

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

July 1956 • 35c

SOLVING THE ROLES AND MISSIONS MUDDLE

ALSO IN THIS ISSUE:

How to Insure Your Flight Pay

Let's Take an Impartial Look at Our Weapons Systems

The British Defense Budget





ACES ... back to back

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SYSTEMS CAPABILITY

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For systems work, at the discussion stage particularly, you must look beyond narrow fields of capability. The norm should be a company's past and present performance in all the technical fields and branches of industrial science systems work calls upon today.

The more deeply rooted you are in all the things of which systems are comprised, the better able you are to produce completely dependable systems.

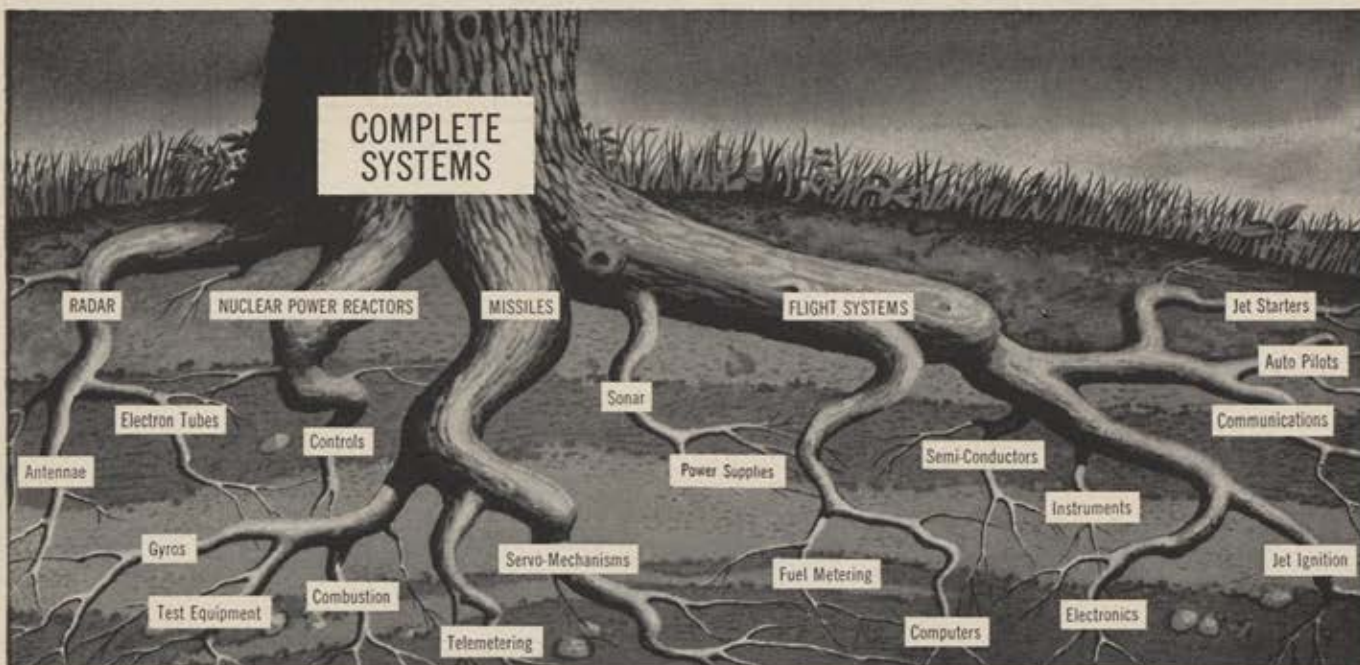
Bendix has an engineering and research staff of over

9,000 with an exceptionally broad range of technical abilities.

Over \$80 million was expended on engineering and research functions in fiscal 1955.

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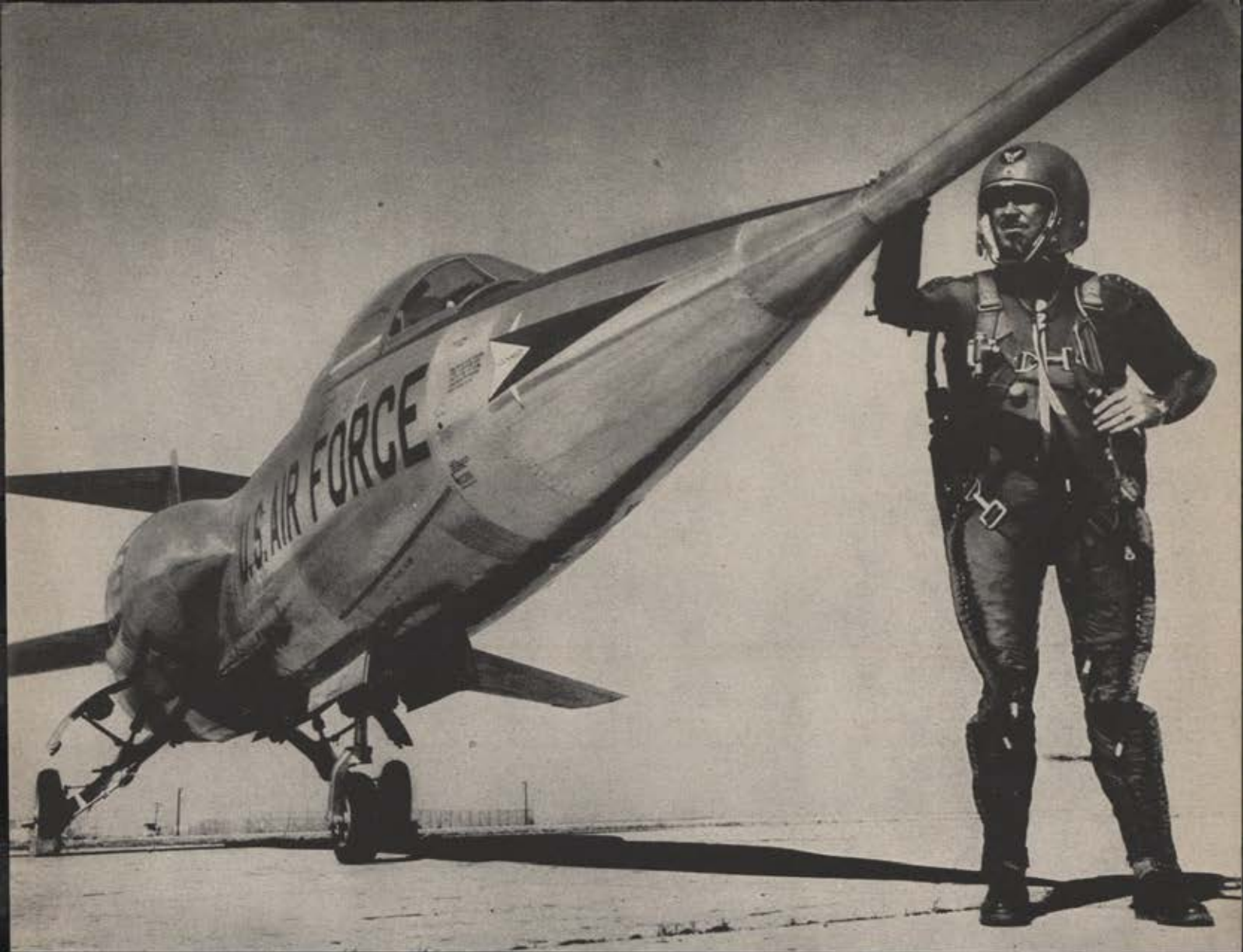
WORLD'S FASTEST FIGHTER POWERED BY NEW G-E J79 TURBOJET

In quantity production for USAF's Lockheed F-104A, General Electric J79 delivers most thrust per pound of any engine in its power class



J79 TEST BED RUN-UP. Emphasizing fast development, G-E engineers brought the entirely new J79 jet engine from draw-

ing board to hardware in record time. Close G-E teamwork with USAF helped cut entire year from development cycle.



F-104A HIGH SPEED AND LOW WEIGHT ARE DUE IN LARGE PART TO G-E J79'S SMALL SIZE, HIGH THRUST OUTPUT.

Potent new addition to the U.S. Air Force's might, the ultrasonic Lockheed F-104A is an extremely versatile aircraft. It is equally effective as a light-weight day fighter or as an interceptor. Rugged ground-support missions are also within its operational scope.

The spectacular design features of the F-104A demand a versatile engine: light weight, efficient, powerful. And today, the F-104A has that engine—General Electric's new J79.

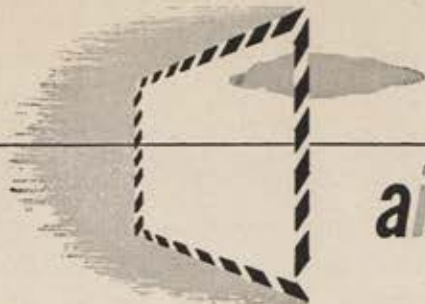
Outstanding performance is built into this new G-E turbojet. The J79 incorporates radical new features which assure efficient operation at both sub- and

supersonic speeds. It delivers more thrust per pound of engine weight than any other jet in its power class. It is now in quantity production at General Electric, where more than 30,000 G-E J47's and J73's have been produced since 1948.

"The J79, with its light weight and high thrust, was selected for the F-104A because it was the only engine that would give the aircraft this much performance," states Robert E. Gross, Lockheed President. Teamed with the F-104A, the J79 permits still another dynamic step forward in American airpower. General Electric Company, Cincinnati 15, Ohio. 235-6

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air mail

Originated in England

Gentlemen: Just received the June issue and, as usual, enjoyed it very much. There is, however, one discrepancy in "Air Mail" which I would like to clear up. Mr. Clyde E. Bourke, Jr., of Flight Refueling, Inc., states that the probe and drogue system of aerial refueling was developed by Flight Refueling, Inc., Baltimore, Md. He is right about the company; however, it (the system) was developed by the parent company in England, not Maryland. The Maryland company was formed some years after the probe and drogue system had been in continuous operation in FEAF. How do I know? I was in FEAF, driving one of those KB-29s, with probe and drogue, when the Maryland outfit went into operation. I might add that we were all happy to hear of it, since it meant we'd eventually get US-made equipment, which is easier to maintain with US tools than British equipment with US tools.

This is not meant to cast any reflections on Mr. Bourke, who is somewhat misinformed. Just thought I'd like to see credit given where due.

Capt. Alvin B. Dyck
Fort Collins, Colo.

Fifth Air Force

Gentlemen: We have just received the May '56 issue of our AIR FORCE Magazine. As usual, it has been read from cover to cover with great interest and enjoyment. I think your current series featuring the major commands, such as SAC and TAC, is a wonderful idea. It is a shame that more Americans don't read the magazine because AIR FORCE carries a message that should be known to all. Perhaps a few more plugs by Arthur Godfrey like that one mentioned in "Shooting the Breeze" will swing the trick.

There was one item in this issue that diluted somewhat our enjoyment of the magazine. The double-page spread entitled "TAC in Korea—A Look Backward," caused some distress and dismay here in the Fifth Air Force. Your cut lines and copy either state or imply that the air war in Korea was carried on by the Tactical Air Command, but no mention was made of the fact that these tactical air oper-

ations were carried out by the Fifth Air Force (the only US Air Force with experience in jet combat operations).

The historic fact is that Fifth Air Force conducted all phases of the air war in Korea throughout the entire Korean Campaign, June 1950 to July 1953, except for heavy bomber operations which were carried on by Bomber Command, a FEAF organization, and Thirteenth Air Force in the Philippines, using B-29 aircraft under escort of Fifth Air Force fighter aircraft.

Tactical units which participated in the Korean air war did so under direct control of Fifth Air Force to which they were assigned during the period in question. This assignment effectively separated these units from TAC, and their crews and aircraft were identified as belonging to Fifth Air Force.

It was Fifth Air Force which developed the UN Air Order of Battle and committed these elements to combat action.

It is not our intention to detract in any way from the importance of TAC or the training it has given to many of our personnel. We simply wish, in the interest of historical accuracy and because we of the Fifth Air Force are proud of our record, to present the facts.

Maj. Thomas M. Ellington
Hq., Fifth Air Force
APO, San Francisco, Calif.

Services on the Tower

Gentlemen: I enjoyed very much reading Mr. Winchester's article on the Texas Tower [May '56], and was very much surprised to see my name there as the Chaplain who visits the tower once a month. Actually the visits to the tower will be accomplished by

two chaplains, Chaplain (Maj.) Raymond F. Coleman (Catholic) and myself (Protestant). At this time, neither of us has visited the tower; however, our visitations will start this month. We each will hold services for our own faith.

I think it should be clarified that we do not hold "non-denominational" services in the Air Force, but under the three major faiths, Protestant, Catholic, and Jewish.

Let me assure you of my appreciation of mentioning our Chaplains' work in your article.

Chaplain (1st Lt.) J. E. Davis, Jr.
Otis AFB, Mass.

AACS Request

Gentlemen: In reference to that TAC fan from Hampton, Va., in your May '56 issue, how about the Airways and Air Communications Service outfit? Since it's about the most important communications outfit in the Air Force, let's hear something about it and its role Air Force-wide.

How about a photo layout of AACS installations, overseas, such as Alaskan remote outposts, and stateside?

Hope to hear something of our outfit soon in AIR FORCE mag.

A/2C Frank Goldner
Seattle, Wash.

One for the Cadets, Too

Gentlemen: In my opinion AIR FORCE Magazine is the best publication of its kind which tries to bring to the American public the mission of airpower. My hat is off to the editors and writers for the fine job they've done. Here's to a bigger and better AIR FORCE.

Would like to see a feature article on the USAF aviation cadet training
(Continued on page 7)

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and carry a big stick"*

Theodore Roosevelt

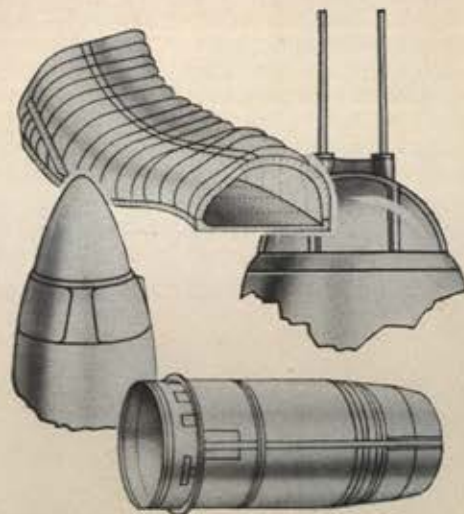


GOVERNMENT PRODUCTS DIVISION

In December 1907, the "Great White Fleet," consisting of sixteen fully armed battleships, set sail from Hampton Roads, Virginia. Its purpose: to quell the tension that was mounting in the Far East by creating visible evidence of United States power. This was Teddy Roosevelt's "*big stick*."

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and pilot training. Bet others would, too.

A/2C Robert L. Sholl
APO, N. Y.

Photographed

Gentlemen: We of St. Augustine, the nation's oldest city, are proud to have been the subject of the photograph, "From 38,000 feet," in Brig. Gen. Hewitt T. Wheless's article "The Eyes of the Strategists," in the April 1956 issue of your publication.

Thank you and General Wheless for the publicity. Good luck to you always.

John L. Rhodes, Mgr.
St. Augustine & St. Johns County
Chamber of Commerce
St. Augustine, Fla.

Let's Not Hide It

Gentlemen: You can't drink after hours with an AFA card. It is usually well hidden among other cards in your wallet. When you do perchance come upon it, it serves as a reminder that you don't have to wave any flags to help keep the peace. What you and others in the Air Force proved in World Wars I, II, and Korea is first in the eyes of our defense leaders in Washington. The "hidden pride" we all have is exemplified every time we see an aircraft—civilian or military. We helped!

Samuel F. Carlley, Jr.
Philadelphia, Penna.

Take-Off

Gentlemen: In the April edition of *Air Force* you had an article on the B-36 which I thought was very interesting. However, I personally disagree with the statement that the B-36 could easily land and take off on a 5,000-foot strip of runway.

I spoke to a fellow who is an aircraft mechanic at Selfridge Air Force Base and we had quite a discussion about the B-36.

Selfridge AFB has runways between one and two miles long and he said they only took in B-36s when empty. So if the B-36 were filled with its fuel, oil, and other flight gear, you would have quite a problem of taking off on a 5,000-foot runway.

As an AFA member, I would say that the B-36 would have to use a good 10,000- to 13,000-foot runway to land and take off safely.

Bill Gumbko
Richmond, Mich.

• The 5,000-foot take-off capability mentioned in our April issue was what the AAF asked for when the B-36 was



Dear Joan:

Honey, I was the happiest dad on earth when you turned down that job as a mechanic for Smashcrash Air Cargo. So why are you grieving me now, playing second base for the Gashouse Glove Dusters? You know I sent you to the Conservatory for but one reason: So you could master the tuba and make a name for yourself. I'll cherish forever those moments when, after a rugged cross-country, I'd come home, take off my shoes and relax while you curled up in your tuba and played me *Flight Of The Bumblebee*. Your 24 years, 5'5", 120 lbs., brown eyes and dark hair are better suited to that than to catchin' pop flies.

However, if you're going to be a ball player, you've got to understand teamwork. For instance, Southwest Airmotive has forged up through 24 years with teamwork second to none. In an overhaul or conversion, my aircraft, engines, accessories, props, and instruments are routed off to specialized "team members" who blend them smoothly into a winning finished product. New parts come from the SAC Sales Division, representing flying's top team of famous manufacturers.

For both business aviation and for the Air Force (jet engine overhauls and refueling), SAC functions harmoniously throughout the nation's most diversified facility.

Do your part well, Joan, and you may be famous yet. I'll try to understand—and say, how about getting Mickey Mantle or somebody to autograph me a ball?

Love,

Daddy

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first designed. Actually, today's B-36 comes close to meeting this requirement. The J model, for example, which has a gross take-off weight of 410,000 pounds, requires 5,290 feet of runway at sea level and another 1,530 feet before it's high enough to clear a fifty-foot obstacle. This is well within the limits of Selfridge's longest runway, which is 8,200 feet long.—The Editors.

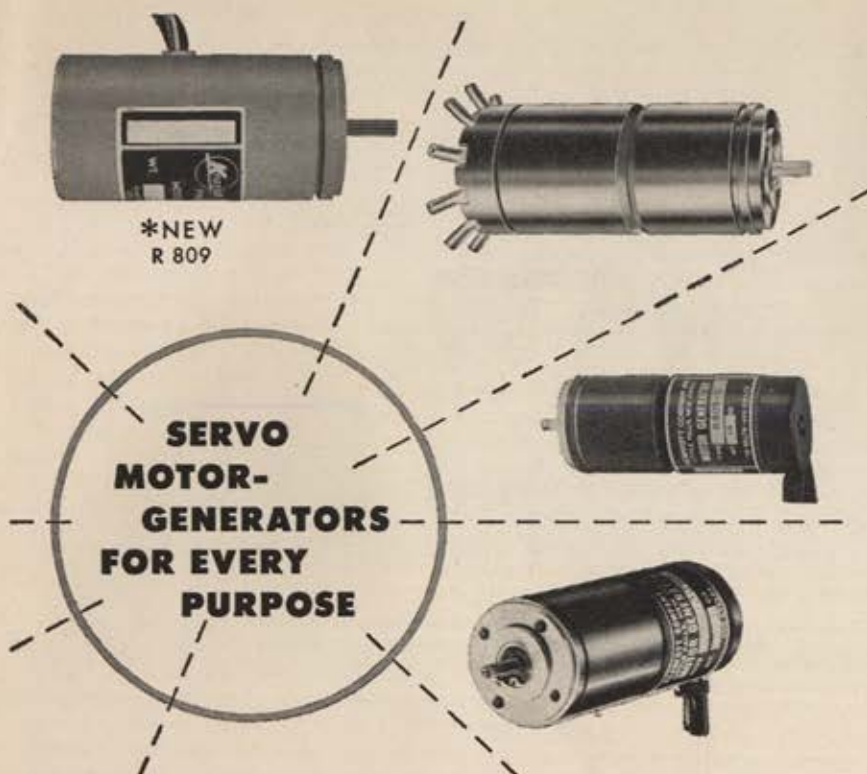
Jets! Jets! Everywhere!

Gentlemen: I just finished reading the April issue of *Air Force* Magazine. I found it very interesting and informative, but—all about jets, jets, the

latest jets, the records set by jets. The following statistics constitute a record, I believe, which no jet will ever better, and many a recip [reciprocating engine] man will find hard to believe: field elevation, 7,800 feet; landing gross weight, 165,000 pounds; runway length, 5,700 feet; take-off gross weight, 134,000 pounds; 5-knot tailwind on take-off.

The above was accomplished by C-124 No. 53016 on October 21, 1955, at Addis Ababa, Ethiopia. See? Props are still doing a job, too!

S/Sgt. Paul S. Schlachter
Robins AFB, Ga.



Kearfott Servo Motor-Generators are characterized by low rotor inertia, low time constants and high stall torque. Motor-Generator combinations provide $\frac{1}{2}$ to 3.1 volts per 1000 R.P.M. with an extremely linear output over a speed range of 0—3600 R.P.M. and useful output up to 10,000 R.P.M.

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SIZE 15	1.5 OZ. IN.	3000	25/1	.5%
SIZE 18	2.4 OZ. IN.	3000	25/1	.5%
SIZE 18	3.0 OZ. IN.	9600	23/1	.5%
RATE				
SIZE 15	.45 OZ. IN.	10,500	170/1	.5%
SIZE 15	1.5 OZ. IN.	4700	350/1	.2%
SIZE 18	2.4 OZ. IN.	4700	350/1	.2%
SIZE 18	3.0 OZ. IN.	8400	350/1	.2%
*INTEGRATOR				
SIZE 15	.70 OZ. IN.	6300	400/1	.1%
SIZE 15	1.25 OZ. IN.	4500	400/1	.1%
SIZE 18	1.35 OZ. IN.	7200	400/1	.1%
SIZE 18	2.4 OZ. IN.	5200	333/1	.06%
SIZE 18	3.0 OZ. IN.	8000	333/1	.06%

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RENDEZVOUS

Where the Gang gets together

2D AIR DIV. ASS'N REUNION: Just a reminder that the 2d Air Division Association is holding its ninth annual reunion in Chicago on August 17, 18, and 19. Former members of the Division who haven't as yet made arrangements to attend should contact me as soon as possible. *M. T. Kelley, Sec'y, 2d Air Division, 70 Randolph Rd., White Plains, N. Y.*

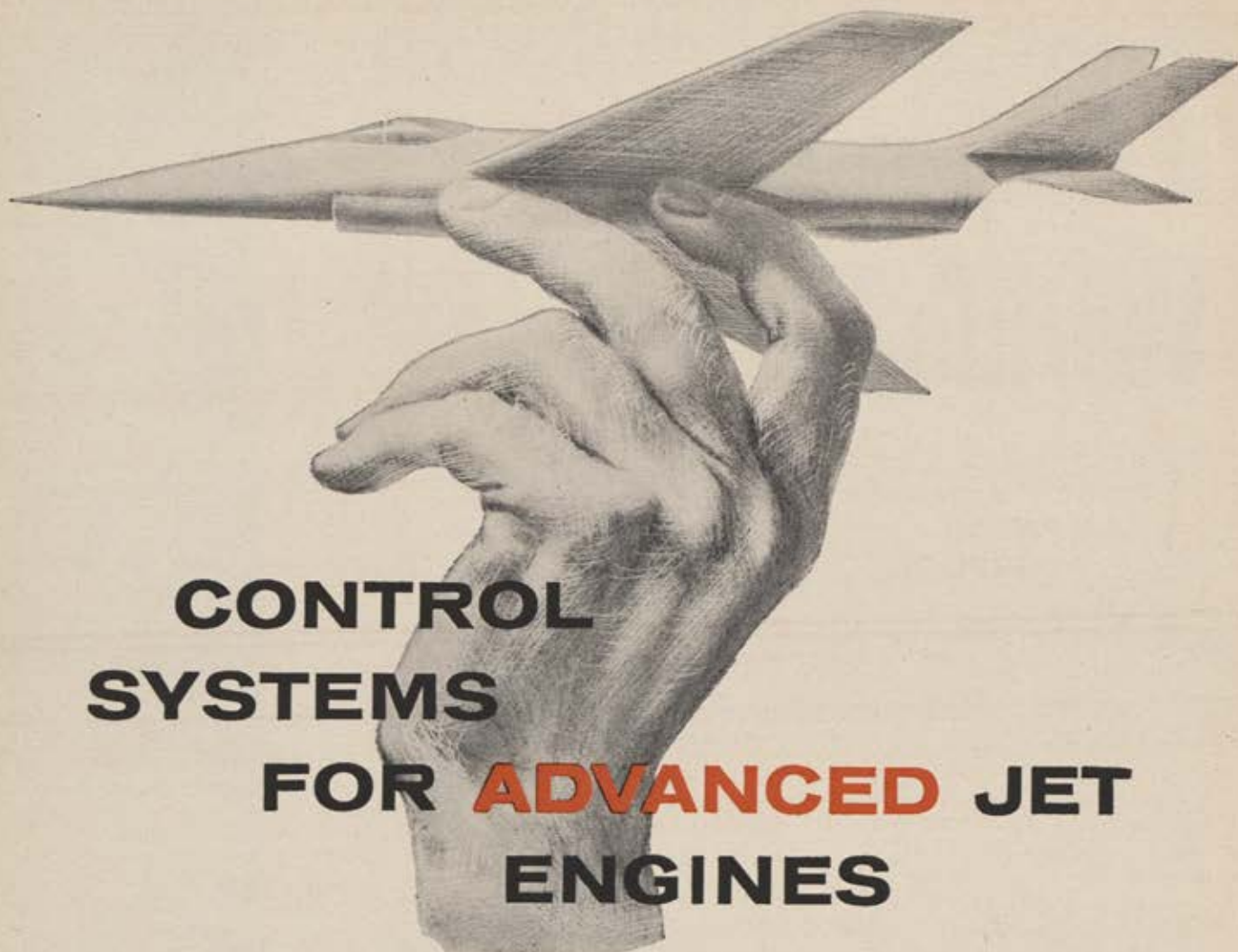
446TH BOMB GROUP, 2D AIR DIV.: Members of the 446th Bombardment Group are having a get-together in conjunction with the 2d Air Division Reunion mentioned above. For details write *T. F. Melody, V. P., 2916 Wolf Ave., Pennsauken, N. J.*

414TH BOMB SQDN. REUNION: The 414th Bombardment Squadron, 97th Bombardment Group, will hold its annual reunion in New York City this year. The dates are from August 31 to September 2 and will be at the Hotel New Yorker. We'd like a big turnout for the event so for further details write either *Alvin A. Stander, M.D., or R. E. Flack, 9473 N. Parkview Dr., Baton Rouge, La.*

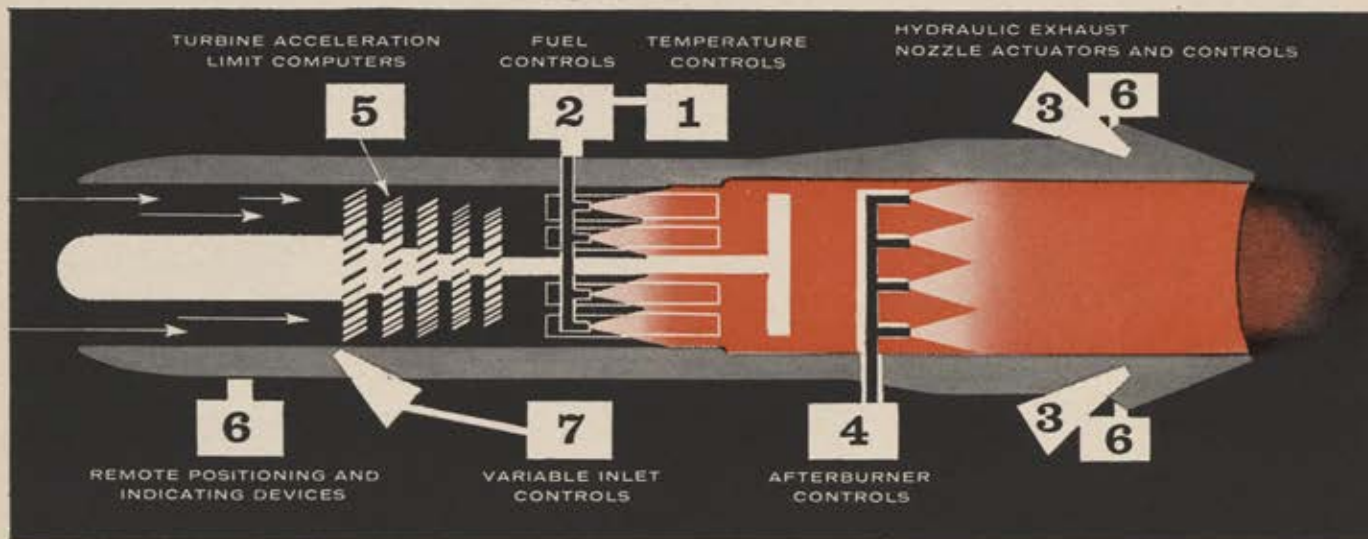
CONVENTION REUNIONS: Three outfits have now scheduled reunions in conjunction with AFA's Convention next month in New Orleans. They include the Night Fighters (contact *Miss D. D. Berry, 8000 Woodley Ave., Van Nuys, Calif.*); 302d Bomb Group (*Lt. Col. Newton Moscoe, 1303 Ann Arbor Dr., Norman, Okla.*); and 401st Bomb Group (*Mr. E. C. Cury, Lincoln Highway, York, Penna.*).

8TH WEATHER BOYS: I would like to hear from any of the 8th Weather Sqdn. fellas who served with me at Ikateq, Greenland, better known as "The Rock," during 1942 and 1943. *Earl "Griff" Griffith, 315 Kemp Ave., Ironton, Ohio.*

OUT OF PRINT BOOK: The US Government Printing Office tells me that the US Strategic Bombing Survey, *The Fifth Air Force in the War Against Japan*, Military Analysis Division, June 1947, is out of print. Can anyone supply a copy or advise me how to locate one? *Laura T. Fain, 635 Far Hills Ave., Dayton 9, Ohio.*



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"MISSILE WITH A MAN IN IT"

Lockheed/USAF F-104

World's Fastest Jet

The F-104 *Starfighter*, now in production for the U. S. Air Force, is the most advanced airplane of its type ever developed. *Dimensions:* height, 13 feet, 6 inches; length, 54 feet, 9 inches. *Wings:* knife-sharp, and only 7½ feet from fuselage to wingtip. *Engine:* General Electric J79, which develops more thrust per pound of engine weight than any other turbojet of comparable size. *Electronics system:* new "plug-in" type, to permit quick changes and replacements of components. *Pilot's seat:* downward firing ejection type, the first in a production jet fighter. *High, T-shaped floating tail:* twice as effective in controllability as conventional tail designs. *Armament and top speed:* both are military secrets, but the Lockheed F-104 can overtake and destroy any plane—of any size—known today.

The *Starfighter's* dart-like configuration,

perfected by extensive wind-tunnel tests, permits the F-104 to flash through the sonic barrier, routinely, without a tremor. And even at supersonic speeds the *Starfighter* has unmatched ease and decisiveness of control—because never before have so many advanced design and engineering features been so superbly combined in one aircraft.

Like all Lockheed-built planes, the *Starfighter* has inherent "design flexibility" that makes it readily adaptable to a variety of military requirements—at lowest cost to our government.

Lockheed's leadership in the design and production of military planes, of nine widely different types, stems from its policy of close cooperation with the armed services. In the F-104 *Starfighter* the U. S. Air Force has the world's fastest and deadliest jet—America's "Missile With a Man in It."

Lockheed

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Lockheed Air Terminal, Burbank, Calif.
Lockheed Aircraft Service, Ontario, Calif.

LOOK TO LOCKHEED FOR JET LEADERSHIP, TOO





LOCKHEED'S NEWS COLUMN

Dick Tracy has lost his lead in the electronics race. His wrist radio is surpassed by a new "miniaturized" TV camera. Small enough to fit into a vest pocket, its "eye" is about the size of a cigarette. Built by Lockheed for research ONLY... (so far)...

Missile Mail is promised in the foreseeable future as a civilian development of missile technology. A Lockheed official says that the thousands of scientific and technical people now researching the whole environment of man in connection with missile development will produce civilian benefits beyond the imagination of the layman today. A letter by missile, of course, would get there faster than you could write the letter in the first place...

A Lockheed Man is working quietly in a sanctuary abroad on a nuclear engine design that will make headlines world-wide when they take the wraps off. Same man's blueprints on a nuclear contraption so startled top military authorities very early in the nation's atomic program that they locked his patent in a government vault where, for security reasons, it still remains...

Lockheed has been handed a big piece of the much-talked-about ICBMissile that will keep its Missile Systems Division scientists working nights in their new facility near Stanford University — which, incidentally, tripled in size between blueprints and ground breaking...

Beating the heat which tops 250 degrees Fahrenheit at twice the speed of sound is a matter of concern now to engineers of Lockheed's California Division who are working on methods of making airplane skin glass-smooth. Even modern, high-strength dural surfaces approach their temperature limits at these speeds...

Early America makes atomic history this month as Lockheed Georgia Division breaks ground for its new atom-powered plane facility. The 10,000-acre North Georgia site was in the same family ever since the area opened for settlement in the 1840's.

Safety in all weather with TACAN



HOFFMAN makes the complete airborne portion of the TACAN system—another example of Hoffman integrated electronics at work

TACAN is the trustworthy electronic navigation system that unerringly guides pilots through fair and foul weather every second of the flight. Two compact dials on the instrument panel automatically show the pilot his exact distance and direction from a fixed ground station with an accuracy never before attained. Result: greater safety in any weather, any place.

Some of TACAN's advantages over other systems include: three times greater accuracy; handles more airplane traffic—allows planes to fly safely at closer intervals; permits starting landing approaches further out—minimizes "stack up" of planes waiting to land; meets military requirements for ruggedness, compactness and mobility.

The same teamwork, experience and facilities at Hoffman Laboratories that put TACAN into full scale production are available for you to use—whatever the size or complexity of your electronic needs. Why not discuss your specific systems engineering problem with a Hoffman Labs' representative soon?

TACAN REQUIRES INTEGRATED SKILLS



Range (distance) indicator
Azimuth (direction) indicator



Control Panel



Receiver
Transmitter
Strobe circuits
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Envelope signal detector
Phase comparison circuits

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TECHNICAL ABILITY to achieve maximum component density. TACAN contains as many tubes as four TV sets (plus more than 8,000 other parts), takes up half the space of one TV set

EXPERIENCE AND FACILITIES to field test complex systems in every conceivable weather condition and environment

PRODUCTION KNOW-HOW to build a unit capable of withstanding the rigors of military operations, and the intense G-shock and vibration of carrier deck landings

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Maj. Gen. Charles I. Carpenter, Chief of Chaplains, USAF, has been proclaimed a "Special Brother" by the students of Hughes Memorial School, Danville, Va. With Chaplain Carpenter, left, and Gen. Nathan F. Twining are Patricia Pollard, Buddy Compton and Pat Conner, Hughes students.

■ After several weeks' delay because of unfavorable weather conditions, the first US hydrogen bomb to be dropped from an airplane was exploded high over the Pacific Island of Namu on May 21. It was dropped from a USAF B-52 flying at an altitude of 50,000 to 55,000 feet and exploded over the bullseye Bikini atoll island at a height of approximately 15,000 feet. An official task force statement after the blast said, "Preliminary estimates show the yield of the Cherokee (code name for the drop) was substantially blow that of the largest 1954 test, although today's shot likely will be one of the biggest of the current series." However, William Laurence of the New York Times, observing the test from the USS *Mt. McKinley*, thirty-four miles from the target, felt that the explosion dwarfed all previous hydrogen fusion explosions by the US and, probably, all similar tests held by the Russians. Estimates on the strength of the explosion ranged all the way from ten to twenty megatons (a megaton is equal in power to a million tons of TNT). This would mean that the blast was 500 to 1,000 times more powerful than the explosion that wrecked the Japanese city of Hiroshima in World War II.

■ Commenting on the announcement by the Russians that they were reducing the size of their Army, Secretary of the AF Donald A. Quarles said, "It is no mere coincidence that the things they are cutting are not the jet planes and atomic weapons that would be important in an air-atomic battle. The grave danger in the present situation is that the talk of peace and the smiles from behind the Iron Curtain may delude us into a sense of security and cause us to relax our guard to the point where terms can be forced upon us." Speaking at a dinner meeting of the National Industrial Conference Board at New York's Waldorf-Astoria Hotel, he said that "the air-atomic strength we need from here out must be measured relative to the strength of a potential aggressor. It means that if at any time we allow our relative position to sink to a point where an enemy could hope to neutralize our striking

power before we could strike back, we would be impotent and at his mercy. Worse, we would invite the attack."

■ A contract for a broad study of the air facilities the US will need for the next twenty years has been jointly granted by the Defense and Commerce Departments. The study, under the supervision of Edward P. Curtis, President Eisenhower's special assistant for aviation facilities planning (see *AIR FORCE*, April '56), will be conducted by the Airborne Instruments Laboratory, Inc., Mineola, N. Y., in cooperation with Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., and the Aeronautical Research Foundation, Boston, Mass. Costing an estimated \$300,000, the program is "to determine for the next two decades the requirements for those aviation facilities commonly used by all airspace users, both civil and military, including navigation aids, communications, air traffic control, airways and airports." Initially, the objective is to develop the most effective and economical means of meeting the air facilities needs of the nation. In addition, there will be submitted any necessary legislative organization, administrative and budgeting recommendations to implement the comprehensive plan."

■ Gen. Earle E. Partridge, Commander of the Air Defense Command has told the Senate Armed Services Subcommittee that the threat of a Soviet attack with ICBMs is "frightening," and urged that the US give top priority to development of an "anti-missile missile" to meet it. His testimony also indicated that both the US and Western Europe were not prepared adequately to defend themselves from nuclear air attacks. General Partridge blamed the air defense weaknesses on shortage of AF funds and on the difficulties of getting skilled aircraft maintenance men to reenlist. Also, because "the Russians came along a little more rapidly than we had anticipated. . . . We find ourselves in the years 1957, 1958, and early 1959 in not too good shape with regard to our high-altitude and our low-altitude air defense," he said.

■ The long expected shift of the Air Research and Development Command is now official. It had been expected that a shift would be made either to Dayton, Ohio, or the
(Continued on following page)



Brig. Gen. J. S. Holtner, left, congratulates William Holden upon becoming a member of the Mach Busters. Holden portrays a pilot in "Toward the Unknown," and took a faster-than-sound ride to familiarize himself with role.

Friendship Airport area near Baltimore, so most persons were surprised by AF Secretary Quarles's announcement that "Andrews AFB, Md., has been selected as the permanent site for the Air Research and Development Command." Among the reasons for moving to the Washington area are the requirements for coordinating the ARDC efforts with those of the other services and the necessity for close liaison between ARDC, the Atomic Energy Commission, the National Advisory Committee for Aeronautics, and other technical agencies. No time has been fixed for the transfer.

■ The current controversy among the three services once again put the spotlight on what is probably the only real solution to the problem—true unification. In a speech before the Aviation Writers Association in San Francisco, AF Vice Chief of Staff Gen. Thomas D. White suggested adoption of a unification plan to allow "free transfer of men among the services." He felt that this would allow the men in the three services to think more about defense and less about "gaining or keeping weapons, and missions for their own particular branch." He said, "with the passing of time, the roles and missions of all the services seem to overlap more and more. Conceivably, if these trends continue, the day would come when, for practical purposes, all three services would have the same weapons, the same capabilities and limitations, and all attempting to do the same jobs. If that happens, perhaps we certainly would find it advisable to standardize uniforms and streamline the organizations."

Suggesting just about the same things in his *Newsweek* column, former AF Chief of Staff Gen. Carl Spaatz wrote: "What is needed is a complete integration of the services—one uniform, a single promotion list, interchangeability of personnel, and a General Staff presided over by a Chief of Staff under a civilian Secretary of Defense."

■ The 1956 Elmer A. Sperry Award has been given to Donald W. Douglas in recognition of his "distinguished engineering contribution which has advanced the art of transportation through development and production of the DC series of airplanes." The award, to be presented in October, is in honor of Dr. Elmer A. Sperry, holder of patents to many devices basic to transportation.

STAFF CHANGES . . . Maj. Gen. Orrin L. Grover, Commander, 3450th Technical Training Wing, has reported to Hq., USAF, for duty with the Joint Middle East Planning Committee, Office of the Joint Chiefs of Staff. . . . Maj. Gen. Kingston E. Tibbets has moved from his position of Comptroller to Director of Plans and Programming at Hq., AMC. His former position of Comptroller will be filled by Brig. Gen. Leo P. Dahl on Sept. 1. General Dahl's position of Commander, Spain Air Materiel Area, will be filled by Brig. Gen. Lewis L. Mundell, who is now Inspector General, AMC. Brig. Gen. Ira D. Snyder, Deputy for Materiel, TAC, will replace General Mundell on August 1. . . . Brig. Gen. Noel F. Parrish, Air Deputy to the Commandant, NATO Defense College, will become Director of the Military Assistance Div., US European Commander, on Sept. 1. . . . Brig. Gen. Glynne M. Jones, Special Assistant to Deputy for Operations, TAC, will be reassigned as Deputy Commander of the Fifth Allied Tactical AF in July. . . . Gen. Orval R. Cook retired on May 31. . . . Brig. Gen. Bertrand E. Johnson, Judge Advocate General, FEAF, will become Judge Advocate General of Air Training Command on Sept. 1. . . . Brig. Gen. Otis O. Benson, Jr., will become Commandant of the USAF



Maj. Robert L. Embury, operations officer of the 327th Fighter-Interceptor Sqdn., George AFB, Calif.—first unit to get the Convair F-102A—helps M/Sgt. Roy H. Morgan apply the squadron's "Iron Mask" decal on the new plane.

School of Aviation Medicine on Sept. 1. His present position of Director, Medical Staffing and Education, Office of the Inspector General, Hq., USAF, will be filled by Brig. Gen. Major S. White. General White, as Surgeon, TAC, will be replaced by Brig. Gen. Robert E. Lee, who is now Chief, Medical Division, Office of the Director of Readiness and Materiel Inspection. This position will be filled by Brig. Gen. Earl Maxwell, Surgeon, Alaskan Air Command. All four moves will be made on Sept. 1. . . . Brig. Gen. John C. B. Elliott, Commander, Aviation Engineer Force, ConAC, has been reassigned as Chief, ConAC Liaison Team. . . . Brig. Gen. Charles J. Bondley, Jr., Director of Materiel, SAC, will be replaced by Brig. Gen. John D. Ryan, Commander of the 19th Air Division. Brig. Gen. Edwin B. Broadhurst, Commander, 57th Air Division, will replace General Ryan. General Bondley will become Director of Supply and Services, DCS/Materiel, Hq., USAF, in July. . . . Maj. Gen. George W. Mundy, Deputy Commander, Second AF, will replace Maj. Gen. Frank A. Armstrong, Jr., as Commander of the Second AF when General Armstrong becomes Commander of the Alaskan Air Command in July. . . . Brig. Gen. William P. Fisher, Commander, 1st Air Division, has advanced to Assistant Director of Operations, SAC. . . . Maj. Gen. John P. Doyle will retire on June 30. He was Director of Transportation, DCS/Materiel, Hq., USAF. . . . Maj. Gen. Manning E. Tillery, Commander, Ogden Air Materiel Area, will retire on June 30. . . . Maj. Gen. Gordon A. Blake, Director, Communications-Electronics, has been replaced by his Deputy Director, Brig. Gen. Alvin L. Pachynski. General Blake has moved to the position of Assistant DCS/Operations. . . . Brig. Gen. Richard J. O'Keefe is now Commander of the Seventeenth AF. He was DCS/Materiel, Hq., USAF. . . . Brig. Gen. George F. Schlatter, Commander, 2d Air Division, Hq., USAF, has been relieved of his assignment while convalescing and will return to the US. . . . Brig. Gen. Franklin Rose reported to the 2353rd Personnel Processing Sqdn. in May for retirement processing. . . . Maj. Gen. James C. Selser, Jr., Deputy Commander, Eighth AF, SAC, will report on July 1 for duty as Deputy Director, Net Evaluation Subcommittee, National Security Council, Hq., USAF.—END



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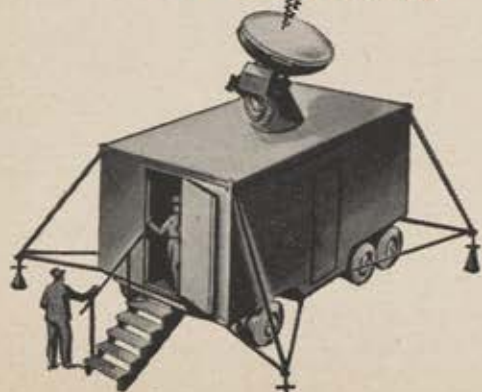
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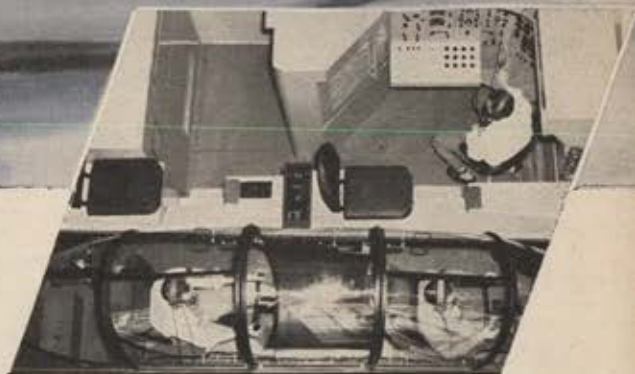
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AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

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wing tips

By Wilfred Owen

The US Department of Commerce estimates that ninety percent of the US public has never flown.

Last year US airlines spent \$33.6 million to feed their passengers. Eastern spent fifty-two percent more for food than in 1954, United thirty-five percent more, Western Airlines upped food expenses nearly eighty percent, and local air carriers boosted their food budget seventy-three percent.

The airlines as a whole spend \$100,000 a day for advertising. Eastern is the biggest advertising space buyer.

If two passengers leave San Francisco at the same time in 1959, one by jetliner and the other by rail, the air traveler will be in Paris when the rail rider nears Elko, Nev.

United States-Europe cargo traffic in 1955 was up one-

third over 1954. Foreign airlines got two-thirds of all the business.

The jet transports now being ordered for transatlantic use in 1959 will each provide three times as much transportation per year as one of today's planes. Each one will have approximately the same annual transatlantic carrying capacity as the British liner *Queen Mary*.

The Navy has a simulated aircraft trainer that is so



effective it can make a trainee air sick on the ground.

To build a heavy bomber takes approximately nine years, from preliminary design to first flight.

SORRY— The Roosevelt and Jung are **SOLD OUT!**

HOTEL RESERVATIONS

The four New Orleans hotels listed below have reserved 1,500 rooms for the Air Force Association's 1956 Convention and Airpower Panorama. A special housing office has been established at the New Orleans Convention Bureau to handle hotel reservations for the Convention. All reservation requests **MUST** be sent to the AFA Housing Office, not to AFA in Washington or directly to the hotels. All four hotels are air conditioned. No advance deposits are required.

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Second Choice

Type Room

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ARRIVAL DATE & HOUR

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OTHERS IN ROOM

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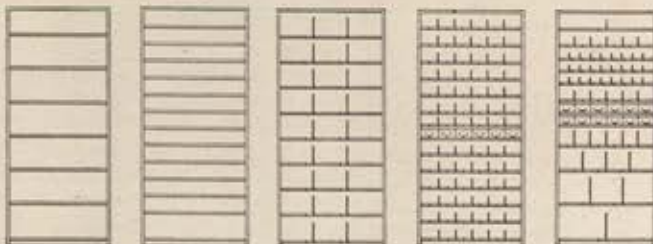


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AIRMAN'S BOOKSHELF

Among the foremost writers of air literature was the intrepid flyer and French author, Antoine de Saint-Exupery. His mysterious disappearance in North Africa during a flight in July 1944 capped a legendary career of adventure and letters (three of Saint-Ex's best works—*Wind, Sand and Stars*, *Night Flight*, and *Flight to Arras* appear in a single volume, *Airman's Odyssey*, Reynal and Hitchcock, 1943). *Knight of the Air: The Life and Works of Antoine de Saint-Exupery*, by Maxwell A. Smith (Pageant Press, \$4), combines a biography of this renowned author and air hero with a critical analysis of his literary works. The result is an absorbing narrative. Few writers have examined the great airmen of our age with the same precision and understanding that Dr. Smith has here. *Knight of the Air* is an important addition to any airman's library.

Hundreds of WW II Air Force and naval pilots downed in the vast reaches of the Pacific owe their lives to the US Navy's Submarine Lifeguard League. In this operation subs surfaced at points close to target areas and performed daring rescues in the teeth of enemy shore fire and low-level air attacks. This incredible story now is told in *Zoomies, Subs and Zeros: Heroic Rescues in WW II by the Submarine Lifeguard League*, written by Vice Adm. Charles A. Lockwood, USN (Ret.), and Col. Hans Christian Adamson, USAF (Ret.), published by Greenburg, \$3.95. Supplementing the intriguing narrative of rescue are the accounts of the dangers from friendly forces. Time and again trigger-happy US planes and ships went after the Lifeguard subs, believing them hostile. This authentic story, co-authored by the man who organized and commanded the Lifeguard League, inspires our deepest admiration for the men of the US submarine fleet.

Most everyone is a self-styled expert on leadership. Many write about it. But a book on leadership that makes sense is rare. The US Air Force edition of *Right Down the Line: A Book About Leadership* (Arrowhead Books, \$2.50) does, and our hat is off to Charles A. Pearce, the editor, and June Kirkpatrick, the talented illustrator. *Right Down the Line* packs a half hour of the most entertaining and humorous reading you can find on a traditionally dry-as-dust subject. Combining attractive cartoon illustrations with thoughtfully phrased chunks of narrative and short, snappy captions, this pleasing book represents a brand new approach to an old subject. It is designed to give a graphic analysis of the basic factors of leadership and to show certain techniques for the development of leadership in the Air Force. (Arrowhead, located at 124 East 30th St., New York City, offers special prices for official AF purchases.)

AF Lt. Col. Carrol V. Glines, Jr., has come up with an easy do-it-yourself method for compiling personal and family history. *Our Family Affairs: A Record and Guide* (Exposition Press, \$3) is a practical, comprehensive "log-book" organized into eleven specific categories for recording vital statistics and easily forgotten data. These categories, prefixed with instructions, include: personal data on each family member; wills and codicils; powers of attorney; insurance; real estate; investments; savings; military service; family property; taxes; and miscellaneous. It covers all aspects of a family-of-five record from baby's birthmarks to auto motor number. You simply fill in the blanks and become your own historian. All families, especially military, will find this "log" a valuable way to collect and preserve the facts that easily slip away and become hard to find when needed.—END



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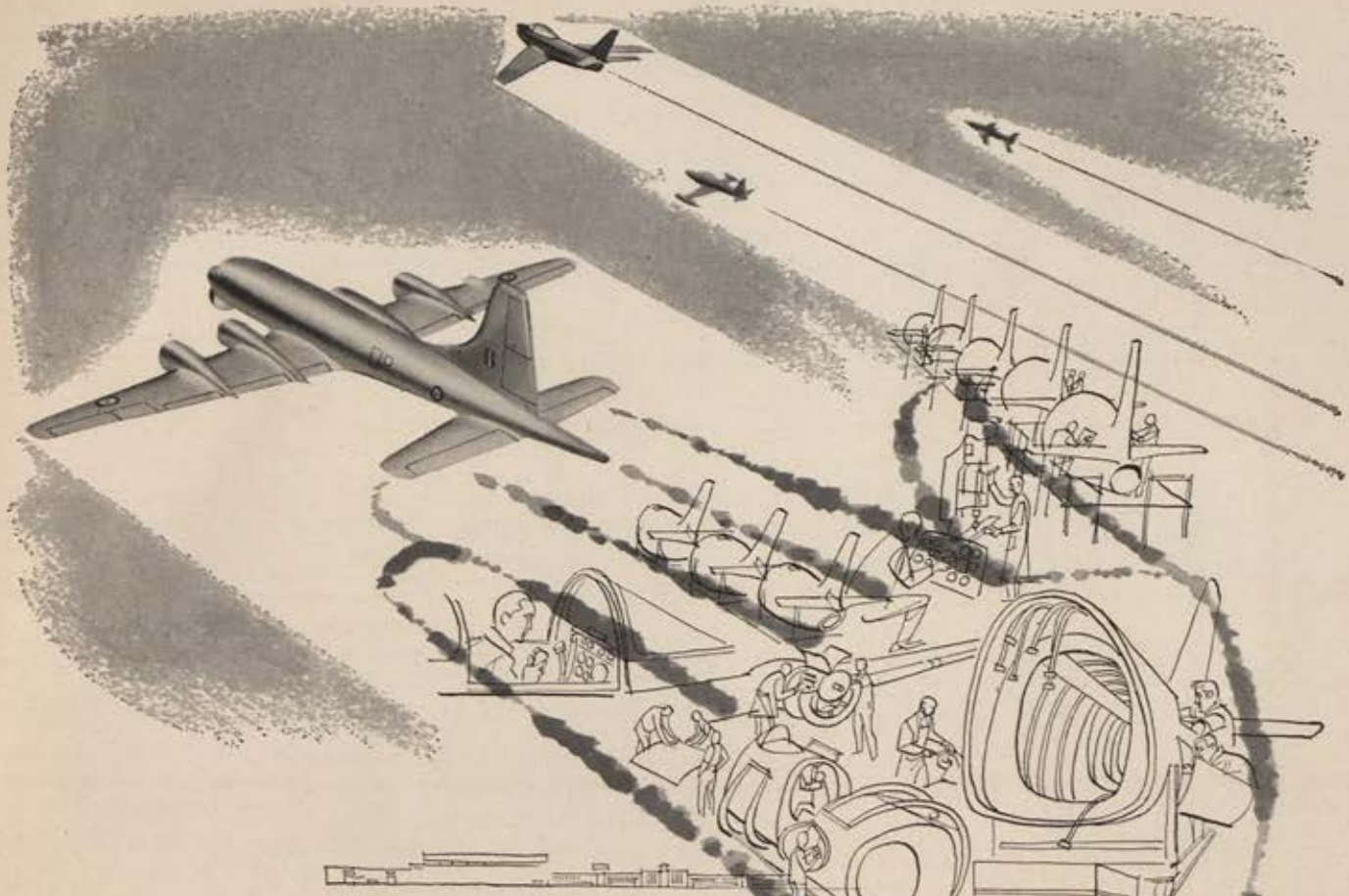


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SHOOTING THE BREEZE

WITH THE EDITORS OF AIR FORCE MAGAZINE

When DelVina Wheeldon, broadcaster for WCKY, Cincinnati, overheard some women in a beauty shop say they did not want their sons ever to "get in the Air Force, or anywhere near those jets because they are dangerous," she decided to do something about it.

Here's what she wrote to Continental Air Defense Command Headquarters: "It seems to me with all the things the Air Force has in the way of responsibilities for our national protection that it should not have to unnecessarily suffer mother antipathy toward jet flying and housewife complaints of jet noise while meeting those bigger responsibilities. . . . From my own lack of knowledge and talks with others who are business and professional women as well as housewives, I found we women know appallingly little about the Air Force, what it's like, why it has to do what it does, and what its problems are." She said that she wanted to "dramatize for all women the safety factors, the degree of preparation and training of airmen."

To help her do this, the AF put her through the pressure chamber, gave her a careful medical check, and then flew her through the sound barrier. Of that flight, she said, "I felt safer up there with this pilot than I do when I'm on a highway which is jammed with hot rods, and my experience leads me to believe the Air Force leaves nothing to chance—and takes no chances."

As a result of all this, she started a series of twenty-six broadcasts in June about ConAd, covering fighter-interceptor aircraft, Ground Observer Corps, jet propulsion, jet noise, recruiting and career opportunities, steadily decreasing accident rate, family life, and religious guidance.



We were very happy to see that Walter T. Bonney, assistant to the executive secretary of the National Ad-

visory Committee for Aeronautics, has been given the 1955 public relations award of the Aviation Writers Association.

It was unofficially reported that in the balloting, AFA ran second and the Fairchild Company publication "Pegasus" came in third. This was especially interesting because Walt is a national director of AFA and is also a frequent contributor to "Pegasus."



Many of the airmen leaving the service for the "better" life as civilians, are finding things are not so rosy after all, according to an AF study among more than 3,000 ex-airmen. The Air Force has always listed higher pay on the outside and free schooling as the two things that lure men out of the service. However, the study showed that one-fourth of those who planned to go to college under the GI Bill have not done so, and most are making only about \$60 a week to start.



We think it significant that the first invitation for an American military chief to visit Russia went to the Air Force Chief of Staff General Twining. We also hear that the other service chiefs were a little put out at not being asked to the party and pulled wires frantically but to no avail.



The familiar red, white and blue Republic F-84s flown by the AF's Thunderbird aerial demonstration team have given way to supersonic North American F-100 Super Sabres (*see cut*). According to Maj. Jacksel Broughton, leader and Commander of the team, the group will demonstrate the same techniques with the new aircraft
(Continued on following page)



Small, powerful, compact, and reliable are the manufacturer's words for this Fairchild J-44 turbojet engine. And lovely is our word for Pauline Falk who graces this cutaway version of the bantam-weight powerplant. The CAA has now granted an Approved Type Certificate for this jet, making the J-44 available for a variety of thrust-augmentation applications for which it'd been under consideration. First designed in 1947 for use in a US Navy guided missile, the J-44 has been produced in quantity since 1950. Fairchild has turned out more than 560 of the 1,000-pound-thrust units, many of which have been used to power Ryan Firebee drones that are operated by all three services.



The Thunderbirds with models of the North American F-100s they're now equipped with. Members of the supersonic aerobatic team include (from left) 1st Lt. Robert Anderson, left wing; Maj. Jacksel Broughton, team leader; Capt. Billy Ellis, right wing; Capt. Edwin Palmgren, slot man; and 1st Lt. William Pogue, who flies solo act.

that were previously shown to combined audiences of more than 10,000,000 persons in the US and Latin America. The team's final appearance in the F-84s was at the Armed Forces Day ceremonies at Bolling AFB, Washington, D. C. on May 20.



Any of our readers watching "The Mechanical Cook" on the Schlitz "Playhouse of Stars" on Friday, July 6 (CBS Television network, 9:30 pm EDT) will find the story has a familiar ring. It should, for the play, starring William Bendix, is based on "Never Underestimate Your Crew Chief," by Col. Kenneth Kay, which appeared in our March '56 issue.



With all the talk about technological advancements, it's sometimes easy to overlook the most important element behind a strong air force—the manpower. Several speeches in recent weeks have stressed the importance of our valuable human resources. These in our opinion, deserve a wider audience than they have received. The speeches were as varied as the experience of the men who made them, and while they showed that there is complete agreement about the existence of a real and formidable Russian threat, they also indicated that there is no such agreement—especially among the different services—about how best to meet this threat.

In a speech at the National Conference on Aeronautical Electronics in Dayton, Ohio, Dr. H. Guyford Stever, retiring USAF Chief Scientist, said that "as a nation, we are just beginning to face up to the multiple task of

maintaining current technical strength, of improving the strength of the years that lie immediately ahead, and, of continuing that position into the more distant future. This job has been faced by the technical community since World War II, for they have had to maintain a sort of a continuous partial mobilization, attempting to achieve the proper delicate balance of effort between education, basic research and non-military development on the one hand, and on the other hand, participate in building our military strength."

Doctor Stever went on to list four key factors of importance to our capability to perform research and development. "The first and foremost is the manpower factor; in this factor the critical items are scientists and engineers. The second factor is facilities; here I refer to the specialized facilities of research and development. The third factor is funding; the fourth factor is organization and management."

AF Chief of Staff Gen. Nathan F. Twining, speaking before the National Board of the Civil Air Patrol in Washington, said that "even if we keep our weapons superior to those in the hands of the Soviets, we are not guaranteed the superiority necessary to deter war. We must also be able to man these weapons. . . .

"As our airplanes, electronics equipment, armament, and bombs become more complicated, they require more maintenance and more difficult maintenance. For example, behind each actual flying hour of a modern jet fighter is twice the hours of ground maintenance that were required for earlier jet fighters."

Giving the Army's point of view about how to meet the Soviet threat, Secretary of the Army Wilber M. Brucker told the San Francisco Chamber of Commerce and Commercial Club that "If our earnest efforts to deter an aggressor from making war should be unsuccessful—if it should come to actual fighting—the major combat burden would sooner or later fall upon our ground troops. No technological advance has diminished their importance. The Army is the component of the defense team which has the means and capability needed to gain and maintain control over an enemy's land, his resources, and his people—in other words, actually to conquer him . . . the idea that wars can be won by remote control—with pushbuttons—is a dangerous myth. It can lead only to psychological, spiritual, and downright physical unpreparedness for the realities of military conflict."

At the Aviation Writers Association in San Francisco, Maj. Gen. E. J. Timberlake, Commander of the Ninth AF, said, "Many Americans, including some whose honesty is beyond question, and whose intelligence commands respect, stand ready to accept war as inevitable; and every American with any intelligence at all must admit that it is possible, and therefore we should be prepared for it in case it proves to be inevitable." He felt that for the present and "for many years in the future, this nation and its allies cannot escape the compelling requirement of a formidable military establishment and especially a fully manned and totally equipped air force. The enemies of liberty will not be contained by anything short of a show of force. Whether we may be called upon to employ our might to halt an aggressor, or to protect our national interests is beside the point. We must attain and retain the combat effectiveness which is in keeping with our dominant position in this unsettled world."

AF Secretary Donald A. Quarles had something to
(Continued on page 27)



FORESIGHT—Northrop Aircraft's long-range vision is continuously focused on new horizons. Advanced planning by Northrop scientists, engineers and administrators has resulted in the development of formidable aerial weapons for our national safety. Among them are the atom-armed Northrop Snark SM-62s, first intercontinental missiles to be disclosed by the U.S. Air Force, and the Northrop Scorpion F-89 interceptors, lethal guardians of our defense perimeter. In addition, Radioplane Company, a Northrop subsidiary, has delivered over 40,000 pilotless aircraft for use by all branches of the military. At Northrop, today's goal is tomorrow's starting point. In this forward-looking spirit, Northrop is continually achieving scientific breakthroughs which contribute to our national progress and welfare.



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it has successfully met the exacting time schedule
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the supersonic demands of tomorrow.



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David Beach, New Orleans

Many people feel a speedboat race is as exciting as a low-altitude pass by jet fighters. These racing enthusiasts will be pleased to learn of an event that promises to be one of the highlights of the AFA Convention in New Orleans next month—the Motorboat Race Regatta. It will be held Sunday, July 29, on Lake Ponchartrain, under the joint sponsorship of the AFA Convention Committee and the New Orleans Power Boat Association. At left is a view of racing hydroplanes, typical of the races spectators may expect to watch from grandstand seats along the seawall, with nearly a hundred racing craft speeding along a course only yards offshore. For details, write Fred Rudesill, AFA Convention Hq. in the Jung Hotel, New Orleans.

say about the reduction of Russian armed forces. Speaking at commencement exercises at Grinnell College in Iowa, he said, "The recent Soviet announcement that they are cutting their armed forces by about a million men may represent a step toward disarmament. However, this is more likely an indication that the Soviets are reaching the same conclusion we reached some years ago—that modern technology and atomic weapons have changed military values. If, as one might expect, the Soviets have released these men to work in their industries producing capital goods and weapons, they may actually have strengthened their military position by this move. The various interpretations which can be put on this action do not offer any real assurance that the Soviets are reducing their armed might; they only reaffirm the wisdom of President Eisenhower's proposal that an effective inspection system must precede disarmament so that each side can be certain the other is acting in good faith."

Two AF officers, in speeches in widely separated parts of the world, stressed the importance of people in our over-all military position. Brig. Gen. Thomas C. Darcy told the American Club of Copenhagen, Denmark, that "the subject of people should be of particular importance to all of us in the military sense at this time when the world appears to be looking to new weapons of war to solve all the problems of security and defense. New weapons in themselves are not going to guarantee our way of life. These weapons will help—but only to the extent that they are managed and controlled by people. There must be people to design such weapons. There must be people to produce such weapons and—above all—there must be people to use these weapons intelligently."

And speaking to a group of aviation writers at Castle AFB, Calif., Gen. Curtis E. LeMay, Commander-in-Chief of the Strategic Air Command said, "The blunt truth is that we are far from having a professionally qualified personnel resource in the Strategic Air Command." He said that SAC can carry out its mission now "only because of a small hard corps of dedicated people who place national security ahead of self and family. . . ." He blamed this state of affairs on two things—the high personnel turnover and the retraining required for the expansion and modernization of SAC. He pointed out that by this December, only eight and a half percent of SAC's airmen will have been in SAC more than four years—and that only a sixty-five percent reenlistment rate would produce the force SAC needs. General LeMay said that his command anticipates a rise in the reenlistment rate,

but that at the most it would only go up to thirty-five percent this year.

His answer to the problem was a five-point program. First of all, he called for a "realistic pay structure" saying that the antiquated idea that one man in uniform is worth as much as another "simply is not true today, when highly technical skills are required by modern military equipment. . . ." The other points he listed were: more housing, complete medical care for dependents (he felt the bill recently approved by Congress did not go far enough), a full restoration of base exchange and commissary privileges, and an expanded educational program.—END

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FLIGHT PAY PROTECTION

IN OFFERING its unique flight pay protection plan, the Air Force Association is proud to add another special service for its members.

The idea began to take root some months ago as a result of our studies relating to the desirability of military service as a career. In considering how to make this service more attractive—and thereby help solve our pressing manpower problems—the path inevitably led to the public treasury. We did not feel this answer to be either complete or desirable.

Yet, our studies clearly brought out the fact that rated personnel of the Air Force, and the other military services as well, actually have two types of income. The first, consisting of base pay and allowances, is about as secure as any type of income can be. The other, involving pay for hazardous duty—flight pay—could not be counted upon. For at any time injuries or illness could prevent a man from passing the flight physical and thereby cut him off from his flight pay.

This instability of income became more important when we determined, through our studies, that the average rated individual in the service lives up to his last dollar of flight pay. He is rarely able to distinguish between his two types of income. He inevitably takes on financial responsibilities, in the shape of installment buying, house payments, and the like, to the extent that removal of his flight pay would create a financial crisis for him and his dependents. This is conducive neither to high morale nor to operational efficiency.

Interviews with men in this predicament underlined the seriousness of the problem. We learned of upset homes, wives forced back to work, lowered living standards, and the like—due primarily to loss of flight pay. We learned further of men who needed medical attention, but who continued with their flying because they could not afford

to stop it. For example, one young jet pilot had pulled too many Gs and needed an exploratory operation, but he postponed it because his flight pay would have been cancelled.

Air surgeons told us that, at any given moment, a certain percentage of pilots who should have been grounded, were in the air risking their own necks, the necks of others, and multi-million dollar equipment—all because of the financial pressures involved.

With the need firmly established, we set out to establish a program that would protect a man's flight pay. We found the Aetna Insurance Company a progressive partner in our efforts. We took care not to develop a plan that would stimulate a man to ground himself, but rather, a plan to stimulate better and safer flying.

That plan is now available to rated members of the Air Force Association. Underwritten by Aetna, it goes a step further, we are proud to say, than the airline protection program for commercial pilots. That is, while the airline pilots have a waiting period before receiving income from their group program, our policy is retroactive to the day the government ceased to issue flight pay income.

The AFA flight pay protection plan has been coordinated in the Pentagon with all necessary agencies, including the Air Judge Advocate. It has been discussed with leaders of the combat commands. Without exception, it has been enthusiastically endorsed and welcomed.

Never before has security like this been offered rated military personnel, and more security is a basic need of those who serve both our Regular and Reserve establishments.

We proudly invite our rated members to avail themselves of this service at the minimum cost involved, and equally welcome others now receiving flight pay to join the ranks of AFA and thereby become eligible for this protection plan.—END

PROTECT YOUR FLIGHT PAY



PROTECTION PLAN EXCLUSIVE FOR **AFA** MEMBERS

NOTE: Of course this protection does not apply in case of war, declared or undeclared, or hostile action, civil war, invasion, or the resulting civil commotions or riots. There are also other exclusions which may never apply to you, but you are entitled to know them. They are as follows:

Plan does not cover losses due to criminal act of the AFA member; or from bodily injury occurring while in a state of insanity (temporary or otherwise); or from officially certified "fear of flying;" or caused by intentional self-injury, attempted suicide, criminal assault committed by the Member, or fighting, except in self-defense; or from failure to meet flying proficiency standards unless caused by or aggravated by or attributed to disease or accident; or accidents caused while riding or driving in any kind of race; or by alcohol, drugs, venereal disease, arrest or confinement; or

wilful violation of flying regulations resulting in suspension from flying as a punitive measure; or sentence to dismissal from the service by a general court-martial, submitted resignation for the good of the service, or suspension from flying for administrative reasons not due to accident or disease or voluntary suspension. Loss of life shall not be deemed as loss for purposes of this plan.

In the event you receive the total limit of twenty-four (24) months indemnity, your coverage is automatically terminated. You may thereafter reapply for insurance coverage in the same manner as a new Member. Coverage also ends with termination of membership in AFA, or with resignation, retirement, or pensioning from the Service, or at age 60.

This insurance is renewable at the option of the Company.

Policy Form No. 1-620-3A

DEPENDENTS OR NOT, if you suddenly lost your flight pay, could you handle your present financial commitments?

If you are like most of us these high-cost days, you have your flight pay spent or committed *before* you get it. You treat it as part of your monthly income.

But it *isn't* part of your regular monthly income. As you know . . .

Anytime you can't qualify for flight status because of accidental bodily injury or disease, your flight pay comes to a screeching halt.

NOW, FOR THE FIRST TIME, YOU CAN GUARANTEE YOUR FLIGHT PAY INCOME AGAINST LOSS. AFA'S NEW EXCLUSIVE FLIGHT PAY PROTECTION PLAN PROVIDES UP TO 24 MONTHLY PAYMENTS MATCHING YOUR LOST FLIGHT PAY INCOME AT THE RATE REPORTED ON YOUR INSURANCE CERTIFICATE.

Here's how the plan works for Air Force Association Members:

You sign up and pay an annual premium of only 1/100th of your yearly total flight pay. (Example: Your flight pay is \$1,800 a year. The plan costs you 1/100th of \$1,800, or \$18.)

Then, if you're grounded due to accidental bodily injury or disease, our AFA Plan pays you monthly indemnity for loss of flight pay for up to 24 months—after a waiting period of 180 days for military Aviation Accidents, and after 90 days for other accidents or disease. The insurance payments pick up retroactively where the government left off.

When you go back on flight status, or at the end of 24 months, the payments end. But by that time, if you can't requalify for flight status, you should be able to adjust your commitments to conform to your reduced income.

All members of the U. S. Air Force, Air National Guard and Air Reserve who are on flight status and who belong to the Air Force Association are eligible.

APPLICATION

for Protection of Flight Pay Income
Exclusively for Members of the

AIR FORCE ASSOCIATION

underwritten by
AETNA INSURANCE COMPANY
670 Main St.
Hartford 15, Connecticut

Name _____
Rank, Name, ser. No., service (USAF, ANG., etc.) _____
Mailing Address _____

Amount of Annual Flight Pay _____

I certify that I am currently receiving incentive flight pay.

Signature _____

Date _____

The annual premium charge is 1% of annual flight pay.

APPLICATION MUST BE ACCOMPANIED BY CHECK OR MONEY ORDER FOR ANNUAL PREMIUM.

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This Thing Called 'Leadership'

Can leadership be developed, or is it innate? Can you teach people to be leaders? What constitutes leadership?

Few will agree on the answers to these questions. The disagreement divides itself largely into two points of view. One believes that leadership is a process, a behavior or pattern of action. It will be exercised by one member of a group under certain circumstances and another member of the same group under other circumstances. The other school of thought holds that leadership is a trait, like intelligence or keen eyesight.

The fact that leadership is a behavior form, which emerges in one individual at one time and in others at another, appears obvious when one examines the matter dispassionately. If a "leaderless" group, for instance ten tourists of diversified background and experience, are attacked by Moroccan Nationalists, it is likely that one of them will become the leader, i.e., the one to whom the others look for guidance. If the same ten men face the problem of surviving a forest fire, the chances are that another will become the leader. Aboard a small boat in an ocean storm, it is probable that the cloak of leadership will fall on the shoulders of still a third. A fourth might be the leader in a conference on civic improvement and a fifth if the group were trying to raise a flagpole.

If leadership were an individual trait, like keen eyesight or even superior intelligence, the same person would have been the "leader" in all situations. But leadership is simply a mode of behavior appropriate to a given situation; to be exact, *leadership is getting people to work together as a team so as to get their job done most effectively*. The most obvious characteristic of those who emerge as the heads of leaderless groups is their *knowledge of the subject*. If our group of ten tourists contained a yachtsman, a forest ranger, and a member of a police riot squad, it is a safe bet as to who emerged as

leader in each of the first three situations, and if a city manager and a lumberjack were in the group you could probably guess who would lead in each of the last two!

The implications are obvious. Whatever your job, study it! Learn all you can about it. In a military situation the senior person will be the *official* leader, but the person he will think of for praise and promotion is likely to be the person who has the most know-how. That person (although perhaps a subordinate) is demonstrating a quality of leadership which makes him valuable to the leader and marks him as a potential leader himself. If you know more about every question that comes up in your area of work than does anyone else, you are in an ideal position to look like a leader. Air Force manuals, tech manuals, unit records, historical reports, professional books and magazines pile up into steps mounting to leadership if you study and profit from them!

Closely related is *mental alertness and ability* to put principles and facts together constructively, to perceive relationships and originate ideas which move the group toward its goal. The person possessing this fertile, active, capable mind may emerge as the leader of a group rather than the more knowledgeable but less creative man. The "knowing" person may become merely the source from which the alert, creative person gets his facts.

This is the ability to *synthesize*, to put the pieces together imaginatively. It is the spectacular, razzle-dazzle, "Eureka! I have it!" aspect of leadership.

Many people decide to become leaders by cultivating it while slighting the less dramatic and more fatiguing business of acquiring knowledge. That plan won't work. Flashes of genius don't come to brilliant but empty minds, because brilliant minds are never empty—they are filled with pertinent information. People who try to be masterful decision-makers without preparing themselves through ex-

haustive study just make themselves look silly. The common expression is, "He goes off half-cocked."

Of course, knowledge alone will not give one the ability to make brilliant decisions. Lots of "educated idiots" know the facts but can't use them constructively. So while mastering the facts of your area of work, also read books on logical thinking, creative imagination, and problem solving, and practice the exercises they suggest. Also apply their principles and techniques for constructive thinking in *your work*. A combination of these two factors—superior knowledge and its practical yet imaginative use—will certainly enable you to demonstrate improved "leadership behavior."

The third element found in leaders is the *ability to gain the confidence of the group*. This, too, is often mistaken for the whole of leadership, but successful confidence men possess it and so do demagogues who "lead" only until a real test comes of true leadership. It is merely one aspect, the "personality" aspect, of leadership. Its importance varies greatly with the situation. Among children and among people of low intelligence or education this personality appeal may lead to a shallow popularity which passes for leadership. Among more mature and intelligent people this element is proportionally less important. Intelligent groups tend to look to the more able of their number for leadership, with less regard to personal likes or dislikes. It seems probable that this personality element in leadership depends in great measure on some combination of the following factors: Good appearance, vigorousness or "aliveness" (vitality?), the desire to lead, the knack of saying things that please people and perhaps what is called "tact" and "graciousness."

In its finest sense, this personality aspect of leadership is reflected in high *esprit de corps*. If your personality does not inspire people, changing it is not merely a matter of saying, "I'll change." However, you *can* change the outward manifestations of your personality through self-discipline. (Continued on page 33)

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From its beginning, with one airplane flying between Tulsa and Oklahoma City 28 years ago, Braniff has pioneered many achievements in air travel and has grown step by step with the continuing advances in commercial aviation.

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pline. It isn't quick or easy. But any library has books on improving your personality and on how to get along better with people. There are some by retired military officers that are excellent. They discuss personality from the standpoint of the needs of a commander. Just reading won't change your personality, but they will help you improve your ability to impress people by your qualities of leadership.

A fourth element of leadership is the ability to express yourself fluently and clearly in oral speech. Knowledge, an alert mind, even personality appeal, depend largely upon ability in oral communication to make themselves known so that others may recognize and profit by them.

The Air Force has encouraged its personnel to improve their speaking ability. United States Armed Forces Institute offers courses in written expression.

Not only is developing the ability to express yourself an important aspect of leadership, but it can be an interesting and stimulating activity in itself. They are both challenging and entertaining. Developing leadership is a bonus!

A final element is willingness to accept responsibility. One phase of responsibility is mission orientation, putting first things first. The second phase is the courage to do what is necessary to carry out the mission. In one type of situation this may take moral courage . . . the willingness to support one's convictions, and to make decisions on the basis of one's judgment. In a "physical" type situation, combat for instance, plain physical courage is needed for leadership.

Many people take the attitude that a man simply has courage or he doesn't have it. It is probably harder to change ourselves in this respect than in any of the other areas we have discussed. But it can be done. Few of our great leaders whose dedication placed their duty above selfish and personal considerations were born with a yen for self-sacrifice. Most of them were men like us. Through long practice in looking at matters from the standpoint of the good of their unit, service and nation they finally reached the stage of putting first things first automatically, as second nature. They developed a genuine "mission religion." Such dedication doesn't just come naturally. It is developed by those who have the basic moral fiber required, by practice in self-discipline, objective evaluation of situations, and decision-making

capabilities based on the welfare of something bigger than themselves.

It should be unnecessary to discuss physical courage with military men. But moral courage, the courage to support one's convictions in the face of opposition, may be another thing. An officer who would never abandon his men in the face of a shooting enemy sometimes will abandon them in the face of a superior officer when his duty demands that he support them. An officer who would not abort on a combat mission will sometimes abort in defending a position which he knows to be sound because it is not good politics. A leader must be able to perceive the difference between courageous support of a conviction and insubordination, and recognize where one stops and the other begins. Courage is an essential of leadership, and the leader must exhibit it in headquarters and at the conference table as well as in the combat situation. His men will lose confidence in him if his courage fails in either situation, and when they lose confidence he is no longer a leader even though he may still hold the prerogatives of rank!

Developing responsibility in its two aspects, mission religion and courage, comes through practice, through self-discipline, and through consistently guiding your life and actions by them until accepting their guidance becomes second nature.

These five factors: knowledge of the situation, mental alertness and ability to synthesize, ability to gain people's confidence, ability in oral expression, and responsibility are identifiable components of leadership. In some situations one will overshadow the others, in other situations another will be most influential, but one or more, and usually all five, tend to determine leadership in an informal situation. Even in a structured situation, such as a military unit, the extent to which you display these traits will determine, within the limits imposed by the command structure, the influence you will exert in the group, which is to say the extent to which you lead it. They will also exercise a powerful influence on the opinion of your superiors as to your potential as a leader.

From this analysis three conclusions can be drawn: (1) Leadership is a complex, not a trait. One person will demonstrate it in one situation and therefore be a leader in that situation, and another person may demonstrate, and therefore be the leader, in another situation. (2) To develop lead-

ership, these constituent traits and abilities must be learned or developed. To the extent that they can be learned and developed, leadership can be learned and developed. (3) Persons who tend to display this "leadership behavior" oftener, or in more crucial situations, than others gradually come to be looked on as "leaders." We say they have developed leadership.

The moral of this is plain. You can improve your leadership capabilities. It takes work and self-discipline, but their expenditure will pay big dividends to yourself, to the Air Force, and to the nation.

Dr. Thomas F. Staton

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At General Electric, George F. Metcalf reports:

New Department to Help Solve Complex Defense System Problems



GEORGE F. METCALF, is General Manager of General Electric's new Special Defense Projects Department, located in Philadelphia, Pa. Mr. Metcalf has had extensive management experience in the military electronics field, both in Government Service and in the General Electric Company's Electronic Division.

Realizing the increased complexity of some of the nation's current defense system problems, General Electric has formed the Special Defense Projects Department. The new department will act as a Company focal point for large, highly complex missile projects. Headquarters for the new department will be located near Philadelphia, Pa. This new department has responsibility for large defense systems that require the combined research, development, and manufacturing resources of many of General Electric's operating departments and laboratories.

Manned by a highly skilled engineering and development staff, the Special Defense Projects Department relies upon

General Electric operating departments and laboratories for many specialized phases of its defense projects.

The Special Defense Projects Department is making significant contributions to America's defense program by focusing the wide range of specialized talents of General Electric on highly complex defense system problems. Section 224-4, General Electric Co., Schenectady 5, N.Y.

ENGINEERS: G.E.'s Special Defense Projects Department is currently expanding its staff of highly skilled engineers and scientists. If you have a background of successful, creative engineering send your qualifications to: Mr. George Metcalf, 3198 Chestnut St., Special Defense Projects Department, General Electric Company, Philadelphia, Pa.

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The ROLES and MISSIONS MUDDLE

By Gill Robb Wilson
PRESIDENT, AFA

AT A TIME when the Soviet Union's military progress is giving us all the competition we can handle, it is regrettable that the Air Force, the Army, and the Navy should be engaged in competition of lesser importance, commonly termed "inter-service rivalry."

The above statement may appear strange, coming from the head of an organization that has been credited in some quarters with stimulating such competition. One reputable newsman even reported that editorials in this magazine "allegedly panicked the Army into divulging classified documents and precipitating the recent Pentagon furor."

We must modestly disclaim any such intent or result. I have served the United States Army proudly in my time, and I refuse to believe that it panics quite so easily. Panic usually implies surprise, and I am sure the Army was neither surprised by the current furor nor unprepared for it.

Any Pentagon messenger boy knows that arguments as to the proper roles and missions of the respective services have been boiling beneath the surface these many years. That the controversy has waited this long to erupt publicly, for the first time since the B-36 hearings, is, if anything, a bit of a surprise.

The Air Force Association holds no brief for interservice rivalry *per se*. Nor can we be credited with the initiative in the present discussion. As a matter of fact, we have deliberately held aloof, refraining from comment during periods when there seemed to be calculated attempts to goad us into action.

Only when the national capacity for security, as we see it, appeared to be endangered through duplication of military effort and waste of public funds, have we spoken.

As a matter of fact, our record for interservice cooperation, rather than being one of controversy, is just the opposite.

When Army partisans began to see the need for an organization, similar in structure to the Air Force Association, to help tell the Army story, we freely made available the benefits of our own experience of the past ten years. On request we supplied copies of our Constitution and By-Laws. Representatives of the national staff of the Association of the US Army freely have been invited to our conventions and conferences. The Army Association's first annual meeting, at Fort Benning last fall, was frankly patterned after AFA's conferences.

When Army-minded writers, including active-duty Army officers, repeatedly took issue, in their Association's official publication, *Army*, with the strategic concepts in which we believe, we did not question either their right so to express themselves or their patriotism. We did question their logic and we still do.

When an editorial in another Army publication, *Armor*, claimed that the Army's experience with bullets has gained for it a proprietary right in the development of ballistic missiles, we merely shrugged our collective shoulders and let it go at that. We did the same when a Navy-partisan publication early this year suggested that all space vehicles would be known as "ships," and therefore be controlled by the Navy.

At the same time we could not help but note the deep and growing interest of both the Army and the Navy in
(Continued on following page)

airpower. Not merely to support their surface operations but as an end product for the delivery of nuclear firepower at long range. Here we drew the line, not as partisan advocates of the Air Force as *the* service, but in the interests of economy and military efficiency. As our own Jimmy Doolittle put it so succinctly some years ago, "We need the Air Force, a Navy, and an Army—but only one of each."

We could not but question the ability of the nation to support the simultaneous build-up of three independent airpower organizations, each striving to become self-contained. We think this a wasteful and inefficient approach to national security. To say otherwise, or to remain silent, would have made us derelict in our duty.

Along the way, an Army general with a sense of humor is supposed to have suggested that the Air Force might wish to take over our national pastime, on the grounds that a baseball flies through the air. Undoubtedly there are airpower partisans rabid enough to subscribe to such a theory. But the interest of the Air Force Association has been directed solely toward the ability to pitch air vehicles fast enough, straight enough, and far enough to hit the strike zone, if called upon to do so, and to play the game with maximum efficiency and minimum cost.

The recently aired argument over the capabilities of carrier-based aviation is a case in point. If it is possible, as the President intimated and Secretary Wilson claims, that the Navy can assume responsibility for a portion of SAC's major targets, we will be the first to welcome this contribution, *provided* there is unified command and control of all strategic air operations, including the Navy contribution. As General LeMay has repeatedly pointed out, SAC is facing plenty of problems in adequately basing and manning its equipment.

Unfortunately, a strategic air capability cannot be bestowed by fiat. It must be earned. Whether the Navy has that capability is certainly a matter for exploration. Its responsible military leaders should be able to produce indisputable evidence if such is the case. For this reason, it is in the national interest that the entire matter should be scrutinized.

President Eisenhower put the interservice row into perspective when he said, at a press conference, that disagreement among the services was to be expected during a period of profound change affecting "all military formations, policy, and organization and equipment." The President said he thought "a good, strong, argument" was the only logical outcome of such a situation.

However, he pointed out, once a national policy decision had been made, he expected all to support it loyally.

"The day that discipline disappears from our forces we will have no forces, and we would be foolish to put a nickel into them," the President said.

We agree wholeheartedly with this point of view. However, one of the reasons why the controversy has burst forth is the very fact that basic policy decisions appear not to have been made. On the pages immediately following, an examination of the public record indicates that the question of Navy participation in strategic air warfare has not been settled. This, indeed, is the nub of the problem. For if the matter has been decided, as President Eisenhower points out, that would be an end to the debate.

Contrary to Secretary Wilson's opinion, we do not believe that the matter should be left with the Joint Chiefs. They have had hold of the problem for some years now. Huge public expenditures are involved. And if there has been no decision, as the public record indicates, as to the degree and extent of Navy strategic air capability and responsibility, then the taxpayer is entitled to question the

Navy's need for its programmed ten super-carriers. For, in Secretary Wilson's own words, "[The Navy has] strategic power unquestionably or we wouldn't be justified in spending the money for the carriers like we do. . . ."

The national interest demands a more reasoned explanation. One doesn't build the carriers and then say we must need them or we wouldn't build them. Logic demands the reverse procedure—establish a need and then build as required.

From a strictly Navy point of view, it undoubtedly is not difficult to construct a case for ten super-carriers. But the question is not does the Navy need them? Rather it is, does the nation need them? The same question may be fairly applied to the Air Force's B-52s and to the Army's Intermediate Range Ballistic Missiles. The yardstick in every instance must be the national, not the service, interest.

As long ago as 1953 the Air Force Association asked for such a yardstick. In our Statement of Policy that year we said:

"The establishment of national strategy is a job of incredible complexity, involving particularly questions of the relative effectiveness of various weapon systems. The Joint Chiefs of Staff need professional help with this part of the job—help which ordinarily should come from the Weapons Systems Evaluation Group. Unfortunately, this segment of the Department of Defense has not been uniformly objective or effective in all of its studies; further, all of the military services have either prevented objective evaluation of their weapons or have failed to implement the results of sound evaluations. The Air Force Association believes that this situation is likely to continue so long as the Weapons Systems Evaluation Group remains in the Department of Defense and is dominated by military men.

"The nation sorely needs a competent and objective evaluation of its military effectiveness. *The Air Force Association believes that such an evaluation demands the establishment of an independent commission of leading civilians similar to the President's Air Policy Commission of 1947.* This group should have full access to the findings of the Joint Chiefs of Staff, but in no way be bound to these findings. It should have full access to scientific testimony. It should be non-partisan and its directive should be broad in scope.

"The findings of such a commission must be kept current, which is no small task in this age of new and revolutionary weapons. Accordingly, the Air Force Association recommends the establishment of a permanent organization devoted to the formulation and review of national strategy, and a continuing evaluation of our military effectiveness.

"This organization should be guided by a group of eminent citizens, and kept completely free of military influence or control. It should be financially and politically independent of pressure by any branch of government. It should be financially strong enough to attract and retain the best-non-partisan thinkers in the nation."

The recent reorientation of the Weapons Systems Evaluation Group, whose work is discussed on page 49, is a big step in this direction. Most WSEG work is now being contracted to a corporation of universities headed by the Massachusetts Institute of Technology and including the California Institute of Technology, Stanford University, Case Institute, and Tulane University.

We sincerely hope that full use will be made of this weapons evaluation tool. Such use would go far in resolving interservice problems based on competing weapons systems. The *Forrestal*-class carrier, for example, has

never, to the best of our knowledge, been evaluated by the Group. Neither has there been an offense-vs.-defense study of the underwater threat posed by the atomic submarine. The B-52 and the ballistic missile likewise should be subjected to impartial WSEG scrutiny.

For without an objective yardstick, each service builds toward what it thinks it needs. Unfortunately, the requirements for all three add up to much more than the nation is either willing or able to pay. So compromises and horse-trades are made under budgetary ceilings that insure, among other things, that we may well never have enough of anything.

This, then, is the problem and the root of everything that smacks of interservice rivalry. It leaves one with the uneasy feeling that the services are building and buying for three relatively separate war plans. It is a manifestation, on a grand scale, of what one expert calls the "commander's syndrome." Every commander wants to control everything he thinks he needs to do the job. Lacking clear definition of responsibilities, the individual services can scarcely be blamed for following the same pattern.

It is one thing, however, to define a problem and quite another thing to solve it. And it is the solution that interests us.

One immediate requirement would appear to be provision for free and friendly transfer of individual officers among the services. This in itself would allay, in great part, the fear of technological unemployment which seems to be gripping the surface forces. Such an arrangement would automatically enlarge our pool of military talent by giving new hope of advancement to many highly capable officers.

A further step in the same direction would be the establishment of a single promotion list for all services. This one point might well prove to be the key to the interservice wrangle. A single promotion list is a complicated problem and one that should be approached in a spirit of fairness and deliberation. Once decided upon, perhaps its implementation should be delayed for a specified number of years. Even so, its effect would be felt, I am sure, almost immediately. If an Air Force major, a Navy lieutenant commander, and an Army major know that eventually they will be reporting to a single chief of staff and gaining their promotions through a single chain of command, prudence alone would dictate that they cease bucking partisan heads and get together in the national, rather than the service, interest.

All of this leads, of course, to what we know as a single service—true unification, with military organizations based on missions rather than on the color of the suit. The Air Force Association has long been on record as favoring such a concept. We are delighted that public and official opinion are moving rapidly in that direction. We are also delighted, and proud, that the Air Force itself which, as current "top dog" might have the most to lose and the least to gain, selfishly, through a single service, is exercising leadership to this end.

Let me quote from Gen. Tommy White, AF Vice Chief of Staff, in this regard. General White recently told the Aviation Writers Association in San Francisco:

"To this end, I believe that our military services will move toward more complete unification. We need a military organization that will help us all to be free of conflicting service loyalties and confusing influences.

"One step could be to more closely integrate existing forces. The Continental Air Defense Command is an example of what I mean. Units of the Army, Navy, and Air Force are united in a common effort—the air defense of

the United States. Further integration of our forces into joint commands oriented toward one mission might be effective.

"Another step toward more complete unification would be the free transfer of men between the services. Perhaps this would allow the men in each of the three services to think a little more objectively about the requirements of defense and less about the gaining or keeping of weapons and missions for their own particular branch.

"With the passing of time, the roles and missions of all services seem to overlap more and more. Conceivably, if these trends continue the day could come when, for all practical purposes, all three services would have the same weapons, the same capabilities and limitations, and all attempting to do the same jobs. If that happens, perhaps we certainly would find it advisable to standardize uniforms and streamline the organization.

"As proud as we are of the United States Air Force, we will certainly be behind any actions which will reduce the chances for wasteful duplication and controversy and above all give our nation a better-working, more effective defense establishment."

This is military statesmanship of the highest order. Certainly we in the Air Force Association heartily applaud this approach even though many individuals in the Air Force may not agree with it. The Army and the Navy have no monopoly on parochial thinking. To these I can only say that there seems to be no other solid answer. We cannot go on indefinitely down our present path without jeopardizing the airpower strength this nation needs for survival. Hence, when the chips are down, the Air Force Association must put "Airpower" above "Air Force."

These are scarcely the thoughts of a partisan organization. We are proud that our unique type of citizens' group has always stood for and encouraged this kind of broad-gauged thinking. We hope that all service groups will submerge partisan feelings and assist us in this effort. Specifically, we invite the Association of the United States Army and the Navy League to join arms with the Air Force Association in supporting the progressive development of a single military service. We trust our distinguished conferees will declare themselves today—while controversy runs high—on the single service issue.

Nor should our joint declarations cloak themselves in vague generalizations of unification but rather, they should deal specifically with the basic ingredients of a single service—namely, free transfer among the services and a single promotion list.

In so doing we would all be following the advice of an eminent military leader, who has said:

"Such unity as we have achieved is too much form and too little substance. We have continued with a loose way of cooperating that wastes time, money and talent with equal generosity. With three services, in place of the former two, still going their separate ways and with an over-all defense staff frequently unable to enforce corrective action, the end result has been not to remove duplication but to replace it with triplication.

"All this must be brought to as swift an end as possible. Neither our security nor our solvency can permit such a way of conducting the crucial business of national defense."

It has been reported that the man who uttered the above words has directed that a study be made leading toward true unification of the services. We hope this is true. If it is, the Air Force Association will help in every possible way, for the man is our Commander-in-Chief, President Dwight D. Eisenhower.—END

Bombers and Aircraft Carriers— Secretaries and Senators

By Robert W. Berry

AS AN Army veteran of World War II and the Korean war, whose only association with the Air Force has been to ride in some planes and whose only association with the Navy has been to ride on some ships, I have no axe to grind in the current controversy as to aircraft carriers and their capabilities. But I am confused by it and in this I believe I am not alone. To seek clarification for myself and others I here set forth the issues as I understand them, based on the information provided officially to the public. In this review of the record, I exclude the content of the alleged Air Force staff study leaked to the press (see the *New York Times*, May 20, 1956), which was declared "not an Air Force paper" by General Twining, though its substance was not disavowed.

The issue: Are carriers able to perform any part of the SAC mission?

The current discussion of carriers and their aircraft is an outgrowth of the investigation by the Symington Subcommittee of the Senate Armed Services Committee into "the conditions and progress of the Department of the Air Force to ascertain if present policies, legislative authority, and appropriations are adequate to maintain a force capable of carrying out its assigned missions." On motion of

the Republican minority of the subcommittee, Senators Saltonstall (Mass.) and Duff (Penna.), the inquiry was expanded to include naval and Marine airpower. The sequence of events relating to this investigation is important in defining the issue.

Between April 25 and May 2, 1956, Gen. Curtis E. LeMay, Commander-in-Chief of SAC, testified as to the capabilities of his command. He noted many deficiencies, including personnel turnover and base structure, but the statement which received greatest public attention was that, under current programs, the Soviet Union would pass the United States in long-range jet bombers in 1958-60 and would thereafter progressively increase its lead.

On May 4 at a regular press conference the President's comment on this testimony was requested. So far as his comment related to the Navy it is as follows:

"I think we ought to broaden our vision a little more widely than looking at one particular phase or part of an organization when we begin to compare our positions with theirs. . . . We have the most powerful Navy in the world . . . and it features one thing, airpower. No one has talked about that. . . . By the time the Department of Defense gets done presenting its full picture, the United States will see that they have a great many bodies of men who have not been idle; who have not been indifferent to the security of the United States and who have carried their responsibility."

(Continued on page 43)



Top military officials hold an unusual press conference at the Pentagon May 21 to comment on the current interservice row. From left, AF Chief Gen. Nathan Twining; AF Secretary Donald Quarles; Army Chief Maxwell Taylor; Army Undersecretary Charles Finucane; Defense Secretary Charles Wilson; Adm. Arthur Radford, Chairman of the Joint Chiefs; Navy Secretary Charles Thomas; Chief of Naval Operations Adm. Arleigh Burke; Marine Commandant Gen. Randolph Pate.

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Here's why carriers are vulnerable, according to alleged AF documents reported in *N. Y. Times*: With carrier aircraft limited to 1,500 miles range (without refueling) carriers must steam close in to hit Eurasian targets. In so doing, they must enter restricted waters where they are subject to easy electronic detection, mines, submarines, and land-based air. Map shows approaches to Red land mass.

The *N. Y. Times* story also points out that carriers operating in the Mediterranean would be hard put to avoid detection by airborne enemy radar. It takes a fast carrier force three days to steam the length of the Mediterranean, but a pair of B-36-type aircraft can scan the same area electronically during a single twenty-four-hour period.

VULNERABILITY

WITH the problem of the Navy's strategic air capability still unresolved on a policy level, alleged Air Force criticism of the carrier as a strategic weapons system came to light in a copyrighted story in the *New York Times*. On May 20, *Times*

reporter Anthony Leviero disclosed what was said to be an Air Force study of carrier capabilities and limitations. General Twining made it clear that the document had no official Air Force status, but the information it contained raised questions

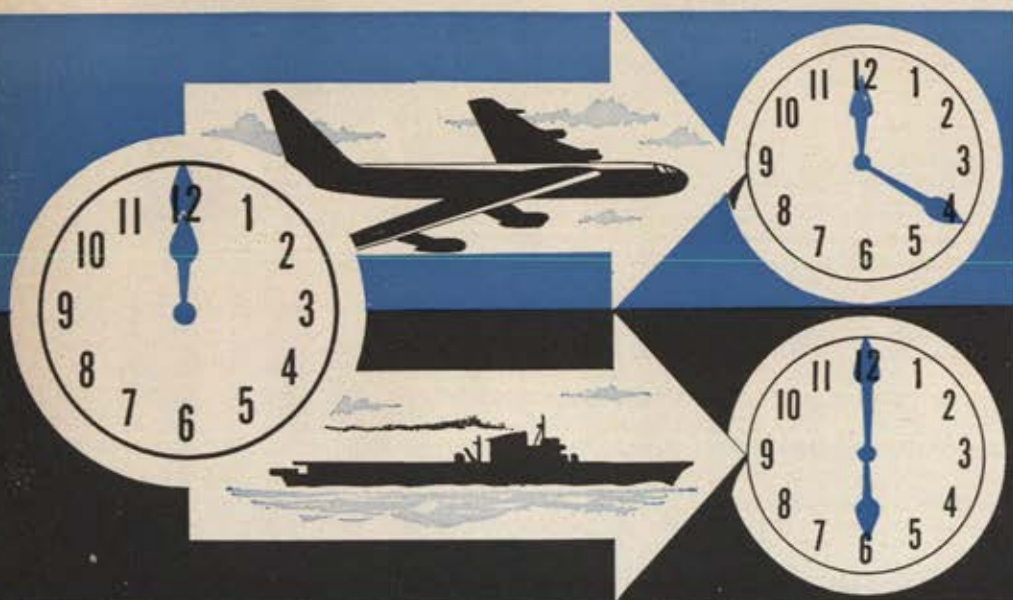
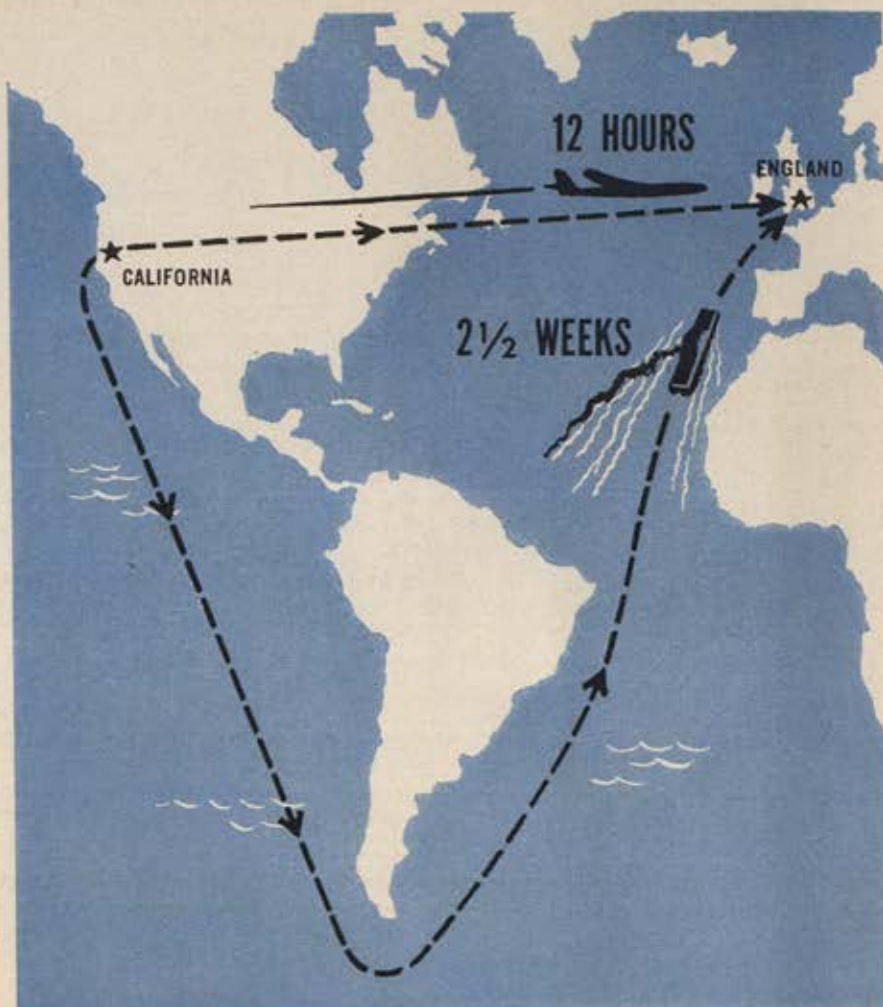
that are still officially unanswered.

The Air Force position, as outlined in the *Times* article, is that carriers, especially giant super-carriers of the *Forrestal* class, are ineffective strategic weapons. Or, at the very least,

(Continued on following page)

Mobility of carrier task forces, says quoted AF document, sounds better than it is. Big carriers can't make it through Panama Canal, hence would take two and one-half weeks (see chart) to steam from California to England. An entire wing of forty-five B-47s has made same trip in twelve hours and landed equipped and ready to begin offensive operations upon arrival. AF paper also was quoted as citing Navy dependence on overseas bases, a point on which Navy spokesmen have often criticized the Air Force. Navy construction overseas has been heavy since World War II.

Carrier speed doesn't mean much in the Jet Age, says *Times* quote from AF document. "Full throttle steaming of a carrier for a period of six hours represents approximately twenty minutes flight time for modern jet aircraft. . . . At medium altitudes and above, one twenty-second 'sweep' on an airborne search radar can accurately survey an area of approximately 15,000 square miles or an area greater than the combined states of Massachusetts and Connecticut." According to the document, two B-36-type aircraft could radar-scan an area of about 1,540,000 square miles in three hours.



MOBILITY

that they cannot be counted on for any part of SAC's job. In general, carrier criticism fell under the general headings of vulnerability, mobility, and strike capability.

On the question of vulnerability, the Air Force document, as reported

by the *Times*, pointed out that, in order to hit Eurasian targets, carrier forces would have to steam into waters heavily infested with mines and submarines and likewise within easy range of superior-performance land-based air. In these waters they

would be easily detected electronically by land-based reconnaissance aircraft.

On mobility, the *Times* reported the Air Force document as equally skeptical about carrier task forces. Leviero quoted the alleged AF document as follows, "On 27 June 1950 President Truman authorized air and naval aid for the Republic of Korea. On the same day 748 Americans were evacuated from Kimpo and Suwon, and pilots of the Far East Air Forces destroyed seven North Korean fighters over Kimpo. Six days later, on 3 July 1950, carrier-based planes of the United States Seventh Fleet made their first air strike." Carrier mobility is further restricted, said the document, by the fact that the big ones cannot go through the Panama Canal, and it cited a situation whereby it would take a carrier force two and one-half weeks to go from California to England as against twelve hours for a jet bomber. And the bomber would be ready to fight upon arrival. The alleged study also said that Navy forces were just as dependent on overseas bases as is the Air Force, a favorite Navy argument being that the carrier force

(Continued on page 45)

bilities forward to the point that they will, the United States will, feel a lot better than just on this one piece of testimony. . . . Now we have got a tremendous airpower, a mobile airpower in the sea forces. It hasn't even been mentioned yet. Let's wait until we get this picture sort of all before us, and let's have a talk about it at that time."

I do not find in these statements of the President any assertion that any part of the role of Strategic Air Command can and will be assumed by the Navy. However, since the statements were made in response to questions directed at General LeMay's testimony as to loss of parity with the Soviet Union in long-range bombers for the SAC mission, the President's statements can be read as indicating a belief that a wait-and-see attitude ought to be adopted as to whether the Navy can contribute to the SAC mission and thus compensate for an unfavorable disparity between SAC force and the Soviet long-range bomber force.

Secretary of Defense Charles E. Wilson, in a prepared statement before the Senate Appropriations Committee on May 8, was a good deal more specific. He defined national airpower in the broadest terms, including all military aviation of all services, the reserves, our civil air fleet, and aircraft industry. Then, turning to Strategic Air Command, he emphasized that the B-47 wings constitute "the heart of our strategic striking power today" and "the most powerful single element of airpower in the world today." He then had this to say about naval air:

"Before leaving the subject of strategic aviation I would like to comment on the strategic capability that our carrier-based aircraft add to our retaliatory striking power. We now have in operation fifteen large carriers, all of which carry aircraft with an atomic capability. . . . These carriers are capable of being dispersed widely through the world and they give us the ability to project our airpower into certain areas where we might not otherwise be able to do so, or where land-based aircraft would operate initially only under severe handicap. . . . Under the direction of the Joint Chiefs of Staff their use is carefully integrated into the plans for the employment of our strategic forces. The aircraft carrier today represents one of the most important parts of our over-all security program, providing mobile bases for immediate retaliation against enemy attack."

There is no question as to what Secretary Wilson was talking about. It was, in his words, strategic aviation, the strategic capability of carrier-based aircraft, employment of carrier-based aircraft in strategic forces, and the provision of mobile bases for immediate retaliation against enemy attack. There is also the suggestion that, not only do the carriers supplement SAC, but they may be able to reach targets which "we" might not otherwise be able to attack.

So there the issue appears to be stated. No one has said in so many words that a deficiency in SAC can be compensated by carrier strength. But I for one am unable to find any other implication in the context of these remarks. Surely the press has widely drawn this inference as indicated, among many other utterances, by questions asked at Mr. Wilson's press conference one week later, on May 15 (see below).

Since this is the immediately relevant issue, let us dismiss some other issues that can divert attention. On this matter there is no question whether we shall have carriers or not, or in what numbers and of what size; whether carriers can support the land battle in such areas as Southeast Asia; whether carriers can make a useful show of force in the Mediterranean; or whether carriers can attack those naval and air bases from which the control of the seas

by the United States and its allies can be threatened.

The issue, to repeat, is: In determining whether the nation has the force required to accomplish the mission of SAC, can the Department of Defense and the Congress properly conclude that carrier-based aircraft can remedy a deficiency in SAC to do the job alone, and if so to what degree?

It is now useful to see who has said what on various aspects of this problem.

Mr. Wilson's May 15 press conference

Secretary Wilson's next press conference was the occasion for unusually insistent questioning by several members of the press. The relevant passages speak for themselves.

The assignment of a strategic bombing mission to carrier-based aviation was queried:

Mr. Henkin (*Army-Navy-Air Force Journal*): Are there certain areas where the Navy has a primary strategic mission?

Secy. Wilson: Surely.

Mr. Henkin: Primary strategic mission?

Mr. Norman (*Chicago Tribune*): Strategic bombing mission is what he meant.

Secy. Wilson: Yes, sir. . . . Why don't you let the Chiefs fool around with the war plans?

Mr. Norman: We are not interested in the war plans, but we are interested in the statement that's been made by you and by other administration officials that imply that we don't need as much Air Force strategic bomb power because we have Navy strategic power which to us sounds like a rather new concept and, therefore, it has not been explained as to what part the Navy plays. . . .

Secy. Wilson: I think we had better let it alone. Everybody knows the Navy has a strategic striking power and when you talk about how much, what kind of a percentage and how much the Air Force can count on them and so forth, but they have their missions and they have strategic power unquestionably or we wouldn't be justified in spending the money for the carriers like we do. . . .

Mr. Norman: As recently as last week when I asked the Navy about what its assignments are in strategic bombing missions they said they had none, that traditionally the Navy's job is to control the seas and to protect itself against any attack that might come at them from land, but not the same thing as a strategic bombing mission.

Secy. Wilson: Well, obviously the Navy must have more responsibility or missions than to just protect itself. If they didn't have any other purpose than that why in the world would you have it? You have got to be reasonable about the whole business. . . .

Mr. Corddry (*United Press*): We are trying to find why you were . . . emphasizing them as an answer on the strategic bomber side.

Secy. Wilson: Well, they have an important part in our military strength, and we are building one of these big force carriers every year here in recent years, and certainly they must have a purpose, or we must all think they have, or we couldn't justify the expenditures; not only for the carrier itself, but the planes that go on it. It's quite an expensive business.

Mr. Henkin: Is the essential purpose of the carriers strategic air, sir?

Secy. Wilson: The carriers have a double mission. They have got the job of protecting ocean lines, but we used

(Continued on following page)

carriers in the war in Korea. I was over there myself when they dropped bombs that came off of carriers in the battle of Korea.

Mr. Henkin: These were tactical missions.

Mr. Norris (*Washington Post and Times-Herald*): What is that double mission? Would you define that, sir?

Secy. Wilson: Well, there is a tactical mission, too; you can use them for their multi-purpose things, you see.

Mr. Evans (*New York Herald Tribune*): You mentioned the first, sir, the first part of the carrier's mission is to control sea lines, sea lanes; the second is—I didn't get that.

Secy. Wilson: To assist in a tactical mission, and also in any strategic bombing mission.

Mr. Norman: Sir, do you know of a single instance where a US Navy carrier was assigned a strategic bombing mission at any time in World War II or thereafter? Certainly the Navy, in briefing you for this statement, must have mentioned its capability in that area. They talk about a striking—strategic striking power, but I can't recall at any time in the past where they claimed this striking power until just very recently. Could you give us an example of some hypothetical case without mentioning any specific target?

Secy. Wilson: I think we better leave that up to the Navy to go into that detail. It is on the order of something that they should talk about.

Mr. Evans: The trouble with that, sir, is the Navy makes a claim and the Air Force contradicts it. That is why we have come to you with it.

Secy. Wilson: Actually, the statements that are made haven't been completely contradictory. It's just a difference in the meaning of the words and the weighing of them. . . .

Clarification was requested as to the capability of carrier-based aviation to reach targets otherwise unreachable.

Mr. Henkin: Mr. Secretary, in your recent Senate testimony you said that naval strategic air was capable of hitting targets that were otherwise not accessible. The President has indicated that this—

Secy. Wilson: What is that I said?

Mr. Henkin: I believe you said, sir, that naval aviation was able to hit targets not otherwise accessible.

Secy. Wilson: I don't recall any such statement.

Mr. McDaniel (*Associated Press*): Your testimony on the Hill last week, Tuesday or Monday, whichever day, the first day up there in your prepared text.

Mr. Henkin: You said that the carriers gave us the capability to project our air force into certain areas where we might not otherwise be able to do so. On the basis of that statement—

Secy. Wilson: A carrier is a floating base if you want to look at it that way, and there are some places we don't have overseas bases that perhaps we wish we did have or a situation might arise sometime in the future. That is what I was referring to. . . .

The Press (unidentified): What places did you have in mind, Mr. Secretary?

Secy. Wilson: Well, just get yourself a globe and pick out the spots where we have got bases overseas and where we don't know how far away some of those places might be away from the Continental United States and, you see, it might be pretty handy, if you have the problem, to have some military force a little closer. . . .

Mr. Norman: Then you do then reaffirm your earlier statement that there are places in the world that strategic bombers or other bombers of our Air Force cannot reach at this time?

Secy. Wilson: I don't think I quite want to say that.

This refueling business gets into it and all that kind of thing.

Mr. Norman: Well, that was the statement read to the Hill and—

Secy. Wilson: We are interpreting it a little differently than I meant it, but just to take the specific thing and say that the Air Force, given the problem, couldn't [drop] a bomb anywhere in the world, I wouldn't quite like to challenge them on that one.

Mr. Wilson himself raised the question of enemy ability to locate and attack carriers:

Secy. Wilson: . . . You can say in one way that it is difficult to make your plans because you don't know where the carriers are, but it is also an asset on your side that the enemy doesn't know where they are either. So it's a—

The Press (unidentified): Why doesn't the enemy know, Mr. Secretary?

Secy. Wilson: Because they don't know where the carrier is going to steam the next day or next hour.

The Press (unidentified): They will know if it's close enough to them to do any damage, won't they?

Secy. Wilson: They might or might not know.

Mr. Corddry: How could they possibly not know?

Secy. Wilson: Well, you can go quite a distance in one night, you know. You can't move an air base very fast.

The Press (unidentified): Radar is not inhibited by night, is it, sir?

Secy. Wilson: Well, there is no radar that could follow the carrier.

The Press (unidentified): No radar can follow the carrier?

Secy. Wilson: At great distances. . . .

Mr. Corddry: Mr. Secretary, you made the statement, which I am sure you would like to explain to us, that there is no radar that follows a carrier.

Secy. Wilson: Well, I meant no one has a radar that they can put it on a carrier and follow that carrier mile by mile and hour by hour as it goes around the oceans of the world. I don't know of any such thing. I think they can follow it a certain distance from shore.

Mr. Leviero (*New York Times*): Couldn't that aircraft radar follow a carrier?

Secy. Wilson: Not at those distances, not that I know of.

Mr. Corddry: If they are that far away, then they don't pose any threat to you, do they?

Secy. Wilson: Well, aren't we talking about fifty or a hundred miles, something like that? . . .

Mr. Corddry: These radars, sir, sweep the horizon and they could pick up at a hundred-mile distance on the surface a target in World War II, and I am sure that the advances have made that even more possible today.

Gen. Nathan F. Twining, Chief of Staff of the Air Force, had testified on May 11 before the Senate Appropriations Committee that the amount of striking power the carriers could contribute to the strategic air offensive was "small." Secretary Wilson was asked his views:

Mr. McDaniel: Mr. Wilson, when General Twining made the flat statement that the Navy's contribution to strategic striking power would be small, do you agree in your context that he is correct, in the context which you just explained?

Secy. Wilson: I don't want to get into the argument over what you mean by small. A man is small as compared to an elephant; he is large as compared to a mouse.

Mr. Corddry: Do you have any idea on a percentage
(Continued on page 46)



Seventy percent of a carrier's planes must stay with the ship for defensive purposes, the N. Y. Times story points out. In a task force that includes seventeen carriers this would mean that about 1,190 planes would be held just for defense. This figure, according to Rep. Robert T. Ashmore (D., S.C.), is about the same number of aircraft allocated for protection of one-half the United States.

Only three out of every ten carrier aircraft would be able to put bombs on mainland targets, the others being retained for defense. "In the future," said the AF study reported in the N. Y. Times, "the defense of ships against aircraft may be improved by surface-guided missiles." "On the other hand," the report went on, "the defense of ships will be vastly complicated and made more difficult by air-to-surface missiles, which can be launched by aircraft beyond the range of a ship's detection radar, but which could use the ship's defensive radar as one of many possible means of aiming..."



STRIKE CAPABILITY

does not depend on "politically unreliable" overseas bases on foreign soil.

These drawbacks might be worth living with, the so-called Air Force document implied, if the carrier force possessed a strike capability large enough to influence the early phases of a nuclear war. But the documents cast serious doubt on the Navy's ability to deliver. In addition to the vulnerability cited above, the document was said to point out that carrier tactics involve a "sacrifice of offensive capability that results from the normal allocation of seventy percent of the available planes for defense of a carrier task force. . . . During Operation Mainbrace [North

Atlantic Treaty Organization maneuver] six carriers were unable to conduct aircraft operations (defensive or offensive) for a period of more than twenty-four hours due to rough seas and bad weather."

What it all added up to was an assertion that carrier strike forces are so vulnerable to air and sea attack, so limited in mobility, and so deficient in striking power that they could not, and should not, be expected to bear any of the responsibility for knocking out strategic targets. Or, in other words, Navy carrier strength could not in any way be counted in the picture when totting up Strategic Air Command's allotted war tasks. Whether or not

our policy makers were so planning was not clear, as outlined in the article beginning on page 40. But there seemed room to question the advisability of a carrier construction program adding up to ten of the *Forrestal* class when (1) their contribution to the winning of a nuclear air battle would be, in General Twining's own words, "small"; and (2) General LeMay's SAC and General Partridge's ConAD on whom the winning of the air battle would depend, were suffering from financial malnutrition.

You pays your money and you takes your choice. Without astronomical hikes in spending you can't have both.—END

basis as to what the Navy's strategic striking power is in relation to the country's total striking power?

Secy. Wilson: I don't think I would want to state any percentage off-hand. . . .

Mr. Corddry: I think the American people would be interested in your views on the subject since they are concerned with the adequacy of our strategic bomber force, and you imply that part of your reliance on our current superiority is the Navy's participation in that function.

Secy. Wilson: I am not going to tell you when and how many jets the Navy have that are now prepared to deliver atomic weapons. I am just not going to tell you that. I shouldn't do that.

Mr. Corddry: Sir, your department declared down to the last B-52 how many of those had been built.

Secy. Wilson: We did it very reluctantly, I'll tell you that.

Mr. Norman: Can you be just as reluctant today? We have reached a strange period I think in the Pentagon where none of us know any more what to expect in the way of answers. One day we are told we can't discuss H-bombs or the capabilities of planes to carry H-bombs, and we find people discuss that rather loosely as soon as they get up on the Hill, and we can't find out the production rates of the B-52, and yet that is published. . . .

Secy. Wilson: . . . No. Frankly, these different things change in relative importance. At the time when even if it was good for the country to keep the information, you no longer can: things have happened to such a degree at various times and places, it no longer can be done and we have tried to move in the direction of telling as much information as we thought we possibly could, weighing the importance of the people understanding what the facts were as against telling so much to the enemy that we felt we were breaching our own security regulation, and I was never in such a business before. I mostly have been used to putting the facts on the table and discussing the things and drawing conclusions from the facts. . . .

Secy. Wilson: Even General Twining didn't say that [the carriers] didn't have any strategic capabilities. He said it was small. He was talking about it as compared to what he thinks Air Force does.

Mr. Evans: Do you agree with that, sir?

Secy. Wilson: Certainly it's not of the same order, but it's not insignificant by any means.

Statements of the Navy position

Official Navy views have been stated by Secretary Charles S. Thomas, former Assistant Secretary James H. Smith, Jr., and Chief of Naval Operations Adm. Arleigh A. Burke. Strangely enough the statements of Admiral Burke are much less sweeping than those of his civilian superiors, and even these latter fall considerably short of the expressed views of Secretary Wilson.

Secretary Thomas, is quoted in the *New York Times* of May 20, 1956, as stating that carriers of the *Forrestal* class have the "ability to carry a powerful atomic punch (and) take the fight right into the enemy's front yard."

Assistant Secretary Smith is quoted in the *New York Journal-American* for April 28, 1956, as stating that the Navy could hit any land target on earth by launching from shipboard a plane or missile that can go 1,700 miles: "The mobility of a naval striking force permits its attack on an aggressor's heartland from a multitude of points on the high seas." He added, "Nor can an enemy

afford to attack our homeland while a naval striking force of such retaliatory power roams the high seas unopposed." It will be noted that these statements of capability probably refer to the future since missiles or carrier-based planes of 1,700-mile radius (without aerial refueling) are not now in the inventory. The statements also fall short of stating that any part of the SAC mission has been assumed by the Navy.

Admiral Burke has twice recently expressed himself as to the capabilities of the Navy for attack upon land targets, once in an interview in *US News and World Report* for May 4, 1956, and again in the round-up press conference of May 21. In each case he stated that the Navy's role was control of the seas, including attack upon land targets threatening such control. In the first interview he said:

"Our primary mission is to control the seas, which I know is an overworked—and not understood—expression, too. But what we have to do is to be able to project our military power over the seas—into Eurasia, or any place else which we may have to—and to do that we have to make sure that the supplies arrive and make sure that the reinforcements arrive. And before either of these events occur, we have to strike all possible enemies off their coasts, to disperse the enemy's strength, destroy his attacking capability and insure that our convoys are not destroyed en route. So that we really have two very important major tasks in maintaining control of the seas: to strike the military power of the enemy, and to make sure that the supply and reinforcements arrive. That means that we have to be able to defeat any threat whatever against control of the seas. Now those threats may be naval, they may be missiles or aircraft, or submarines, or mines, or motor torpedo boats, or even sabotage and subversion. It doesn't matter from where or by whom the threats are launched—we must be able to defeat all threats through control of the sea."

At the press conference held on May 21, Admiral Burke said:

"The primary role of the Navy is to maintain control of the sea. That we will do and that we can do.

"In maintaining control of the sea, the thing that we must do beyond all else is to destroy those threats which threaten our control of the sea.

"Those threats occur in several different areas. One of them is the submarine. Another one is air. Another one is missiles. Another one is mines, and there are others that you can think of.

"The best way to destroy a threat, whether it be control of the sea or some other area, is to destroy the weapons at their bases before they are launched. For that reason, we have developed and will continue to develop the capability of striking the source of our threats.

"In other words we will have the capability. We now have the capability, and we must continue to have the capability to destroy submarine pens, bases, airfields from which planes are launched which threaten our control of the sea. . . .

"[As to whether the Navy should destroy enemy bases in the heartland] . . . that is a very loaded question. No, it isn't a fair question, either, because when we start in to attack an enemy country we attack from far out at sea. We start our attacks well out at sea. We start our attacks well out at sea because that is a proper place to do it.

"The enemy can bring less force to bear against us than we can bear against him, and we can work our way

(Continued on page 48)



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BUILDERS OF POWER FOR OUTER SPACE

in. There are occasions when we have a collateral duty to assist in striking targets which are assigned by the Joint Chiefs of Staff, after a series of long coordination conferences by the local commanders, by the unified commanders, and by SAC.

"Those targets are the result of complete agreements by all those commanders. There are some occasions when an individual target is in doubt. Those particular targets are resolved by the Joint Chiefs of Staff."

Question by Press: Did I understand you correctly in saying that SAC had assigned some targets to the Navy?

Admiral Burke: No, I say there are some targets that are assigned to the Navy as a result of coordination of the commanders.

Question by Press: But not from SAC?

Admiral Burke: It is a coordination business.

Significantly, no contention was made that the Navy had taken responsibility for the destruction of any part of the key SAC target system. The word "strategic" does not appear, nor any reference to Navy participation in the "retaliatory offensive."

The views of the Air Force

On May 11, 1956, the Chief of Staff of the Air Force, appearing before the Senate Appropriations Committee, was asked to express his views as to the participation of carrier-based aircraft in the SAC mission. He gave the following answer:

"The first priority task facing the United States in any general war is winning the air battle. . . . In a war with the Soviet Union the air battle job would consist of two missions: first, defense against the Soviet air attack and, second, retaliatory attack upon the Soviet Union, especially the bases for its long-range aircraft. . . . Carrier aircraft . . . have an attack capability with nuclear weapons. The size of this total capability depends on the attack aircraft complement of the carriers (which must also carry defensive fighters, search planes, and the like).

"The portion of the attack capability available to supplement Strategic Air Command, depends upon what priority naval tasks may exist at the time. The targets that can be attacked by such carrier-based planes as are available also depend upon the location of the carriers at the time in relation to the combat radius of their attack aircraft. The range of carrier aircraft is relatively short compared with their land-based counterpart.

"But we must be realistic about such factors as the probable location of the carriers, as well as the amount of striking power they could contribute [to the strategic air offensive], which is small."

A comparison of this statement with the expressed views of Admiral Burke discloses no substantial disagreement. Neither indicates that the Navy has undertaken to destroy any part of the SAC target system. General Twining's statement that the attack capability which the carriers "could contribute" is small is uncontested.

Secretary of the Air Force Donald A. Quarles appears to have made no statement on the carrier issue.

The silence of General LeMay

When Gen. Curtis E. LeMay, SAC Commander, testified before the Symington Subcommittee one would have expected a rather full exploration of Navy participation in the SAC mission, especially from the Senators at whose

insistence Navy aviation was added to the Subcommittee agenda. The published record (May 2, 1956, pp. 179-80) discloses the following:

Senator Symington: If at this stage anybody said that any foreign power or any Army aircraft or any Navy aircraft was a justification for failure to give you an adequate Strategic Air Force, it would be the first time that you had ever heard of it as commander of SAC?

General LeMay: That is right. The missions of the services are assigned by the Joint Chiefs of Staff and I have this mission and no other service has it assigned.

The Navy has a corollary mission of assisting in strategic bombardment within their capabilities, but it is only a corollary mission. It is not a primary mission. . . .

Senator Symington: And again I want to be sure. Over all the years that you have run Strategic Air Command if anybody brings up as an excuse, or reason for shortage in SAC, the capacity of another service, or another country, to do the job, it will be the first time to your knowledge it has even been brought up?

General LeMay: Yes, sir.

Senator Saltonstall: At the same time we have been told, General LeMay, by several responsible persons, to be very frank I can't remember which ones, that the plans of the Army, Navy, and Air Force, in event of a war or in the event of a strike on this country, have been coordinated. Do you agree with that?

General LeMay: Yes; we just explained to you how we went about coordinating our part of it with the other services. I think that is a fair statement that they have been coordinated.

Senator Saltonstall: And they are in a better state of coordination today, as shown by those charts that you have given us, than they have been in the years past? Are you working toward a better coordination?

General LeMay: Yes, sir.

Who is deciding what?

The press for May 25, 1956, contained excerpts from a "hitherto secret staff paper written for a Hoover Commission task force" dealing with the Joint Chiefs of Staff. Among other disturbing conclusions it declares that the JCS are unable "to agree on major issues that affect the future growth and strength of their respective services and to use organized scientific advice, primarily the Weapons Systems Evaluation Group." Can it be that participation of carrier-based aircraft in the retaliatory atomic offensive is one issue upon which no definite decisions have been made?

If decision has gone by default on the military side, have the civilian chiefs of the Pentagon come to their own conclusions, and upon what basis of fact and analysis? It is a peculiarity of the organization of the Office of the Secretary of Defense that none of the nine Assistant Secretaries of Defense is charged with responsibility for studying and advising upon the capabilities of various types of force. It would seem, then, that if such issues are to be decided on the civilian side the job must be done by the Secretary of Defense himself.

The reader must judge whether the record here set forth suggests that firm decisions have been reached upon the type of patient study the issue requires.—END

Mr. Berry, a graduate of Washington State College and Harvard Law School, is a first lieutenant, USAR (Infantry). He served in World War II and in Korea.

Are we making the most of THE TOOLS WE HAVE?

By Lt. Gen. Samuel E. Anderson
with Dr. Charles A. Boyd, Jr.



GENERAL ANDERSON



DR. BOYD

THE WEAPONS Systems Evaluation Group is one of the fact-finding and analytical facilities available to the policy-makers within the Department of Defense. To begin with, the basis for weapons systems evaluation is "operations analysis."

Historically, the first significant application of modern operations research to the solution of military problems was made during World War II.

Here are a few examples. At the beginning of World War II the British Coastal Command had disappointingly little success in air attacks on submarines. They made several changes in the design of the depth charges being air-dropped with no improvement in effectiveness.

An operations research team led by E. J. Williams made an investigation of the attack method. They found that the fuzes of the depth charges were set to explode at a depth of 100 feet. This setting was chosen on the assumption that a submarine, under attack from the air, would see the aircraft and would dive to a depth of from fifty to 150 feet during the time that it took the aircraft to catch up with it.

By careful analysis of operational data on actual attacks, however, the group found that in one case out of every three or four, the airplane would catch up with the submarine when it was still visible or had just barely disappeared, and its position was known well enough so that it could be attacked with maximum accuracy.

In the cases where the submarine had dived deep and disappeared, its position was uncertain due to evasive maneuvering. Thus, it appeared advisable to concentrate on getting submarines still on the surface or which had not been submerged for more than fifteen seconds, as they were the easiest targets.

The calculated best exploding depth under these conditions was found to be twenty-five feet, but actually the settings had to be made at thirty-five feet because of limitations on the detonating mechanism. With this new setting and attack technique the number of submarines sunk or killed per air attack increased by a factor of two to

The accompanying material (somewhat condensed) was prepared by General Anderson and Dr. Boyd for an address General Anderson made at a Defense Policy Seminar in the Defense Studies Program (see "Pentagon Prep School," AIR FORCE, August '55) at Harvard University on March 22. General Anderson has been Director of the Weapons Systems Evaluation Group since August '54. In WW II he was CG of 9th Bomber Command and later served first as Director of Plans and Operations, Hq., USAF, then as Commander of the Fifth Air Force. Dr. Boyd joined WSEG in 1953 and now is General Anderson's Assistant Director of Research. He received his Ph.D. in physical chemistry from the University of Wisconsin in 1948. This article does not necessarily report official policy of the US Air Force.

four. German reports on this marked increase in effectiveness estimated that the British had doubled the amount of explosives in their depth charges.

My own personal experience with operations analysis from the consumer's point of view began when I arrived in England on June 1, 1943. I inherited command of several groups of Martin B-26 medium bombers. These were the original B-26 groups to go to the UK and had been trained entirely for low-level bombing. They had flown only two combat missions. The first, against a power plant at Ijmuiden, in Holland, was unsuccessful from the point of view that the target was not destroyed. The second was unsuccessful because all eleven airplanes which penetrated the defenses of the target area were shot down. Not a one returned.

When I took over, the units were grounded. The concept of low-level bombing against the intense flak surrounding most target areas had been abandoned. It was my job to find out how to get some effective use out of the units. We decided to try medium-level bombing, that is, bombing from 10,000- to 12,500-foot altitudes. The crews, particularly the bombardiers, had to be completely re-

(Continued on following page)



A good example of the value of operations research can be found in the experience of British anti-submarine operations early in World War II. Before a study was made, depth charges were set at 100 feet—with poor results.



After careful analysis, it was found that the best exploding depth was thirty-five feet. The new setting increased the number of kills by so much that the Germans were led to believe that the British had doubled the explosive.

trained. I say particularly the bombardiers because they had not been trained to use the Norden bombsight, and it was essential to use this sight when bombing from medium altitudes. We were most anxious to get the units back into combat so we flew our next combat mission after only one month's training. The target was the railroad marshaling yard at Abbeville, France. Not a single bomb landed in the target area. On succeeding missions bombing improved a bit, but the average error remained unacceptably large. Airplane commanders almost universally blamed the large error on their bombardiers.

We had in my headquarters a group of operations analysts headed by Dr. Lauriston Taylor. At that time I was very dubious about getting any real assistance from the group. I was astounded at the source of my first real assistance. Among the group was a Dr. Bichowski. He was elderly, small, roly-poly, a candid camera fan. And it was his interest in photography which paid off for us. We always took strike photographs in the immediate target area. Dr. Bichowski came to me and suggested that we take strip photographs all the way from the initial point of the bombing run through the target area. He said he wanted to analyze it and see if he couldn't find out who and what were causing bombing errors.

We took the photographs, turned them over to him, and he began his studies. Within a few days he could tell whether bombing errors were caused by poor synchronization on the part of the bombardier or by the pilot's having the airplane in a turn, a skid, a bank, a tail-low, or a tail-high position at the time of bomb release. Many aircraft commanders' faces were red thereafter. His analysis resulted in the average error's decreasing from 1,500 feet to an average of 443 feet for the final 120,000 combat missions flown by B-26 Marauders in Europe during World War II.

From this experience I learned to take my problems to my operations analysts. Naturally, when I was asked in the spring of 1944 if 9th Bomber Command could destroy the nine railroad and thirteen highway bridges spanning the Seine River between Paris and the English Channel within the last twenty days before the invasion of Normandy, I asked Dr. Taylor's group to evaluate the Command's capabilities against the proposed job. The problem was whether to continue 9th Bomber Command operations against the rail network and the V-1 sites in France or to concentrate its efforts against the bridges I have mentioned.

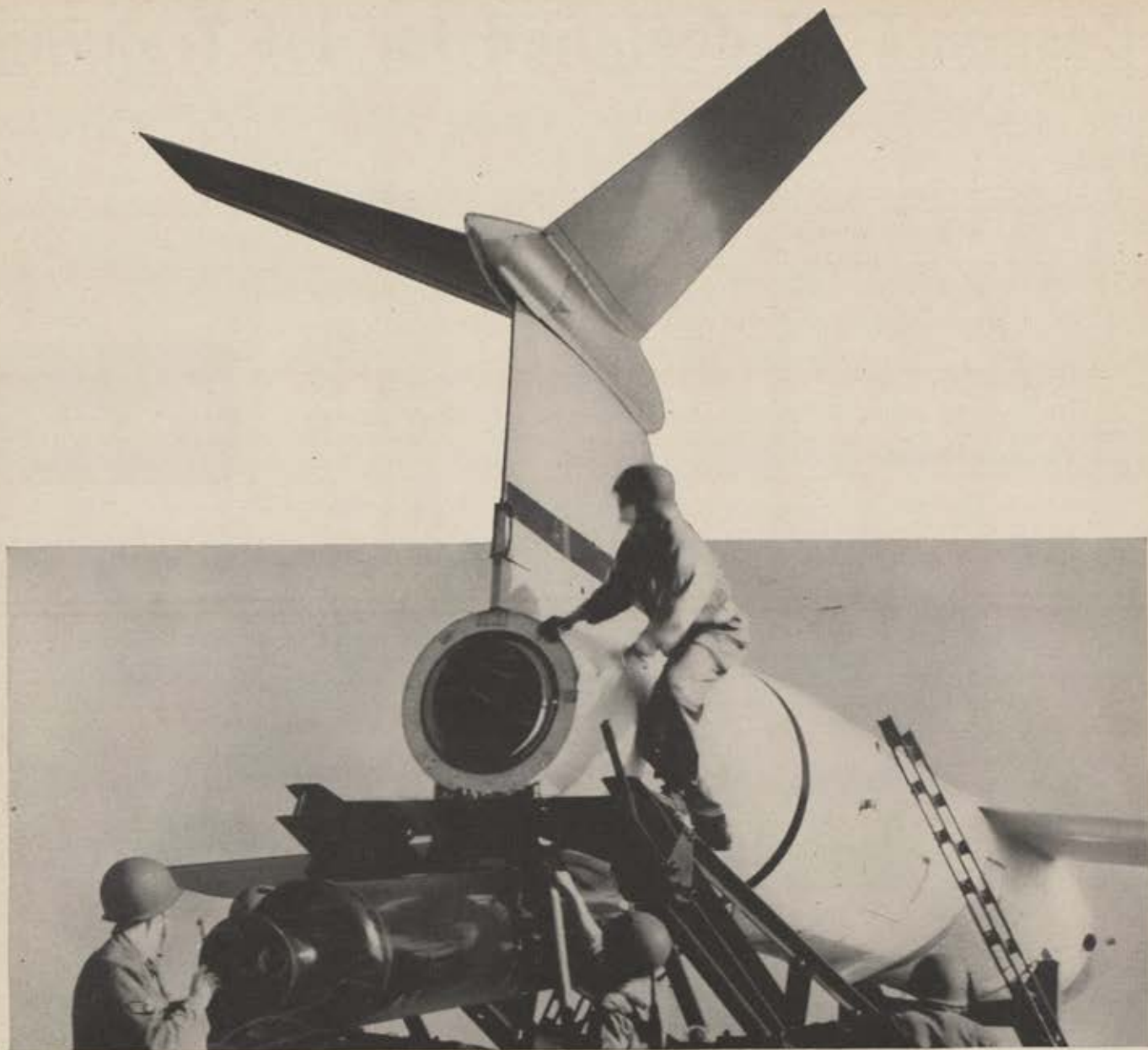
Dr. Taylor's group did a thorough analysis, including an analysis of the structure of each bridge to be attacked. The latter gave us the information as to what size bomb and what type fuzing, or combination of fuzing, would be most effective against each bridge. They then analyzed tactics and techniques and came up with a recommended method of attack for each bridge. They estimated that an average of seventy-two sorties would be required to totally destroy each of the bridges.

The 9th Bomber Command was then a part of the Allied Tactical Air Force commanded by the late Air Chief Marshal Sir Trafford Lee-Mallory. He had a scientific advisor named Dr. Zuckerman. Basing his calculations only on single shot probability of hitting a bridge, Dr. Zuckerman estimated that it would require on the order of 700 sorties to destroy completely each of the bridges. It was obvious that if this figure—700 sorties—was anywhere near correct, the 9th Bomber Command could not possibly generate enough sorties to destroy the bridges within the twenty-day time limitation. The arguments preceding a decision were many and, at times, downright bitter. It was only because the analysis made by the Ninth Air Force operations analysts was so thorough that the bridge bombing campaign was undertaken. It was successfully completed well within the twenty-day time limitation. The actual number of sorties required to completely destroy each bridge turned out to be eighty-eight.

The point of this story is that on a small scale it illustrates one facet of Weapons Systems Evaluation Group's job, which is to make studies, evaluations, and analyses to assist the decision-making processes within the Department of Defense. The analysts in the cases I have described were working with field data taken under combat conditions. Scientifically speaking, they were working very close to the experimental results. Today, similar tasks are somewhat different and a great deal more difficult. We are required not only to investigate the effectiveness of a given type of weapons system, but we must also project the conditions under which this weapons systems will be used. These conditions must reflect the impact of new but untried weapons of destruction and we must work with little or no experimental data.

WSEG was formally established by the late Secretary of Defense James Forrestal in 1948. It has changed con-

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siderably since then. Until recently, all of our civilian analysts and scientists were Civil Service employees. Now they are contract employees of the Massachusetts Institute of Technology. Within the next year they will become employees of a corporation of universities comprised of California Institute of Technology, Stanford, Case Institute, Tulane, Massachusetts Institute of Technology, and possibly one or two others.

When I came to WSEG on August 1, 1954, it was made up of seventeen professional civilians and twenty-seven military. Now, after two months of operating under the MIT contract, we have twenty-five professional civilians but still only twenty-seven military. We do not plan to further increase the ratio of professional civilians to military.

In the past, the WSEG operation has had too much of a military flavor. Yet the WSEG charter provides that the Director shall have only general supervision of the work and that the Research Director—Dr. Albert Hill at present—“shall be the chief scientific officer of the Group and he shall serve as Deputy Director of the Group. Subject to the general supervision of the Director, he shall supervise and direct the work of the Group.” It boils down to this. We are trying in WSEG to solve a problem which Dr. Lee DuBridge has said he thinks “neither the scientists nor the military agencies have solved,” namely, the problem of trying at every stage in the development and accomplishment of a WSEG project to bring together scientific and military experience.

The projects in WSEG are staffed by military personnel of all services and scientists working closely together. This close association results in a mutual understanding of and respect for divergent points of view. Such understanding and respect play an important part in the resolution of controversial issues.

In setting up a project, we usually begin with a directive from the Joint Chiefs of Staff. Such a directive does not ordinarily come to us as a surprise. We are given an opportunity to react with the thinking going into the formulation of the directive, and sometimes a number of documents pass back and forth between ourselves and the Joint Staff before the final directive emerges. Our main concern is to be sure that we can, in fact, turn out something in response to the directive which will be useful.

There are many important problems which cannot be treated in their entirety in a quantitative fashion and whose final solution must, of necessity, be made on the basis of judgment. With this type of problem our main concern is to locate probable areas within the over-all scope of the problem where quantitative analyses can be made which will contribute to the formulation of an informed judgment.

Another step is the selection of a project leader. He is usually chosen from the senior scientific staff of WSEG, or, if particular talents are required, we may bring in outside experts. For example, at present, one of our project leaders is a professor of physical chemistry on leave from the University of Notre Dame, and a second is on loan to us from an aircraft company.

The project leader usually assembles a small working group to study the directive and to formulate a definite plan of attack. This is then discussed with a Review Board, made up of the senior service members, the Director and Assistant Director of Research, and the project leader. After the plan is examined, adjusted if necessary, and approved, the project gets into full swing. Outside contacts have to be established with interested agencies, usually personnel with specialized abilities have to be obtained by loan or by hiring, requests on other agencies for special information (and perhaps studies) have to be initiated,



A study of bombing techniques decreased the bombing error from 1,500 to 443 feet for World War II B-26 Marauders.

and all of the things which go to make up a WSEG study program get under way.

As reports on various aspects of the problem are completed, they are brought to the attention of the Review Board, and meetings of the Board are held to discuss the reports and to provide guidance for the project whenever necessary. If items of special interest to the Joint Chiefs are developed during the course of the study, they are forwarded as soon as possible without waiting for completion of the entire study.

The final report is subjected to close scrutiny by the Review Board, and usually there is a period of interaction between the Board and the project before a final, approved copy of the study is produced. This is then submitted to

(Continued on following page)



The Weapons Systems Evaluation Group was established by the late Secretary of Defense James Forrestal in 1948. Since then it has undergone many changes.

the director of WSEG for forwarding to the proper agency.

In practice our studies do not follow this outline to the letter. Each study has its own character, its own peculiarities, and its special problems. However, these steps represent the objectives toward which we work.

Because of security requirements, it would be difficult to describe an actual WSEG report. So, I would like to describe an idealized WSEG-type study on a weapons system of considerable historical importance as it might have been made for the Chiefs of Staff of the Philistine armed forces.

We will assume that we have been working under a directive which asked us to evaluate the war chariot weapons system as a potential item in the military structure.

We would probably begin with the "tactical considerations." We would examine the missions in which war chariots might play an important role, such as the cutting of the enemy's lines of supply or interdiction, encirclement of his forces, frontal assault, or as fast task forces. Second, we would have to examine typical operations in which the government might become involved during the time period of our study and make some estimate of the frequency with which the Philistine armed forces might be called upon to perform these missions provided a war were declared. In order to help evaluate the worth of the war chariot in these roles, we would require effectiveness data of "kill probabilities." We would try to estimate these from historical data, from proving ground data, by pure calculation if necessary, or by some combination thereof.

We would probably examine the maintenance and support requirements that the employment of war chariots would place upon the military structure and the training program required for their effective use. We might examine the psychological impact to be expected when enemy troops were confronted with war chariots. Although we would not expect to provide quantitative degradations of enemy effectiveness, still an examination of the psychological implications of the employment of war chariots might be important.

We would try to develop the tactics, indeed the optimum tactic if one were to exist, by which the enemy might counter our employment of war chariots. This, of course, is an important item in any analysis of a weapons system and would require close study of enemy doctrine and capabilities. As Sir Winston Churchill has said, "However

absorbed a commander may be in his own thoughts, it is necessary, sometimes, to take the enemy into consideration."

Map exercises and mathematical models would play an important part in this tactical phase. It might be necessary to program some of the mathematical models for high speed machine computation.

Depending upon the nature of the directive, we might very well examine the production capacity for war chariots. What kind of procurement program could be established? How could they be phased into the structure of the armed forces with various levels of production effort? We might determine whether the production of these items would require strategic materials needed for other phases of our defense effort.

Finally, we would try to determine if there were any future potential in war chariots in terms of improvements which might be expected. For example, we might examine the feasibility of providing the war chariots with internal motive power, increasing their armor, and replacing the wheels with tracks. As you see from this hypothetical example, the term "weapons systems evaluation," as it is interpreted in WSEG, covers a wide range of interests. In passing, you may be interested to know that the Philistines are credited with having employed 30,000 war chariots when they defeated Saul and the Israelites in the battle of Mount Gilboa.

In closing, I would like to spend a few minutes discussing the responsibilities that I think an analyst must assume upon becoming a member of a group such as WSEG. I believe that these responsibilities are shared equally by the military and technical members.

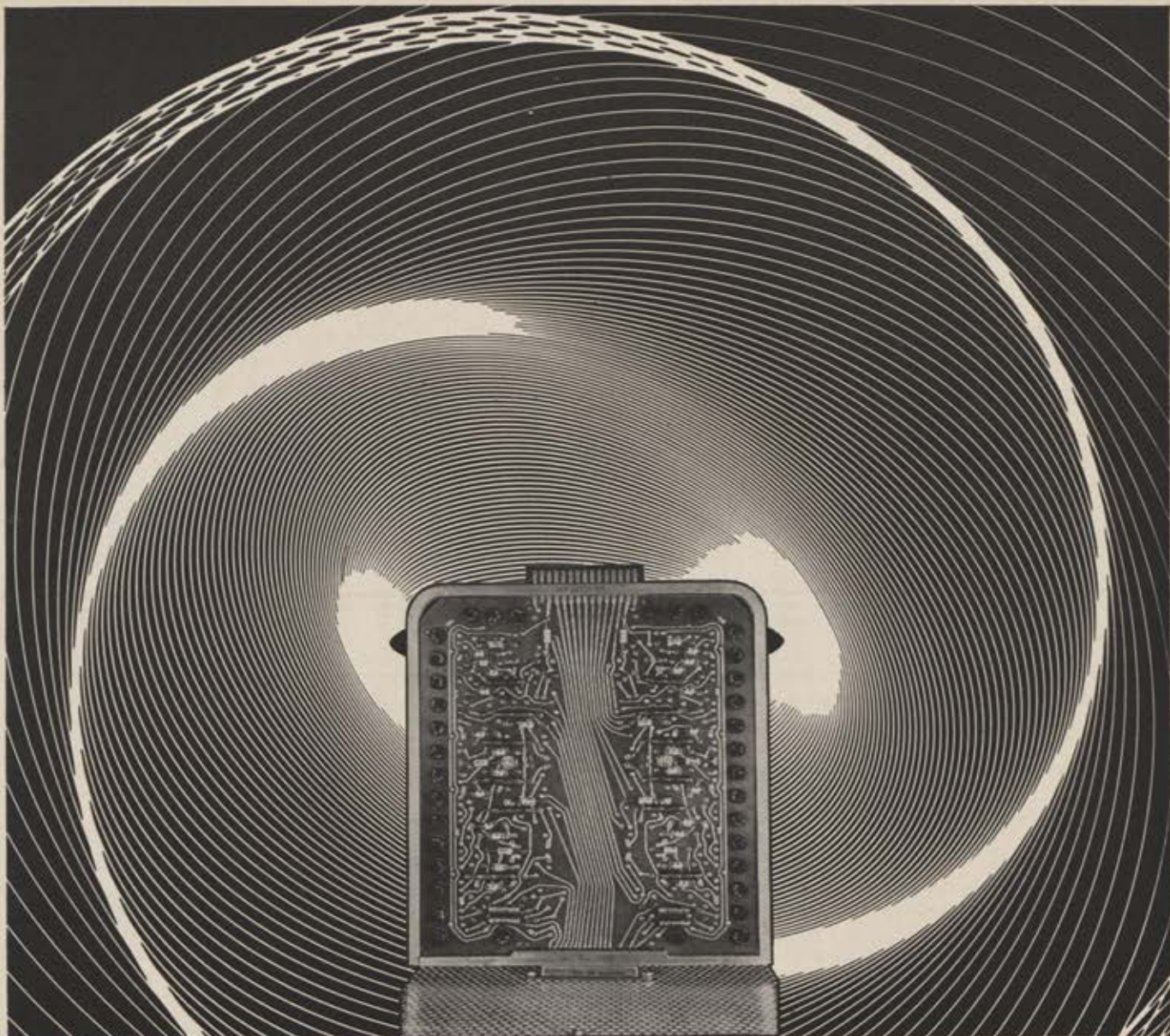
First, of course, objectivity and integrity are the keystones of any real evaluation. Without these the entire arch will collapse.

Next, the analyst should recognize that the primary purpose of a study is to develop facts upon which decisions can be based. Sometimes the decisions stemming from the facts are obvious, and this is indeed a fortunate situation. Other times, the decisions are not clear-cut and require judgment in their formulation. It is helpful in these cases to delineate as far as possible the judgments that have to be made.

Third, it is the responsibility of an analyst to make his reports as understandable as possible. This requires, among other things, an explicit statement of the assumptions made during the course of the study. Further, it is of extreme importance that these assumptions be both realistic and complete. Once the assumptions are agreed upon, and work on a project has begun, no amount of analysis will improve the assumptions. In other words, the quality of the results of a project will be in direct proportion to the realism and completeness of the assumptions.

Fourth, excess mathematical or verbal window-dressing should be avoided. It does not contribute to a report's usefulness; it uses up the time of a harassed reader; and, in fact, it may obscure important points.

Weapons systems evaluation is a valuable and necessary element in the building of our national defense structure. It is not a completely new discipline; yet it has developed rapidly in the last decade. It is revolutionary in character and can readily be adapted to the needs of the time. Its techniques are applicable not only to the weapons systems of the present, but to those of the future. Already it has made significant contributions to the military art, and it has promise of being of even greater value in the fabrication of a strong national defense. It is one more important tool to be used in the arsenal of democracy.—END



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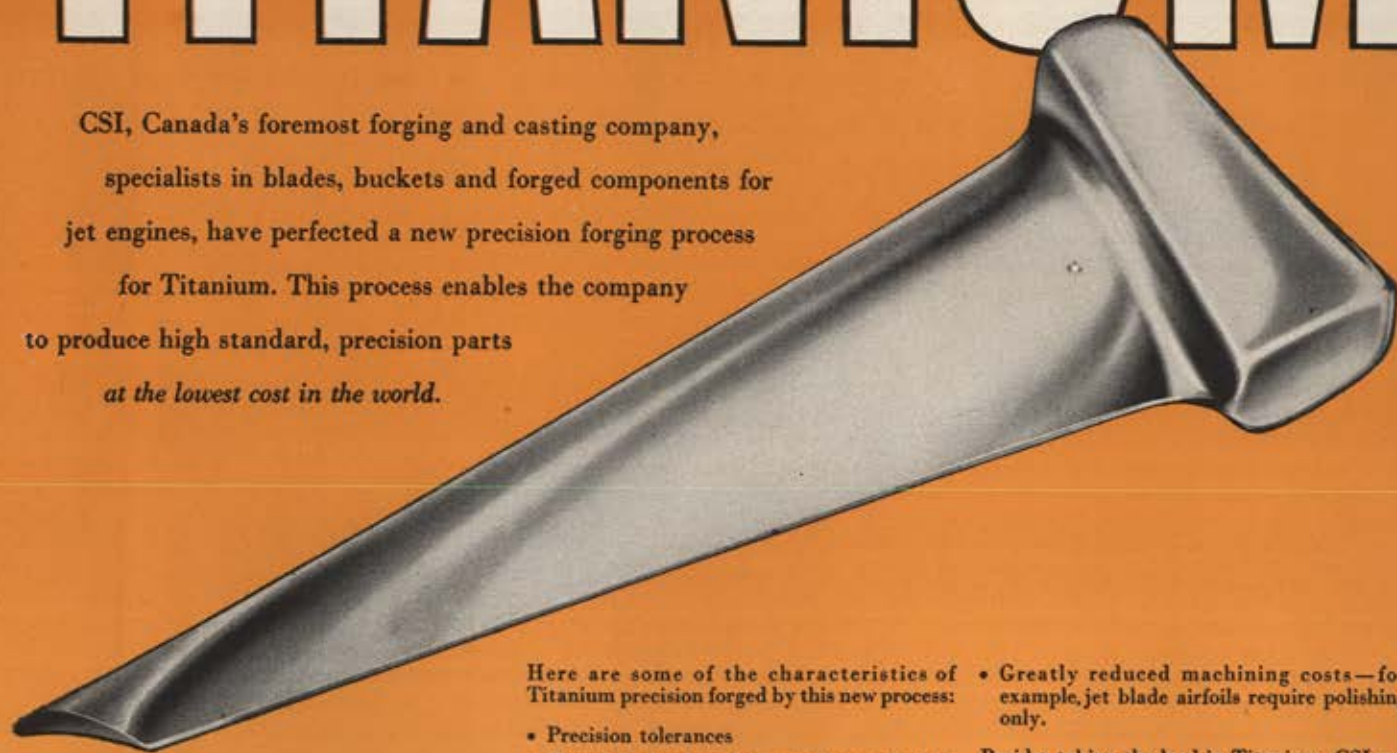
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RAF Hawker Hunter over Europe.

Where the money goes in

BRITAIN'S DEFENSE BUDGET

By Norman H. Gibbs

PROFESSOR OF HISTORY, OXFORD UNIVERSITY

THE ANNUAL series of debates on the presentation of the Fighting Services Estimates to Parliament has been completed. These debates provide Parliament with its best opportunity to discuss the government's defense policy, both as a whole in its grand strategy setting, and the separate parts of it as they concern the Navy, the Army, and the Air Force.

Britain's defense budget in comparison with that of the United States is small; but in relation to our national wealth it is very large indeed. This financial year it totals £1,550,000,000 (\$4,340,000,000) or one-third of the domestic budget. This sum is about one-tenth of Britain's gross national product, and amounts to nearly thirteen shillings a head per week for every man, woman, and child in the country.

The present strength of the active, uniformed forces is about 800,000 men, about 500,000 of them regulars or professionals, and about 300,000 National Servicemen or conscripts. This represents rather less than one in fifty of our total population, but a very much higher proportion of the adult male population between the ages of eighteen and forty-five. More-

over, alone in Europe—except for Turkey—Britain has a two-year period of national service.

The use to which all this money and manpower is put has changed considerably during the past two years. The hydrogen bomb made its formal impact on Britain's defense planning only in 1955. Last year's Defense Statement, therefore, virtually formed the first of a new series. It, and this year's Defense Statement, should be taken together to illustrate the government's basic conception of warfare in the thermonuclear age and how it is developing in detail.

The political assumptions on which the program is based, however, have remained unchanged for the past eight years and are likely to remain unchanged in the immediate future. The government has reaffirmed its belief that, "for the present at least, there is no change in Soviet long-term policy which, fundamentally, aims at world domination." The aim of the democracies, on the other hand, "is to establish peace and prosperity within which the people of the world can develop their lives in freedom."

This contrast between East and West means that the Western powers

must "hold their own in the world by their defensive strength until such time as a true understanding of Western policies can make its impact on the Soviet people." The recent visit of the Soviet leaders to Britain has in no way changed this political assumption. Whether it will eventually prove to be the first step in such a change remains a matter for speculation.

Introducing the 1955 Defense Statement in the House of Commons in March of last year, Sir Winston Churchill, then Prime Minister, argued that with the coming of the hydrogen bomb "the entire foundation of human affairs was revolutionized. . . . There is no absolute defense against the hydrogen bomb, nor is any method in sight by which any nation, or any country, can be completely guaranteed against the devastating injury which even a score of them might inflict on wide regions." From this it followed, in the government's view, that until there could be some reliable and universal agreement upon disarmament, there was only one sane policy for the Free World—"defense through deterrents."

Deterrence means, first, the posses-

(Continued on following page)

sion of strategic airpower armed with nuclear weapons. It means, secondly, the assumption that that power and those weapons can and will be used, even if we are faced with a surprise attack. For we plan on the assumption that no surprise attack can deprive us of our power of instant and overwhelming retaliation. "It is the retaliatory power which is the vital factor." Deterrence means, thirdly, the hope—indeed, the belief—that, faced with these weapons and the certainty that they will be used against them, Communist countries will refuse to put their doctrine and their plans to the test of global war. Incidentally, when I write of "we" and "our" at this point I mean the West as a whole. Nobody who thinks of these matters in this country underestimates the overwhelming importance of the United States Strategic Air Command when speaking of "deterrents."

From these premises the British government now places first in its strategic program the development of a contribution to the Allied deterrent. This is to be the V-bomber force and Britain's own manufacture of the H-bomb. At present the V-bomber force consists only of the Valiant four-engined jet, but, during the next two years, is scheduled to include an increasing proportion of delta-winged Vulcans and crescent-winged Victors. The total force will be about 200 aircraft, though no final date for the achievement of this aim has been announced. These aircraft are really medium bombers, more comparable with the B-47 than with the B-36 or B-52. But they will be able to deliver thermonuclear weapons on selected targets in western, northern, and southern Russia. The second part of Britain's contribution to the

deterrent is that part of the Royal Air Force assigned to NATO in Germany, the Second Tactical Air Force.

Fear of the consequences of global war fought with thermonuclear weapons should, if the government's protestations are to be believed, place this dual contribution to the Western deterrent far ahead of any other strategic requirement. There is, however, one other contribution. Four Army divisions are permanently stationed in Germany and there form part of that NATO "trip-wire" of ground forces designed to set off the alarm if Russia indulges in the kind of aggression that will lead to total war.

Clearly, if there is general fear of global war and the deterrent does its job, our potential enemies will probably be forced into other courses. The second requirement of our strategy is, therefore, for forces which can maintain our position in the cold war, particularly in those overseas territories, for example, Malaya and Kenya, "whose peaceful development may be threatened by subversion whether overtly Communist or masquerading as nationalism." Our third requirement is for forces to deal with outbreaks of limited war, such as we have already seen, for example, in Korea and Indo-China, and as many fear we may see in the Middle East. In these two respects the Army particularly, and the Navy also, have a big contribution to make. An attempt is being made to work up a small strategic reserve of two or three divisions in this country for rapid deployment, in the colonies or elsewhere—as at Cyprus—wherever a threat develops. And, so this year's statement says, "in such limited wars the possible use of nuclear weapons cannot be excluded."

Moreover, it is claimed that reorganization of basic fighting formations in the Army—for example, armored divisions—designed primarily to provide for global war fighting in Europe, will be adaptable to the needs of other theaters.

Fourthly, we must be prepared for global war, should it break out. It is admitted that the V-bomber force and the Second Tactical Air Force would have an immediate and perhaps an all-important part to play in this event. But there is a subtle change in this year's Defense Statement from that made a year ago.

Until the advent of the hydrogen bomb it was assumed that global war would open with an all-out nuclear attack inflicting great destruction. If that period produced no decisive result, it was assumed that it would be followed by a so-called "broken-back" period of fighting, "during which the opposing sides would seek to recover their strength, carrying on the struggle in the meantime as best they might." This broken-back period disappeared from the government's reckoning last year with the appearance of the H-bomb. It seemed that the revolution spoken of by Sir Winston Churchill implied that an all-out thermonuclear struggle would be a struggle for survival of the grimmest kind, and that a decision would probably be reached in a matter of days.

This year, again, there is no specific mention of a broken-back period. But the 1956 Defense Statement does say of global war that "its course would be unpredictable after the initial intense phase." More particularly, there have been frequent statements about the increasing submarine threat and

(Continued on page 60)



Great Britain's contribution to the Allied deterrent includes the Vickers Valiant four-engined heavy jet bomber.



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about the vital necessity of keeping our sea lanes open in global war. In other words, the implication is of a continuing period of warfare either simultaneously with or coming after the thermonuclear attack, and of warfare in something more like conventional terms—the broken-back period, but without calling it such.

It has always been taken for granted that the Army, or that part of it already stationed in Germany—for in the thermonuclear war the mobilization and build-up of reserve forces is assumed to be impossible—would fight with the rest of NATO's ground forces in global war. What that would amount to, in the light of some recent pronouncements by General Gruenther about his ability to hold up a Russian advance, is doubtful. But, at any rate as the government sees it, the Army has always had a part to play in global war and is being retrained and re-equipped to that end. Whether this view of the Army's place in a thermonuclear war is illogical has not been seriously questioned. With the Navy, however, it is different. A year ago it looked as though the Navy, apart from a possible addition to the nuclear strike through the medium of aircraft carriers, would have no part to play in global war. Now, the Navy is thinking of a smaller fleet, but of one with a vital part to play in global war. First, there is the concept of the

battle group centered round the modern carrier, to be supplemented by cruisers and destroyers armed with anti-aircraft guided weapons. These presumably will deal with surface raiders. Destroyers and frigates will be devoted more especially to the attack against submarines. But note, the government's conception of the course of global war appears—at any rate implicitly—to be undergoing a change. This is all too much in the melting pot to make it worthwhile to suggest how these ideas will develop.

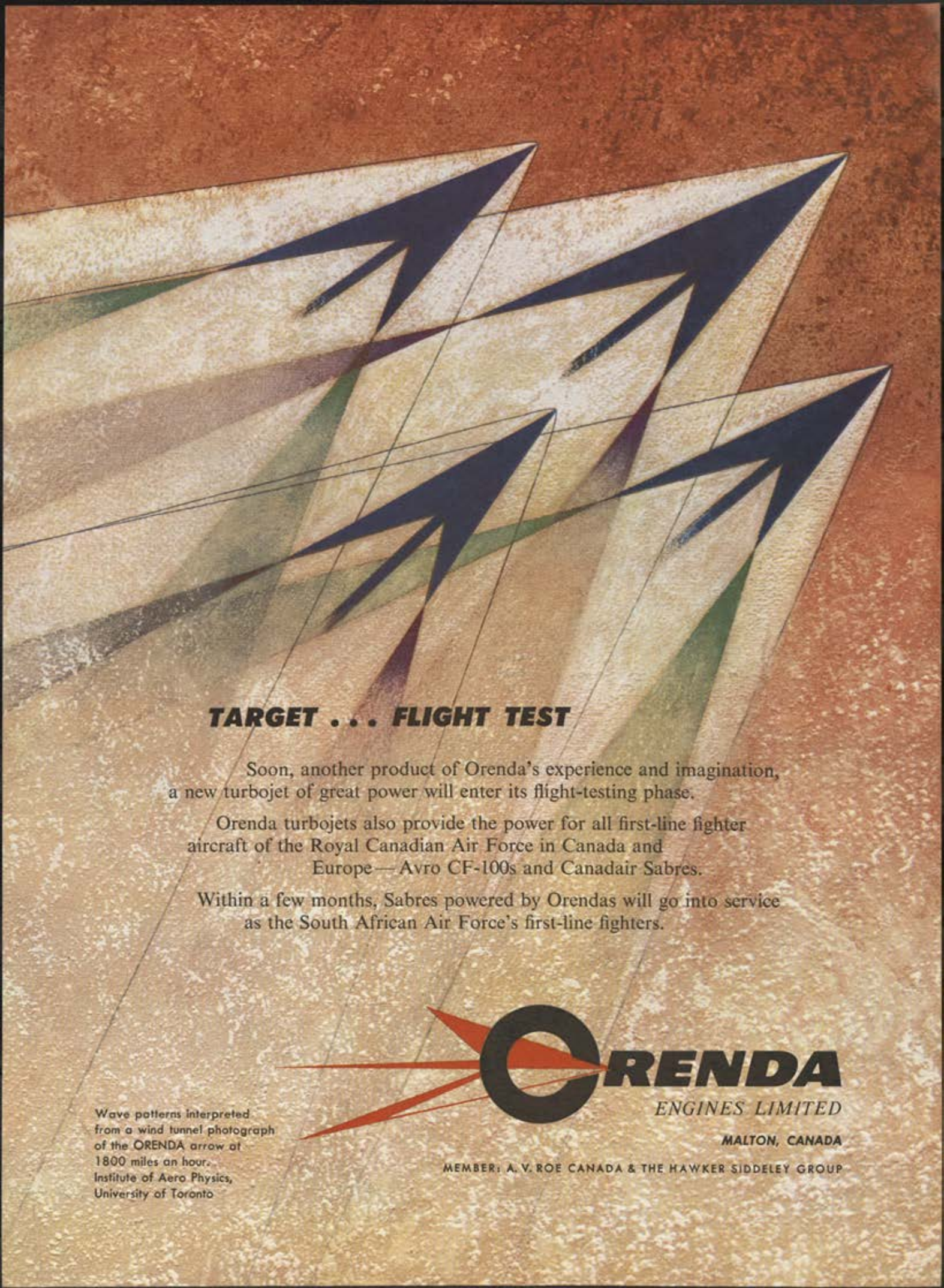
This is the defense plan. What of criticisms of it? In the first place it is important to realize that there is no fundamental criticism in the Conservative or in the Labor Party either of the political assumptions on which the plan is based, or of the strategic consequences which appear to follow from them. Russia is the main enemy, the deterrent is the main protection and the chief hope, and the government's strategic order of priorities is not seriously questioned. There has been a strikingly bi-partisan quality about the defense debates this year. But there have been many criticisms, some of them important ones.

The broad strategy is criticized in two ways. There are those who argue that the logical implications of the thermonuclear warfare are not being fully accepted. Others argue that the implications are being accepted too

simply and inflexibly and that both policy and military action should be more delicately graduated. Under the first heading the government is criticized on the ground that the Royal Air Force is not, in fact, being given the priority which its contribution to the deterrent, and to global war if it happens, justifies. The Air Estimates are down this year by £23,000,000 (\$64,400,000), while those for the Army and Navy are roughly the same as for last year. It is true the government claims that actual spending on the RAF, about £510,000,000 (\$1,428,000,000), will be about the same this year as last, for last year fewer aircraft were delivered than were ordered. But prices have gone up and money buys less. Although the RAF has about one-third of the defense budget, the argument is that in these present circumstances it should have more.

Further, there has been some strong criticism of the Navy Estimates, which stand at £350,000,000 (\$980,000,000). Sea power demands time for its use. If we are faced with a short, catastrophic thermonuclear war, why spend so much on the Navy? Or, alternatively, if we are faced with a long war of attrition what force can we any longer give to deterrents whose threat was of swift annihilation?

This sort of criticism, as Americans
(Continued on page 63)



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well know, is made elsewhere. Thermo-nuclear strategy poses a fundamental problem for all navies. But let sympathy help where logic finds it difficult to do so. In two world wars Britain has come nearer to defeat through the submarine than through any other weapon. This problem is not going to be solved in a hurry. What might help would be a more open statement by the government that it has changed its mind, if it really has done so. And, if we must insure against all risks, is this not part of the case for greater specialization within the Atlantic Alliance? But more of that later.

There are other critics, perhaps not so numerous but certainly influential, who argue that a strategy tied so closely to the hydrogen bomb means either extinction for us all or refusal to fight because we fear the consequences of our own weapons. These are the advocates of graduated deterrence. So far the government has refused to accept these arguments; indeed, this year's Defense Statement is a clear rejection of them. And, indeed, how could it be otherwise? The forms of graduated deterrence so far suggested all amount to an attempt to reduce the horror of thermonuclear weapons and the certainty that they will be used. But it is precisely these qualities that give them their power to deter. Moreover, if the power of

the deterrent is weakened then, in the absence of any general and satisfactory scheme of disarmament, the West must be prepared to compete with Soviet strength in conventional weapons. The government of this country has repeatedly argued that the West cannot do this—although to some those arguments are not convincing.

The second range of criticisms applies to the government's use of manpower, and really follows on from what has just been said. At this point, it is claimed, technical military requirements and those of the nation's economy as a whole conflict. The government has declared that since the economic strength of the Free World is an essential part of its ability to resist Soviet aggression, "the burden of defense cannot be allowed to rise to a level which would endanger our economic future." But unfortunately "the cost of new weapons is increasing, and will go on increasing." The only way the government sees to keep costs level while introducing new equipment is to reduce military manpower. For that reason it has announced that . . . manpower in the forces will be reduced by 100,000 in the next two years, to a total of 700,000 by March 1958. The largest part of this reduction will be borne by the Army.

On the other hand, increased weap-

on strength should demand fewer men, though those men ought to be highly skilled, long-service regulars. With this latter idea in mind there have recently been substantial pay increases for all military personnel other than two-year National Servicemen, in the hope of increasing our regular non-conscript manpower. The Labor Party argues that, as a consequence of all this, National Service should be abolished now, and some of its members accuse the government of holding this trump card up its sleeve until the next general election. The government refuses to take any drastic step at the moment. Rightly so, for we shall need a year or two to see whether better pay will attract more men into the services as a career. But it is almost certain that the next two years will see progressively selective National Service.

Thirdly, the government is being urged from many quarters, both inside and outside Parliament, to give more power to the Minister of Defense. Here, again, is an argument you are familiar with in the United States. Broadly, the case is that the Minister of Defense is at present little more than an advisor who keeps the peace while the Army, Navy, and Air Force, in the persons of their Ministers and Chiefs of Staff, bargain among them-

(Continued on page 67)



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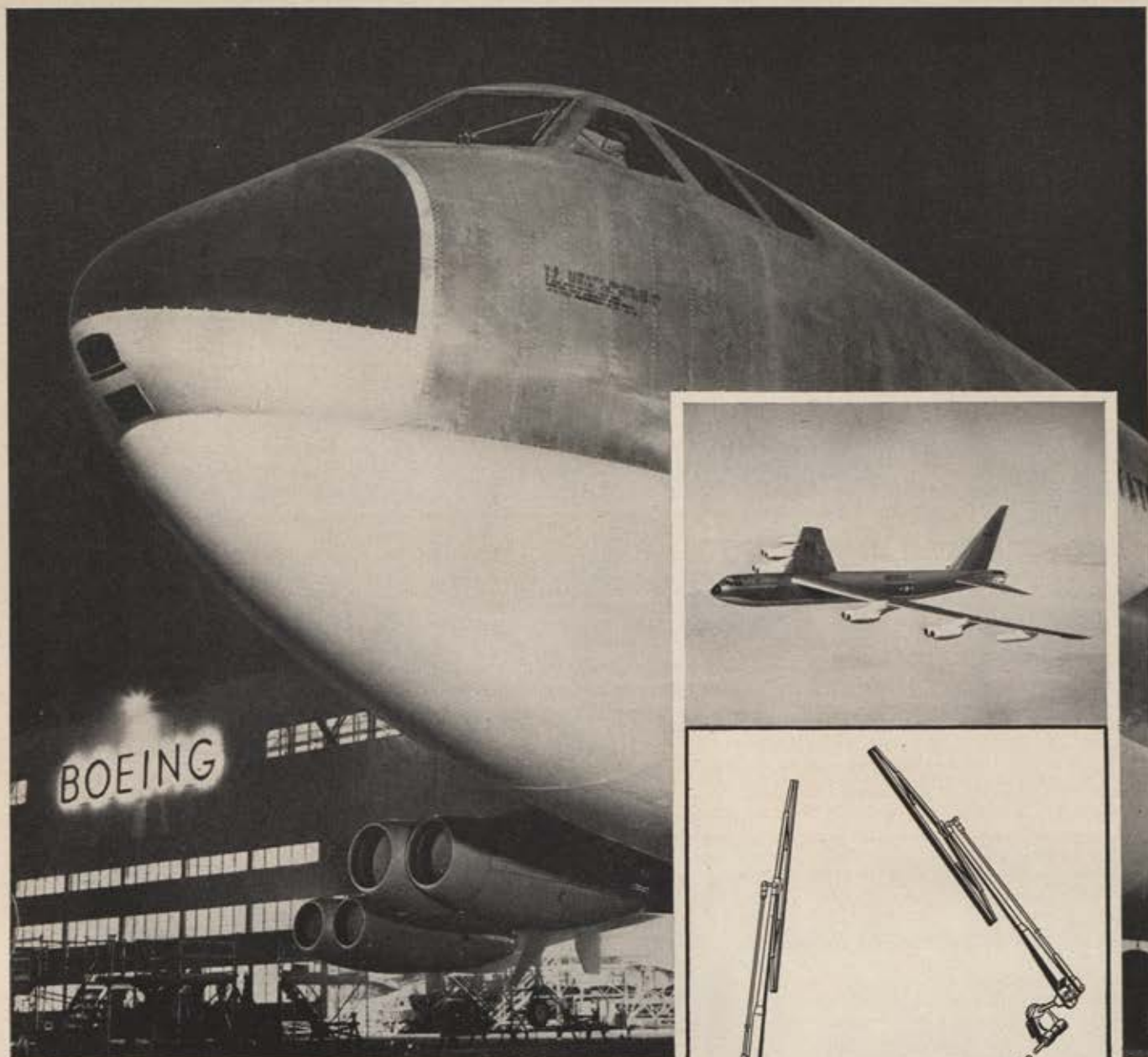
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selves over the financial cake the Treasury offers. As a result, so say these critics, we get a defense policy which is simply the result of a gentlemanly share-out, and not a decisively coordinated policy which puts first things first and ruthlessly sacrifices relatively unimportant items which we cannot afford.

Already the government has appointed a full-time Chairman of the Chiefs of Staff Committee to give it and the Minister of Defense something of the independence demanded. But this is not executive control. And there are many who would like to see the Minister of Defense given such control over the three service departments. It is difficult to avoid the conclusion that some of the implications of a revolution in strategy will not be accepted until unity of control is imposed.

Lastly, the government is accused of trying to do something of everything in its defense preparations and of doing nothing, therefore, well. This is the sort of criticism any government can expect. It is bound to be more frequent than ever in a transitional period of weapon equipment. But undoubtedly there is considerable cause for complaint. It is claimed, for example, that during the past ten years Britain has had over 160 aircraft projects; 140 of them have been consigned to the wastepaper basket and only eight could be classified as successful.

The government felt compelled a year or so ago to issue an official explanation of the supply of military aircraft which, whatever else it did,



As Prime Minister, Sir Winston Churchill urged "defense through deterrents."

did really imply that too much had been attempted and too little done well. Even now, our latest operational aircraft, the Valiant bomber and Hunter fighter, have come in for a full measure of doubt. Mr. Stokes, the Labor shadow Minister of Defense, argues that our aircraft production firms are, on an average, far too small to do some of the necessary jobs properly, and has suggested a degree of forcible amalgamation.

Looking still further ahead, several Members of Parliament argued in recent debates that we cannot afford even our present manned aircraft program and a full range of development of guided missiles, too. The Minister of Supply has admitted that his ministry needs to make and will make reforms on the industrial side, and will go all out to get proper coordination between producer and user. We certainly must have fewer plants if any of them are to produce weapons of first-class quality.

But there is a further point here which provides a useful note on which to end. Time and again in this year's debates those who have used these arguments have gone on to claim that one remedy, the fundamental one, for trying to do too much so that nothing is done well, is a far closer Western Alliance with a planned program of weapon specialization among its mem-

bers. One newspaper correspondent has suggested, for example, that Britain should not try to produce weapons that the United States is already producing and would automatically use in defending Britain and the NATO area generally. Make no mistake about this. These serious critics who suggest that we should do fewer things are not attempting to off-load British responsibilities on to American shoulders. They are using the perfectly respectable argument that specialization and efficiency normally go together.

Nor do they expect a complete revolution overnight. But consider the development of the ballistic missile. America has devoted far greater resources to its development than Britain can afford, and is several years ahead. Is it more reasonable—within the sense and purpose of the Atlantic Alliance—for Britain to repeat in this field what America has already done, or for America to relax the provisions of the Atomic Energy Act of 1954 so that she can provide Britain with nuclear weapons, such as the ballistic missile, which she is far better able to produce? Whatever the difficulties seen in such a suggestion, remember that here is a fundamental problem in the defense policy of any British government. Without some pooling of resources it will grow greater, not less, with time. —END



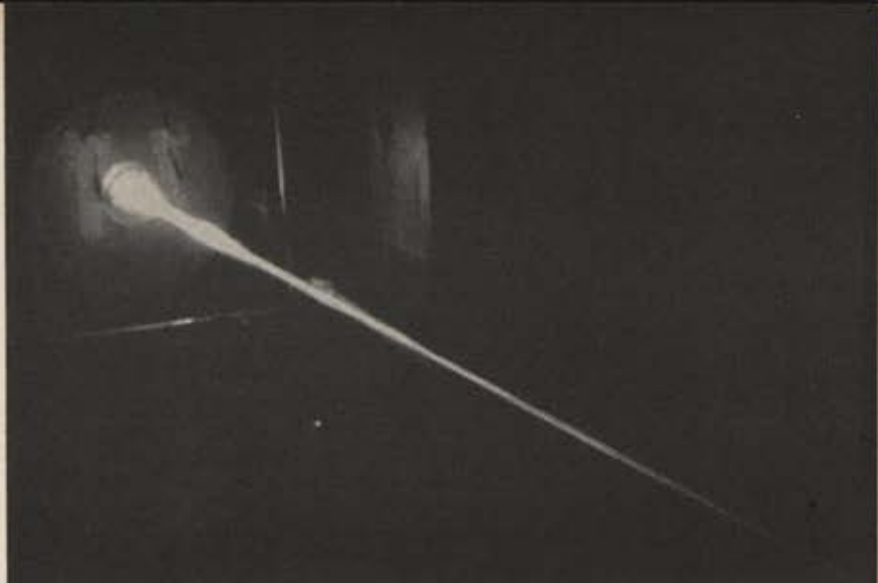
THE AUTHOR

Prof. Norman H. Gibbs was born in London in 1910. He was graduated from Oxford University, where

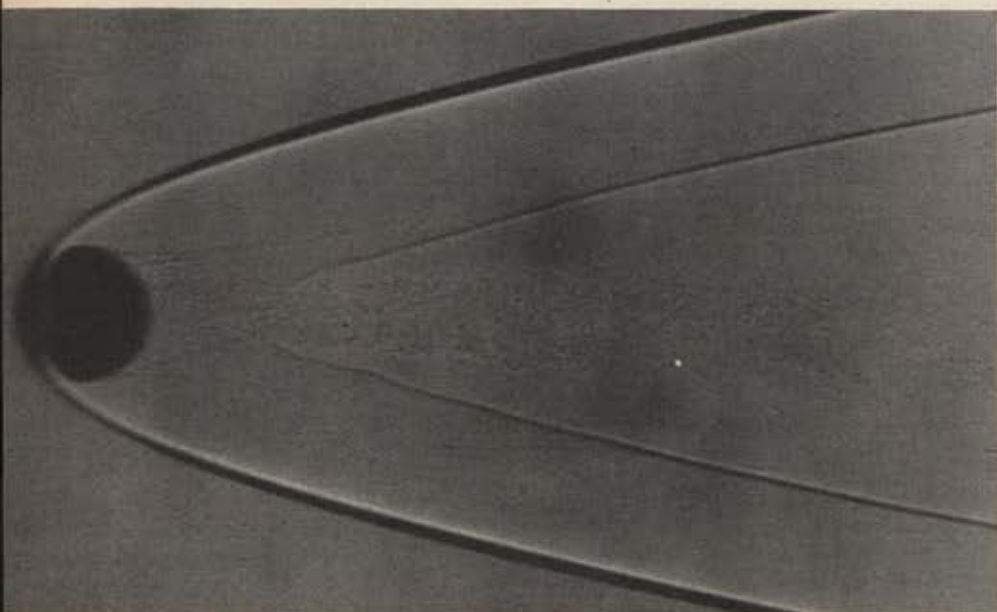
he studied Modern History, in 1931, and was elected a Fellow and Tutor in Modern History and Politics at Merton College, Oxford, in 1936. In 1939 he was commissioned in the Armoured Corps and in 1943 was assigned to the staff of the War Cabinet Office. He was appointed Professor of the History of War at Oxford and Fellow of All Souls College in 1953. At present, Professor Gibbs is on the historical staff of the Cabinet Office and is engaged in preparing a volume of the British Official History of the Second World War.

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Here's what 10,000 mph looks like. Shadowgraph showing the strong shock waves formed by the speeding model was made at one ten-millionth of a second. Knowledge gathered in these experiments will be of value in designing ICBMs.

THE FASTEST flight speeds yet reached under laboratory test conditions—exceeding 10,000 miles per hour—have been accomplished at Moffett Field, Calif., at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics.

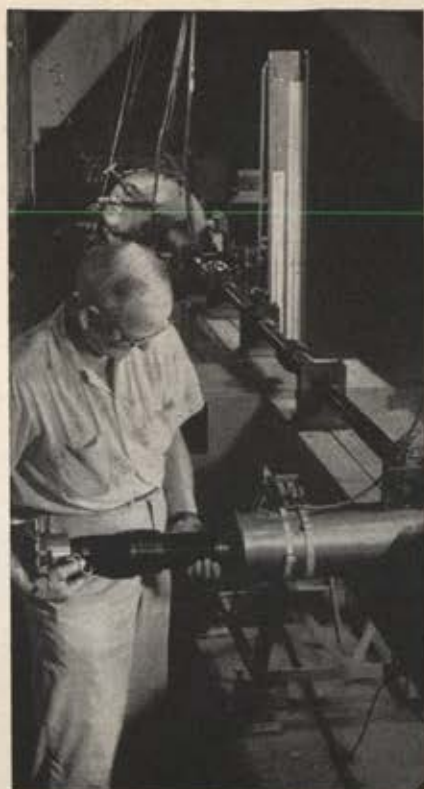
The record speed was set by a model fired from a newly-developed light-gas gun. It was fired under con-
(Continued on page 73)



The model (center), though tiny, can be fired under conditions to duplicate behavior of a twenty-inch satellite.



Pressurized test tank used with the light-gas gun. Pictures of the model are taken in the Y-shaped sections.



The breech end of the long-barreled gun. The mechanic is closing the breech in preparation for a firing.

KEY TO PINPOINT NAVIGATION



Omni/ILS Plus **ARC's** New Course Director



This new and advanced navigation instrumentation system is a complete **PACKAGE**, consisting of single or dual omnirange equipment, teamed with the new **ARC COURSE DIRECTOR**.

The **COURSE DIRECTOR** consists of a computer which gives precise steering data and a compass slaved gyro which provides *stabilized*, accurate, directional information.

The system supplies the pilot with **AUTOMATICALLY COMPUTED** steering information on all **ENROUTE OMNI TRACKS, HOLDING, IN-BOUND, OR OUTBOUND ILS OPERATIONS**, thus providing **PRECISE APPROACHES**. Complete automatic

crosswind compensation is provided for **ALL** operations.

The computer performs all your calculations and presents correct steering data directly on the cross-pointer meter. The gyro needs no resetting at any time, since precession is completely compensated. *You simply set in your selected course and steer to keep the needle centered.* The system will then either intercept or precisely follow the desired track as required.

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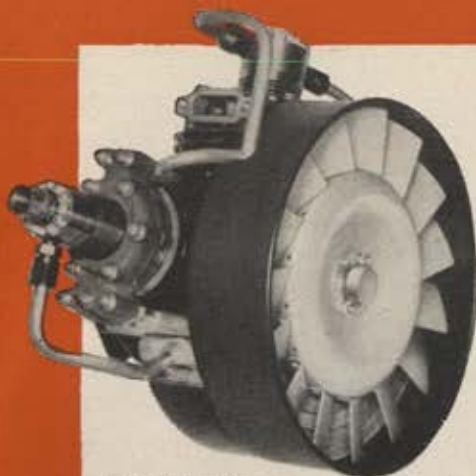
DELIVERING FROM 1.8

Stratos compressors for high pressure pneumatic systems cover a wide range of rated volume delivery and applications.

Models are available either as complete packages, or as basic compressors only. Complete units include electric or hydraulic motors, interstage coolers, moisture separators and automatic controls. Certain models can be ordered with or without controls, with provisions for a variety of drives—electric, hydraulic or turbine. For the basic units, controls and ancillary equipment such as pre-coolers and after-coolers can be provided to match the specific aircraft requirements.

Installation of the packages is simple, requiring only four mounting bolts and connecting to the high pressure air lines and electric or hydraulic service of the aircraft. Automatic controls, standard equipment on all compressor packages, provide a minimum pressure differential of 100 psi between shut-off and turn-on pressures. The allowable shut-off pressure range is 2950 to 3050 psig, and the allowable turn-on pressure range is 2700 to 2950 psig. A relief valve prevents overpressurization.

Light and compact, each compressor is designed to operate over a wide temperature range—from 65° to 165° F. Integral cooling fans are standard equipment on all units.



Model PCM3



Model 7024

PSI COMPRESSORS

TO 16 SCFM

by STRATOS



Model 6071-1



Model 7023

BASIC MODELS

- FCM3** Delivery—from 7 to 16 SCFM
Nominal rating—11.2 SCFM @ 15 PSI inlet
No fall-off with altitude when pressurization is available
Controls and moisture separator available
Suitable for electric, hydraulic or turbine drive
Weight 21 lbs. without motor.
- 7023** Delivery—2.4 SCFM
Complete package including controls, moisture separator and 400 cycle motor
Weight complete 33½ lbs.
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Complete package including controls and moisture separator
Constant speed 3 gpm hydraulic motor operates on 2200 to 3000 psig
When operating under 80° F, full rated output is maintained from sea level to 10,000 ft.
Weight complete 30 lbs.
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Weight complete 33½ lbs.
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Controls not included — can be provided as a separate package • Hydraulic motor drive
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Weight complete 29½ lbs.
- 7024** (available soon) Delivery—1.8 SCFM
A simplified 3-stage compressor with 400 cycle motor.
Incorporates pressure regulator.
Other controls available.

For more complete data on Stratos' compressors write to: Stratos' Western Branch:
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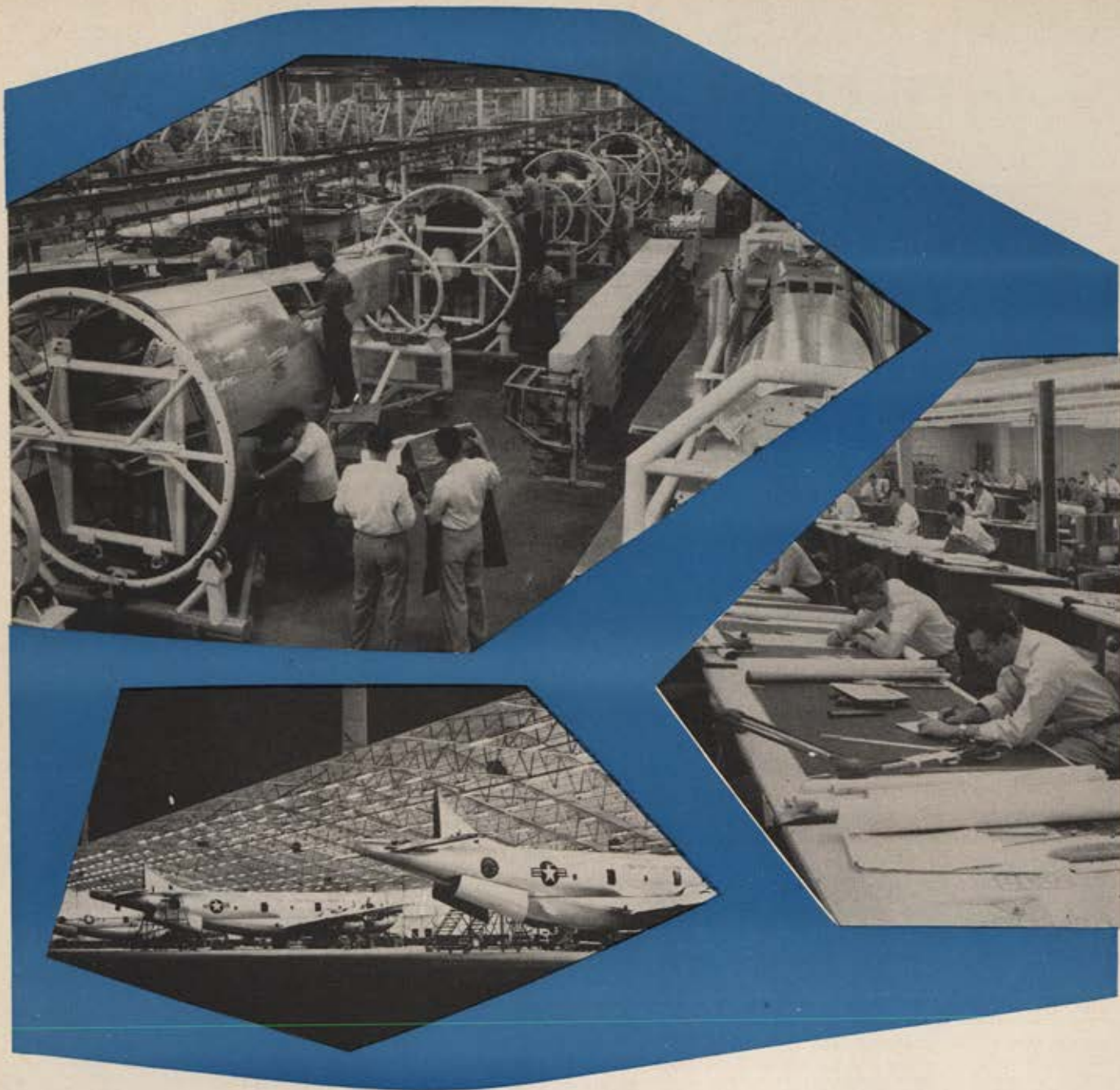
STRATOS

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Only ten years old, Temco has already become a big name in the field of aircraft sub-contracting. Big, in every sense of the word. Temco has three large plants — separate yet integrated. It has *capacity* — the size, the facilities, and the varied human skills to handle any job: design, tooling, manufacturing, assembly, modification-overhaul.

When the job's a big one — when it calls for high production — call on a firm with the capacity to handle it — call on Temco.

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Openings in all phases of aircraft design and development; write to

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ditions that reproduce at full scale the heat that would be encountered by an Intercontinental Ballistic Missile (ICBM) as it plunged down through the earth's atmosphere near the end of its trajectory.

NACA, the federal government's principal scientific agency for aeronautical research, said the new gun which set the 10,000-mph record is the forerunner of a larger device which will fire up to 16,000 mph. The gun is based on principles worked out at the New Mexico School of Mines where a "hydrogen gun" was developed during World War II. National Advisory Committee for Aeronautics scientists have increased the gun's maximum performance and adapted it to aerodynamic research, using helium as the working medium.

For test purposes the gun can be fired into a pressurized tank filled with air or other gases at any pressure to simulate various altitudes.

It is also possible to fire models from the high-velocity light-gas gun head-on into a supersonic air stream generated in a special wind tunnel. In this way the gun now in use can fire models in free flight at test Mach numbers up to twenty and the larger gun will be able to attain a Mach number of thirty.

Models streaking from the muzzle of the light-gas gun are moving so fast they can be photographed by their own incandescence (*see cut*), and the light generated is similar to the brilliant streaks made by meteors entering the earth's atmosphere.

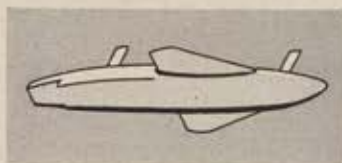
By means of special timing devices, photographs of the model in flight are made at a speed of one ten-millionth of a second. These pictures, called shadowgraphs, show the strong shock-waves built up as the model flies through the test setup.

The new research equipment was developed to provide scientific information on the aerodynamic design requirements for long-range ballistic missiles. It is expected that these missiles will fly between 10,000 and 15,000 mph and return to the earth's atmosphere at those speeds. (The slowest meteors enter the atmosphere at speeds only slightly greater than this.)

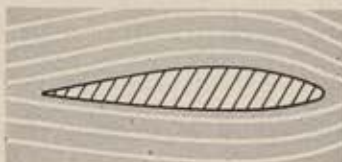
Of major significance is the fact that the Ames light-gas gun and its associated equipment now provide in the laboratory an accurate simulation of the actual speeds and temperatures that a full-scale missile is expected to meet in flight—something that conventional wind tunnels in their present form cannot reproduce.—END



Now even the ice- and snow-covered Arctic regions present no landing problems to aircraft whose design includes the Pantobase landing system. A product of Stroukoff research and development, Pantobase will permit landings and take-offs from snow, ice, sand, water and unimproved terrain, thereby extending the operational capabilities of the aircraft and reducing the need for conventional airports in many remote and previously inaccessible parts of the earth's surface.



Pantobase—When designed into an aircraft the Pantobase system enables the plane to land and take off from many types of surface without changes or additional landing equipment.



BLC—Boundary layer control as developed by Stroukoff increases the effective lift and delays stalling of the wing, thereby reducing required speeds and distances for take-offs and landings.

Achievement is a tradition at Stroukoff. A leader in the development and design of cargo and transport aircraft, Stroukoff offers challenging opportunities to creative engineers.

Extending the Frontiers  of Aircraft Performance

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reputation seems...



A reputation can be purchased or promoted.

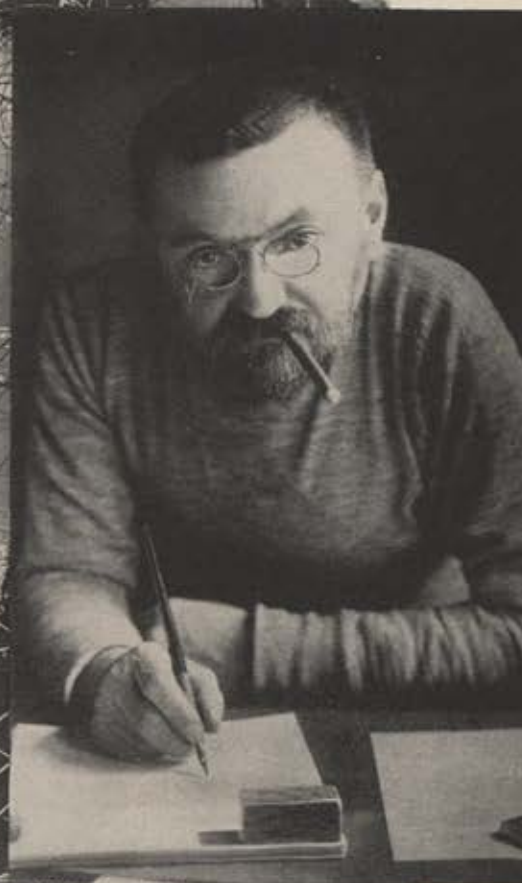
It may flower fleetingly . . . and as fleetingly disappear. Character is what we are . . . and what we are evolves slowly and surely through the years.

If the years have been rich in achievement and in fine works . . . we are that much *bigger* in a priceless and enduring sense.

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FRENCH ROAD, UTICA, NEW YORK

Our Airpower Needs of Today and Tomorrow

TO THE radar operator in his lonely, isolated outpost, it was just another day.

Suddenly, a few minutes after seven on a Sunday morning, it happened. Tell-tale blips appeared on his scope, and the picture grew. Sergeant Lockhard fumbled for a telephone and put in a call to headquarters. His message: "Large numbers of planes approaching the island of Oahu." His call had little effect. The response was, in essence, there isn't anyone here.

What followed is history—Pearl Harbor. An aroused nation vowed it would never happen again.

But only a few days ago, in testimony before the Symington Subcommittee, Gen. Earle E. Partridge, Commander-in-Chief of the Continental Air Defense Command, voiced some sober warnings. It *could* happen again.

There have been many changes since December 7, 1941. Today, throughout the nation, Air Force combat units are on the alert. Today Sergeant Lockhard's warning would set in motion a trained and growing Air Defense Command. Here's part of what its commander General Partridge told the Symington Subcommittee:

"In a normal day—and I get a report on this at my headquarters every morning—we have about thirty, thirty-five, something of that order of aircraft, detected in the United States in our radar coverage and not properly identified.

"We work against these with our fighters, scramble fighters to go up and look at them, send them off to look at them. . . .

"Presently we are working by what is known as a manual system, a radar operator sits at a scope, he watches a strobe line go around and as a blip

appears, a little spot of light appears on the scope, he takes his grease pencil and makes a mark.

"If the next time or the time after the strobe, the line of light goes around, he gets another blip, he makes another mark, and he has a very short time in which to say this is a known aircraft or it is an unknown aircraft.

"If he thinks it is an unknown aircraft, he takes the information as to the location of that blip on his radar scope, the height information which he gets from another instrument, and sends that data by voice or by teletype to an air defense control center.

"Eventually, if it continues as an unknown, the information gets all the way up to my headquarters. But the point is that the system is presently manual. It depends on a man making a mark on a scope, interpreting that into an airplane, sending the information by manual means, and finally if they send off a fighter, controlling that fighter by voice radio.

"In this present day of congested communication channels, this is quite difficult."

Gen. Curtis LeMay and his SAC staff also dealt with the Pearl Harbor type of problem during the hearings. While admitting that their studies of SAC's ability to survive surprise blows are theoretical, General LeMay cited these findings:

"The results indicate that alert time is more important than anything else. It does not make any difference whether you shoot down zero percent or thirty percent of the bombers coming in. That is not so important. But alert time is. That is the factor that will give us ability to save more of the force."

Our air defense system is only one of the elements being given careful

consideration by the Senate Subcommittee. It has heard testimony from the Air Force's top commanders and staff officers. In the testimony released thus far, commanders and staffs were unanimous in expressing the belief that we are short in all of the elements of airpower—men, modern planes, bases, and research and development.

Lt. Gen. Emmett O'Donnell, Deputy Chief of Staff for Personnel, laid the manpower picture squarely before the subcommittee. He had this to say:

"We in the Air Force who are charged with maintaining a combat-ready force are deeply concerned over the quality and experience level of our personnel.

"The complex weapons of today and those programmed for the future cannot be properly operated and maintained by inexperienced personnel in their initial tour of duty, a large percentage of whom are only awaiting the end of the military obligation.

"The capability of the Air Force depends upon our ability to attract and retain skilled personnel on a voluntary basis.

"The solution must of necessity be threefold. It must provide for the retention of officers, the retention of airmen, and the retention of civilian personnel.

"Each category requires a special approach because each differs in the criteria for selection, responsibilities demanded, and in the compensations offered to attract volunteers.

"In the officer area we are faced with the unpleasant fact that our younger officers have not been attracted to a military career in sufficient numbers.

"Our procurement efforts have been primarily directed toward the ROTC graduates who now constitute the bulk of our new officer intake. We have a most urgent need for career personnel to fill the valley in our officer structure behind the hump of World War II experience.

"This applies particularly to young pilots who are capable of operating our complex high-performance aircraft now and who will be capable of assuming higher command and staff positions in the future.

"The relatively high educational level of the ROTC graduate makes him a very desirable person to retain in the Air Force on a career basis.

"Unfortunately for the Air Force, civilian pursuits also attract this young man, and the retention rate of our ROTC source is extremely discouraging, with only a small percent-

(Continued on page 79)



Did you ever notice that some of Nature's most amiable creatures are those most effectively equipped to deal sorrow to bullies? Now, we at REPUBLIC don't necessarily go all the way with the late Ernest Thompson Seton, who once said the much misunderstood skunk ought to be some sort of national symbol because of its peaceable disposition backed by formidable fire-power. But we do think history has shown that in human affairs, too, those who would live without fear must first earn respect.

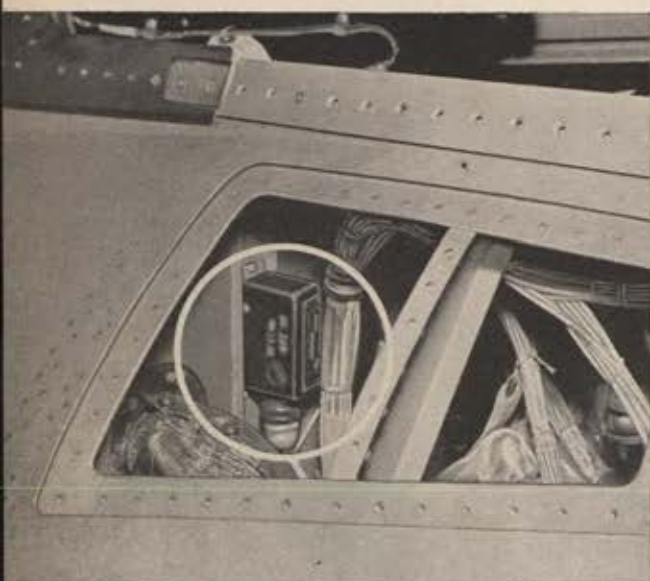


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THE THERMISTOR OF THE FENWAL 81000 is located in the tip of a spring loaded probe which conveniently screws into one of the positions normally occupied by one of the screws which hold the windshield in place. The spring loaded probe extends into the inner glass surface and laminated portions which form the center of the laminated "sandwich."



IN THE CONVAIR F-102A, the Fenwal Thermistor Over-Heat Detector, 81000 Control, warns the pilot if the windshield becomes overheated. The windshield in the Convair F-102A is heated with hot air. At extremely low temperatures this serves to raise the temperature of the windshield and prevent fogging. If the air continues to heat the windshield after coming from the low temperature area, the Fenwal thermistor unit prevents the danger of the glass cracking by warning the pilot to turn off the heat.

HOW FENWAL'S THERMISTOR OVER-HEAT DETECTOR PROTECTS CONVAIR'S F-102A

The Fenwal Thermistor Over-Heat Detector gives quick, dependable response to temperature changes in a variety of aircraft applications. Its compact size and light weight, plus conformance to applicable military specifications, may be the answer to one of your temperature control problems.

Write for complete data to **Fenwal Incorporated, Aviation Products Division, 347 Pleasant Street, Ashland, Mass.**

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Controls Temperature
... Precisely

THE FENWAL 81000 CONTROL UNIT consists of a black crackle finished aluminum housing with a five pin male receptacle for connecting the power supply, a thermistor probe, and an indicating device. The unit features an adjustable potentiometer that is accessible through the top and has a hermetically sealed relay with all components coated with a fungicide varnish.

It has an input of 20-30 volts D.C. at .05 amperes maximum. Load contacts are rated at 30V. D.C. at 2 amperes maximum: non-inductive. The adjustable range of the unit is $170^{\circ}\text{F} \pm 10^{\circ}\text{F}$, to $270^{\circ}\text{F} \pm 10^{\circ}\text{F}$. It has a temperature differential of 10°F maximum over adjustment range, maximum storage temperature of 212°F and operating temperature range of -65°F to 160°F . Total weight of probe and control unit is less than 0.5 lb.

tage of these officers remaining in the service beyond their obligated tour.

"Experience to date has shown that young college graduates are leaving the Air Force just as they become fully qualified, and at present retention rates the training invested in them, particularly in the flying area, does not give a sufficient return in terms of increased combat effectiveness. . . .

"In the airmen area the men we require must be of high quality, capable of absorbing training leading to the maintenance and operation of complex and intricate equipment.

"Unfortunately, approximately seventy percent of our airmen are on their first tour of enlistment.

"As you know, these losses of personnel who complete their first enlistment are very high. During the fiscal year 1956 from an average on-board airman strength of 785,000, we will lose 143,000 through non-reenlistment of airmen we need. . . .

"This represents a formidable loss in experience and causes continuation of an extremely expensive training program to provide replacements.

"It is further complicated by the fact that we are in a period of expansion to 137 wings. Our reenlistment program has produced an encouraging increase in retention, but the upswing has for the most part been in the non-technical areas, still leaving our technical skills seriously undermanned.

"In the civilian manpower area, the statutory graded ceiling constitutes a serious problem. . . .

"One of the major reasons for our losses is the high-pressure competition offered by a booming civilian economy.

"Industry has openings for practically all college graduates, particularly those with technical degrees, which are actively recruiting our technically high-skilled airmen and civilians. These men are offered high wages, job security, and increasingly attractive fringe benefits.

"The Air Force is not now able to meet the competition of prosperity and the attractiveness of civilian life.

"However, if we are to be realistic, we must offer opportunity to our professional service personnel; that is, relative pay, housing, working conditions, and family benefits must not be too unfavorable when compared to civilian competition.

"Only in this way can we hope to retain the people we need to have a combat-ready Air Force. . . .

"We are taking every practical administrative action aimed at personnel retention. In this respect we believe that a radical change is needed in the present across-the-board pay structure.

"In lieu we feel that a system should be devised whereby we can provide more realistic compensations for our highly trained technically skilled people. We are proposing special incentives for personnel serving at remote and isolated locations and have under study a proposed incentive payment for officers who contract to serve for periods beyond their obligated service commitment.

"In each case the dollar cost of these proposals, if successful, would be much less than the resulting saving in replacement training costs. . . .

The manpower difficulties the Air Force is facing were brought out further during the questioning:

Senator Symington: How many wings have we now?

General O'Donnell: At the end of the year, 131, I believe. . . .

Senator Symington: How many wings had we at the beginning of this fiscal year?

General O'Donnell: It was 125, if my memory is correct.

Senator Symington: I think it was 121. . . . How many military had we for operation of those 121 wings; people, personnel?

Maj. Gen. William S. Stone (Director of Personnel Planning, Hq., USAF): We had approximately 960,000 at the beginning of this fiscal year.

Senator Symington: That is 8,000 military roughly per wing; is it not? In other words, 121 times eight. How many wings are programmed for the end of the fiscal year 1957?

General O'Donnell: 137.

Senator Symington: And how many military are scheduled for the operation of those wings?

General O'Donnell: 960,000 military.

Senator Symington: That is about 24,000 less military for sixteen more wings; is it not?

General O'Donnell: I guess it works out that way; yes, sir.

Senator Symington: In other words, now you have less than 7,000 men per wing—is that right?

General O'Donnell: That is correct, sir.

Senator Symington: In your opinion will there be a deficit of manpower from the standpoint of having 137 wings combat ready by the end of 1957?

General O'Donnell: Not if we have the quality.

Senator Symington: In other words, you have the bodies but not the quality?

General O'Donnell: We have enough bodies; if we can get quality we are all right.

Senator Symington: Do you think you will have the quality?

General O'Donnell: I am afraid not, sir. . . .

General O'Donnell's views were strongly endorsed by the combat commanders. Both General LeMay and General Partridge agreed that manpower was their Number One problem.

It was inevitable that this question be asked, "How did we get into this bind?" Here is General O'Donnell's reply:

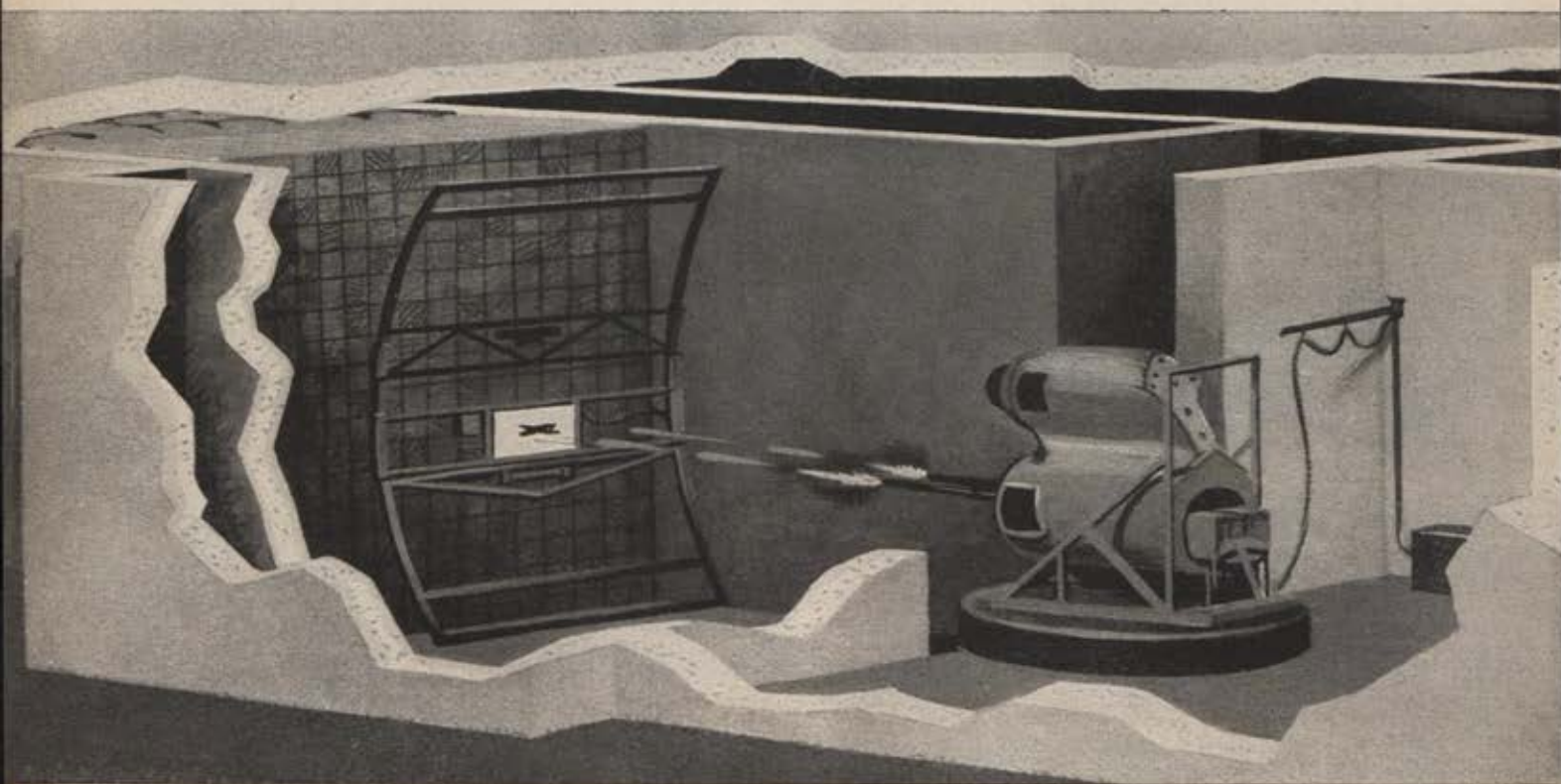
"At the time the 137-wing force was established as an objective to be attained by the end of Fiscal Year 1957, requirements for each fiscal year ahead appeared to exceed capabilities under the established ceilings. At the same time, however, it was anticipated that much of the apparent deficit could be eliminated through management improvement efforts and the Air Force agreed to attempt to attain the 137-wing force within the established ceilings.

"Since the beginning of the 137-wing program in Fiscal Year 1954, considerable progress has been made in reducing requirements. Over this period through standard reductions in certain functional support areas, through the lowering of training costs by leveling enlisted input, through increased utilization of natives in overseas areas, and numerous other actions, requirements as originally seen for Fiscal Year 1957 have been reduced by approximately 142,000 spaces.

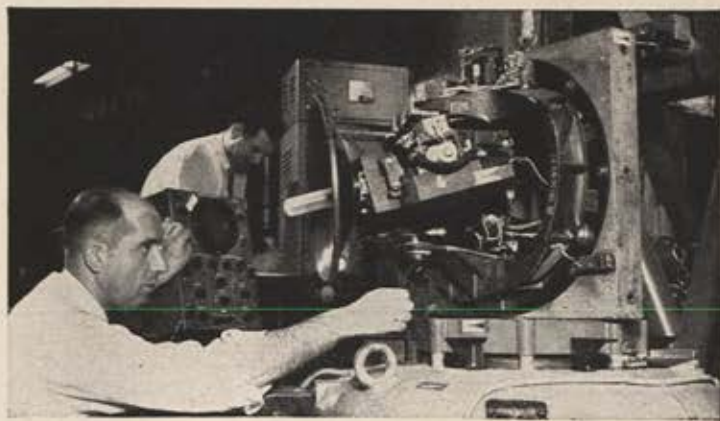
"On the other hand, over this same time period there have been many unanticipated additives to the Air Force program commonly referred to as the 137-wing program. Such items as an expansion of the radar aircraft warning net, additional missile sites and units, the Air Academy, assistance in training the Japanese and German Air Forces were not in the original program. These and many others have increased requirements over those originally foreseen by approximately 125,000 spaces. Looking beyond Fiscal Year 1957, it can be foreseen that, with the increased number of aircraft planned for heavy bombardment wings, the necessity

(Continued on page 82)

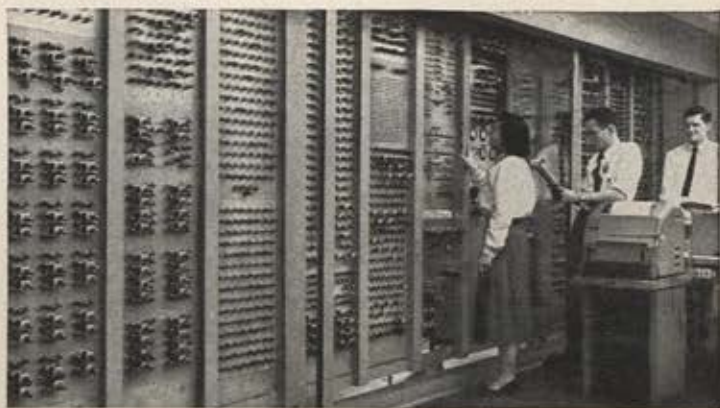
Here's How Facilities at General Electric Speed



ENVIRONMENTAL TEST CHAMBER simulates atmospheric conditions found at altitudes up to 100,000 feet.

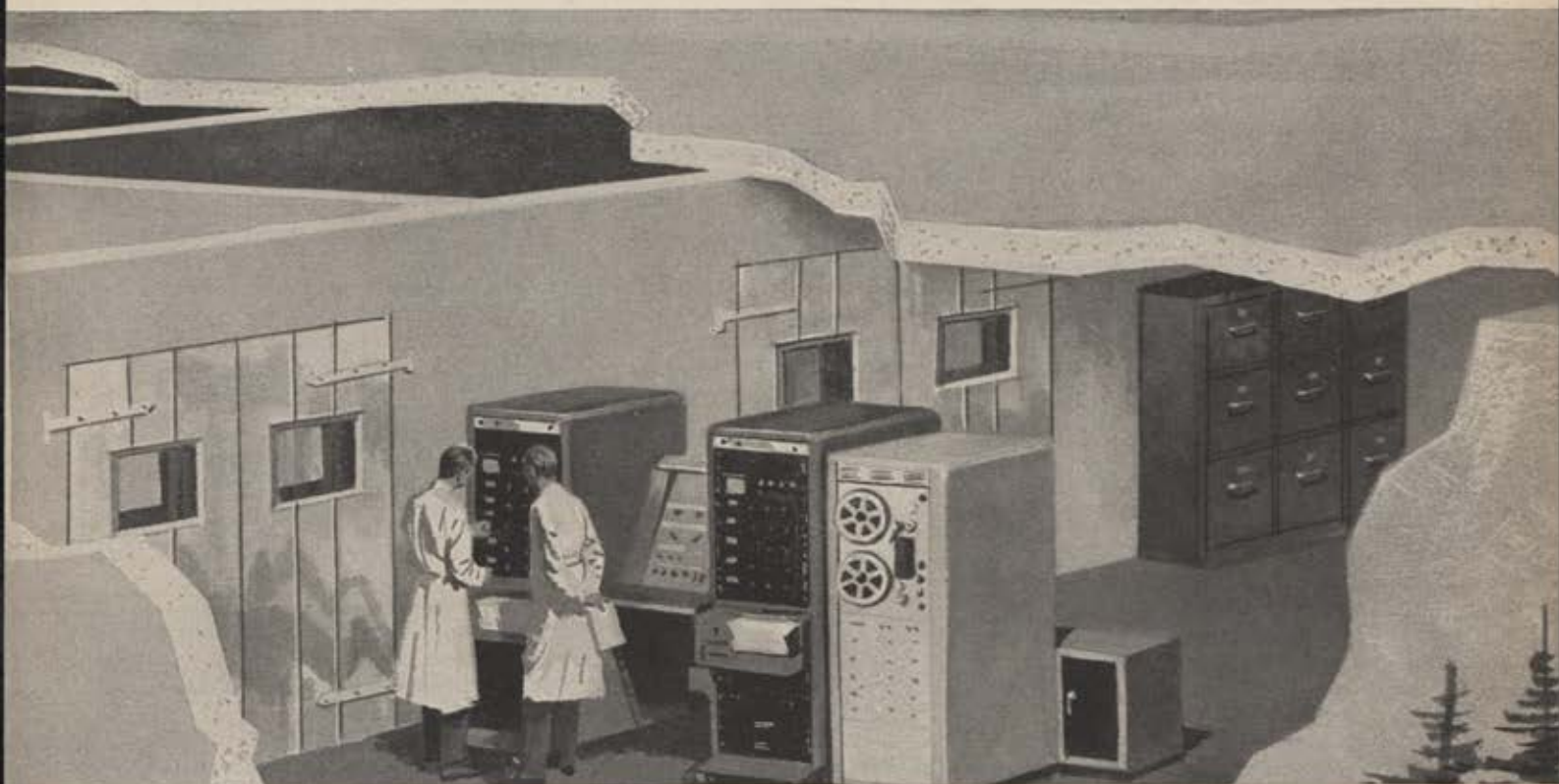


AIRBORNE EQUIPMENT such as the radar antenna being tested here is subjected to severe vibration tests.



DIGITAL COMPUTER, designed and built by General Electric, is used to help solve airborne defense system problems.

Electronic Bomber Defense System Development



DYNAT (DYNAMIC Accuracy Tester) simulates flight conditions and combat situations on an indoor test range, minimizing costly flight tests and reducing qualification time.

Located at General Electric's Aircraft Products Dept., this installation permits all-angle fire testing of electronic bomber defense systems at temperatures ranging from -100°F to 160°F .

G-E Facilities Help Researchers Anticipate and Solve Problems Prior to Airborne Tests

Cutting lead time in the development of aircraft equipment has become increasingly important. All possible measures must be taken to reduce development and testing time in order to speed delivery of operational aircraft to our armed forces.

General Electric test facilities provide an important means of reducing development time of airborne defense systems. The test facilities pictured here help experienced G-E personnel to analyze and solve

problems difficult if not impossible to duplicate by flight tests. Just as important is the saving in valuable time and reduction in expense of airborne testing. These facilities help make the saving possible—speeding the development of aircraft defense systems for tomorrow.

Engineers: Expanding electronic bomber defense projects at G.E. are creating opportunities for you. Contact C. E. Irwin, General Electric Company, Aircraft Products Department, Johnson City, N. Y. 22-3

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GENERAL  **ELECTRIC**

for dispersal, etc., that the trend toward increased costs is continuing.

"From the above it can be seen that had there been no increases to the program, the Air Force would have reached its initial goal without difficulty. As a matter of procedure, however, additions to the program were accepted and every effort made to absorb them also within the ceilings. At such time as the Air Force cannot see its way clear to man the 137-wing force within the current ceilings, it will request that they be raised."

Both General LeMay and General Partridge indicated dissatisfaction with the numbers and performances of their aircraft. General LeMay said:

"It is very difficult to answer unequivocally a question dealing with striking power during this time period. Striking power is a function of aircraft, weapons, bases, refueling capability, maintenance, and training.

"Under the assumptions stated in the question, the Soviets will enjoy a numerical advantage in long-range bombers in the period 1958-60. We would be foolhardy to assume they would not also provide the weapons, bases, refueling capability, maintenance capacity, training, and professional personnel to support this numerical superiority in aircraft.

"I can only conclude then that they will have a greater striking power than we will have in the time period under our present plans and programs."

Fowler Hamilton (General Counsel for the subcommittee): Is it not a fact that under our national policy of peace and nonaggression, we must have an Air Force adequate to meet a surprise attack?

General LeMay: Yes.

Mr. Hamilton: Does this not mean that we should have a long-range Air Force that, from the standpoint of striking power of its aircraft, is considerably stronger than that of the Russians?

General LeMay: If we suffer a surprise attack, it is reasonable to assume that we will suffer losses to our force. The remainder should be strong enough to inflict damage on the enemy that will be unacceptable to him if we are going to succeed in deterring an attack in the first place.

It is then reasonable to assume that the original force without losses should certainly be initially stronger than the Soviet force.

Mr. Hamilton: Will we, by the period 1958-60, have such a long range Air Force under present plans . . . ?

General LeMay: I have already brought out that the Soviets will have a numerical advantage in long-range bombers during the time period, and again assuming they will provide bases, weapons, maintenance capability, refueling capacity, and training to support this numerical advantage, then we will be inferior in striking power to the Soviet long-range air force by 1958-60.

Mr. Hamilton: Do you think there should be an increase in the number of B-52 bombers presently planned for SAC, General?

General LeMay: Yes, I believe that we should maintain the deterrent position that we have had over the past ten years. I think this means an increase in the planned number of B-52s. Our force should be equipped with modern equipment, in sufficient quantity, at a rate that can be produced by our industry and absorbed by our units, and supported by our base structure, without unacceptable dislocation of industry and the national economy.

The SAC Commander also maintained that his force would be far more effective with more jet tankers. He said:

"The ratio of tankers to bombers that we now have programmed is the best compromise we could come up with at the time the program was laid down. However, we could increase our intercontinental strike capability considerably from our planned base structure and with the same size of bomber force if we had more tankers than we are now programmed to have."

Mr. Hamilton: If present plans were changed to establish an adequate ratio between jet tankers and B-52s, would this require the acquisition of substantially more jet tankers than is now planned?

General LeMay: Yes, this would require substantially more jet tankers.

Mr. Hamilton: If the decision were made promptly to acquire these additional jet tankers, could a satisfactory ratio be established between now and the period 1958-60?

General LeMay: Yes. If prompt action were taken now, I believe that the desired tanker force could be provided by 1960. . . .

Mr. Hamilton: Your testimony shows that the Boeing KC-135 jet tanker creates a far more efficient strategic Air Force than the current obsolescent KC-97 conventional tanker.

Why, therefore are we ordering so very few KC-135s and receiving so very few KC-135s.

General LeMay: The KC-135 tanker program got a late start. Its production lags behind the B-52 production by eighteen months at the outset. We are now programmed to get KC-135 tankers in a ratio of two to three against B-52s.

This is short, in my opinion, of the ideal ratio which should be one to one. We have received no KC-135s to date.

Mr. Hamilton: What ratio of tankers to bombers do you consider would be the most desirable, for maximum effectiveness?

General LeMay: For the heavy force the ratio should be one to one. For the medium force, if supported by KC-97 tankers, the ratio should be one to one. If KC-135s could be available for support of the medium force, then the ratio could be two to three.

Mr. Hamilton: Based on present schedule, how far short of that desired ratio will SAC be?

General LeMay: We will be considerably short.

General Partridge's concern was directed toward performance—particularly of interceptor aircraft. He frankly admitted that the altitude limitation of his present fighter force is a defense deficiency against modern bombers. He said the operating ceiling of the North American F-86D is "lower than we would like to have it." He had a similar view regarding the Lockheed F-94C. While he was more hopeful of the Northrop F-89s equipped with Falcon missiles, he expressed dissatisfaction with the F-89's combat ceiling. General Partridge said, however, that he expected relief in the future when the Convair F-102 started coming into his defense inventory. He also expressed high hopes for the McDonnell F-101B, while admitting he had none at this time.

The Continental Air Defense Commander said the main need was for aircraft with "far better engines than any we have now, so they can cope with the threat of enemy high-flying, high-speed bombers—not only of the manned variety, but also of the unmanned variety, such as the Navaho and the Snark."

The base situation, eternal plague of the combat commander, was described by Maj. Gen. Lee B. Washbourne, Assistant Chief of Staff for Installations. He said:

"Since 1951, the base construction program of the Air Force has amounted to approximately two-
(Continued on page 85)

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thirds of all military construction authorized by the Congress; in other words, the Air Force program is more than twice as big as those of the other two services combined. Generally speaking, the Air Force program has been one of new construction as distinguished from the replacement and modernization programs of the other services . . ."

Under questioning by the Committee, General Washbourne gave his views on the military construction funds needed to support properly the 137-wing force.

Mr. Hamilton: Looking down the road, if you were not restricted by budgetary limitations and these Department of Defense guidelines, would you have in mind any figure as to a desirable rate of expenditure on construction by the Air Force during these years that you have mentioned, 1958, 1959 and 1960? . . .

General Washbourne: If you put it on the basis of money being no object, I would say that \$1,500 million a year is a good pace to follow, to get this job done. . . .

Mr. Hamilton: [Including] things like SAGE and DEW line and missile facilities for testing the IRBM and ICBM?

General Washbourne: They include all of that. . . .

Mr. Hamilton: Would the adoption of (the alert) concept (for SAC) involve additional construction work over and above that in the two programs you have mentioned?

General Washbourne: No; the higher program would include a start on the alert requirements for Strategic Air Command.

Mr. Hamilton: Would that program also include construction that might be necessary to give a desirable degree of dispersion of SAC bases?

General Washbourne: It would start it, but it wouldn't take care of it. . . .

Senator Symington: How much more money than you are getting now would you say that you could use in order to expedite the base program?

General Washbourne: The fund shortage in fiscal 1955 was \$270 million, and the present shortage in fiscal year 1956 is \$565 million.

Senator Symington: \$565 million?

General Washbourne: Yes, sir.

Senator Symington: And where do you stand in fiscal year 1957?

General Washbourne: Fiscal year 1957, the authorizations that Congress approved, for all intents and purposes, were about \$1,450 million,

and the present budget request is \$1,228 million, so that will be some \$250 million less of appropriations than there were of authorizations for 1957, and, of course, that doesn't do anything to make up for 1955 and 1956. . . .

Failure to meet base construction needs was also reflected in the testimony. General Partridge said:

"Perhaps one of our most serious difficulties, and this is one also mentioned by General LeMay, is the matter of construction.

"It is a long, involved process to go from statement of requirement in the field by a field commander to actual possession of the building.

"Furthermore the introduction of new weapons and new equipment, new weapons like Talos, for example, or Bomarc, requires sums of money for construction which far surpass anything which we have asked for previously in the Air Defense Command.

"In the field of radar we have many new pieces of equipment to be put in place and we require expedited construction to get it into place to meet this threat which is coming along in 1958 and 1959.

"This is particularly true when we are talking about radar for the intercontinental ballistic missile. It is going to be complicated and it is going to cost a lot of money. Our SAGE system is costing very large sums for construction purposes alone, disregarding the equipment. All of these add up to very greatly increased requirements for construction, construction funds.

"I would like just to give you an order of magnitude of the kind of money we are talking about.

"In 1955 we asked for 321 millions of dollars. We actually received 139. I hasten to say that this is not the fault of Congress necessarily, probably not.

"I am a field commander. I put in my requirement. I think it is \$321 million, but in the long process of review, discussion in Congress, appropriation, apportionment and so on, we actually get far less in most cases than we think we need.

"Probably this is a good thing in many ways because it provides a check on useless expenditure. But in some cases, and I think we are at that stage now, when we are changing

(Continued on page 93)

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The READY ROOM

RESERVE AND AIR GUARD NEWS



1st Lt. Ada J. Monahan is helped aboard an Air National Guard F-94 Starfire at the Niagara Falls, N. Y., Air Guard base by T/Sgt. James F. Bartz. Lieutenant Monahan was flown to Mitchel AFB, N. Y. by Maj. Sydney K. Johnson, Jr., as part of her duties as a nurse with the 107th Tactical Hospital, NYANG. 1st Lt. Mary Bordanara, also with the 107th, made the trip in another plane.

Five of the Air Force Reserve's thirteen troop carrier wings will take part next month in a major airdrop exercise which has been designed to test the ability of the Reserve units to function under actual combat conditions.

The wings will work with Eighteenth Air Force to drop more than 8,000 paratroopers in a one-day operation in the Fort Bragg, N. C. area. Some 250 combat airlift aircraft will participate. Planning staffs are headed by Maj. Gen. Chester E. McCarty, Commander of Eighteenth Air Force, and Maj. Gen. Paul D. Adams, Commander of the Army's Eighteenth Airborne Corps.

The five Reserve wings will be combined with a number of Eighteenth Air Force units to make up a provisional combat airlift division. This will be headed by Brig. Gen. Clayton E. Styles of New York, a Reserve wing commander who has been called to active duty for ninety days to work on the exercise plans. His deputy will be Col. Robert Choate of the directorate of operations, Eighteenth Air Force.

Three Air National Guard communications units and two Reserve aerial port squadrons also are included in the exercise, which will involve an

estimated 50,000 Air Force and Army troops.

The Reserve and Guard units will go on active duty August 12. They will train at various bases in the East until August 22 when they will move into air strips in the Fort Bragg area. The mammoth airdrop will take place between August 22 and 26.

The five Reserve wings programmed for the exercise include the 514th of New York, 302d of Ohio, 434th of Indiana, 442d of Missouri, and 512th of Delaware. Reserve aerial port squadrons are the 11th of New York and 16th of Indiana. The port squadrons will join the Eighteenth Air Force Aerial Port Squadron to form a provisional aerial port group.

The Air National Guard units include the 223d Radio Relay Squadron of Hot Springs, Ark., 264th Communications Squadron of Chicago, and 266th Communications Squadron of St. Louis.

All Eighteenth Air Force units will participate, including the 62d and 63d Troop Carrier Wings, equipped with C-124s; 314th, 463d, and 464th Wings, equipped with C-119s; and four helicopter squadrons based at Sewart AFB in Tennessee and Donaldson AFB in South Carolina. Reserve wings, composed in large part

of veterans of the Korean airlift, will use C-46s and C-119s in the exercise.

The Air Force has announced plans to recall to active duty this year approximately 400 Reserve officers and 150 Reserve warrant officers. The officer recall, one of the most limited ever programmed, will be confined almost exclusively to first lieutenants and captains.

The majority of rated officers, who are over-age-in-grade for flying positions and are selected for recall to fill non-flying jobs, will be suspended from flying status before they enter on active duty. Officers in this category will be asked to submit a request for voluntary suspension from flying status before being processed.

Jet pilots seeking recall must have 500 total hours of jet flying time, or a minimum of 250 hours in operational fighter or bomber jet aircraft. Only a very few openings will be made available to pilots who do not hold a jet specialty.

Applications for recall by Air Guard and Reserve officers serving on extended active duty as warrant officers will be processed through Headquarters USAF. All other applications will be processed through the Air Reserve Records Center in Denver.

Five Air Guard general officers will be called to Washington this month to select the most outstanding ANG all-weather fighter squadron which will be honored at the Air Force Association's Convention in New Orleans, August 1-5.

The unit selected will receive the Night Fighters Association's first award to an Air Guard all-weather unit at the Night Fighters' Annual reunion luncheon on Saturday, August 4. The principal speaker will be Lt.

(Continued on page 89)



Max Baer and Group Commander Lt. Col. Justin G. Knowlton at the 9080th Air Reserve Group Ball, Oakland, Cal.

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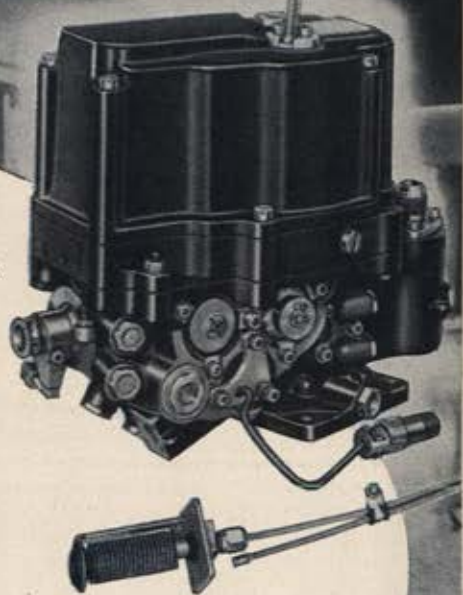
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Gen. Donald L. Putt, Air Force Deputy Chief of Staff for Development.

In previous years the Night Fighters, an organization of pilots who flew night intruder missions in World War II, have had only one award—the Hughes Trophy for the Air Force all-weather squadron voted the most outstanding in the active duty establishment. Last year, at AFA's Convention in San Francisco, the association expanded its award program to include the Air Guard, which now is operating all-weather equipment.

Also this month, the Guard will select its most outstanding unit and outstanding airman to receive the Air Force Association's trophies in these categories. These awards will be made on August 1 in New Orleans at a Reserve Forces Awards dinner on the opening day of the Convention.

The huge Ricks Trophy also will be awarded at the August 1 dinner. This trophy is presented annually to the winner of AFA's Earl T. Ricks Memorial Trophy Flight for Air Guard pilots. The flight, designed to point up the high level of proficiency ANG pilots must maintain, will be held this year on July 28 between San Francisco and New Orleans. Previous winners have been Lt. Charles J. Young of New Jersey and Lt. Col. James A. Poston of Ohio.

This year's event will be restricted to F-86 Sabrejets, and eight of the top ANG pilots will participate. The flight will be from Hamilton AFB to Moisant International Airport.

Unit vacancy promotions, frozen as a result of enactment of the Reserve Officers Personnel Act, have been resumed in a limited way.

These promotions are those afforded members of Air National Guard and Air Force Reserve combat and support units, as well as mobilization assignees and designees. They were frozen last August because mandatory promotions required by ROPA caused overages in all grades.

The freeze has been lifted only on promotions to the grade of colonel and captain. The number of lieutenant colonels and majors is still too high to permit resumption of unit vacancies in these grades.

To qualify for promotion to captain, a first lieutenant must have at least two years in grade. For promotion from lieutenant colonel to colonel, the time-in-grade requirement is three years.

Guard promotions will follow established procedure in that the governor will make the promotion, subject to



Brig. Gen. Clarence A. Shoop, Commander of the 146th Fighter-Interceptor Wing of the California ANG, and Robert Cummings. General Shoop played himself on a CBS-TV "Bob Cummings Show" devoted to a story about the Air National Guard.

confirmation by a federal recognition board. Unit vacancy promotions in the Reserve will be made by central selection boards scheduled to convene at the Records Center late this summer or early in the fall.

At the same time, it was announced that the Air Force has inaugurated a new "five year" plan for promotion to permanent Reserve colonel under provisions of ROPA. This plan affords an opportunity for promotion of lieutenant colonels whether they are assigned to units or hold a mobilization position.

The plan will provide an average ratio of one selection to each seven officers brought into the zone of selection. But, to equalize the opportunity

of those who would become eligible in the later years of the plan, an "ascending selection ratio" feature has been cranked into it. In simple terms, this means that a greater number of those eligible will be promoted each of the five years. In the current fiscal year, for example, only 176 will be promoted of an estimated 1,762 eligible. But in 1961, the fifth year, 300 will be promoted out of an estimated 1,185 eligibles.

In all, projection estimates that 7,000 officers will be eligible for promotion to permanent colonel in the next five years with about 1,000 actual promotions to be made.

An examination of the problems and importance of air reserve forces was one subject discussed at the annual convention of the Aviation Writers Association, held last month in San Francisco. Speaking at a June 2 meeting at nearby Hamilton AFB, Maj. Gen. William E. Hall, Assistant Chief of Staff for Reserve Forces, outlined the major objections civic officials raise to the operation of reserve flying units near large cities.

"The public and the airport officials will have to face up to the inconvenience that reserve forces flying may involve," General Hall said. He pointed out how the aviation writers could help bring out the positive side of the picture by stressing the fact that "along with the inconvenience of a little jet noise comes a strong feeling of security in and around our nation's great industrial and metropolitan areas."

—EDMUND F. HOGAN



Brig. Gen. Joe C. Moffitt, Commander of Colorado's 140th Fighter-Interceptor Wing, is featured on first cover of the unit's new monthly magazine.

Tech Talk

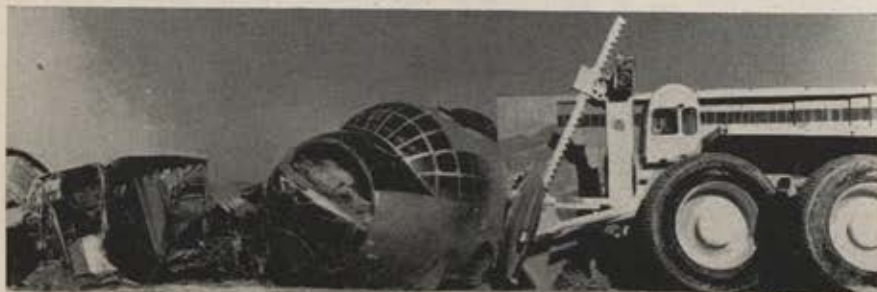
By Bob Strobell



A modified Lockheed F-94 is used at the AF Missile Test Center, Fla., to test and evaluate missile components prior to their installation in test missiles.



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A new type of radio telescope will soon begin exploring the sun's turbulent atmosphere. Financed by the Air Research and Development Command after conception of the idea by Stanford University, the microwave spectroheliograph will make its explorations from an observation point on Stanford's campus in California. It consists of thirty-two parabolic antennas, or "dishes," which will be aligned in two rows to form a huge cross in a level, two-acre meadow. As the dish antennas scan the sun's surface in the same way a television camera scans its subject, the photograph produced shows the "chromosphere"—a hitherto mysterious billowing layer of incandescence, rising to heights of 6,000 miles above the sun's surface. The chromosphere is believed to have some connection with sunspots which in turn are related to magnetic storms which interrupt radio communication.

The Air Force Missile Test Center, Fla., is using a modified Lockheed F-94 Starfire to test and evaluate missile components prior to their installation in an actual test missile, thereby saving a missile and countless man-hours. Instrumented with guidance systems, telemetering sets, electronic systems, and other specialized equipment, AF aircraft simulate missile flights over the test range in Florida. Malfunctions of missile components incorporated in the modified aircraft can be noted upon the aircraft's return and corrected. Components malfunctioning while an actual test missile is in flight cannot be corrected, and since the missile seldom can be recovered for future use, thousands of dollars and precious man-hours are lost.

Beech Aircraft Corp. has developed a new supersonic aerial tow target for
(Continued on page 94)

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ing over from one sort of a system to another we have to have very greatly increased appropriations and they are hard to get simply because we did not get them last year. . . .

"But perhaps this will give you some measure of the magnitude of the sums we have to ask for for the United States—and I am not counting the DEW line or the Mid-Canada line or any of those installations outside the United States because I am not responsible for those—\$321 million in 1955, \$758 millions in 1958, an increase of about two and a half times."

Earlier General LeMay had said:

"In general terms, the plan for expansion of the Air Force has developed ahead of the base structure to support it. The building of the bases has lagged behind the production of airplanes to form the wings; this has resulted in a shortage of bases and a crowding up of units and aircraft on bases."

"During the 1958-60 time period, the overseas base structure will generally provide an adequate capability for the Strategic Air Command. There will still exist some shortage of ZI bases."

"This will be overcome to a degree by the expeditious construction for additional bases that are currently programmed. However, this will still not provide the desired degree of dispersal and will not give the desired base posture."

The adequacy of the Air Force research and development program in the future will determine how this nation stands in airpower in 1960 and beyond. The testimony of Lt. Gen. Donald L. Putt, Deputy Chief of Staff for Development, had not been released at the meeting. However, both General LeMay and General Partridge commented at length on the importance of research and development and the shortcomings of present programs. General LeMay said:

"This problem of security is a dynamic one. The rate of progress achieved by the Soviets in the past few years demonstrates this. There is no indication that their rate of progress will not be sustained. It might even be accelerated."

"As their appreciation of the significance of air offensive power grows, our efforts to retain the deterrent advantage must be continuous. This means that research and development for the weapons system of a few years from now must receive increased emphasis and vigorous attention today."

"I have previously stated my views

on the ICBM and the requirement for hastening its operational date as a matter of first priority. I also stated that in my opinion the manned bomber will be used by us as a primary means of long-range weapons delivery for several years to come."

"Therefore, it is most important that we address our efforts and our scientific and production capabilities to the development and production of the manned bomber 'follow-on,' or successor to the B-52/KC-135 combination, at the earliest possible date."

"We must have a modernized force in being to meet each new threat as it develops. Attempts to catch up once we have been overtaken can only result in keeping us off balance and in surrendering our ability to deter. . . .

"We are always short of research and development money. The tendency is to put it on the most difficult problem, which is defense. So we have lots of defensive missiles coming up and things of that sort."

"We must make sure that enough research and development money is spent on penetration problems to stay somewhere in the same ball park. . . ."

General Partridge cited the need for research and development improvement in air defense:

Senator Saltonstall: Are you satisfied with the quality of the research effort, as far as it goes?

General Partridge: As far as it goes, yes.

Senator Saltonstall: Are you satisfied with the way that it is being coordinated today and administered, as far as you know?

General Partridge: No, I wouldn't say I am very happy about that.

Senator Saltonstall: What would you do if you were in complete charge?

General Partridge: I really don't know. I would work, to the best of my ability, to reduce the amount of time it takes to get a decision.

If we could make up our mind along what paths we want to proceed, this business of fanning out again, do we want to go that way or this way, all going to the same objective, you understand, if we could get the machinery streamlined in some way so that we could get a decision, I believe this is the line of approach I would take. . . .

Mr. Hamilton: Would you mind giving the committee the principal matters that you think from the standpoint of defense, it would be useful to be developed?

General Partridge: Well, I think very high priority should be given to the development of a powerplant for a fighter to get high speed, high altitude, a manned fighter."

Mr. Hamilton: What sort of altitudes would you have in mind, performance-wise?

General Partridge: I think we could get one that would go up to 80,000 feet, or perhaps higher. . . .

Mr. Hamilton: Within what period of time do you think it would be desirable to have such a fighter?

General Partridge: As soon as you can get it—yesterday, if possible.

Mr. Hamilton: Then what about the speed of the fighter?

General Partridge: It seems reasonable to assume that we can get speeds up around Mach three now, three times the speed of sound. . . . But a great deal of research is going to have to be done, not only in the field of the engine itself, but in bringing along an airframe and components to withstand the terrific heat which will be encountered."

Solutions to all these problems have one common denominator: money.

Elsewhere on Capitol Hill, Air Force witnesses from General Twining on down, were saying that the Air Force could use more money in Fiscal Year 1957. They have also warned that there must be a sizeable increase in Fiscal Year 1958 if the 137-wing program is to be continued.

There have already been some additions to the FY 1957 budget. \$230 million has been added for B-52 procurement, \$18.5 million for industrial facilities and \$128 million for military construction.

While there have been no estimates of the size budget the Air Force will need in Fiscal Year 1958, a statement by General Partridge sheds some light. Speaking of the future needs of his command he said:

"We have laid out a program for the continental United States, which, we believe would give us a minimum effective defense versus manned aircraft. It would not provide defense against ICBM's, although parts of the program may well be adapted for this purpose."

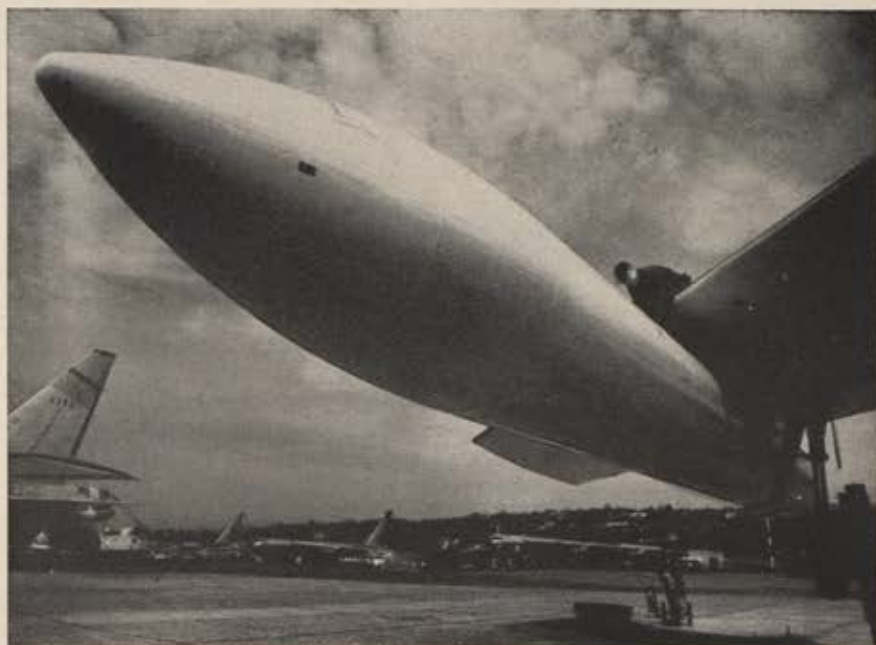
"A rough estimate of the money required to implement this program would be \$61 billion, for the years 1951 to 1965. The capital outlay would run about \$24 billion; and operating costs about \$37 billion, giving us the \$61 billion, total."

"Very little of this has been spent . . . the big costs still lie ahead."—END

modern air-to-air gunnery training which will allow fighter pilots to test their marksmanship at maximum performance in supersonic fighters. The tow target, called the DART, is constructed of a three-inch steel tube twelve feet long, and four triangular plywood fins, resembling a dart. Jet fighters towing the target use the snatch technique (similar to the glider pick-up system employed in World War II) to get the target into the air. One model of the Dart has radar reflectors installed near the tail so that airborne radar systems can "lock on" the target during tracking and firing missions. The Dart is inherently stable during flight and has been pulled through simulated fighter tactics that approach actual combat conditions. While conventional sleeve and banner type targets produce considerable drag and limit the speed of the tow plane, the Dart is aerodynamically clean and capable of supersonic speeds.

Philco Corp. announced that it has developed an airborne television system which may be used in jet aircraft on reconnaissance missions by the AF. The new airborne TV system will provide ground control points with an active picture of troop and vehicle movements transmitting a TV picture not only from near ground level, but from the stratosphere, beyond the reach of antiaircraft gun fire. Unlike those systems which have been used commercially to relay TV signals from one ground point to another, via a slow-circling plane, the new airborne reconnaissance system is a complete, self-contained, broadcasting station—so compact that it may be carried in a single-seat aircraft. Signals from the plane are transmitted to the ground control point where they are picked up by a receiver or instantaneously photographed on 35-mm film.

The AF and the Sperry Gyroscope Co., Great Neck, N. Y. announced a new automatic flight control and electronic bombing system which will be installed in the Boeing B-52 Stratofortress. This system, monitored by the bombing team, will unerringly guide the super bomber to a predetermined, precise pinpoint in space at which a bomb must be released to strike the target. The new system incorporates further improvements over the K-bombing navigation system previously designed for the B-36 and B-47. Electronic subsystems combine the autopilot and bombing systems into one integrated system. The flight



External fuel tanks, looking like miniature submarines, are mounted under the wing tips of the Boeing B-52C Stratofortress jet bomber to extend its range.

control system provides precision control during long hours of approach to distant targets, supplies automatic control by the bombardier, and aids in instrument landings. The bombing system is designed to utilize target data obtained visually or by radar, automatically feeding steering information to the automatic flight control system. It will also allow the B-52 to take evasive action to avoid enemy aircraft and ground fire while on the bomb run, eliminating the dangers involved in a straight and level approach. The so-called "electronic copilot" helps the pilot control the bomber with ease and efficiency at both minimum and maximum flight range. By "changing gears" the system can compensate for different control requirements at various flight speeds and altitude, automatically determining how much or how little force should be applied to the control surfaces under varying flight conditions.

The General Electric Co. unveiled its T58 turboshaft engine, developed for the US Navy, Bureau of Aeronautics. While the initial application is to power helicopters, the small T58 (it produces 1,024 shaft horsepower yet weighs only 325 pounds) can be modified for use in fixed-wing aircraft. As a turboshaft, air is taken in through the compressor, mixed with fuel, ignited, and burned in the combustion chamber. The expanding gasses are discharged through a two-stage turbine connected by a shaft to the

compressor. The gasses are then discharged through a "free turbine"—not mechanically connected to the preceding turbine or compressor. The free turbine turns a shaft connected to reduction gears which are, in turn, connected to the helicopter's rotors. The engine can thus be started and brought up to operating speed with the helicopter's rotor braked. This engine produces about three horsepower per pound which is a considerable advantage over the one pound per horsepower delivered by the average piston engine currently used to power helicopters.

Tiny particles of airborne dust, almost invisible to the naked eye, may be a great hindrance to outer space travel, according to the findings of the Armour Research Foundation, Chicago, Ill. Damage from millions of dust specks striking the surface of a satellite vehicle could seriously diminish its chances of completing its mission. The dust, sometimes referred to as micrometeorites or interstellar dust, travels at high speeds in outer space, and an estimated 1,000 tons of it enters the atmosphere and drifts to earth each day. This dust striking a space vehicle will have an erosive effect great enough to wear away the skin of the vehicle. Experiments at Armour have been conducted which resulted in propelling dust particles through copper plates .008 inches thick. In these studies the dust was propelled against the plate at a velocity of 4,000 feet per second.—END

DELAY LINES

by **Admiral**

... fixed and variable, distributed constant, with high temperature stability. Designed for your special application.

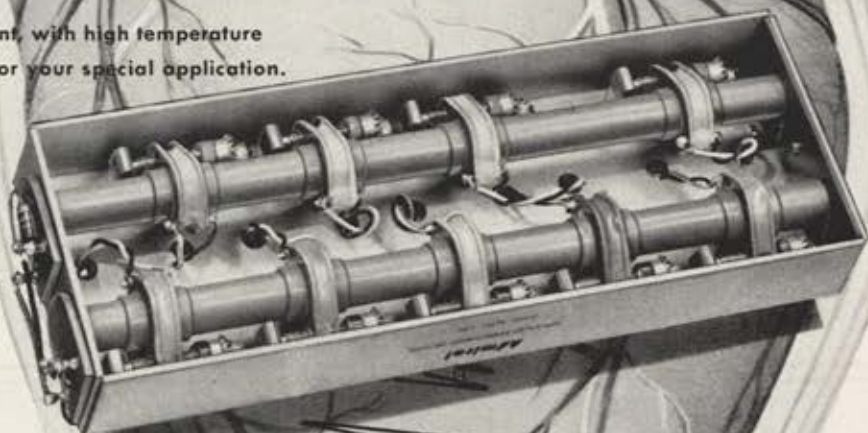
Micro-second Control for an Electronic Pulse

Scarcely fifteen years ago radar made its sensational debut when it helped defeat Hitler's Luftwaffe in the Battle of Britain. Since then its scientific offspring have become commonplace in such fields as aerial navigation, interrogation (IFF) and missile guidance.

All these elaborations of the basic radar principle, and many others now on the scientific horizon, depend on an electronic pulse train, established and controlled by means of a delay line ... the very heart of the apparatus ... that determines its scope and usefulness.

There was pressing need for a *variable** delay line, self-contained, with utmost accuracy and stability. Now Admiral research has developed such a unit. Where the flexibility of fixed delay lines is limited by the number of taps, the Admiral unit is *infinitely variable* within its overall capacity. It is adjustable with the greatest of ease for any desired interval ... *without auxiliary circuitry*. Accuracy is limited only by the accuracy of the measuring equipment. Stability is maintained over an extreme temperature range. These delay lines, completely self-contained, including switching apparatus, are much lighter, more compact, and cost far less to make. Write Admiral about designing a delay line for your special application.

*Admiral research has also developed a new procedure for making fixed delay lines very much smaller, with excellent phase characteristics.



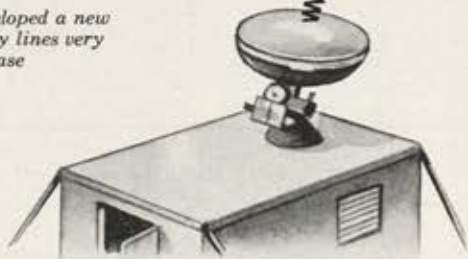
LOOK TO **Admiral** FOR RESEARCH, DEVELOPMENT AND PRODUCTION IN THE FIELDS OF:

COMMUNICATIONS UHF AND VHF • MILITARY
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RADIAC • TELEMETERING • DISTANCE MEASURING
MISSILE GUIDANCE • CODERS AND DECODERS
CONSTANT DELAY LINES • TEST EQUIPMENT



FACILITIES BROCHURE describing
Admiral plants, equipment and
experience sent on request.

ENGINEERS: The wide scope of work in progress at
Admiral creates challenging opportunities in the field of
your choice. Write Director of Engineering and Research,
Admiral Corporation, Chicago 47, Illinois.



Admiral Corporation Government Laboratories Division, Chicago 47, Illinois

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It's United Air Lines



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On United you enjoy
relaxing spaciousness
and comfort, on any
flight, at any fare.



Telephone or write United or your Travel Agent

There's a difference when you travel in the Mainliner[®] Manner



GEORGE A. ANDERL



GILL ROBB WILSON

AFA Nominees for 1957

The Nominating Committee names Chicago's George Anderl for the AFA Presidency, with Gill Robb Wilson as Board Chairman

GEORGE A. Anderl, Chicago, has been nominated by AFA's Nominating Committee for the Presidency of the Association during 1956-57. The nomination was not contested and is subject to confirmation by delegates to the Tenth Annual AFA Convention, in New Orleans, August 1-5.

The Nominating Committee, meeting in Washington, D. C., on May 19, also proposed President Gill Robb Wilson for the office of Chairman of the board to succeed John R. Alison. Julian Rosenthal and Samuel Hecht

(see below) were nominated for another term each as Secretary and Treasurer, and a full slate was named (see page 100) of Regional Vice Presidents and Directors.

Mr. Anderl, a salesman for the Rol-screen Company in Chicago, has been an AFA member for nine years, holding many offices including Squadron and Wing Commander, and Regional Vice President. He has been a Board member for four years. His home is in Oak Park, Ill., near Chicago. A sergeant during World War

II, he served fourteen months with the Air Training Command as a crew chief.

Gill Robb Wilson is editor and publisher of *Flying Magazine*. His aviation history dates back to World War I when he served in combat with the French and US Air Services. Since then he has devoted his life to the development of airpower. During his term as AFA President, he has traveled more than 75,000 miles, becoming one of AFA's most traveled Presidents.

PRESIDENT
GEORGE A. ANDERL
Oak Park, Ill.

Salesman; age 38; unmarried. AFA record: Member 9 years; Squadron, Wing Commander; Regional V-P; National Director. Military rank: Sgt.

SECRETARY
JULIAN B. ROSENTHAL
Lake Success, N. Y.

Attorney; age 47; married. AFA record: Life Member; Assistant Secretary; National Secretary; National Constitution Committee Chairman. Military rank: Pfc.

CHAIRMAN OF THE BOARD
GILL ROBB WILSON
New York, N. Y.

Editor, Publisher; age 62; married. AFA record: Charter Life Member; Squadron Commander; Director; National President. Military rank: Lt. Col.

TREASURER
SAMUEL M. HECHT
Baltimore, Md.

Department store executive; age 48; married. AFA record: Charter Member; Squadron Treasurer; National Treasurer; 1953 National Convention co-chairman. Military rank: Capt.



AFA Nominating Committee's Slate for 1957

REGIONAL VICE PRESIDENTS

NEW ENGLAND REGION
(Me., N. H., Vt., Mass., Conn., R. I.)
THOMAS C. STEBBINS
Worcester, Mass.

Textile worker; age 44; married. AFA record: Member 6 years; Squadron, Wing Commander; Regional V-P. Military rank: S/Sgt.

NORTHEAST REGION
(N. Y., N. J., Penna.)
LEONARD A. WORK
State College, Penna.

Postal supervisor; age 41; married. AFA record: Charter Member; Squadron, Wing Commander; National Committees. Military rank: S/Sgt.

CENTRAL EAST REGION
(Md., D. C., W. Va., Ky., Del.)
WILLIAM W. SPRUANCE
Wilmington, Del.

Industrialist; age 39; married. AFA record: Life Member; Member AFA Air National Guard Council. Military rank: Brig. Gen.

SOUTHEAST REGION
(Fla., Ga., N. C., S. C.)
ALEX G. MORPHONIOS
Miami, Fla.

Sales engineer; age 35; married. AFA record: Member 6 years; Squadron, Wing Commander; Regional V-P. Military rank: S/Sgt.

GREAT LAKES REGION
(Ohio, Ill., Wisc., Ind., Mich.)
GLENN D. SANDERSON
Battle Creek, Mich.

Appliance dealer; age 40; married. AFA

record: Member 8 years; Squadron, Wing Commander; Regional V-P. Military rank: Sgt.

NORTH CENTRAL REGION
(Minn., S. Dak., N. Dak.)
EDWIN A. KUBE
Minneapolis, Minn.

Steamfitter; age 37; married. AFA record: Member 9 years; Squadron, Wing Commander; Regional V-P. Military rank: T/Sgt.

SOUTH CENTRAL REGION
(Tenn., Ark., Ala., La., Miss.)
FREDERICK O. RUDESILL
New Orleans, La.

Age 49; unmarried. AFA record: Member 4 years; Squadron, Wing Commander; 1956 National Convention Chairman; National Committees. Military rank: Col.

MIDWEST REGION
(Mo., Kans., Nebr., Iowa)
J. CHESLEY STEWART
St. Louis, Mo.

Airline executive; age 51; married. AFA record: Member 9 years; Squadron Commander; Regional V-P. Military rank: Col.

SOUTHWEST REGION
(Tex., N. Mex., Okla.)
CLEMENTS McMULLEN
San Antonio, Tex.

Aviation consultant; age 64; married.

AFA record: Member 9 years; Director; Regional V-P. Military rank: Maj. Gen.

ROCKY MOUNTAIN REGION
(Colo., Wyo., Utah)
GWYNN H. ROBINSON
Colorado Springs, Colo.

Engineer; age 35; married. AFA record: Member 9 years; Squadron Commander. Military rank: Lt. Col.

NORTHWEST REGION
(Wash., Mont., Idaho, Ore.)
WINFIELD G. YOUNG, JR.
Seattle, Wash.

Aeronautical engineer; age 39; married. AFA record: Member 9 years; Squadron, Wing Commander; Regional V-P. Military rank: M/Sgt.

FAR WEST REGION
(Calif., Nev., Ariz.)
CECIL C. HOWARD
Pasadena, Calif.

Teacher; age 50; married. AFA record: Member 9 years; Squadron, Group, Wing Commander; Regional V-P. Military rank: M/Sgt.

PACIFIC OCEAN AREA REGION
(Areas in or bordered by Pacific Ocean)
ROY J. LEFFINGWELL
Honolulu, T. H.

Public relations director; age 48; married. AFA record: Member 9 years; Squadron, Wing Commander; Regional V-P. Military rank: Col.

NATIONAL DIRECTORS

WALTER T. BONNEY Silver Spring, Md. Government aviation executive; age 47; married. AFA record: Member 6 years; Director. Military rank: S/Sgt.

BENJAMIN W. CHIDLAW Cleveland, Ohio. Aviation company executive; age 56; married. AFA record: Member 9 years. Military rank: Gen.

JOHN J. CURRIE Paterson, N. J. Trucking company owner; age 31; married. AFA record: Member 10 years; Squadron, Wing Commander; Director. Military rank: Flight Officer.

MERLE S. ELSE Minneapolis, Minn. Sales manager; age 38; married. AFA record: Member 10 years; Squadron, Wing Com-

mander; Regional V-P; Director. Military rank: Lt. Col.

JACK B. GROSS Harrisburg, Penna. Automobile dealer; age 45; unmarried. AFA record: Charter Life Member; Wing Commander; Assistant National Treasurer; National Committees. Military rank: Maj.

GEORGE D. HARDY Hyattsville, Md. Sales director; age 32; married. AFA record: Member 9 years; Squadron, Wing Commander; Regional V-P; Director; 1953 National Convention co-chairman. Military rank: Sgt.

JOHN P. HENEBRY Park Ridge, Ill. Aviation corporation president; age 38; married. AFA record: Member 10 years;

Director; National Air Reserve Council. Military rank: Brig. Gen.

STEPHEN F. LEO Washington, D. C. Engineering company executive; age 47; married. AFA record: Member 4 years; Squadron Commander; National Committees. Military rank: Capt.

CARL J. LONG Pittsburgh, Penna. Electrical engineer; age 47; married. AFA record: Member 9 years; Squadron, Wing Commander; Director. Military rank: Maj.

DR. JEROME H. MEYER Dayton, Ohio. Surgeon; age 45; married. AFA record: Member 10 years; Squadron, Group Commander; Director. Military rank: Maj.
(Continued on page 100)



Official U. S. Navy Photograph

The U. S. S. Boston (CAG-1), the Navy's first guided missile cruiser, with Terrier Missiles and their launchers at the stern.

NAVY BUREAU OF ORDNANCE DEVELOPS WEAPON SYSTEMS FOR USE AGAINST ATTACK BY SEA OR AIR

The recent unveiling of the Navy's first ready-for-combat anti-aircraft guided missile weapon system—TERRIER—is but one result of the research and development work being done by the U. S. Navy's Bureau of Ordnance and a coordinated team of industrial and educational institutions.

From its establishment in 1842, the Bureau of Ordnance has provided the weapons with which the Navy has fought victoriously in six wars. With the evolution of armament, from the first muzzle loading cannons to today's complex weapons systems, it has directed the design, development, and production of the computers, fire control, and other types of equipment comprising the Navy's air, surface, and underwater ordnance.

The Research and Development Division of the Bureau of Ordnance has the responsibility of initiating and coordinating the research and development of the many projects which result in such end products as guided missiles, homing torpedoes, aircraft laid mines, and the launching and control systems for these weapons.

The job of guiding a key element of a modern day weapon system from the idea stage to the ready-for-combat stage involves a wealth of technology—drawing upon the skill, farsightedness, and courage of responsible scientific and technical personnel in the Bureau of Ordnance and its laboratories, and their counterparts in universities and industrial organizations.

This is one of a series of ads on the technical activities of the Department of Defense.

103



FORD INSTRUMENT COMPANY

DIVISION OF SPERRY RAND CORPORATION

31-10 Thomson Avenue, Long Island City 1, New York
Beverly Hills, Cal. • Dayton, Ohio



Ford Instrument Company engineer placing equipment designed for Navy instrument in one of the environmental test chambers.

ENGINEERS

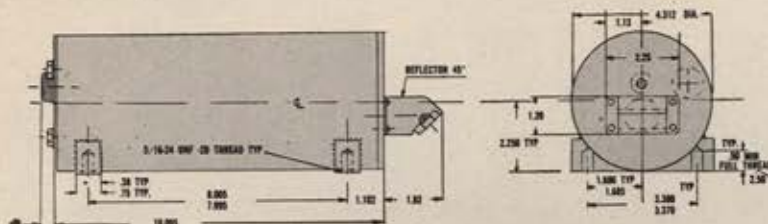
of unusual abilities can find a future at FORD INSTRUMENT COMPANY. Write for information.

MISSILE CAMERA

A Report on the Ejectable, Floatable, Shock Sustaining Traid 100 Camera

Safe recovery of film after ejection from a missile at an estimated 1,000 g's shock acceleration has been assured by repeated tests of the Traid 100 Camera. Tests prove that the camera can withstand a free fall of 300 feet without exhibiting light leaks or sustaining film damage. Recent centrifugal tests at Lockheed's Missile Division, Van Nuys, Calif., proved that the Traid 100 Camera functioned perfectly at 128 f.p.s. under 25 g's applied in both directions of the three major axes.

The ejectable feature of the Traid 100 is coupled with parachute suspension. Its unusual ruggedness, its ability to float, the ease of mounting and its reliability of operation make this camera especially useful in both military and civilian testing.



Engineering writers work with research and development engineers during formation stages of new equipment to produce clear, concise technical manuals, for use in maintenance and training, as well as specialized handbooks for USAF aircrews.



AIR FORCE, NAVY AND AIRFRAME
CUSTOMERS RECEIVE FULL-TIME SERVICE
AND INSTRUCTION ON FIRE CONTROL
SYSTEMS AND GUIDED MISSILES.

ENGINEERING WRITING

Hughes maintains a highly trained organization of expert engineering support to the armed services and airframe manufacturers using the Company's equipment, wherever operational bases or plants are located. Each of the engineers devoted to this work holds a degree in electrical engineering or physics, and is experienced in electronics equipment maintenance or design. These men are assigned to five separate divisions of the department: Engineering Writing, Training School, Field Engineers, Technical Liaison, Field Modification.

HOW HUGHES

SUPPORTS ITS

PRODUCTS FOR

MAXIMUM

FIELD

PERFORMANCE

TRAINING SCHOOL

A completely staffed and equipped school is operated to train qualified military and company personnel in maintaining Hughes equipment. Instructors are graduate engineers or physicists with backgrounds in development work or university instruction.



FIELD ENGINEERS

The field engineer works with squadron officers in training maintenance personnel, and in the provisioning of spare parts and test equipment, and provides liaison to the laboratory design groups resulting in continuous product improvement and reliability.



TECHNICAL LIAISON

Engineers are assigned to manufacturers whose aircraft employ Hughes fire control systems, and are responsible for pre-installation testing of the systems. They work with airframe designers in cases where their operational knowledge bears on equipment installation problems.



ENGINEERS AND PHYSICISTS

If you feel that you are qualified for any of the above positions, send us your resume and qualifications.

SCIENTIFIC
STAFF
RELATIONS
RESEARCH
AND DEVELOPMENT
LABORATORIES

FIELD MODIFICATION

Hughes policy is not only to get reliable equipment into the field promptly and in sufficient amount, but to modify and develop this as soon as field information and test data become available. Engineers correlate engineering changes to the field and indicate engineering changes to the Research and Development Divisions.



HUGHES

Hughes Aircraft Company
Culver City,
Los Angeles County, California



IN THE PALM OF HIS HAND

... a complete military transmitting and receiving station
weighing about one pound!

The "battle maneuvers" illustrated above disclose a new dimension in military communication, made possible by modern transistor developments.

In his hand the officer holds an RCA Transceiver, a complete radio transmitting and receiving unit—the smallest 2-way FM radio ever built. The entire walkie-talkie is only 6" x 3" x 1 1/8" in size, with weight, including battery and all accessories, of about 20 ounces.

The men in the field listen to "battle instructions" over tiny receiver units built inside their helmets.

With a range of about a quarter mile, the RCA Transceiver can be pre-set

for any frequency between 45 and 52 mcs. Only two controls are used and no tuning or adjustment is necessary during normal use. The receiver is an all-transistorized superheterodyne and the transmitter comprises two transistors and one tube, both contained in a single unit.

The feather-lightness and miniature size of the transceiver and receiver make it possible, for the first time, to extend communication to the individual level. It is another instance of RCA's constant search for new and better ways of doing things electronically. Demonstration and consultation with RCA field engineers throughout the world are invited. Call or write.

RCA Ultra-Miniature
FM Transceiver
compared with
AN/PRC-10
(Walkie-Talkie)



TYPICAL MILITARY APPLICATIONS

- Tactical communications between squad and platoon leaders and higher, also with individual soldier or marine
 - Military police and sentry duty
 - Air and sea rescue (unit in survival kits)
 - Guided missile installations (before and after take-off)
 - Communications between maintenance crews, fire crews and between crew and control tower
 - Medical work (litter bearers to field hospitals)
- ... and hundreds of others.



DEFENSE ELECTRONIC PRODUCTS

RADIO CORPORATION of AMERICA
CAMDEN, N. J.



Members of the Air Harbor Squadron admire the Wing Trophy they received as the outstanding squadron of 1956.



Old and new Auxiliary and Wing officers exchange gavels and congratulations at the California Wing Convention.

CALIFORNIA WING CONVENTION



James Czach, Cecil Howard and Curt Christensen discuss plans for 1957. Curt is new Wing CO; Czach heads the Los Angeles group.



Col. Harry Shoup and Convention Chairman Joanne Affronte sat together for lunch.

THE ANNUAL California Wing Convention, held in Long Beach on April 20-22, carried the theme "Life in the Jet Age," and included a discussion on current aviation problems by leading civil and military aviation figures. Among those participating were: Col. Harry W. Shoup, Chief of the Combat Operations Center, ConAD; Henry W. Boggess, President, National Business Aircraft Association; Maj. Gen. B. A. Schriever, Assistant for Western Development Division, ARDC; and Brig. Gen. Joseph S. Marriott, (Ret.), Director of Airports, Riverside County, Calif. AFA's Executive Director Jim Straubel acted as moderator for the discussions.

The Convention also included a Reserve Affairs symposium, presided over by John R. Alison, AFA Board Chairman and Commander of a Reserve Fighter Wing in Long Beach, and a regional meeting called by Cecil

C. Howard, Far West Regional Vice President.

Charles O. Morgan, Jr., San Francisco attorney, stepped down as Wing Commander and was replaced by former Vice Commander Curtis E. Christensen, Van Nuys insurance executive who previously was Commander of the San Fernando Valley Squadron. Others elected were: Bob Dobbins, San Francisco, Deputy Commander; Bob Brooks, Pasadena, Secretary; Frank Brazda, San Diego, Treasurer; and Royal Parker, Stockton, Sergeant-at-Arms. Three new Group Commanders are: Jim Czach, Los Angeles; Bob Begley, San Francisco; and George Saltz, Modesto.

AFA President Gill Robb Wilson was the featured speaker at the annual airpower luncheon and was introduced by movie actor Pat O'Brien, who served as Toastmaster. Honored guests included Trevor Gardner, former Assistant Secretary of the AF, and

Vince Barnett, movie and TV actor.

The Wing's Auxiliary also held its convention at the same time and featured its own airpower symposium. Speakers on the panel were Jan Dietrich, Yarnell Auxiliary, Long Beach, who spoke on "Women in Commercial Flying"; Grace Howell, Yarnell, who spoke on "Civil Air Patrol"; and Grace Brinke, Air Harbor, Hawthorne, who discussed the Air Force Academy. Helen Henderson, Air Harbor, was Toastmistress.

Grace Brinke was elected Auxiliary Wing President replacing Billie McLaughlin. Other officers elected were: Grace Howell, Vice President; Annette Noblett, Air Harbor, Secretary; and Ethelyn McDivitt, wife of Board Member James McDivitt, Treasurer.

Joanne Affronte, former WAF and now a member of the First Reserve Squadron, was Chairman for the convention—the eighth held by the California Wing.—END

Tulsa Holds a Jet Age Conference

ONE-DAY PROGRAM ATTENDED BY MORE THAN 500 PERSONS FROM TWENTY-TWO STATES



Gen. Carl A. Spaatz is shown addressing the Southwest Jet Age Conference banquet in Tulsa. Co-chairman Harold C. Stuart is seated at table at the left.

After attending AFA's Jet Age Conference in Washington in February, Harold C. Stuart, a past AFA President and now a Director, went home to Tulsa, Okla., impressed. He felt such a program should be carried to the local level. With the assistance of Russell Hunt, another AFA member, he organized a one-day conference on May 3 in Tulsa, patterned after the Washington program. More than five hundred persons, from twenty-two states, attended.

The program was kicked off with a banquet for four hundred persons on the evening of May 2, featuring Gen. Carl A. Spaatz, USAF-Ret., as speaker.

The next day, the guests heard a discussion of the various Jet Age problems by Col. Harry W. Shoup, ConAD Combat Operations Center Chief; CAA Administrator Charles J. Lowen, Jr.; Robert Aldrich, President, Airport Operators Council; William Littlewood, American Airlines Vice President; Dr. H. O. Parrack, ARDC; Edward P. Curtis, Presidential Assistant on Aviation Facilities; Dr. George E. Valley, Jr., Lincoln Laboratories; Jerome Lederer, Flight Safety Foundation Director; Col. J. Francis Taylor, ANDB Director; David D. Thomas, CAA; Henry W. Boggess, President, National Business Aircraft Association;



Col. Harry Shoup, center, spoke to the Hennepin County Bar Association in April. He is shown with members of that group and Minneapolis AFA members.

SQUADRON OF THE MONTH

The Metropolitan Squadron
New York, N. Y.

CITED FOR

its outstanding membership program, which has increased the size of the squadron from thirty-five to well over 200 in the past six months.

and Clarence Sayen, President, Airline Pilots Association.

Helping Stuart and Hunt with the program were Tom DeArman, Tulsa Chamber of Commerce; Richard Lloyd Jones, Jr., President and General Manager of the Newspaper Publishing Corp.; H. G. Malbeuf, District Sales Manager, American Airlines; and many others.

The San Francisco Squadron's "Airpower in Action" series last month featured an address by Brig. Gen. Ben I. Funk, Deputy Director for Ballistics Missiles, AMC. The program, a continuation of the series begun last October, was held in the Palace Hotel, and included an address by John Schwinn, AMC, and a panel discussion of AF Procurement and Production. AFA Executive Director James H. Straubel was on hand to moderate the discussion.

Leonard Luka, Commander of the Southwest Squadron, used his cleaning establishment in Chicago to pass the airpower word to his townspeople. In honor of the 10th anniversary of SAC, he installed an exhibit in the store window, depicting the ten years of security the nation has enjoyed because of the Strategic Air Command.

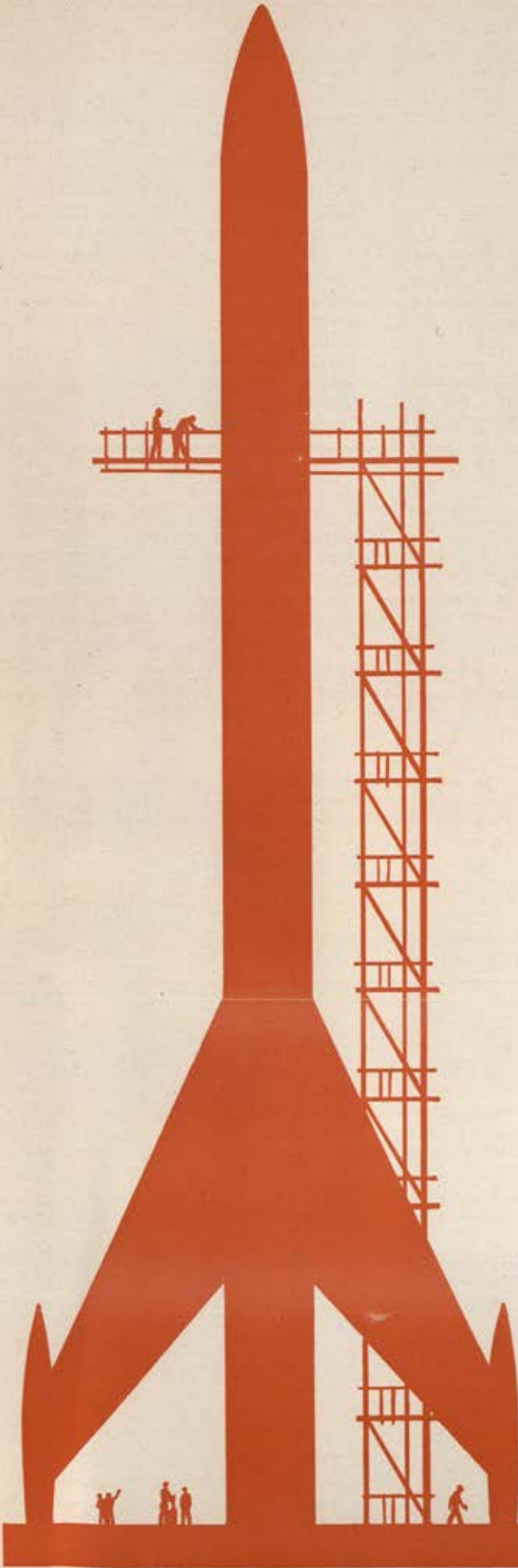
Another program, sponsored by the Illinois Wing with the support of several Chicago Squadrons, was a party given at Hines Hospital for the veteran patients. Entertainment featured talent from several area nightspots.

Don Amey, of Squadron 101, was program chairman. The hospital-impressed by the annual Christmas parties sponsored by the Wing at Hines Hospital—asked the Wing to give the party.

Washington's Capital Squadron, like many others, has switched to luncheon meetings each month. A capacity crowd turned out for the Squadron's May meeting at which a plaque was presented to John G. Norris, aviation writer for the Washington Post and Times Herald.

(Continued on page 107)

You
are cordially invited to attend
The Air Force Association's
TENTH ANNUAL NATIONAL CONVENTION
and
Airpower Panorama
August 1-2-3-4-5, 1956
New Orleans
Roosevelt and Jung Hotels



DESTINATION... UNKNOWN!

Rockets to points in outer space! They are more than a dream. In fact, some morning before long you may wake up to find such rockets a reality.

Right now, AC engineers, together with some of America's top scientists, are hard at work developing electro-mechanical guidance systems that are capable of directing missiles to many points in outer space.

Fantastic? Not at all. AC has built a world-wide reputation with outstanding contributions in the fields of guidance, navigation and fire control.

AC is well on the way to development of control systems that can direct space-rockets on their way.



THE ELECTRONICS DIVISION
OF GENERAL MOTORS
Flint, Michigan
Milwaukee, Wisconsin



Shown at Broadmoor Squadron meeting are Lee Feldt; Buck Shaw, AF Academy Coach; Gwynn Robinson; Paul C. Potter; Maj. Frank Merritt, Asst. Director of Athletics at the AF Academy; and Colorado Wing Commander Herb Stockdale.

The award—in recognition of Norris's series of articles on the serious shortage of technical personnel in the Strategic Air Command—was presented by Donald W. Steele, Squadron Commander. Also at the meeting were Walter Savage, D. C. Wing Commander, and Maryland Commander Paul Fonda, Hagerstown.

In addition to California, Ohio, Utah and New York have recently held Wing Conventions.

Manhattan's New Yorker Hotel was the scene of the ninth New York convention, attended by representatives of all Squadrons in the state. Feature of the one-day program was a three-hour discussion on Jet Age problems, moderated by AFA Executive Director James H. Straubel.

Principal speaker at the annual airpower banquet was Gen. George C. Kenney, past President and now a National Director of AFA. John A. Mack served as Convention Chairman.

New officers elected were William H. Stein, Commander; Mack, Vice Commander, Lower New York; Alden West, Vice Commander, Upper New York; Richard Lasher, Secretary; Arthur Wegman, Treasurer; and Harold Rosenstrauch, Judge Advocate. Stanley Denzer is retiring Commander.

Ohio's annual meeting was held in the Van Cleve Hotel, Dayton, Fred Goulston, Commander, presiding. Feature of the event was the banquet, with AFA President Gill Robb Wilson as speaker. The Wing's Airpower Award for 1956 was presented to C. E. A. Brown, Ohio Aviation Director.

Don Wohlford, Akron Squadron Commander, was elected Wing Commander for 1956-57. Other officers are Morris Ribbler and Ken Puterbaugh, Dayton, and Robert Cranston, Toledo.

The second convention of the Utah Wing was held in the Ben Lomond Hotel, Ogden, with Marvin Fischer, Ogden Commander acting as convention Chairman. The two-day meeting opened with a kick-off luncheon at which the speaker was Brig. Gen. Harold P. Little, Commander of the 349th Reserve Wing, Hamilton AFB, Calif. Little, a United Air Lines pilot on the San Francisco-Honolulu run, has more than 22,000 hours in the air. He spoke on the shortage of skilled manpower in the USAF.

Brig. Gen. Wendell W. Bowman, Commander, 34th Air Division, Kirtland AFB, N.M., was the principal speaker at the Civil Defense luncheon on May 12. That evening, AFA's President Wilson told the banquet guests that the general public does not understand the implications of modern-day aviation.

Helen Daines, elected Utah's Miss Airpower at the Industrial Symposium in Salt Lake City in January, reigned over the Wing convention, and was an honored guest at all functions. Among those present were Maj. Gen. Manning E. Tillery, Commander, Ogden Air Materiel Area, Hill Air Force Base, and his Deputy, Col. Lester Kunish, who was largely responsible for the original formation of AFA in Utah.

George Van Leeuwen, Wing Commander, presided at the convention,

and was succeeded in office by Joseph Jacobs, Ogden.

Visitors to the convention included W. Thayer Tutt, Regional Vice President from Colorado Springs; Herbert Stockdale, Colorado Wing Commander; and Gwynn Robinson, Broadmoor Squadron Commander.

Gwynn Robinson (*see above*), has inaugurated the new monthly luncheon series in Colorado Springs. When he learned that Gill Robb Wilson would be in Ogden for the Utah convention, he invited him to come to Colorado Springs and speak to his Squadron on May 14, at the regular meeting in the Alta Vista Hotel.

Mr. Wilson accepted and spoke to an audience of about seventy-five persons, including the Military Affairs Committee of the Colorado Springs Chamber of Commerce, who were so impressed with his remarks that they want to invite him for a return engagement for the Chamber. Wilson talked about the moral obligations of the community that will soon be the home of the Cadets of the United States Air Force Academy.

(Continued on following page)



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AFA NEWS CONTINUED



Winner of top MATS NCO Academy Award, M/Sgt. R. K. Moorehead, and San Francisco Sqdn. Cmdr. Cliff Griffin.

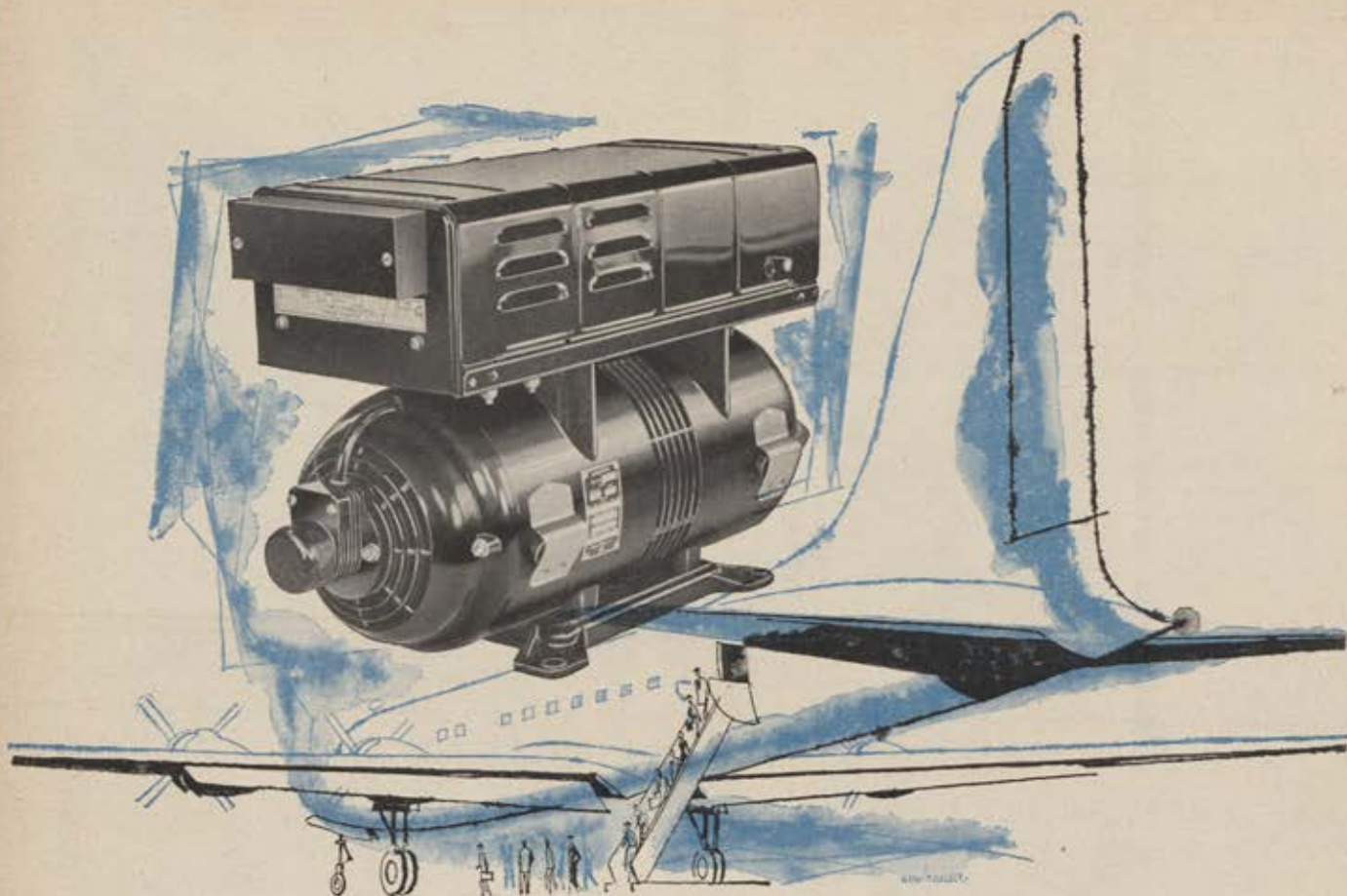
Honored guests included Maj. Gen. Frederick Smith, Air Defense Command Deputy Commander, who is soon to leave to assume command of the Fifth Air Force.

The Mobile, Ala., Squadron has joined the units making the switch from evening to luncheon meetings, and Will O. Ross, Squadron Commander, says it has worked wonders. Meeting attendance went from thirty-four to fifty-two, to 106, as a direct result of the change. Bob Johnson, a Past President of AFA, is scheduled to speak at the next meeting.

California's Air Harbor Squadron at Hawthorne, although barely a year old, has already received much recognition for its efforts. At the recent Wing convention, it won the Wing cash award of \$100 for membership programming; and the Auxiliary received a large trophy as the outstanding unit in the Wing. Grace Brinke, first Auxiliary President, and currently a National Auxiliary officer, was elected Wing President. In 1955, Jim Czach, organizer of the Squadron, received a national AFA award, and he was elected Commander of the Greater Los Angeles Group for the coming year.

The official Charter presentation meeting for the Edward Suarez Squadron, Gulfport, Miss., took place on May 4, in Gulfport. Gus Duda, Organization Director, presented the Charter for AFA President.

Included among the honored guests at the Charter-night dinner were Thomas L. Hogan, Mississippi Wing Commander; Mr. and Mrs. Clyde H. Hailes of New Orleans; and Fred O. Rudesill, 1956 National Convention Chairman. Louis J. Riefler is Commander of the Suarez Squadron.—END



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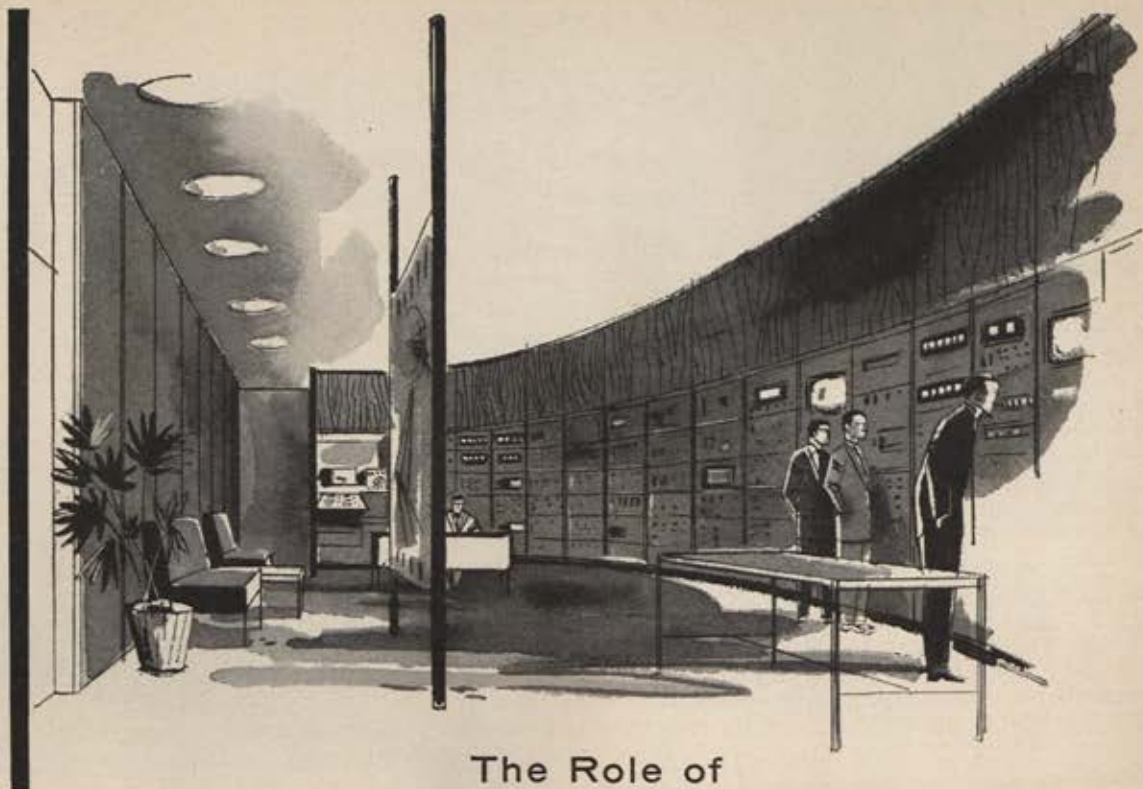
F45-10 INVERTER
Operating Characteristics

	Single Phase*	Three Phase
Output Rating		
Full Load	3000 va	3000 va
Rated a-c Voltage	115	115
Line Amps	24	15
Nominal Frequency (cps)	400	400
Power Factor	90% Lag to 95% Lead	
Rated Input Voltage — d-c	27½	27½
Input Amperes — d-c (at Rated Voltage)		
No Load	44	44
Full Load	185	185
Over-all Dimensions—Inches		
Length	17 13/16	
Width	7 1/8	
Height	11 13/16	
Weight—Pounds	54	

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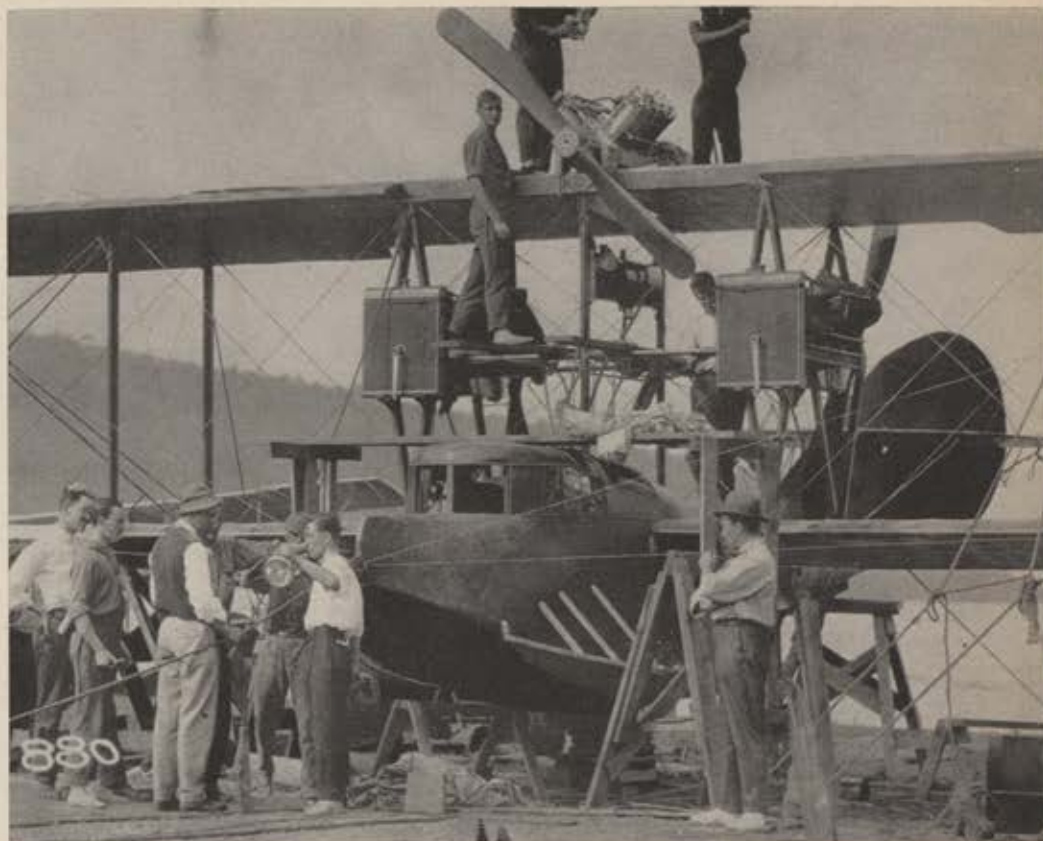
Further information about this R-W activity can be obtained by writing to the Director, Electronic Instrumentation Division.

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SOME OF THEM MADE IT

By Samuel Taylor Moore



Smithsonian Institution

With financial backing from Rodman Wanamaker, Glenn Curtiss built the flying boat "America" at Hammondsport, N. Y., for the first attempt to span the Atlantic. But the try was abandoned with the outbreak of World War I in 1914.

TRANSATLANTIC air travel is so commonplace today that you can go to Europe and return without so much as leaving a note for the milkman. But back when a flight from the nearest points of land on both sides of the North Atlantic represented the hard way to do it, I knew several of the men who tried. Unquestionably Lindbergh's flight in 1927, and his subsequent pathfinder flights for Pan American, were prime factors in making scheduled transatlantic flights a reality, beginning in 1939. But I am not thinking of the "ballyhoo era" from mid-1927 on. My mind goes way back, to the earliest attempts when critical fuel limitations on the crude crates then available made every start a nip-and-tuck gamble.

Not long ago, one of the two men who, in 1914, were set to make the first try, died of natural causes. That would be Adm. John H. Towers, USN (Ret.), who did the test flying on the flying boat *America*, a twin-engine giant box-kite built by Glenn Curtiss. Rodman Wanamaker, the financial angel of the project, had selected as

first pilot, John L. Porte, a retired British naval flyer, because with take-off from St. Johns, Newfoundland, both start and finish lay in Empire territory (Ireland was then ruled by Great Britain). Lieutenant Towers was to have been copilot.

Whether the *America* ever could have made it remains a question. The start of the first World War scratched the attempt. The *America* got to England later, but on a steamship, where it served as the model of England's first anti-sub air fleet of H-boats. War forced suspension of further attempts to span the Atlantic by air for five years. Late spring of 1919 saw a frenzied resumption of attempts, sparked by a prize of ten thousand pounds put up by Lord Northcliffe, which had been awaiting collection since 1913. International rivalry was strong, the number of entries large, and the types of competing aircraft varied. Newfoundland was the critical news point.

Britain's airplane entries all were modified battle types, while back in Scotland, His Majesty's rigid airship R-34 was being groomed to enter.

The four British planes, respectively, were, a four-engined Handley-Page; twin-engined Vickers-Vimy and Martinside bombers; a single-engined Sopwith Camel. The power plants in each plane were identical—Rolls-Royce engines of 350 hp. The American entries, all US Navy, were three flying boats, NC (Navy-Curtiss), numbered 1-3-4, with four Liberty engines of plus 400 hp in each, and also a Navy blimp, C-5.

The British pilots all planned direct non-stop flights from St. Johns. The American pilots, their planes poised at the naval air station at Rockaway, Long Island, projected a longer route, with three refueling stops at Trepassy Bay, Newfoundland; Ponta del Gada in the Azores—and Lisbon, Portugal. Destination was Plymouth, England, selected sentimentally as the departure port of the Pilgrim fathers three centuries before. Safety precautions for the ocean legs were elaborate—sixty-eight destroyers, five battleships, all equipped with signal smokes, starshells, and searchlights to aid the navigation. (Continued on following page)



After making first non-stop Atlantic flight (1919), Alcock and Brown crashed in Ireland.

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First plane to fly from the US to England, the NC-4 landed at Plymouth on May 31, 1919—after twenty-three days elapsed time.

Smithsonian Institution

SOME OF THEM MADE IT

CONTINUED

gators, and on paper, to rescue downed planes as well. As things happened, in both functions, the ships might as well have stayed at anchor.

Some Navy pilots, like Ted King, wanted to make the try non-stop, like the British, using an F-5-L, parent of the later PBY boats. Endurance tests were authorized but the trials failed to convince Navy brass that the older flying boat had the range. Also, all the crews were selected from men who had had the bad luck not to have served overseas. At the time, the Navy was rich in pilots who had had wide experience in flying through fog, winds, and waves on the other side of the ocean, but it did not make use of them. To the deep disappointment of Army flyers, no plane then in the Air Service stable was deemed capable of the effort. DeHavillands and Curtiss Jennies were the only operational types on hand.

The British crews at St. Johns appeared to have a decisive head start. Minor damage to planes in trial flights, and persistent bad weather, however, caused delays which gave the USN entries time to catch up. None of the British landplanes had gotten away before the Navy entries all finally completed the first leg from Rockaway to Trepassy. Even the blimp, in a twenty-five-hour flight, got to Newfoundland ahead of NC-4. That famed survivor of the three flying boats suffered the first of four bad breaks shortly after leaving Rockaway. Off Cape Cod, failing oil pressure and a broken connecting rod forced it down. The crew sailed it on the surface into the naval base at Chatham, Mass., but it did not catch up with the NCs 1 and 3 for six days.

A squall meantime had eliminated the blimp, tearing C-5 from its moorings and ripping its gas bag. In an

unsuccessful attempt to save the wreckage from being blown out to sea, two young Canadians were badly hurt, but the crew was unharmed.

British planes were still awaiting good weather when the three American flying boats rose from Trepassy Bay, and, in rough formation, headed for the Azores on May 16. For three days the world awaited word. First news, on the 17th, was of NC-4. It had flown 1,200 miles, mostly through a blinding fog, to land at Horta instead of Ponta del Gada. Much later, came news of NC-1. Uncertain of his position because of the fog, the skipper had made an intermediate landing to take his bearings. Rough seas prevented take-off again. When, providentially, a Greek tramp loomed nearby, the crew transferred to its dirty decks, securing a towline to their plane. Under strain, the line parted. NC-1 foundered 100 miles short of its goal.

A longer wait followed for news of NC-3. Like NC-1, NC-3 had also gone down to take bearings. Rough seas disabled her too seriously to take off again. Her skipper, the same Jack Towers, turned the aircraft's wings into sails, and after fifty-two tortured hours of wallowing about, finally sailed NC-3 stern first into Ponta del Gada. NC-4, out of fuel at Horta, where no fuel was available, had to wait three days before making the short hop into Ponta del Gada.

News of the completion of the first sea-leg by NC-4, received at St. Johns, spurred two of the British competitors to start on May 18. The Martinside cracked up on take-off. But the Camel, with Harry Hawker at the controls and Mackenzie Grieve as navigator, managed to stagger into the air. For days an ominous silence prevailed. Even those who knew little of the

problems of such a flight could figure that the single-engined entry never had a chance.

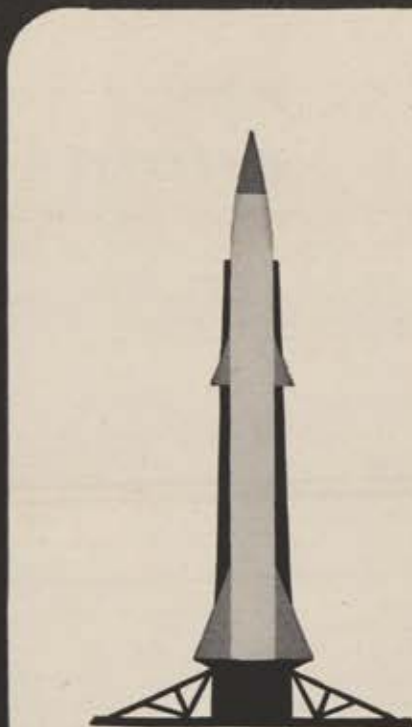
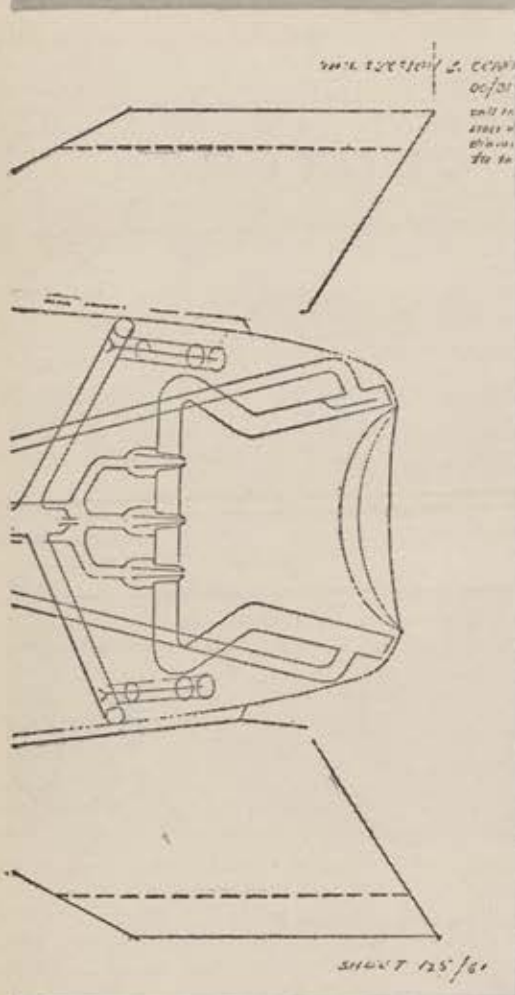
On May 25, news came that Hawker and Grieve had been saved. Their fuel exhausted, they had landed alongside a fishing boat, 700 miles short of the Irish coast. The airplane had sunk, but its two occupants were saved.

NC-4's flight from Ponta del Gada to Lisbon on May 27 was the only decent leg of its entire flight. After three days in Lisbon the flying boat took off on May 30. But a lubricating system failure forced a landing on the Mondega river, a short distance northwards. The craft was repaired only to hit a river sandbar on take-off. Damage was not serious but the time lost prompted a decision to land again at Ferroll, Spain, for an overnight stay.

Twenty-three days had elapsed between NC-4's departure from Rockaway on May 8 and its landing at Plymouth on May 31. Nonetheless the flight marked the first crossing of the Atlantic by air. Somewhat restrained Britishers at Plymouth greeted NC-4's six-man crew, Commander A. C. Read, skipper; Elmer Stone, a Coast Guard officer, first pilot; Walter Hinton, a naval reservist, relief pilot; Ensign Rodd, radio operator; Lieutenant Breeze and Chief Mechanic Rhodes, engineers. America thrilled at the triumph, and the crew came back by ship to a series of fetes.

The Atlantic was soon conquered again in a non-stop flight which rated payment of Northcliffe's fifty grand. On June 15th, John Alcock and Arthur Whitten-Brown flew some 1,900 miles from St. Johns in roughly sixteen hours to land, tail-up and out of fuel, in a soupy Galway bog at Clifden, Ireland. The miracle of that flight was a con-

(Continued on page 115)



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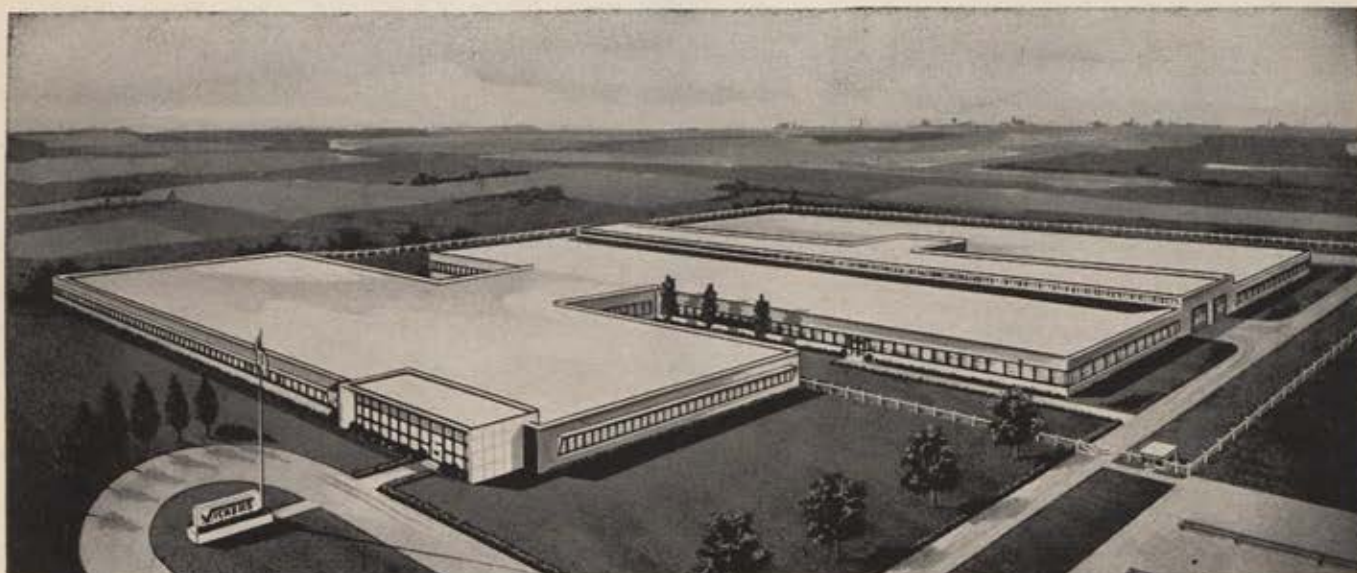
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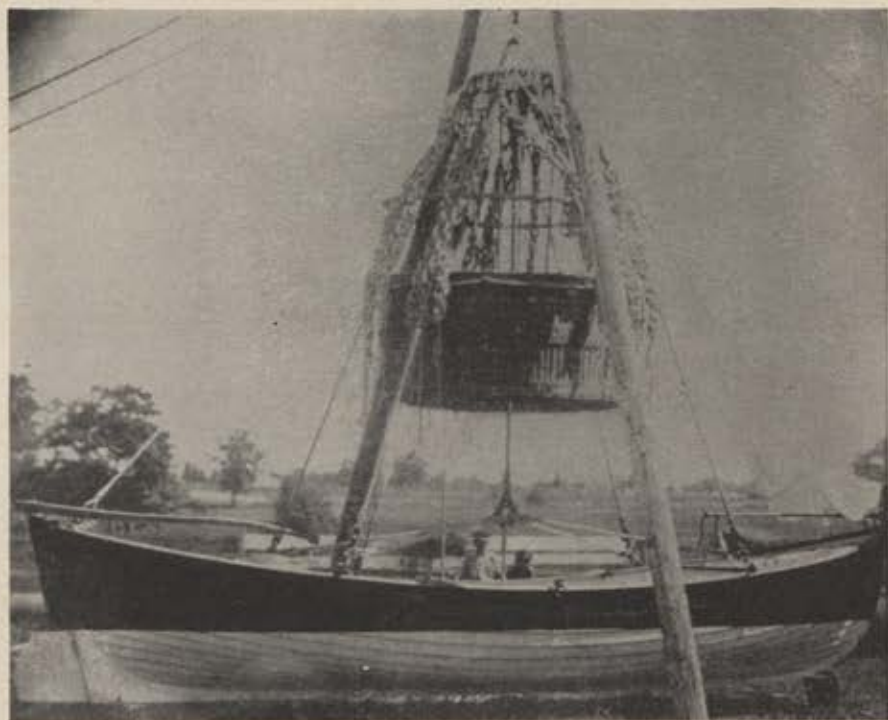
sistent tailwind averaging forty miles an hour. Alcock and Whitten-Brown had waited out the tailwind, because their Vickers-Vimy cruised at only eighty miles an hour. Without the wind's help, the twin-engined bomber would have come down not far from where Hawker and Grieve had dunked. Their speed of close to 120 miles an hour was greater than that of Lindbergh on his solo crossing, and it was well into the 1930s before their time was bettered in a transatlantic attempt.

The money incentive no longer existed for the two British planes still back at St. Johns. Plagued by further minor accidents, the Martinside crew at length gave up. The Handley-Page made a final try three days after R-34 dirigible had left Scotland on July 2, and the crew of the big airship saw the four-engined airplane entry heading east as the dirigible approached the American coast. Mechanical trouble in the bomber shortly thereafter forced its return to St. Johns, and abandonment of further attempts.

The British were not the first to try to span the Atlantic in a lighter-than-air craft. As far back as 1860, Thaddeus S. C. Lowe inflated a 725,000-cubic-foot free balloon at Philadelphia to make the attempt. When the big bag was wrecked during inflation, Lowe built a second balloon which took off from Cincinnati the following year. Fort Sumter's guns had by then signaled the start of the Civil War and when the balloon came down near the South Carolina border, Lowe got back north where, as a civilian, he directed the Union Army's short-lived observation balloon effort. Next to make the free balloon try was Washington H. Donaldson, taking off from New York City in the balloon *Graphic* in 1873. Winds carried the bag north instead of east, and the huge spheroid was wrecked in landing.

The first American to make the transatlantic attempt in a powered airship was Walter Wellman, a journalist-explorer. Taking off from Atlantic City, N. J., in 1910, Wellman and his crew traversed a thousand miles over the ocean. But when a passing steamer took the party off its disabled craft, the airship was only four hundred miles east of Cape Hatteras. In 1912 another attempt was made from the same starting point by Melvine Verman in an airship of his own design. That flight failed almost at its start, killing Verman.

When Washington was advised that the British R-34 dirigible would soon start its projected round-trip Atlantic crossing late in June 1919, the Army



Smithsonian Institution

A free balloon with a boat slung under the gondola was to have carried Thaddeus Lowe across the Atlantic in 1860—but the balloon broke upon inflation.

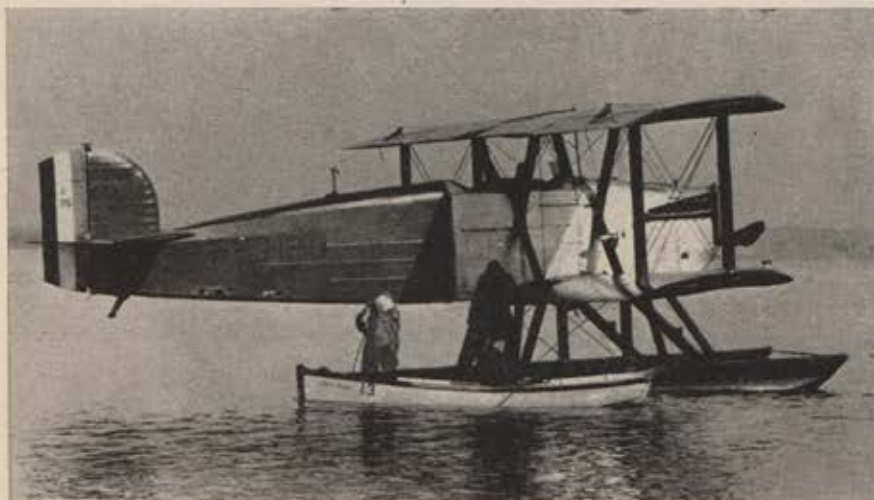
and the Navy were engaged in controversy as to which service would have primary responsibility for the development of rigid airships. A temporary compromise over which service would handle the R-34, should it reach US shores, was reached. The Navy would supply all technical services such as replenishment of hydrogen and water ballast. The Army Air Service would be responsible for landing and ground-handling the behemoth—a perfecto-shaped envelope 870 x 80 feet containing over two million cubic feet of hydrogen. Suspended forward from the hull was a command gondola containing an engine, and three other engine nacelles hung port, starboard, and aft.

I personally played a part in the flight of the R-34, although a non-glamorous role.

It was my fortune to be awaiting separation at Mitchel Field when, as the ranking lighter-than-air officer, I was tagged for the job. I held a rating of "reserve military aeronaut," but my knowledge of airships was confined to once having seen a yellow French blimp patrolling the harbor at Le Havre. I recalled the story in the *New York Times* which had reported that the R-34 carried sufficient fuel for a round-trip Atlantic crossing. That statement was proven untrue. Navy personnel, their experience limited to blimps, were hardly better qualified for their responsibilities than was I.

The R-34 encountered such persistent headwinds on its outgoing 3,200-mile voyage that it required 108-plus hours to reach Mineola, Long Island. In the final twenty-four hours emergency landings were planned at various points in New England. The six hundred men I had been given to handle the airship all were doughboys awaiting separation at nearby Camp Mills, and restive for discharges after eight months of delay in getting back from Europe. They all but mutinied when the airship stayed here four days instead of making the quick turn-around promised and expected. I had given the unhappy men some elemental training in rope-handling, and we were standing by in barracks early on the morning of July 6 when Captain Scott, the R-34's skipper, sent word by radio that his fuel would be exhausted at Montauk Point, at the eastern tip of Long Island. Without consulting me, the Navy shanghaied my ready crew at Camp Mills, adjoining Mitchel Field, on a special train that was speeding to Montauk, when R-34, aided at last by a tailwind, appeared overhead at Mineola. A member of the staff on board, Major Pritchard, parachuted down, and together we landed the ship with untrained soldiers who had been attracted to the landing site by the circling airship. Eventually I got my men back and they were obliged to

(Continued on following page)



Douglas World Cruiser. Two of these planes crossed the Atlantic in 1924 during a flight around the world. They had interchangeable wheels and floats.

hold the airship on the ground all through daylight hours when the sun superheated the hydrogen. Only after the sunset, when the gas would contract, could R-34 be allowed to float by its own buoyancy at the end of a 500-foot steel cable affixed to its nose and anchored to piling buried deep in the ground. Three times the airship was nearly wrecked by the neophytes handling it.

On the first night when R-34 was let up on its cable, the Navy had replaced ballast only in the forward compartments, instead of filling the tanks evenly throughout the length of the hull. As a result, the airship flew nose-down, tail-up, on its cable like a cockeyed skyscraper. The next morning, getting the vertically-posi-

tioned monster down late, after the sun had caused the hydrogen to expand, we yanked out an entire section of its duralium nose-frames. Repairs were made with two-by-four wooden joists and by sewing together the torn fabric. Another night, a sudden drop in temperature after the airship had been put up contracted the hydrogen. The airship sank all the way to the ground, where it surely would have broken into pieces had we not managed to release enough ballast to make it buoyant enough to go back up again. Despite the rough handling, R-34, favored by tailwinds, got back to Scotland in seventy-five hours.

R-34 carried thirty-one passengers and crew both ways, Commander

Zachery Lansdowne representing the United States Navy on the westward voyage, Col. Bill Hensley, the Army Air Service, on the eastward leg. In Europe, Colonel Hensley negotiated a contract with the Zeppelin Company to build a rigid airship for the Army, in lieu of German war reparations due us. Delivery of the airship, appropriated by the Navy and christened the *Los Angeles*, marked one of three Atlantic crossings in 1924. Flying non-stop from Friedrichshafen, Germany, to Lakehurst, N. J., the Zeppelin established a new westward record of eighty-one hours.

The other flights in 1924 marked the first westward crossings by airplanes. The two surviving planes of the Army's round-the-world flight did it in special single-engined Douglas jobs with interchangeable wheels and floats. The Atlantic marked the last ocean leg of that historic circumnavigation by air. The third plane of the original four had been lost on take-off at Kirkwall, Scotland, after having made it that far. The other had "pranged" an Alaska mountain shortly after the start. Capt. Lowell Smith and Lt. Erik Nelson, pilots of the surviving planes, were a full month getting across. Departing Kirkwall on August 2, two stops each were made awaiting weather in harbors at Iceland and Greenland, before a final eleven-hour hop ended safely at Icy Trickle, Labrador, on August 31. Navy surface ships, which had been indispensable in delivering supplies at refueling points on all water legs of

(Continued on page 119)



First airship to cross the Atlantic was the British R-34 which carried thirty-one passengers and crew on the trip.

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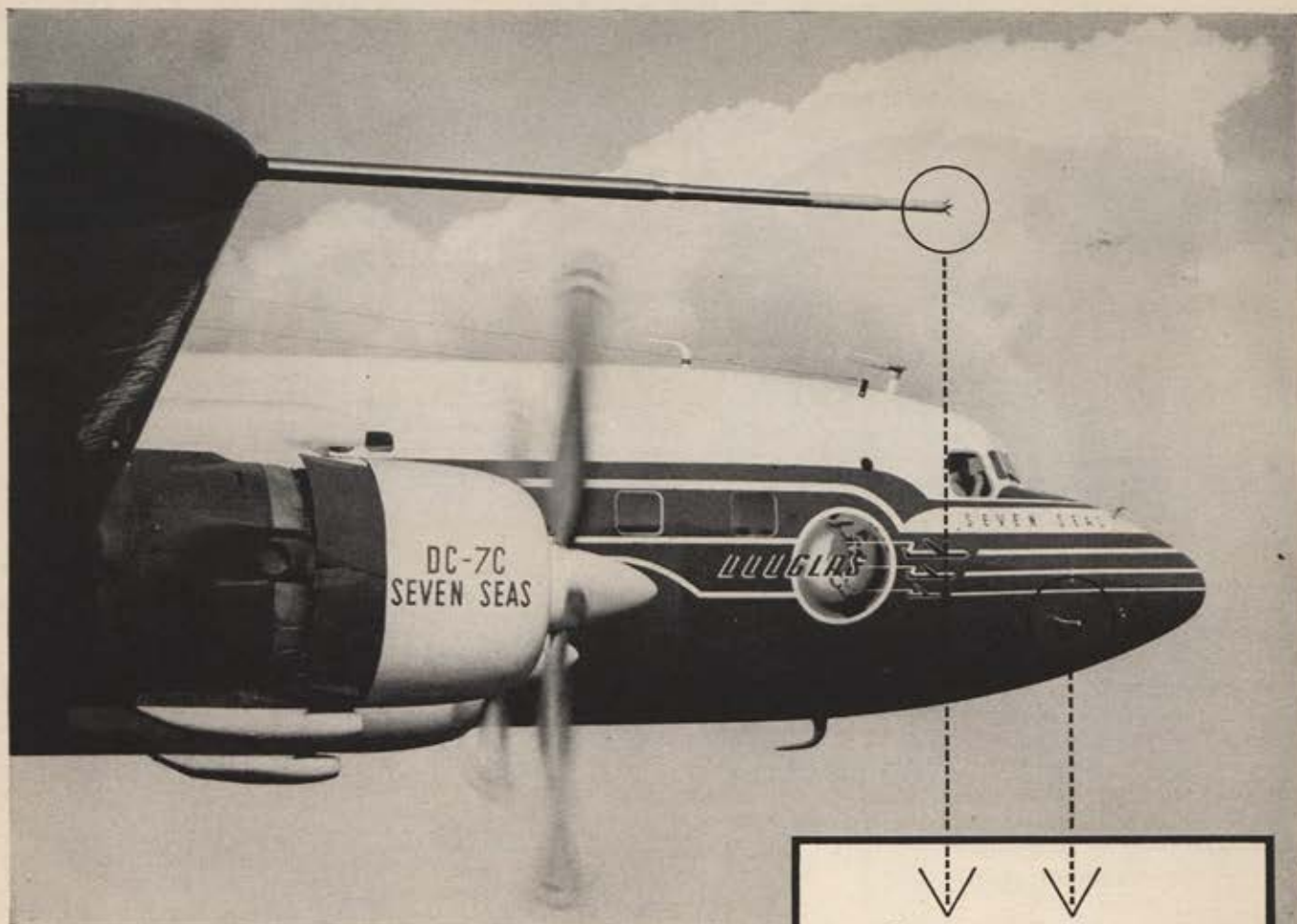
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SOME MADE IT — CONTINUED

the plus 26,000-mile circle, made their first rescue on the Atlantic leg, but it was not one of the Army planes. Uninvited, an Italian pilot, Lieutenant Locatelli, in a Savoia-Marchetti flying boat, had decided to benefit from the usual services arranged for the American planes. Off course, his plane was forced down. A long search followed before he was found and taken off his disabled plane by the Navy.

I had made a courtesy flight in the airplane which in 1926 represented the first try to capture the \$25,000 Orteig prize for a non-stop flight between New York and Paris. Igor Sikorsky had built the plane in a dilapidated hangar at the old Roosevelt Field with his workmen, mainly White Russian refugees. It was a transport design, advanced for its day, but its financing had become involved and Capt. Rene Fonck, ranking French air ace in the first World War, made an arrangement to use it for the non-stop attempt. Overloaded with fuel, it crashed and burned on take-off. Two mechanics were trapped in the flames but Fonck and his co-pilot, Lieutenant Curtin, USN, escaped unharmed.

Fonck's project immediately inspired an American to challenge him in the race. While Fonck was conducting preliminary tests on the Sikorsky, Commander Noel Davis, USN, opened negotiations to buy a tri-motored Fokker which had been built for a projected North Pole flight by Capt. George H. Wilkins, an Australian. The negotiations fell through and early in 1927 Davis selected another plane, a Keystone bomber. As an Air Corps plane, it was a twin-engined job. Davis modified his Keystone by adding a third engine in the nose. Few people had ever heard of Lindbergh when Davis announced his plans. It was known that Nungesser and Gali were making ready in France, that Byrd was building a special Fokker for the try, and that probably another entry would be whoever Charles Levine picked to pilot the *Columbia*. On a final load-test at Langley Field, Davis and his co-pilot were killed when the Keystone dived vertically into Back River. Whether ballast shifted into the nose, or the extra engine made the plane nose-heavy, is unknown. Davis had secured the backing of the American Legion for his attempt and my contacts with him were those of his literary ghost. In retrospect, the title we selected for our first article was not a happy one, "Next Stop, Paris!" And that's where I came in.—END



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