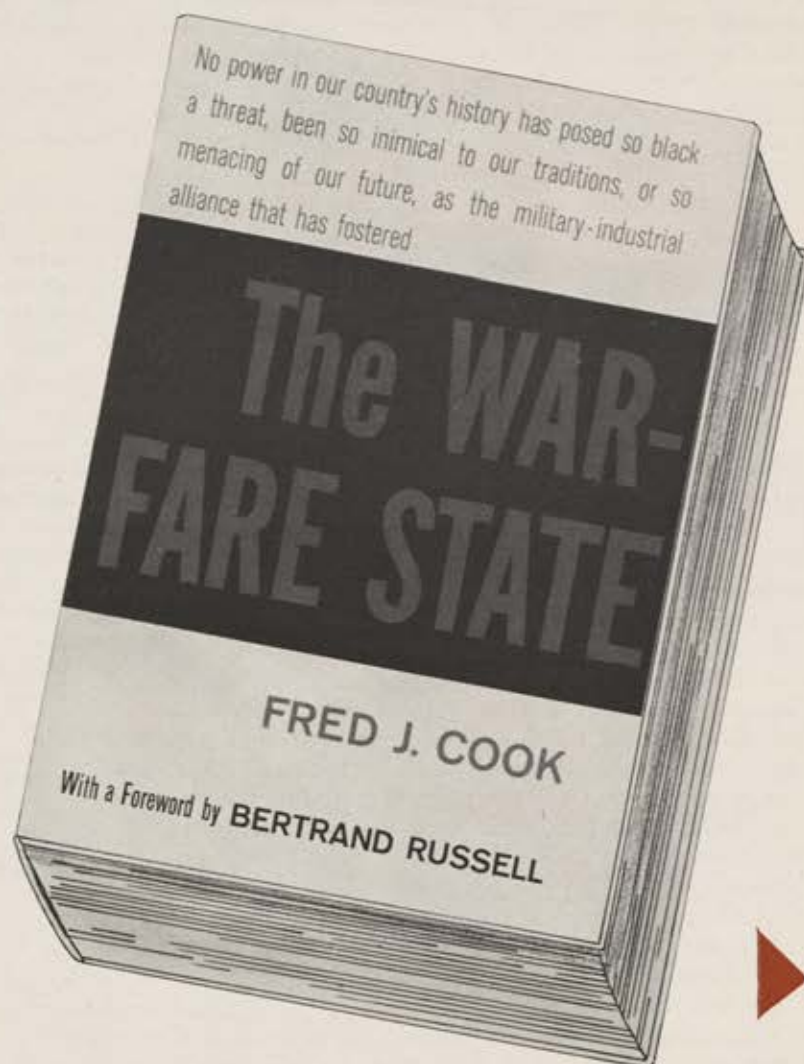
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Reviewed by John F. Loosbrock

EDITOR, AIR FORCE/SPACE DIGEST

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The Macmillan Co., N. Y., 1962

478 pp. \$4.95

JUGGERNAUT

TWO TERMS in office won for President Eisenhower small favor with *The Nation* magazine—until he was about to leave the White House. In his "Farewell Address" Mr. Eisenhower said: "We must guard against the acquisition of unwarranted influence, whether sought or unsought, by a military-industrial complex." In time, the focus on this statement may rival the study and attention given to the last evocation in public office by George Washington.

In October 1961, an entire issue of *The Nation* was turned over to a writer named Fred J. Cook to probe the sources of power and influence of the "Military-industrial complex." Cook also has written other "specials" for the magazine, including "The FBI" and "The CIA," each provoking sharp and continuing controversy. In "Juggernaut: The Warfare State," the basis of a new hardback book, we find a confluence of Cook's special talents—he was billed as "a reporter [who] specializes in crime stories" when he started writing for the magazine in 1957—and the historic prejudices of *The Nation*, whose attitude toward the "Merchants of Death" since the 1930s has been reflected in its references to the "Military" (always with a capital "M") as a sinister influence on the Washington scene.

The Cook concept goes far beyond the probable intention of former President Eisenhower, for Cook suggests the formation of a cabal: the Military wants more power and "Big Business" wants fatter defense contracts. Together they are astride a "Juggernaut" highballing down the road to military-dominated government and, ultimately, to a holy war against communism. In such a holocaust, which the riders are willing to risk, the American people and all of Western civilization will have to pay the price. This is Cook's basic thesis.

If the Berlin crisis following the Kennedy-Khrushchev disagreement in Vienna in June 1961 had not boiled over, it would have had to be invented, says Cook. He offers as fact his opinion that the United States has inhibited the climate of reconciliation with the Soviet Union since the end of World War II. Khrushchev, he says, wanted to lower the international temperature as a basis for a *modus vivendi*, but we haven't encouraged him because it would play havoc with the government's efforts to use defense contracts to maintain a high level of economic activity.

Cook contends that Khrushchev's violation of the nuclear test moratorium on September 1, 1961, somehow was responsive to provocations on our side. To support this contention, he points to an article by Admiral Lewis Strauss in *Reader's Digest*, on the stands a few days before the Soviet tests became

known, urging that the US resume testing. "The *Digest* had hardly conveyed this happy thought to millions of American homes," Cook writes, "when Khrushchev gave himself charter membership in the Strauss-Teller bang-away club."

The logic here is difficult to follow. Strauss had no official position and precious little influence in the Kennedy Administration. Moreover, US nuclear experts reasoned that the Soviet high-yield tests had to be preceded by six months or more of preparation.

To support his conclusions about US provocations, Cook's book contains a chapter, "Birth of the Cold War," which had not appeared in *The Nation*, and which charges that the United States conceived the cold war. In April 1945, when President Roosevelt died, Cook wrote, "the best hope for that permanent

A STUDY IN CONTEXT

General Electric's Charles E. Wilson as quoted by Fred J. Cook in *The Warfare State*:

"First of all such a [preparedness] program must be the responsibility of the federal government," he declared. "It must be initiated and administered by the executive branch—by the President as Commander-in-Chief and by the War and Navy Departments. Of equal importance is the fact that this must be, once and for all, a continuing program and not the creature of an emergency. In fact one of its objects will be to eliminate emergencies so far as possible. The role of Congress is limited to voting the needed funds."

"Industry's role in this program is to respond and cooperate . . . in the execution of the part allotted to it; industry must not be hampered by political witch-hunts, or thrown to the fanatical isolationist fringe tagged with a 'merchants of death' label."

(Mr. Cook's italics)

Mr. Wilson's actual remarks as reported in *Army Ordnance Magazine*, issue of March-April 1944 (Vol. 26, No. 143), p. 287:

"First of all, such a program must be a responsibility of the Federal Government. It must be initiated and administered by the Executive Branch—by the President as Commander in Chief—and by the War and Navy Departments. At a somewhat secondary level, it is obvious that the Labor and Commerce Departments would also be vitally interested. Of equal importance is the fact that this must be, once and for all, a continuing program, and not the creature of an emergency. In fact, one of its objects will be to eliminate emergencies so far as possible.

"The program must be insured and supported by the Congress—in the beginning through resolution or perhaps even through legislation; later, by regularly scheduled and continuing appropriations. Industry's role in this program is to respond and cooperate. Industry must be allowed to play its role. By that I mean that it can act only on request or authorization of government. In the execution of the part allotted to it, industry must not be hampered by political witch hunts, or thrown to the fanatical isolationist fringe tagged with a 'merchants-of-death' label. Let us make this 3-way partnership permanent and workable, not just an arrangement of momentary convenience."

(Mr. Wilson's italics)

REVISITED

world peace he had so passionately sought died with him." The New Deal was "replaced by the men of industry and the Military" who supported a "permanent war economy" for which the General Electric Company's Charles E. ("Electric Charlie") Wilson had pleaded in a January 1944 speech before the American Ordnance Association.

The Wilson quotation is a principal pillar of the entire Cook hypothesis. He returns to it again and again. In one typical instance he states that Wilson "spelled out the projected wedding of Big Business and the Military," with Congress limited to providing defense appropriations and asking few questions.

A comparison of the Cook version against the official speech text (*see box*) shows that Wilson was quoted out of context, that Cook injected statements not in the speech, omitted others that were, and linked together some thoughts which convey ideas diametrically opposite to those the speaker intended.

In this comparison, note Cook's complete inversion of the roles of Congress and defense industry. In fact, the very reference to the "permanent war economy" is spurious. Cook peppered the phrase throughout *The Warfare State* to remind readers that Wilson "openly suggested an alliance of Big Business and the Military."

Both quotations were evidently taken from an article entitled "The Growing Power of the Military," by John M. Swomley, Jr., in *The Progressive* magazine (January 1959). Cook seems to accept without question the credibility of any published source which attacks the Defense Department. For example, he is heavily dependent for source material throughout his book upon Col. William H. Neblett, a Reserve officer in the Field Artillery in the first World War. In World War II Neblett was restored to duty as a colonel in the Air Corps, and was retained in service despite recommendations by an AAF Personnel Board in May 1944 that he be relieved from active-duty status as unqualified for his assignment.

In 1946, Colonel Neblett tried unsuccessfully to secure White House backing to obtain a flying rating. He persisted in his efforts and, in a February 1947 letter to Gen. Carl Spaatz, Commanding General, AAF, argued that "it is possible that I shall be seriously considered by some of the aviation companies as their legal representative here [in Washington]. My standing with these companies would be enhanced by the rating which I seek. . . ." The request was denied.

Subsequently, in 1953, when his book, *Pentagon Politics* was published*, Neblett made a slashing attack

* By Pageant Press, known in the book trade as a "vanity" publisher. The author underwrites all publication expenses in exchange for a promised forty percent of the profits.

on what he called "the new type of influence man," the retired military officer who quits the service "to take high posts in key defense industries." *The Nation*, January 3, 1953, published a condensed article entitled "Generals Into Businessmen," adapted from his book.

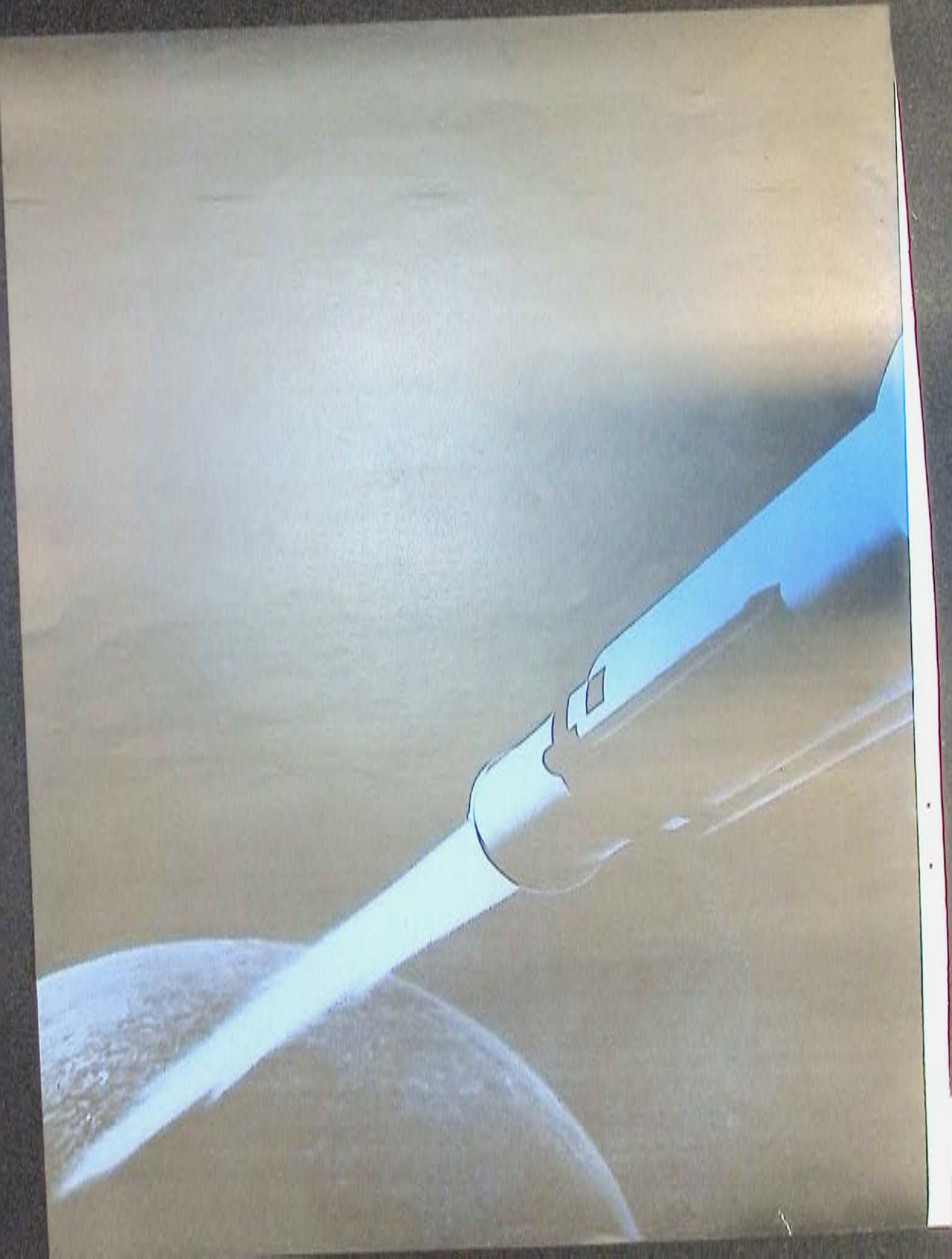
Uncritical dependence upon Neblett creates some embarrassment for Cook. Neblett had charged that Maj. Gen. Leslie R. Groves, who headed the Manhattan Project, gave away key secrets concerning the bomb when he ordered publication of the famous Smyth Report. Cook's acceptance of this allegation places him in the curious position of accusing the military of laxity in security after having already charged the Pentagon in an earlier chapter with obsessive secrecy in trying to keep nuclear secrets from the Russians—offered as a reason why the Soviets began to distrust us.

An easy generalization that civilians in long-time, close association with the defense establishment soon come to reflect the military point of view traps Cook in another contradiction. "Only one man in high position appears to have any clear conception of the enormous stakes involved for mankind," Cook writes. That was Secretary of War Henry L. Stimson, who earned Cook's accolade because of a diary entry published in Stimson's book, *On Active Service in Peace and War*. In the flush of V-J Day, Stimson had briefly considered the possibility of making the atomic bomb secret available to the Russians to show our good faith and desire to retain their friendship in the post-war periods.

Stimson's association with the "Military" happens to have dated back to the 1911-13 era when he served as Secretary of War in the Taft Administration. James Forrestal, on the other hand, opposed making any secrets known to the Russians. He emerges from Cook's book "on most issues a spokesman for the professional Brass," although his association with the military dated back only to 1940 when he was appointed Undersecretary of the Navy. Cook fails to mention that Stimson recanted his early view as the Russians began to exhibit their intractability.

At best, Cook's accolades or brickbats are ephemeral. Take, for example, the case of Senator Stuart Symington. In 1953, the then-junior Senator from Missouri spearheaded the drive to restore a \$5 billion cut from the Air Force budget. In *The Nation* (October 1961) Cook charged that the "special interests" in that earlier day had pressured the Administration for "more millions for heavy bombers than the best military judgment considers needful. . . ."

(Continued on page 91)





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In the spring of 1962, the Senate conducted the "muzzling" hearings in which former Maj. Gen. Edwin Walker and others charged censorship of their views by the Administration. Senator Symington "surprisingly" (to Cook) criticized military officers who attempted to override their civilian superiors. He was transformed in Cook's book to "the tall and distinguished looking Missouri Democrat."

The struggle over control of atomic energy at the Presidential Cabinet level becomes the subject of a dramatic dialectic in which Cook pits "the counsel of even so wise an elder statesman as Stimson" vs. "the desires of the Military." At a White House meeting of September 21, 1945, the President's advisers split on the issue. In the end, Cook writes, President Truman "adopted the policy of the Joint Chiefs as the policy of the Nation." As a consequence, "the military, virtually from the first days of the Truman Administration, had begun to call the shots, and on this issue, the most vital of our time, their triumph was dramatic and final."

In September 1945, few Americans were willing for the US to turn its atomic bomb over to anybody, even the British, without some accompanying safeguard to control its future use. As we know, the Baruch Plan, prepared by Dean Acheson and David Lilienthal, was ready just nine months later. In June 1946, America offered the United Nations our atomic know-how in exchange for an inspection and control system. The Soviet Union rejected that plan just as it has every subsequent proposal that embraces the principle of inspection.

Moreover, to suggest that the military was calling the shots in atomic energy is to ignore the acrimonious debate over the May-Johnson Bill in 1945-46. In his *Memoirs*, Mr. Truman calls it "the War Department Bill." It would have set up a part-time, nine-man Atomic Energy Commission headed by an administrator who could be a military man. Mr. Truman recalls that the bill tailored the job for General Groves. In the ensuing struggle on Capitol Hill, May-Johnson lost out to the MacMahon Bill, a memorial to the late Senator from Connecticut. The legislation established a five-man, full-time, all-civilian Atomic Energy Commission. The Pentagon was restricted to a supporting Military Liaison Committee.

Cook also makes much of the so-called Franck Report. This "Committee on Social and Political Implications," named for Professor James Franck, included many scientists assigned to the atomic-bomb project. In June 1945, they recommended to Secretary Stimson that we first use the atomic bomb in a test demonstration on a barren or desert island, fearing the political and military implications of using the weapon on a military target. Cook calls it a "remarkably perceptive forecast of the future," which showed the scientists "displaying a statesmanship that unfortunately was lacking in the statesmen," but fails to mention another principal conclusion: "One thing is clear," the Committee averred. "Any international agreement on prevention of nuclear armaments must be backed by actual and efficient controls. No paper

agreement can be sufficient since neither this nor any other nation can stake its whole existence on trust in other nations' signatures." And upon this shoal of "actual and efficient controls" the Baruch Plan and subsequent arms-control proposals have foundered.

The Franck Committee did not by any means reflect the views of the senior scientists who worked on the bomb. Enrico Fermi, J. Robert Oppenheimer, Arthur Compton, and E. O. Lawrence—four of the most distinguished scientists in America—were called in by Stimson's Interim Committee. The Committee had been charged to advise the Secretary of War on post-war uses of atomic energy, and to study alternative uses of the first atomic bombs in a demonstration vs. actual war.

These four made up a Scientific Panel which spent a long, agonizing week end at Los Alamos on June 9-10, 1945, just as the Franck Committee was submitting its views. The Panel did not accept this report. It was mindful, as the Franck Committee apparently was not, that our arsenal would initially have only two combat nuclear weapons. It was vitally important that they be used to persuade the Japanese to surrender without physical invasion. In a later article for *Harper's Magazine*, Stimson estimated that the projected invasion of Japan would have cost a half million US casualties.

Returning to Washington, the Panel informed Secretary Stimson that it could propose "no technical demonstration likely to bring an end to the war." These recommendations led to Hiroshima and Nagasaki.

Cook explores this period rather intensely, but makes no mention of the Scientific Panel or its recommendations.

According to Cook, one consequence of the growing power of the military in Washington and the accompanying nuclear arms race is the increasing danger of setting off a holocaust by accident. We have thus far averted the ultimate horror of nuclear war "as much by good luck as good management," Cook claims. There have been "a startling number of accidents or near-accidents," he charges, but luckily, in each precarious instance, he says, the peace has been preserved by the sound judgment of one general. We are fortunate, says Cook, that these accidents have occurred "when one of our fanatical militarists was *not* in command." (Cook's italics.)

To the reader looking beyond these assertions for proof, Cook offers, first, an occasion in the spring of 1960. A group of Air Force officers was dining at an Atlantic seaboard missile base "when they happened to glance out a window and saw a sight that chilled them with horror. A nuclear-armed Bomarc missile, on its launching pad, had begun to spout fumes from its tail-pipe." The officers, Cook says, "rushed to the launching site, yanked off wires and threw switches. With only a few split seconds of leeway, they managed to stop the unpremeditated flight of the Bomarc."

The incident to which Cook apparently refers occurred at McGuire AFB, N. J., on June 7, 1960. One detailed account of June 11, 1960, published in

(Continued on following page)

the New York *World-Telegram & Sun*, formerly Cook's employer, stated that "a fire and two explosions occurred within the mechanism of one of the seven and one-half ton, forty-seven-foot-tall missiles, *lying on its side inside its concrete and metal combined shelter and launching pad*" (italics supplied). About 100 pounds of TNT used to trigger the nuclear warhead burned, and "some radiation resulted" from the burning of the thoriated magnesium, a metal used in the missile, "but this radiation was almost entirely confined within the four walls of the shelter. The atomic warhead, which can be set off only by a complicated, double-check system of controls did not explode." The news report said the fire lasted about forty-five minutes, destroying the missile and badly damaging the shelter.

This account was substantially supported in other publications. *Newsweek* (June 20, 1960) said that two officers at the Bomarc site heard a muffled explosion and saw smoke rising from one of the fifty-six steel-roofed concrete sheds which housed the missiles. They dispatched a sergeant to call New Jersey State Police. As a dozen State Troopers converged on the base, "a wire service reporter picked up a police message and announced to the world that an atomic bomb had exploded in the flats of New Jersey, 50 air miles from New York City."

If pandemonium momentarily reigned outside of McGuire AFB, inside the base "least perturbed of all were AF regulars at McGuire, where men off duty mowed lawns and women placidly wrung out laundry while kids played." (New York *World-Telegram & Sun*, June 11, 1960.)

Cook alleges that the cause of the Bomarc accident, "despite months of investigation, was never fully answered." Actually, an official investigation by the Air Force was made available to the public on June 23, 1960 (Press Release 723-60). A conclusion that the accident presumably was caused by a bursting high-pressure helium gas bottle which started the explosion and fire was reported by the Associated Press on that date.

Cook carries his fiction even farther. He writes, "Some fifty such accidents or near-accidents with nuclear armed missiles and aircraft occurred between 1945 and 1960. In the same period there were a number of false radar reports which had they been accepted and acted upon, would have plunged us within minutes into all the horrors of World War III."

In the first place, Cook's reference to "a nuclear-armed Bomarc missile, on its launching pad" may easily mislead the unsophisticated reader. Nowhere does he say that Bomarc is an air defense weapon only, with a range of about 200 miles, designed to intercept invading bombers and air-breathing missiles. Even if his account of the fire and explosion were otherwise accurate, there is no conceivable circumstance in which the misfire at that "Atlantic seaboard missile base" could have "plunged us within minutes into all the horrors of World War III."

Second, Cook's estimate of fifty accidents or near-accidents is a contrived figure. It appears to have

been lifted from a book called *The Peace Race*, by Seymour Melman, who is another contributor to *The Nation*. According to Melman, "An unofficial study of accidental war places the number of accidents involving nuclear weapons in the United States missiles and aircraft at about fifty from 1945 to mid-1960."

As his source, Melman cites an unpublished study by John B. Phelps and others at Ohio State University, entitled *Accidental War: Some Dangers in the 1960s*. In this account, Phelps, *et al*, estimate that "approximately a dozen major incidents or accidents involving US nuclear weapons are known or reliably believed to have occurred, mostly in plane crashes," including some overseas. Note that the number of nuclear accidents involving aircraft or missiles is down from fifty to twelve. Cook and Melman have used these figures in a different context. Phelps, *et al*, write:

"Many lesser accidents involved in the maintenance, transportation, modernization, etc., of actual nuclear weapons are known to have occurred. One informed estimate places the number of these at about fifty, for U. S. weapons since World War II."

There is no documentation of "one informed estimate." Phelps, *et al*, also note that among these alleged accidents, there have been no nuclear explosions. Many safeguards have been rigidly enforced and, besides, certain physical conditions must exist before a nuclear explosion can take place. Phelps, *et al*, conclude:

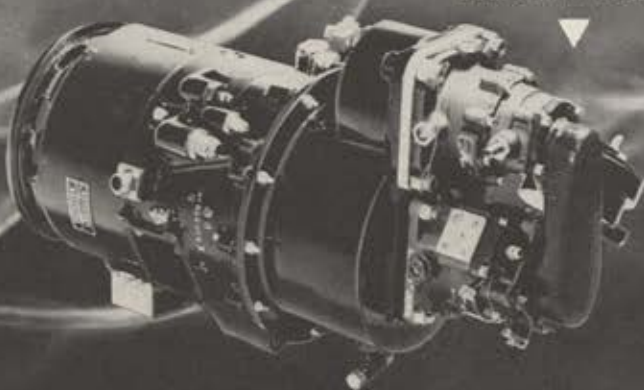
"Some semi-official estimates place the probability of explosion of a single weapon under stress, as in a crash or maintenance mishap, in the one in one million to one in one billion range. Our own order of magnitude judgment suggests that one in 100,000 would be a more realistic average value for different kinds of weapons."

Based on certain mathematical hypotheses as regards the probable number of weapons, the miles each weapon travels in ten years, the crash rate of weapon carriers, etc., Phelps, *et al*, "are led to the conclusion that the chances are of the order of 1 in 100 that a US nuclear weapon will explode at some time in the next ten years."

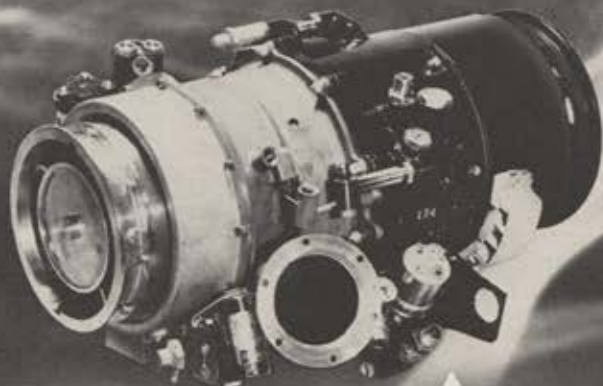
At best, this is pretty speculative stuff. Naturally, no indication of the shaky estimates and vague conclusions may be found in Cook's book, nor does he seem to be troubled by lack of documentation. He extends his flat assertion of fifty accidents involving nuclear-armed missiles and aircraft to a discussion of the danger of accidental war. This danger is related to an incident of October 5, 1960, involving the Ballistic Missile Early Warning System, just completed at Thule four days before. Three prominent US businessmen were being given an orientation tour at NORAD Headquarters in Colorado when the BMEWS warning devices began to signal a contact. Canadian Air Marshal C. Roy Slemon, Deputy Commander in Chief of NORAD, was in charge in the absence of Gen. Laurence S. Kuter, his chief. A dramatic account of the incident was distributed by the "Canadian Press" (a Canadian wire service) which credited Air Marshal Slemon with "quick thinking that headed off a North

(Continued on page 97)

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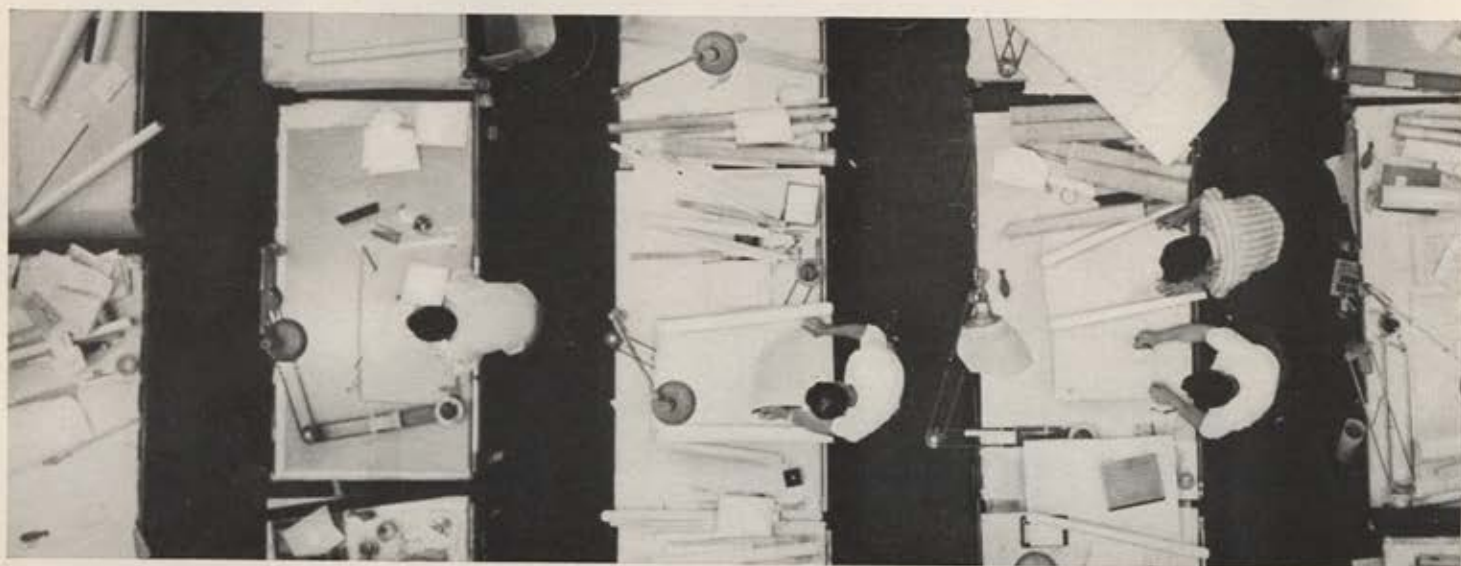
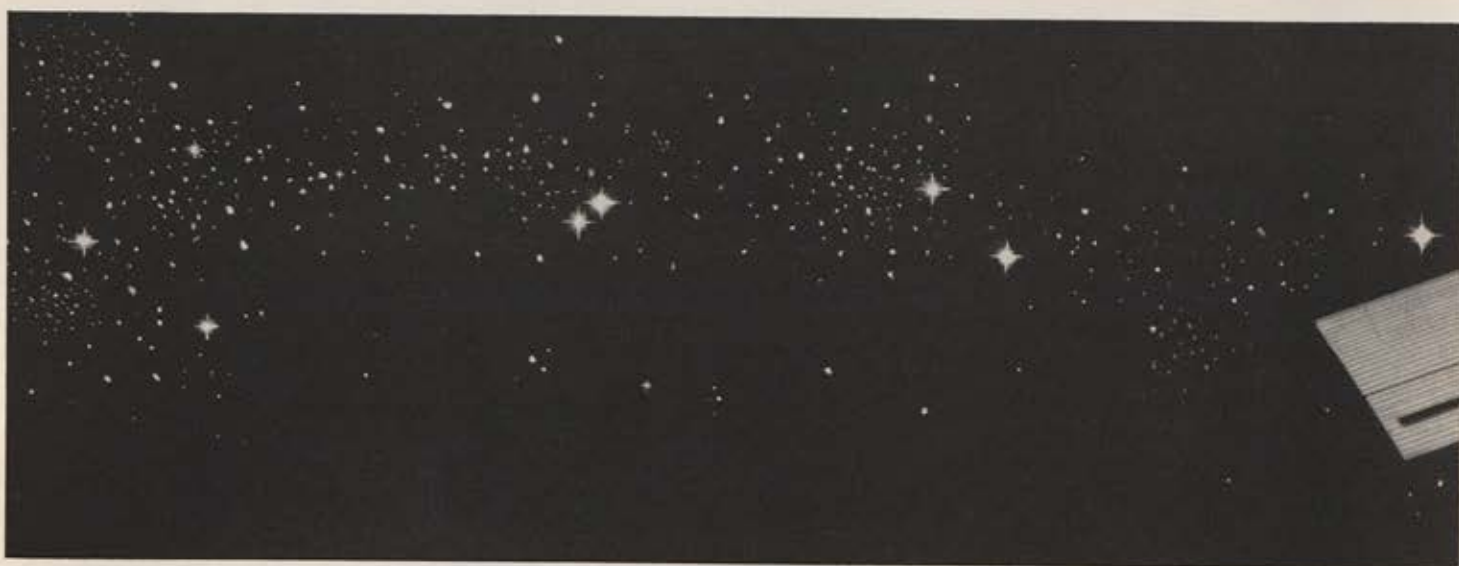
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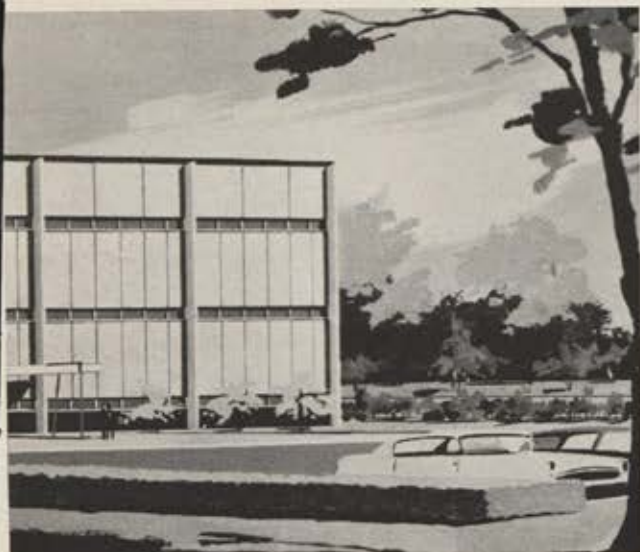


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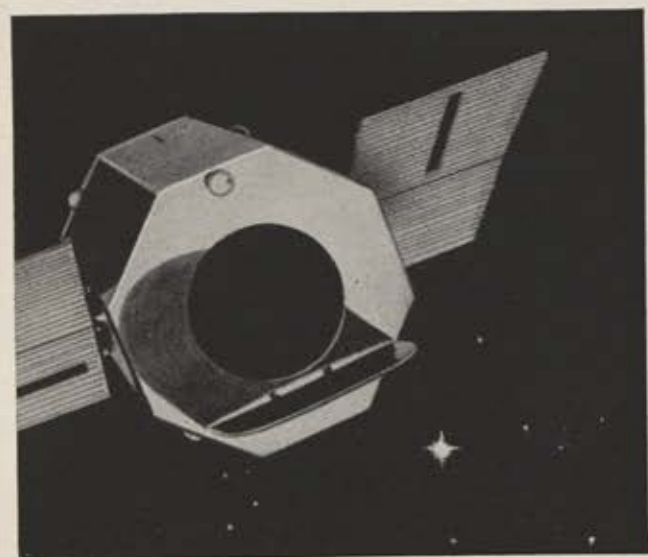
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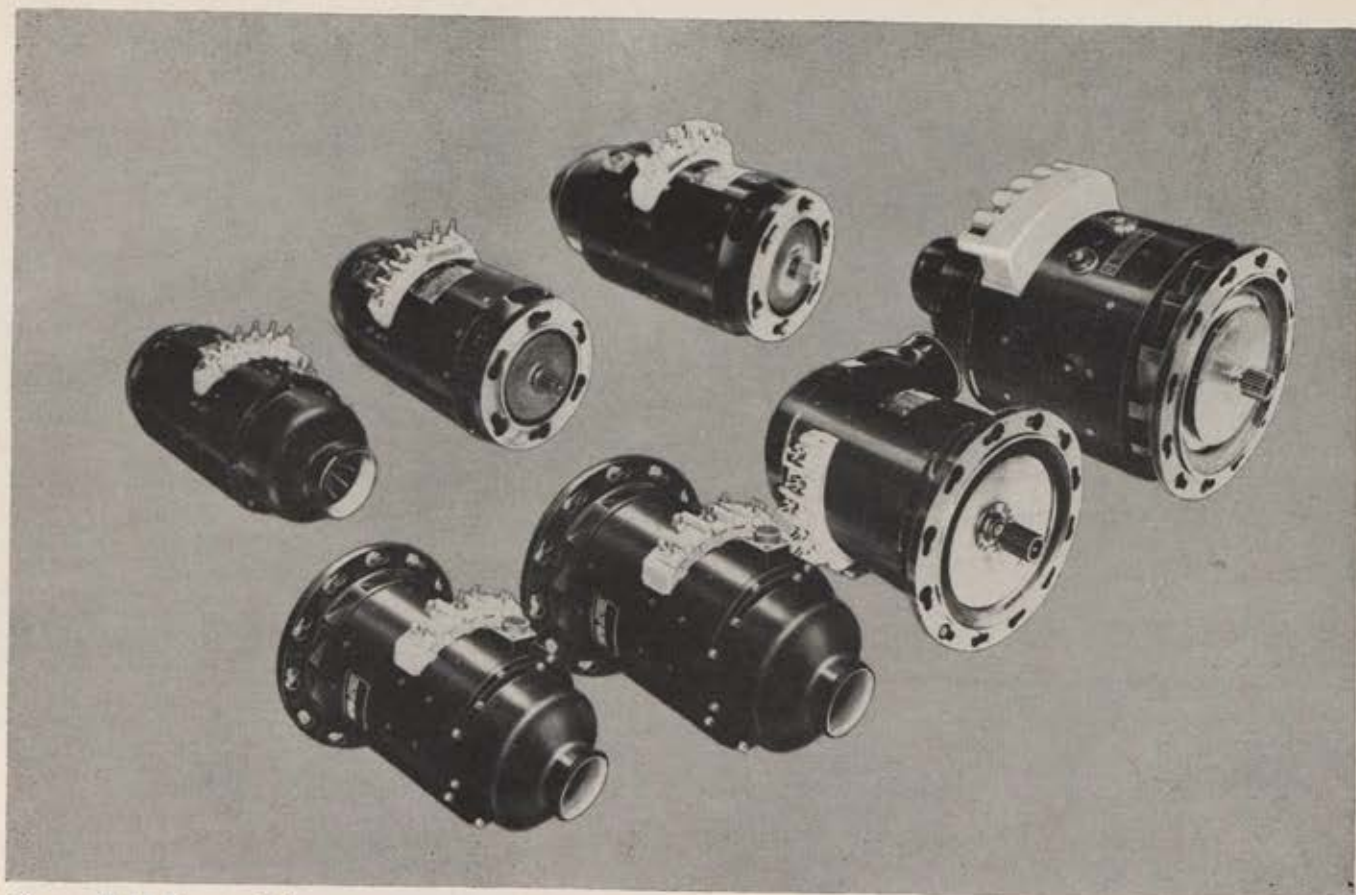
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American missile scare." Some US accounts initially played up the sensational possibilities.

Cook took it from there. In his account, the American businessmen were "in absolute terror" as they were hustled out of the main control room to an outer office. Cook reported "bedlam" in NORAD Headquarters for "twenty agonizing minutes while the generals wrestled with the decision on which rested peace or war." In another match, wholly conceived by Cook, Air Marshal Slemon "wrestled with the problem" of launching a counterattack that would signal the start of a nuclear war.

When the facts became known, the Canadian Press version was officially and publicly denied. The denial and the facts were published in the *New York Times* on December 23, 1960. Within sixty seconds of the time the alert flashed, Air Marshal Slemon contacted Thule and knew that the rising moon (which had not yet been taken into account in BMEWS) had caused the radar to respond. By open line from his Colorado headquarters, he was informed that the BMEWS apparatus was not functioning properly. There was never any issue about launching a SAC counterattack. In any event, Slemon did not have the authority to launch one. Only the President can do so.

When the flurry had settled, there was some public soul-searching. Press accounts which had inflamed public passions were chided for their irresponsibility. The respected *Manchester Guardian* editorialized on December 29, 1960:

"The performance of some of the news agencies over the detection of the moon by the new ballistic missile early warning station early in October suggests that we may be in for a series of war scares such as we have never had before. . . .

"It is time the publicity men took more account of the effect of this kind of thing on the world beyond the United States and even, perhaps, on many Americans. The facts in this case are that no one would have taken seriously an alert given by a completely new radar system which only had been working for a few days; that within a minute the single contact which had been obtained was identified as the moon; that a single contact would never in any case cause a major alert; and that American commanders have made it quite clear in their Congressional testimony and elsewhere that they have no intention of firing missiles on the basis of radar information alone, even if this shows a substantial attack."

Wars can result from itchy trigger fingers as well as accidents, Cook avers. To establish this case, he calls upon Marquis Childs, nationally syndicated columnist for the *St. Louis Post-Dispatch*. On July 19, 1961, Childs gave wings to a story that Gen. Curtis LeMay, Air Force Chief of Staff, at a "Georgetown dinner party recently" had informed the wife of a "leading Senator" that "a nuclear war was inevitable," that it would start in December 1961 and be all over by January 1962. General LeMay reportedly told the lady that certain unpopulated areas in the Far West would be safest. As for himself, he would be inside a top-secret underground hideout near Washington to help direct the

retaliatory strike. When the lady passed this intelligence along to her husband, according to Childs, the Senator "dismissed this as flesh-creeping to which 'Curt' and the other Air Force generals resort at appropriations time."

Accepting and repeating this story as told, Cook noted with self-satisfaction that the Christmas 1961 season passed "without the atomic gifts General LeMay had predicted with such certainty that we and the Russians would exchange." He did not choose to mention that on the same day the Childs account was published, General LeMay categorically denied the report in sworn testimony before the Senate Preparedness Subcommittee. The press reported that General LeMay also testified that he had attended no such dinner party in Georgetown nor had he had any such conversation with any Senator's wife.

Marquis Childs has made other significant contributions to the "Juggernaut" hypothesis. One column in mid-May 1961, datelined Geneva, suffered some curious editorialization in the syndicated version, a matter which deserves separate analysis. In this instance it involved opposition to resumption of nuclear testing. In this particular column, Arthur Dean, the chief American negotiator, was reported to have been importuned by a friend, the "head of a large advertising agency," to stop squandering the taxpayer's money and to discontinue further useless disarmament talks with the Russians. This friend, Childs wrote, had been flown to Washington by the Air Force along with 200 other advertising executives "for indoctrination in the need to improve America's nuclear weaponry."

In a subsequent paragraph, Childs reported that in briefing Dean and John J. McCloy, the President's adviser on disarmament, for their jobs, "one of the proposals for the new wave of nuclear armament, to be achieved with resumed testing, was disclosed to them." Childs didn't say by whom. This proposal involved the use of 50,000 missile trucks, each with a one-megaton warhead atop an ICBM. The trucks were to criss-cross the United States on a rotating basis, each to be manned by a lieutenant and a sergeant.

Childs carefully refrained from identifying any authorship of such a plan. However, in the next paragraph, he wrote: "The principal protagonist of starting new tests is Edward Teller. . . ." (*St. Louis Post-Dispatch*, May 21, 1962). A careless, or too purposeful, reader could easily infer that Teller was the protagonist of the missile-truck idea. Given this ball, Cook ran all over the field with it. First, he attributed the 50,000 missile-truck idea to Teller, then stated in mock irony that Teller had been "the impartial expert" who briefed "the military geniuses from the advertising agencies just what was at stake in the resumption of nuclear testing." From that point Cook launched into an essay about "100,000 lieutenants and sergeants" having at their fingertips economy-sized packages of world destruction. He charged: "The chances of accidental holocaust, of fanatic and irresponsible action, would be escalated to an infinite and appalling degree."

The trouble is, this story in all its major particulars
(Continued on following page)

is not true. There was no Air Force-sponsored orientation conference for advertising executives. The Air Staff has never approved nor has it given serious consideration to any proposal for 50,000 missile trucks for use in the United States. The Air Force is also unaware that Dr. Teller might be the author of such a proposal. The further speculations of Cook based upon Childs' article are of whole cloth.

Needless to state, such expressed sentiments have won for Cook a wide following among the "Ban the Bomb" elements. His book offers a "Foreword" by Bertrand Russell which was not available to readers of his article in *The Nation*.

To write responsibly on such an important subject as the Defense Department and its relationship to national policy, the writer must bring at least two qualities to the product: first, a sound background in his subject matter; and second, integrity.

In the matter of sound background, Cook professes his deep concern lest the "Juggernaut" riders take us down the road to military dictatorship and war. Ironically, his criticism may be 180 degrees off in direction. There is a body of opinion in Washington, headed by Chairman Carl Vinson, House Armed Services Committee, that believes the functions of the military services are being assumed by new, independent agencies, responsible only to the Office of the Secretary of Defense. Certainly the trend in Defense Department relationships has shifted power away from the professional military man. The National Security Act of 1947 established three separate military departments. In 1949, the law was amended to reduce each service to sub-Cabinet level and to strengthen the powers of the Secretary of Defense. The Organization Act of 1951 reorganized the Air Force internally, reaffirming the authority of the Secretary over the Chief of Staff. In 1953, President Eisenhower leaned far in the opposite direction from his background and training. Reorganization Plan No. 6 increased the number of civilian Assistant Secretaries of Defense from three to nine. Urging Congress to enact this plan, President Eisenhower wrote in April 1953:

"Basic decisions relating to the military forces must be made by politically accountable civilian officials. Conversely, professional military leaders must not be thrust into the political arena to become the prey of partisan politics."

In 1954, Public Law 562 (83d Congress) added a civilian Assistant Secretary for Financial Management to each military service and required the military Comptroller to account to a civilian financial expert for his actions. This reform was dictated by a realization of the power vested in the man who grips the purse strings.

Another reorganization of the Defense Department in 1958 gave tremendous new powers to the civilian Secretary of Defense at the expense of the Army, Navy, and Air Force. Certain actions taken since 1960 by Defense Secretaries Thomas S. Gates and Robert S. McNamara to centralize procurement, intelligence, communications, and tactical military operations have given rise to criticism that the Joint Chiefs of Staff and

other military career men have been inadequately consulted before these decisions were reached.

Aside from the merits of this criticism, the fact that Fred J. Cook either ignored or was unaware of its existence bespeaks either his lack of objectivity or his skimpy knowledge of his subject.

The question of Mr. Cook's integrity is, in itself, an important issue. Thus there is still one more entry to consider. Cook, in addition to his labors for *The Nation* between 1957 and 1959, continued to be employed by the New York *World-Telegram & Sun*, where he worked as reporter and rewrite man for fifteen years.

Cook had coauthored a special, "The Shame of New York," for *The Nation* in October 1959, with Gene Gleason, another *World-Telegram & Sun* reporter. Both were invited to appear with David Susskind on "Open End," a TV panel show. Cook and Gleason insisted that an unidentified New York City official had offered to bribe them to cease their investigation of municipal malfeasance. Their appearance caused a sensation. They were called into District Attorney Frank Hogan's office the next day and requested to document their charges. They retracted them. Both were dismissed from their posts. *Editor and Publisher* (December 5, 1959) quoted Lee B. Wood, Executive Editor of the *World-Telegram & Sun*, to this effect: "Because of their conduct in connection with this TV program and the admission to the District Attorney that they had lied, their usefulness to the paper had been destroyed."

Fred J. Cook, however, did not lack for employment. *The Nation* had been attracted to him, and vice versa, as a result of several articles—one about William Remington, who had been convicted of perjury in 1951 for denying he was a member of the Communist Party; and another which Cook subsequently turned into a book, *The Unfinished Story of Alger Hiss*.

Short of a legal determination, none but Cook and the management of *The Nation* can clarify the motivations behind their use of the Eisenhower "Farewell Address" as a bludgeon to destroy or reduce the effectiveness of our national defense structure. The impact may go beyond the modest circulation of *The Nation*. At least three nationally syndicated columnists have taken material from the Cook thesis, without attribution, to attack the Defense Department.

No one can deny that the existence of a \$50 billion defense budget creates pressures and problems. But, as the sums involved in defense spending continue to grow, the influence of both the military and the defense industry on how this money is distributed is on the wane, rather than on the rise. One may deplore this trend or one may support it, but one cannot deny that it exists.

There is much that the American public needs to know about the defense effort for which it foots the bill. And there is much in it that can be improved. But wild-swinging, spuriously documented, irresponsible smears such as *The Warfare State* serve no useful purpose. They only muddy the waters. Deliberately or not, they divert attention from the fact that the real problem is in the Kremlin, not in the Pentagon.—END

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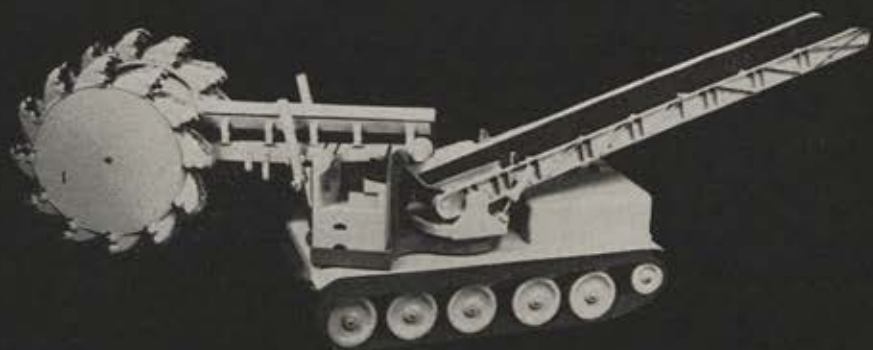


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PROGRESS REPORT ON DEFENSE PRODUCTS FROM CATERPILLAR

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UET (RT) This is a ballastable 4-wheel drive tractor designed for bulldozing, earthmoving and drawbar operations. The Universal Engineer Tractor (Rubber Tired) developed by the Engineer Research and Development Laboratories travels at speeds up to 30 MPH and can be air transported. Its scraper bowl has a capacity of 8 cubic yards. Caterpillar is manufacturing a limited number for the Army, based on the Corps of Engineers design.

LDS-750; LVDS-1100 Developed for use in tactical vehicles, these aluminum compression ignition engines deliver 475 HP and 700 HP respectively from remarkably compact packages. The LDS-750 is a 5 cylinder engine and weighs about 4.2 lbs. per horsepower. The LVDS-1100 has 8 cylinders and weighs 3.6 pounds per horsepower. Both engines use a 5.4 x 6.5 inch bore and stroke. The engines operate smoothly in temperatures ranging from minus 65° F. to 115° F. plus. Caterpillar Engineers developed them in conjunction with Engine Specialists at Ordnance Tank Automotive Command.

UETA Protected with aluminum armor the Universal Engineer Tractor, Armored, will serve as a bulldozer, multipurpose loader, prime mover and personnel-and-cargo carrier. Its distinctive hydro-pneumatic suspension system will provide a smooth ride on or off the highway—at speeds up to 30 MPH. Caterpillar's development contract is with the U. S. Army Engineer Research and Development Laboratories.

CEE A concept study and scale model of the Combat Emplacement Excavator has been submitted, under contract, to the U. S. Army Engineer Research and Development Laboratories. The concept is designed to excavate an emplacement of approximately 100 cubic yards in 15 minutes to provide nuclear blast protection for both materiel and personnel. Highway and cross-country travel speeds are to be 25 MPH and the unit is to be air transportable.

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In this report on the Reserve Forces Seminar held during the AFA Convention in September in Las Vegas, 'Ready Room' finds Air Force leaders are 'sold' on the Air Reserve Forces. But this awareness is lacking at top Pentagon echelons, where . . .

DoD THEORISTS STYMIE THE RESERVES

By Jackson V. Rambeau

AFA DIRECTOR OF MILITARY RELATIONS

EFFECTIVE utilization of the Air Reserve Forces in support of the active Air Force is being stymied by "civilian theorists" in the Department of Defense, it was charged before several hundred Guardsmen and Reservists who attended the Air Reserve Forces Seminar during the AFA Convention in Las Vegas.

The seminar featured key members of Senate and House Armed Services Committees, the men who manage the Air Reserve Forces, and the commanders who employ them.

They included a Republican Senator, Barry Goldwater of Arizona; a Democratic Congressman, F. Edward Hébert of Louisiana; Commander of the Tactical Air Command, Gen. Walter C. Sweeney, Jr.; of Air Defense Command, Lt. Gen. Robert M. Lee; of Military Air Transport Service, Lt. Gen. Joe W. Kelly; and of Continental Air Command, Lt. Gen. Edward J. Timberlake; the Deputy for Reserve and ROTC Affairs to the Secretary of the Air Force, John A. Lang, Jr.; Assistant Chief of Staff for Reserve Forces, Maj. Gen. Chester A. McCarty; and the Deputy Chief, National Guard Bureau, Maj. Gen. Winston P. Wilson.

It is ironic that, after a mobilization in which the Reserve Forces proved themselves so well to active military leaders, they should now be largely hamstrung at the top defense echelon.

Senator Goldwater, a Reserve major general who moderated the seminar, made the point bluntly in summing up the day's remarks.

"Decisions that affect the Reserve have not been determined by Reservists, or by military people who have close relationship with the Reserves," he asserted.

Item. The Reserve Recovery Program.

General Sweeney of TAC and General Lee of ADC emphasized that Reserve recovery capability figures importantly in their plans.

ADC and CONAC are "working together to provide turn-around facilities at selected civilian airfields . . . to ensure that our fighter-interceptors will survive a surprise ballistic missile attack," said General Lee. "I consider this project one of the most important we have in achieving combat effectiveness in the Air Defense Command."

General Sweeney, who followed General Lee to the platform, asserted that TAC "could definitely use recovery squadrons in our dispersal plan."

General Timberlake, CONAC Commander, reported CONAC is working closely with the Strategic Air Command on recovery plans. "I think before the year is out," he said, "we will have the same relationship with them that we have with the other commands."

General Timberlake said he had talked with "sector commanders, region commanders, squadron commanders,"

group commanders. I have asked them: If I could give you any one thing in order to make this program go, what would you want?

"Inevitably," he said, "they come up with the forty-eight drill pay spaces."

Yet, for more than a year, the Department of Defense has blocked development of an effective recovery program by arbitrarily limiting recovery units to twenty-four paid drills a year.

Item. More modern equipment for the Reserve Forces.

"We cannot expect, particularly in the fighter-bomber business, to operate F-84s and F-86s forever," said General Sweeney. Likewise, with the Reserve C-119s, "we should be getting a replacement."

And General Lee reported that the key problem in Air Guard interceptor units is "one of equipment. Follow-on and replacement aircraft are a basic requirement . . . if we expect them to carry their share of the alert load."

"This particular problem," he noted, "is not exclusive with the Guard. Our regular forces are without a follow-on aircraft in production. For the first time in ten years there are no new Air Force weapons in the pipeline for air defense, yet the threat that faces us in the air and in space continues to grow."

Where's the hitch? Said Congressman Hébert, who headed the House Subcommittee that last spring and summer reviewed the Reserve Forces program:

"There hasn't been a single time that the military has asked the Congress for appropriations and money that they weren't given it. It was the Pentagon that stopped them from asking."

Mr. Hébert reported the Reserve's "greatest problem today" is the "attitude of the Pentagon. I am not talking about the individual services," he said. "I am talking about the super-duper organization."

"Increased readiness in Reserve units . . . requires the highest type of morale and dedication—an element not susceptible to measurement by either a slide rule or a computing device. . . ."

Of the major commands using Reserve Forces units, only MATS seemed to be in relatively good shape.

MATS's Commander, General Kelly, reported that MATS employs a total of 221 Reserve Forces units, which, with individual Reservists, brings its authorized Reserve augmentation strength to 39,000.

"Without question," General Kelly said, "keeping Reserve reflexes conditioned and sharp for sudden reentry is one of the major military problems. . . . I want to be on record as stating that the response of our Air Reserve Forces for the past twenty-four months, and especially over



Sen. Barry Goldwater



Rep. F. Edward Hébert



On hand to greet Capt. Earl A. Mead, right, Pittsburgh, Pa., when he won Ricks Trophy in ANG F-102 event, are, from left, John A. Lang, Jr., Deputy to AF Secretary for Reserve Forces; Maj. Gen. C. A. Shoop, California ANG Cmdr.; and Brig. Gen. I. G. Brown, ANG Chief in Guard Bureau.

this last difficult year, has proved conclusively that the problem is being solved."

General Lee explained that, in ADC, the Reserve Forces are utilized in three major areas—individual Reserve augmentation personnel, Air National Guard units with active air defense missions, and Reserve recovery units.

Twenty-three Air Guard interceptor squadrons and three radar squadrons are assigned to ADC, he said. "Their response to . . . alert status requirements and to our inspection system has been gratifying."

He reported the 146th Fighter-Interceptor Squadron of Pittsburgh, Pa., received an Outstanding rating from ADC's operational readiness inspection team. Throughout ADC, he said, only two or three such awards are made in a year. That rating was borne out when the 146th won the Ricks Trophy competition this year (see p. 104).

(Continued on following page)



Lt. Gen. Joe W. Kelly, MATS Commander, was one of four major commanders to address the Reserve Forces Seminar. He also was awarded an AFA Citation of Honor for his "inspiring leadership" of Air Guard transport units mobilized in 1961. A panel to aid speakers in answering questions from the audience included Maj. Chester E. McCarty, left, Assistant Chief of Staff for Reserve Forces; Maj. Gen. W. P. Wilson, Deputy Chief, National Guard Bureau; and John A. Lang, Jr., Deputy to the Air Force Secretary for Reserve Forces.



Gen. Walter C. Sweeney, Jr., TAC Commander, receives Citation of Honor from AFA President Joe Foss for work with Reserves Forces in call-up.

Mrs. Jacob T. Battenberg, Jr., whose husband was killed in C-124 crash, accepts Citation of Honor commemorating those who died on active duty.



Brig. Gen. Rollin B. Moore and Col. Tom Marchbanks accept AFA trophies for their Troop Carrier Wings, named year's outstanding Reserve units.



Work of AFA's Airmen Council drew praise at Las Vegas. Here MSgt. Francis E. Nowicki, Council chairman, second from the right, and MSgt. Emery P. Kertesz, Jr., discuss plans with AFA's Board Chairman, Joe Foss, left, and the Air Force Association's new President, John B. Montgomery.

General Sweeney said the outstanding performance of Reserve Forces units in last year's callup had given him "confidence in your ability to come through in the clutches."

He listed three main problems facing his Reserve Forces.

First, he said, is to get units organized properly to handle the tasks they're called on to face. With assistance of the National Guard Bureau, CONAC, and Air Force headquarters, this problem is under control.

The next, he said, is that Reserve Forces should be authorized one hundred percent manning to "prevent the last-minute shuffle for people that we experienced in the last mobilization." The third is equipment.

General Timberlake, in his remarks, gave no indication that he considers CONAC a short-lived command.

"What do we do with the Reserves?" he asked.

"We can keep the present setup, which I don't particularly like—where we have favored, and not so well favored, units. We have changing programs. We have a dilution of effort. This I think needs changing.

"Another alternate solution would be to divide the Reserves and spread them out with all the commands. I don't believe this is feasible.

"The third alternative—and the one I favor—is to create a strong military force with solid missions and the personnel necessary to carry them out. This would be my goal in CONAC."

Congressman Hébert, winding up the seminar in a sparkling commentary that mixed humor with pungent criticism, suggested that the Defense Department "stop juggling our Reserve Forces as we would a stack of poker chips. . . . Let's develop a pat hand of stable, active, and ready Reserve Forces and stick to it. . . .

"The Congress will, in my judgment, be required to eliminate the present uncertainty as to the size of our future Reserve Forces by establishing a statutory requirement that certain minimum force levels under drill pay status is maintained in each of the Reserve components."

Five Ms Win Reserve Forces Trophies

Unless your last name began with an M, you didn't stand a chance in Air Reserve Forces competitions held in conjunction with the 1962 AFA Convention.

Capt. Earl A. Mead, flying for the 146th Fighter-Inter-

ceptor Squadron, Pittsburgh, Pa., won the Air Guard's Ricks Trophy in an interceptor meet at Tyndall AFB, Fla., climaxed by a redeployment run to McCarran Field in Las Vegas. Seven ANG F-102 squadrons participated.

The Air Force Reserve's Troop Carrier Trophy went to a crew led by Capt. V. W. Moore of Milwaukee, Wis. Team members were Maj. W. R. Berg, Minneapolis, co-pilot; Capt. G. A. Piper, Milwaukee, navigator; SSgt. M. E. Adams, Milwaukee, engineer; TSgt. R. E. Olson, Minneapolis, loadmaster; and Maj. R. L. Maggart, Bakalar AFB, Ind., instructor pilot.

The Ricks event has been a feature of AFA Conventions for the past eight years. This is the first year for AFA's Reserve Troop Carrier event.

To qualify for the AFA Reserve Trophy, three crews from each Reserve C-119 wing competed in the sixth annual troop carrier meet at Ellington AFB, Tex., earlier in the week.

The top crew of each wing then staged at Luke AFB, Ariz., for a precision cargo drop over TAC's Indian Springs, Nev., weapons range. Umpires in each aircraft rated crews on flight procedures and drop accuracy.

Trophies were presented to Captains Mead and Moore before an audience of 5,000 during the spectacular AFA Honors Night in the Las Vegas Convention Center auditorium on September 21.

At the Reserve Forces Seminar that afternoon, Ben Fridge, Special Assistant to the Secretary of the Air Force for Manpower, Personnel and Reserve Forces, presented trophies to Brig. Gen. Rollin B. Moore, Commander of the 349th Troop Carrier Wing, Hamilton AFB, Calif., and Col. Tom Marchbanks of the 433d Wing, Kelly AFB, Tex., as commanders of the Reserve's outstanding units, and the Air Guard outstanding unit trophy was accepted by Lt. Col. Jesse Mitchell, Commander of the 104th Tactical Fighter Squadron, Baltimore, Md.

The finish of the Ricks and Troop Carrier events was timed to coincide with ceremonies dedicating new facilities at McCarran Field in Las Vegas. Mr. Fridge introduced the winners and awarded plaques for second, third, and fourth place.

Runners-up in the Ricks event were Capt. Wallace Green, Jr., of the 159th Fighter-Interceptor Squadron, Jacksonville, Fla., who placed second; 1st Lt. Ritchie Kunichika, 199th FI Squadron, Honolulu, Hawaii, third; and Maj. Jack Burden, 111th FI Squadron, Houston, Tex., fourth.

Second place in the Troop Carrier event went to General Moore's 349th Wing of Hamilton AFB. Third was the 452d Wing of March AFB, Calif., and, fourth, the 403d Wing, Selfridge AFB, Mich.

Sweeney, Kelly, Battenberg Cited

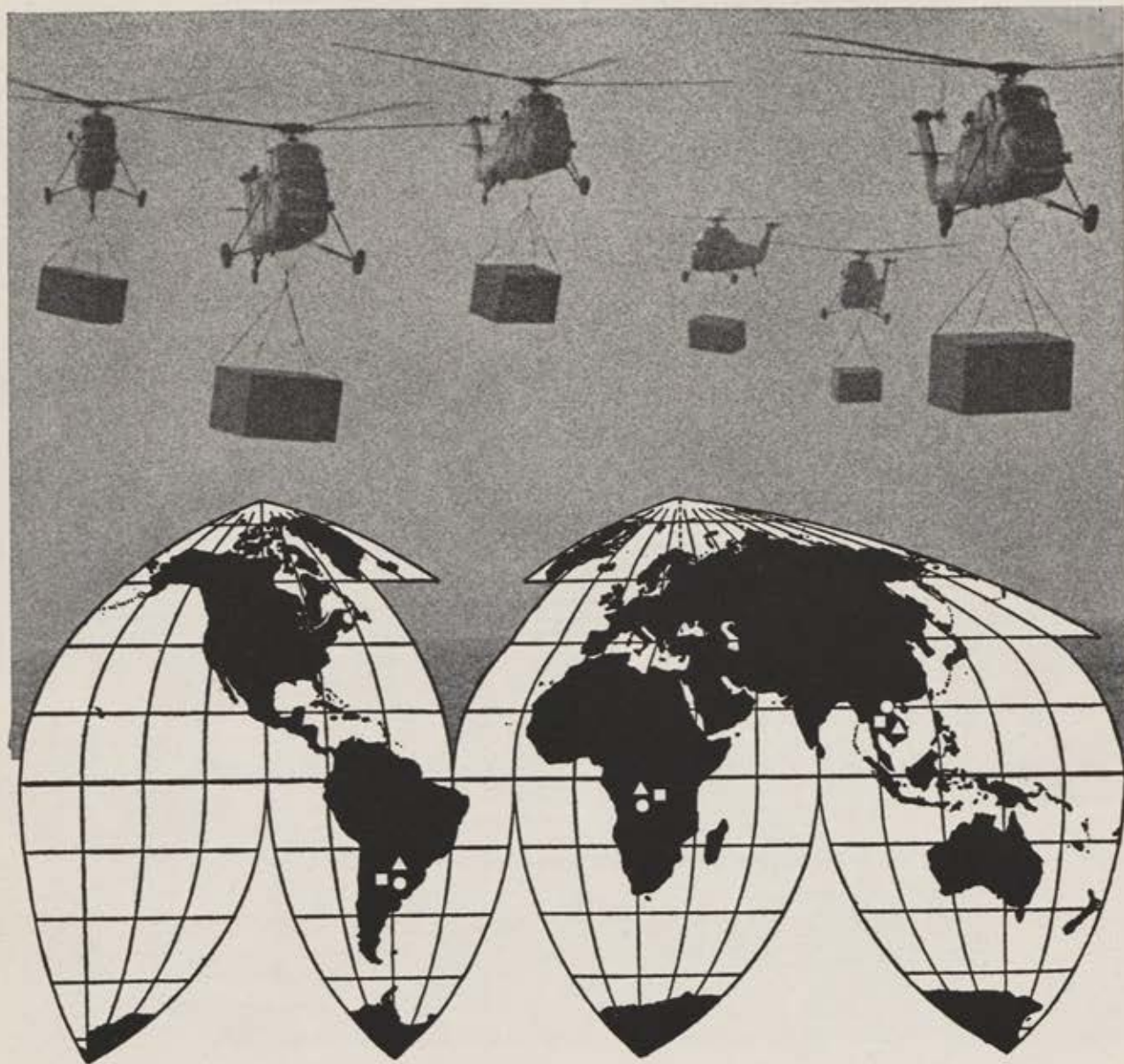
In commemoration of Air Reserve Forces personnel who gave their lives on active duty in the Berlin mobilization, AFA's Citation of Honor was posthumously awarded to Maj. Jacob T. Battenberg, Jr., of Raytown, Mo., during the Reserve Forces Seminar at Las Vegas.

The award was presented to Major Battenberg's widow by Joe Foss, Chairman of AFA's Board of Directors.

Major Battenberg was cited "in commemoration of those members of the Air Reserve forces recalled to active duty in the Berlin crisis who, like himself, gave their lives in defending the cause of freedom."

Last December, with a crew of six, he took off from Richards-Gebaur on a cargo mission. The C-124's engines quit. There were no survivors.

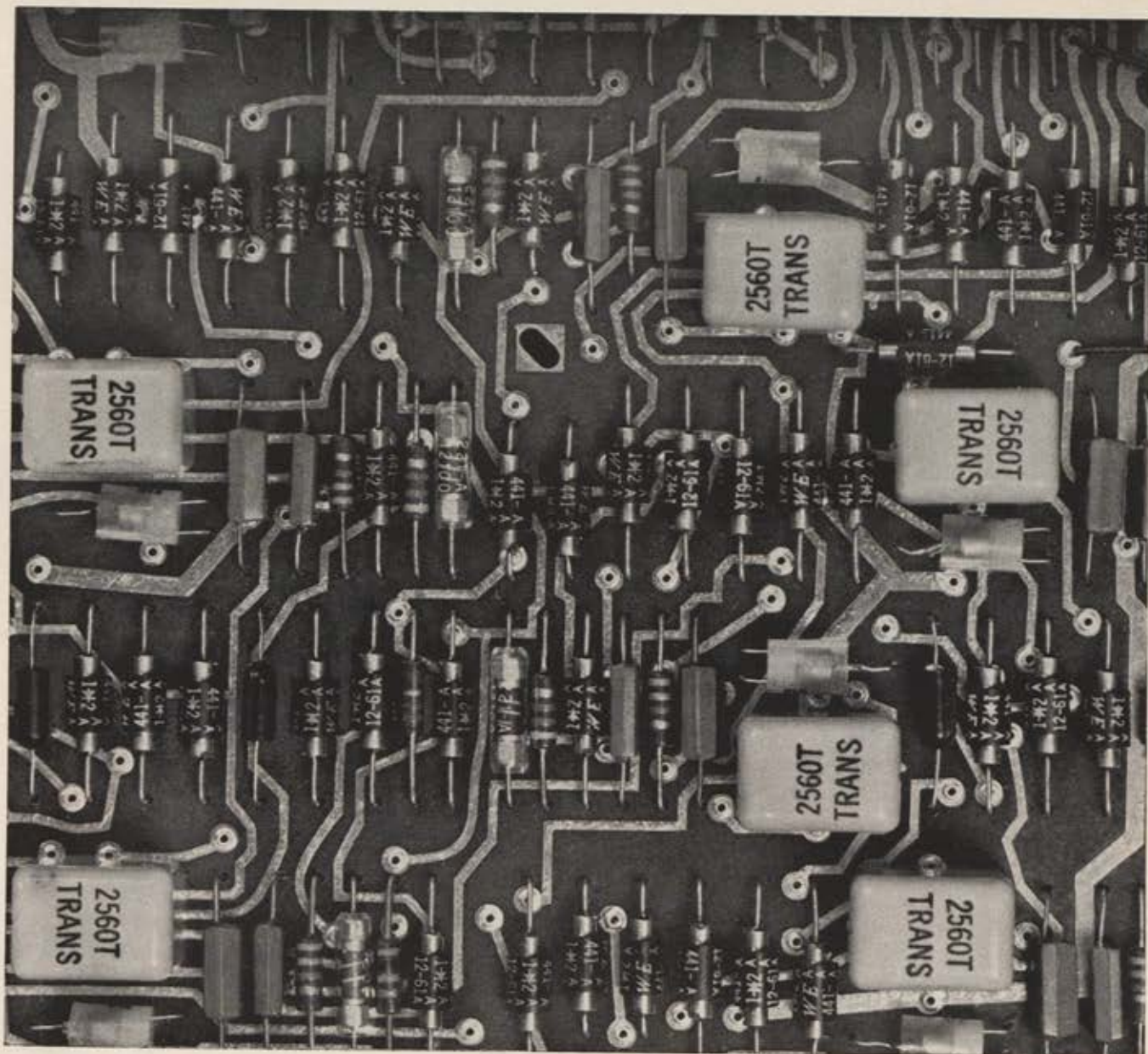
(Continued on page 107)



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AFA Citations of Honor were also presented to Gen. Walter C. Sweeney, Jr., Commander of the Tactical Air Command, and Lt. Gen. Joe W. Kelly, Commander of the Military Air Transport Service, for their leadership in integrating recalled Reserve Forces units with their active forces.

AFA Resolutions on Reserve Forces

A resolution urging the President, the Congress, and the Secretary of Defense to "take cognizance" of the serious aircraft equipping deficiencies in the Air Reserve Forces was one of five resolutions approved by AFA delegates at the Las Vegas Convention.

The resolution called for "immediate procurement actions which will provide and maintain modern up-to-date equipment in our Air Reserve Forces concurrently with that of the regular military establishment."

In other resolutions pertaining to the Reserve Forces, AFA:

- Expressed "its sincere appreciation to the members of the Air National Guard and Air Force Reserve who served their nation with such dedication and competence" on active duty in the Berlin crisis, and urged the Department of Defense and USAF "to continue to make available the resources necessary to capitalize further on the capabilities of the Air Reserve Forces so as to derive maximum military effectiveness at minimal cost."

- Asked the Secretary of the Air Force "to expand the mission of the Air Force Recruiting Service to make it responsible for recruiting personnel for the Reserve Components" and suggested as an interim measure that USAF set up a two-week course "to train selected members of the Reserve components in the art of recruiting. . . ."

- Called for an expansion of Air Reserve Technician manning to cover all Reserve Category A units. The resolution noted the Air Guard is authorized technicians for such support units as communications and food service, while Reserve technicians serve only flying units and directly associated support units.

- Recommended "that legislation be enacted to establish the office of an Assistant Secretary of Defense for Reserve Affairs." Reserve matters are now under the Assistant Secretary of Defense (Manpower), whose "multiplicity of responsibilities . . . precludes effective representation of Reserve problems."

Reenlistment Bonus Gains Ground

The DoD-level Reserve Forces Policy Board is reported to have unanimously recommended a reenlistment bonus for all Reserve Forces.

This is the latest development in the reenlistment bonus proposal originated by AFA's Airmen and Guard Councils.

Lt. Gen. Edward J. Timberlake, CONAC Commander, and Lt. Gen. Robert M. Lee, Commander of ADC, also recommended the Reserve reenlistment bonus at AFA's Reserve Forces Seminar.

Job Conference Set for Retired Personnel

Plans for a National Conference on Utilization of Retired Military Personnel in Washington on December 17, sponsored jointly by the Department of Labor and AFA, were worked out in Las Vegas during the Convention.

Secretary of Labor W. Willard Wirtz and Secretary of the Air Force Eugene M. Zuckert will lead off the meeting. Top representatives will be present from the White House,

Col. Charles F. Bock, career Reservist, once a private in the Pennsylvania Guard, is new Secretary of USAF's Air Reserve Forces Policy Committee.



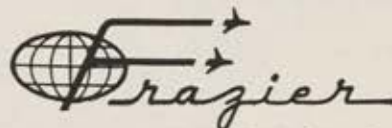
the Civil Service Commission, and from management and labor in the defense industry.

Lt. Gen. William E. Hall, USAF (Ret.), chairman of AFA's Retired Council, emphasized that the discussion on employing retired personnel will cover airmen as well as officers of all services.

The date of December 17 was chosen because the annual Wright Brothers Dinner on that day brings to Washington many leaders of the aerospace industry who will be available to discuss their personnel needs.—END

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Las Vegas was the Aerospace Capital of the nation during the AFA Convention held there during September. In a meeting called 'the biggest and best' in AFA's sixteen-year history, the Delegates worked hard and well, electing officers, hammering out a Statement of Policy, and turning out a series of resolutions . . .

WHAT THE DELEGATES DID

By Gus Duda

AFA ORGANIZATION DIRECTOR

ALMOST without exception, the registrants at the 1962 National Convention and Aerospace Panorama called it the biggest and best of the Association's sixteen-year history. Biggest it certainly was, with a record 4,600 registrants and the entire city of Las Vegas jammed to the rafters. And there is little doubt it was the best, from any viewpoint.

John B. Montgomery, Murray Hill, N. J., a former member of the Board of Directors, was unanimously elected President, succeeding Joe Foss, who moved to Chairman of the Board. Montgomery is President of the Daystrom Corp. in Murray Hill, and is active in the Air Force Reserve program as a major general, with a mobilization assignment to SAC Headquarters. His last active-duty slot was Commander of SAC's Eighth Air Force, then headquartered at Carswell AFB, Tex.

George D. Hardy, College Park,

Md., was reelected as Secretary, while Paul S. Zuckerman, New York, N. Y., was chosen Treasurer, succeeding Jack B. Gross, Harrisburg, Pa. Thos. F. Stack, retiring Board Chairman, becomes a permanent member of the Board of Directors, which now numbers fifty-one members.

Nine new Vice Presidents were named by the Delegates, joining three incumbents. Ten new National Directors were elected to the Board and eight others returned for a new term of office. All new officers are listed on the facing page.

Eighteen resolutions were ground out by the hard-working delegates during the business sessions, which were chaired by George Hardy. The resolution which engendered the most discussion, and which was eventually approved, concerned the proposal to amend the Constitutional requirement for regular membership. This membership category was formerly avail-

able only to those individuals who qualified through prior service in the USAF or a predecessor service, or who were in the Air Force Reserve or Air National Guard program. With the amendment, regular voting membership now is open without this qualification, so long as the applicant is an American citizen not on active duty with the armed forces and is interested in furthering the aims and objectives of the Air Force Association.

A Service Member category is still available for those individuals on active duty with the armed forces, while the qualifications for Cadet Membership remain as they were, i.e.: Cadet status in AFROTC, Civil Air Patrol, or the Air Force Academy. An Associate Member category also remains, for noncitizens who are individually approved for membership by the Board of Directors.

The Delegates also approved a hard-hitting Statement of Policy, which had been drafted by the Policy Committee and the Board of Directors. The full text of the 1962 Statement of Policy appears on page 9 of this issue.

Convention appointments announced by President Joe Foss at the opening business session, in addition to Hardy, included Martin M. Ostrow, Los Angeles, Calif., Parliamentarian; Carson P. Sheetz, Sacramento, Calif., Chairman of the Credentials Committee; and Glenn D. Mishler, Akron, Ohio, Inspector of Elections.

Assisting Sheetz were Cameron S. Orr, St. Louis, Mo., and Joe Shosid, Fort Worth, Tex. Acting as tellers under Mishler's direction were Kenneth Banks, Akron, Ohio; Harold Bates, Milwaukee, Wis.; Carroll Biggs, Alexandria, La.; Willard Dougherty, New York, N. Y.; Fred Edwards, Mobile, Ala.; Roger Ellis, Erie, Pa.; Leonard Luka, Evergreen Park, Ill.;



Carson P. Sheetz, Credentials Committee Chairman, makes his report certifying the official Delegates for 1962. AFA officials at the Speaker's Table include President Joe Foss, Secretary George Hardy, and Board Chairman Tom Stack.

Earle N. Parker, Fort Worth, Tex.; John Russo, Palisades Park, N. J.; Arthur Stump, Jr., Lynchburg, Va., and Kenneth Wander, St. Charles, Mo.

Organizational awards recognizing outstanding service to AFA were presented to twenty-one individuals and five units. Top individual award went to Julian B. Rosenthal, New York, N. Y., in tribute to his many years of devoted service to the organization. He received the Gold Life Membership Card, only four of which have been presented by AFA.

Arthur C. Storz, Omaha, Neb., and Jack B. Gross, Harrisburg, Pa., received Special Citations, while Exceptional Service Plaques were presented to Carl C. Alford, Glendale, Calif.; John L. Beringer, Jr., Pasadena, Calif.; N. W. deBerardinis, Shreveport, La.; Maxwell A. Kriendler, New York, N. Y.; W. Randolph Lovelace II, Albuquerque, N. M.; Ronald B. McDonald, San Pedro, Calif.; and M. L. McLaughlin, Dallas, Tex.

AFA Medals of Merit went to L. A. Fargher, Lompoc, Calif.; James P. Grazioso, West New York, N. J.; Edwin T. Howard, Jr., St. Ann, Mo.; Nathan Lane, Paterson, N. J.; Maj. James Laulis, Barksdale AFB, La.; Truman E. Mellies, St. Louis, Mo.; Martin Ostrow, Los Angeles, Calif.; Richard L. Painchaud, Los Angeles, Calif.; Earle Parker, Fort Worth, Tex.; Joe Shosid, Fort Worth, Tex.; and Gordon E. Thiel, DeWitt, N. Y.



This year's business sessions moved along with unusual speed and effectiveness. Here's an over-all look at the hard-working delegates in action.

AFA's Presidential Trophy, annually presented to the top AFA unit in the nation, went to the Fort Worth Squadron, and was accepted by John Long, Vice Commander. Other unit plaques were presented to the Ak-Sar-Ben Squadron, Omaha, for Membership Development; San Diego, Calif., Squadron, for Squadron Programing; the Utah Wing for Wing-level Programing; Syracuse, N. Y., Squadron, for Community Relations; and the Boise Valley, Idaho, Squadron, for Aerospace Education efforts.

The 1963 National Convention is scheduled to be held in Washington,

D. C., September 11-15. Program details and housing information will be published in these pages in succeeding issues. We suggest you watch for them and plan to attend.

* * *

The Dayton, Ohio, Wright Memorial Squadron (see cut) participated in the annual Science and Engineering Symposium sponsored by the Aeronautical Systems Division of AFSC, held September 25 at Wright-Patterson AFB. George A. Gardner, Squadron Commander, presented four awards to the authors of the win-
(Continued on page 111)

AIR FORCE ASSOCIATION'S NEW LEADERS FOR 1963

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George A. Gardner, Dayton Squadron Commander, left, with winners of plaques sponsored by Squadron for best papers in the Aeronautical Systems Division (AFLC) annual Science and Engineering Symposium (see text).

ning scientific papers. Recipients were Dr. H. R. Velkoff, Electric & Advanced Propulsion Branch, Propulsion Laboratory; Wilbur Hankey and Grover Alexander, both of the Aerodynamics Branch; and Frederick T. Rall, Jr., assigned to the B-70 Engineering Office. The awards were in the form of plaques, designed and fabricated by the Squadron.

Twenty-nine papers were presented at the Symposium, which was opened by Maj. Gen. R. G. Ruegg, ASD Commander, with Dr. John Keto, Chief Scientist at ASD, as Chairman.

The latest Squadron to receive a Charter in AFA flew its application to Las Vegas for consideration at Convention time. Col. Mark Gilman, USAFE Director of Information, who is a Charter Member of the unit, brought the application with him from Germany. The Association's newest addition is located in Wiesbaden, and the unit came to life principally because of the interest and effort of Maj. Richard Schaller, who is sta-

tioned there. He is a long-time worker for AFA and before this duty tour was stationed at the AF Academy.

Myles Abramson, a civil-service USAF employee, was elected Commander. Other officers selected were Tom Hamara, Vice Commander; Donald A. Hughes, Secretary; John Larson, Treasurer. Named to a special Advisory Council were Major Schaller; Lt. Col. William W. James, of the USAFE Information Office; William Wendt; and Les Murray.

(Continued on following page)

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One of CSC's space support systems, produced for NASA's Goddard Space Flight Center, is the Minitrack Digital Command Console.

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The 1962 Outstanding Airman of USAFE, CMSgt. Ross McEuen, and Mrs. McEuen, receive congratulations from Myles J. Abramson as they depart for Las Vegas. Abramson is Commander of AFA's newest Squadron, in Wiesbaden, Germany (see text) with most of the members stationed at USAFE Headquarters located there.



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AFA NEWS ————— CONTINUED

Other than the Mexico City Squadron, this is the only AFA unit active outside the United States, and Major Schaller advises us that the interest is so high he hopes other European Squadrons will soon exist. In fact, he is optimistically inviting Stateside AFAers to mark their calendars for the "First European AFA Convention" in 1963.

Thos. F. Stack, AFA National President for 1960-61 and immediate past Board Chairman, was busier than most registrants during the Convention held in Las Vegas. He arrived on Sunday, participated in the Resolutions Committee meeting all day Monday, a special meeting Tuesday morning, and then flew to Vandenberg AFB, Calif., for a luncheon commemorating the US Air Force Anniversary, at which he was guest speaker. Immediately after his appearance at Vandenberg, Stack returned to Las Vegas for the AFA get-together.

The 435th Troop Carrier Wing, Air Force Reserve, was recalled to active duty on October 1, 1961, during the Berlin callup. In celebrating its return to "civilian life" on August 20, 1962, AFA's Miami, Fla., Squadron participated in "Flamingo Wing Day" at Homestead AFB. Following a Wing review and tour of the base, the Squadron members and guests attended a luncheon held in honor of the 435th's Commander, Col. Forrest R. Harsh. During the event an oil portrait of Colonel Harsh was presented to the unit (*see cut*).

Colonel Harsh is well remembered by many AFA registrants at the 1959 National Convention in Miami Beach, where he contributed much to the success of the event as military co-host.

—GUS DUDA



Col. Forrest Harsh, third from left, and Col. Jackson Flowers accept portrait of Colonel Harsh from officials of the Miami AFA Squadron. Presentation was made on return to inactive status of famous "Flamingo Wing" (435th Troop Carrier Wing, USAFR), following its recall for the Berlin emergency. The AFA Squadron purchased the portrait from a Swiss artist.



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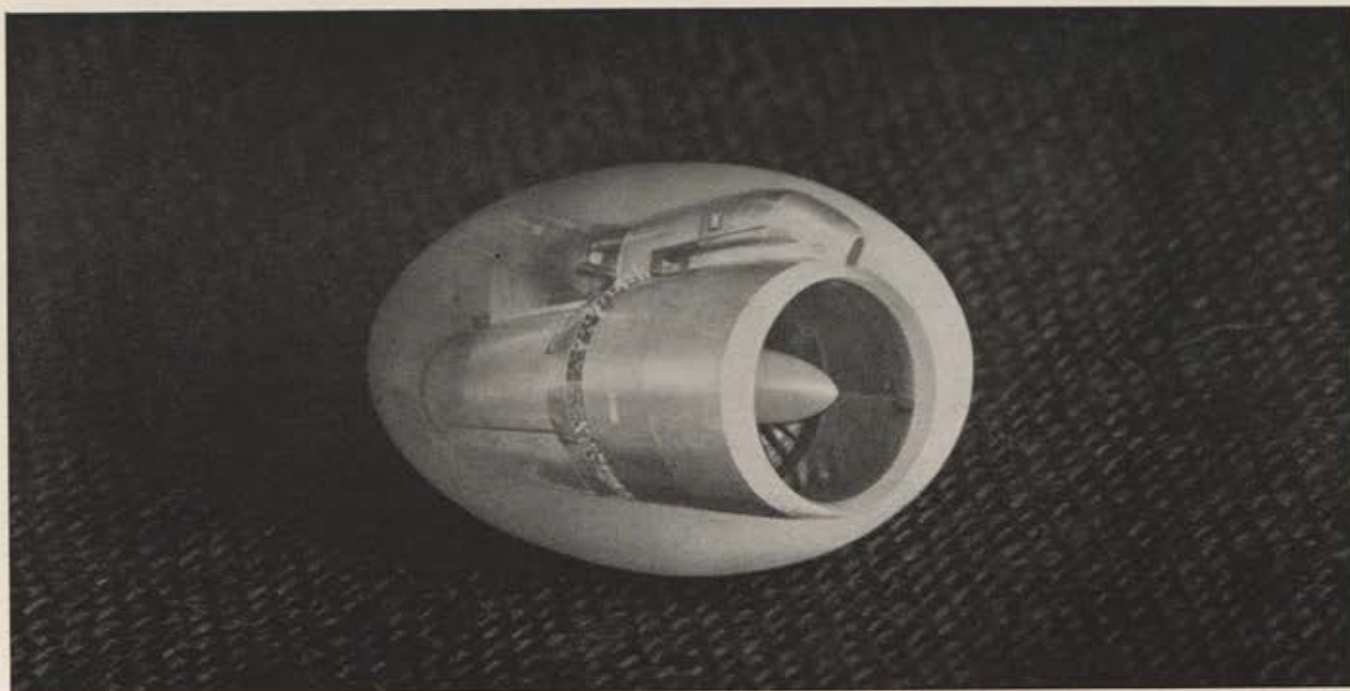
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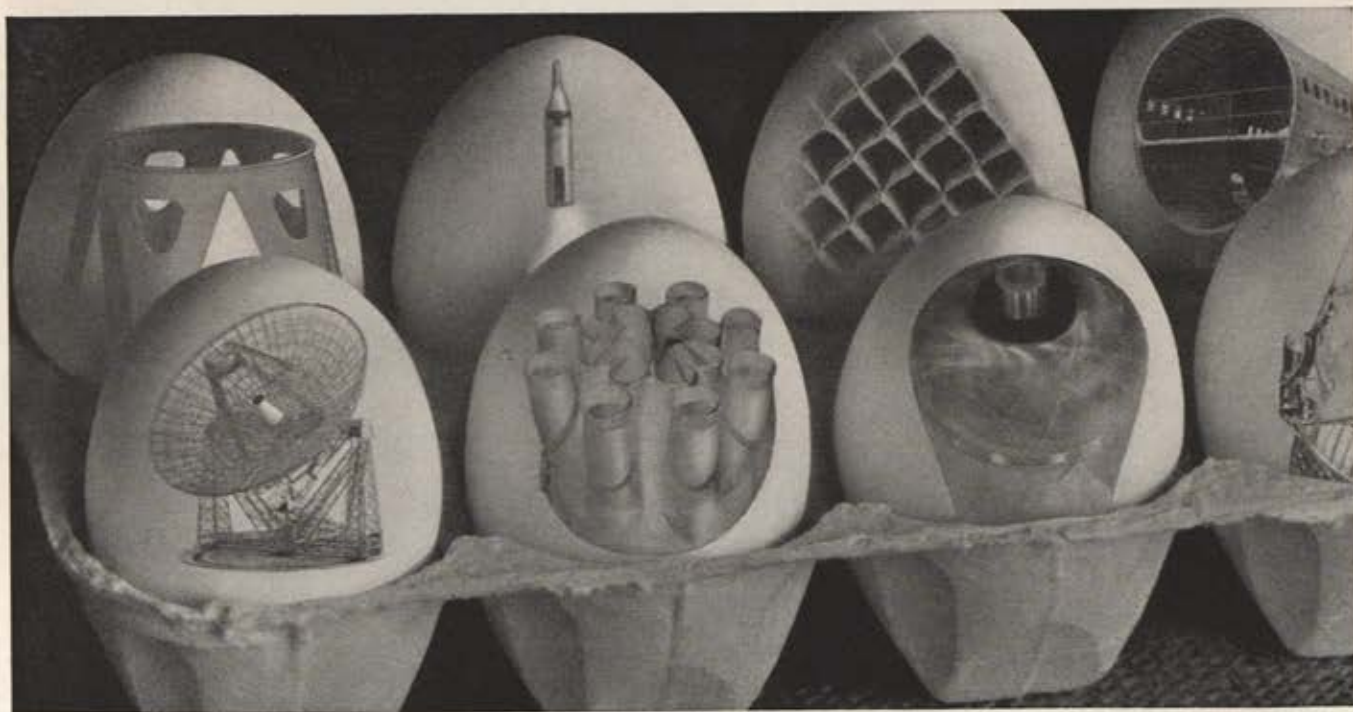
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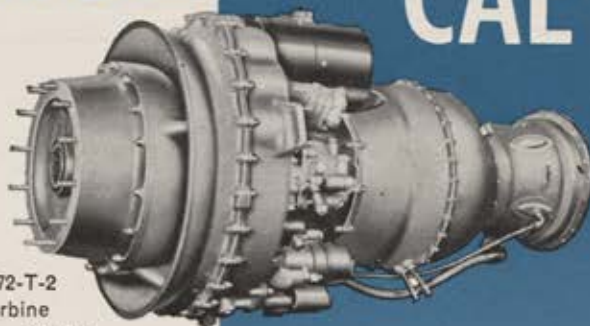
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- To preserve and foster the spirit of fellowship among former and present personnel of the United States Air Force.

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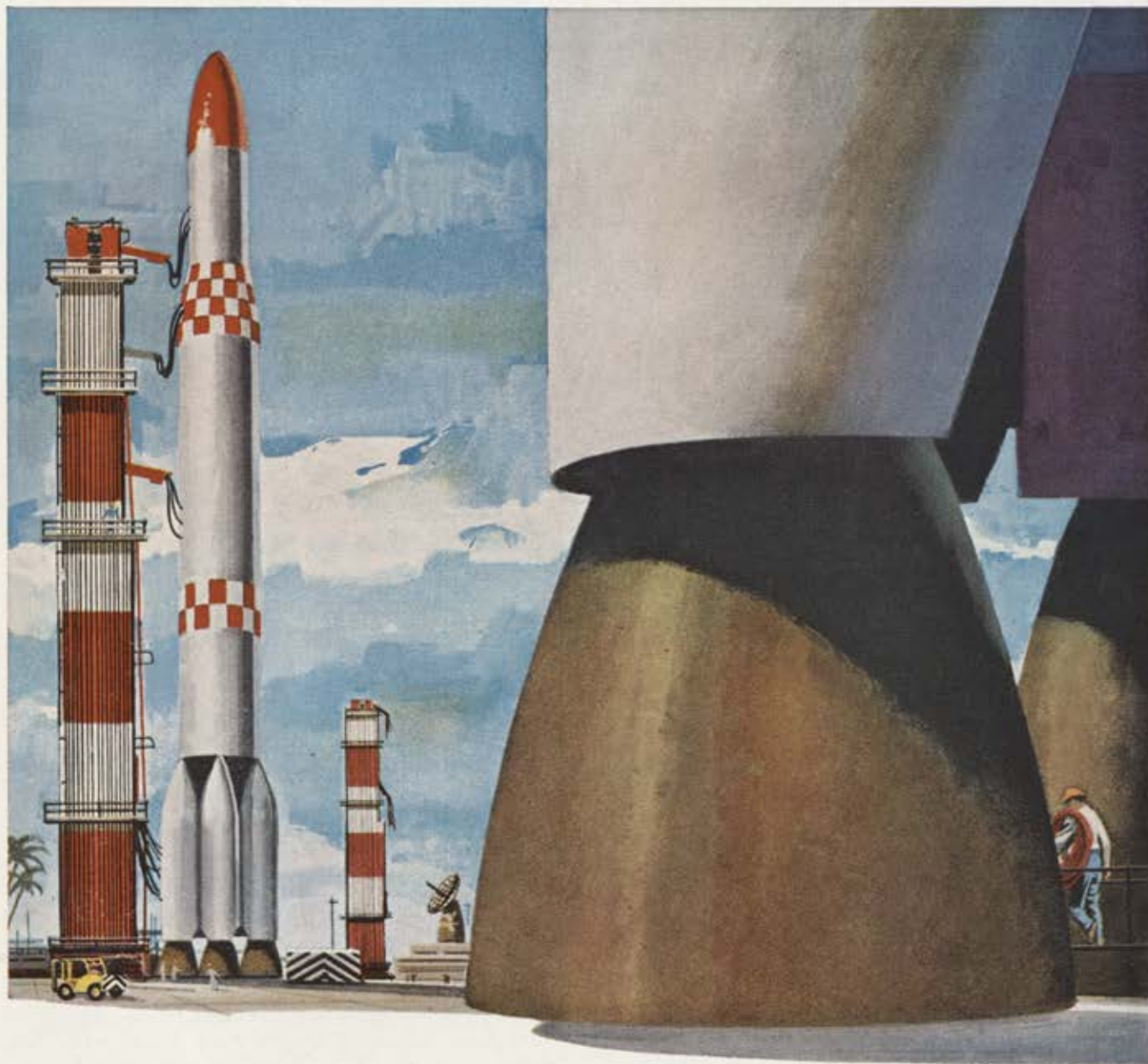
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