AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

In this issue . . .

The AIRPOWER FUTURE

A 50-page report on vital issues of national security

By

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Setting new jet records for speed and stamina

One after another, Strategic Air Command bomber wings are being equipped with the record-setting Boeing B-47 Stratojet. This fighter-fast, six-jet bomber is already standard equipment at several SAC bases.

The Stratojet's revolutionary design and construction endow it with performance entirely new to aircraft of its dimensions.

A B-47, for example, broke all distance and endurance records for jet aircraft when it completed a 12,000-mile nonstop flight. Refueled in the air three times from a Boeing tanker plane, this Stratojet remained in the air for 24 hours, simulating a strategic mission by dropping a dummy 5-ton bomb at the halfway point.

Another B-47 flew the equivalent of nearly 17 times around the world during an accelerated 1,000-hour service test. Approximately half the missions were flown at night. During one flight, the Stratojet, aided by high-level winds, sustained ground speeds as high as 794 miles an hour, and flew from Chicago to New York in 65 minutes.

This summer, 45 Stratojets of the 306th Medium Bomb Wing made the first nonstop mass jet bomber crossing of the Atlantic. They took off at intervals from Limestone Air Force Base, Maine, landing less than six hours later in England. More recently, a B-47 made the same crossing in 4 hours, 45 minutes, averaging 617 miles an hour.

These records give some measure of the performance potential that's built into the Boeing B-47. It's the result of imaginative engineering, forward-looking research, and expert construction. The B-47, and the larger eight-jet B-52 Stratofortress, are "writing the book" of performance standards for multi-jet aircraft. They are another demonstration of the integrity of Boeing research, design, engineering and production.

Boeing is now building a prototype jet transport, designed to be adaptable for either military or commercial use. The new plane has the benefit of Boeing's unparalleled experience in multi-jet aircraft. It will fly in 1954.

BOEING

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TO BUILD NEW TURBOJETS

In one sense, at least, the last six years of hard work at Pratt & Whitney Aircraft have been only preparatory.

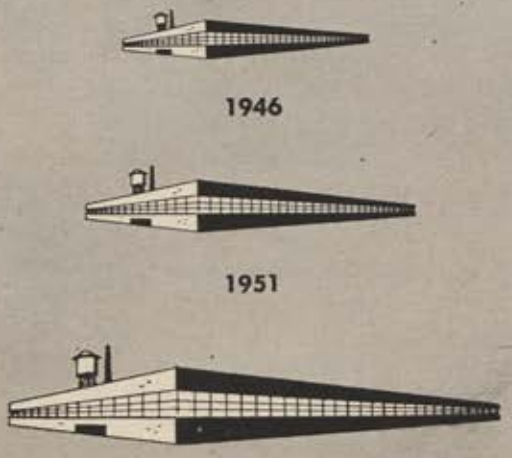
While we have increased output of both jet and piston engines, we have been building and expanding our plant, preparing for one of the most important engine programs in our long manufacturing history.

Today this company-financed plant expansion is almost complete. Production of gas turbine engines in the highest power category is accelerating rapidly to meet the urgent requirements of National Defense. In fact, this year for the first time, Pratt & Whitney Aircraft will produce more engine horsepower in turbojets than in piston engines.

But it has been a big job, building brick and mortar facilities for our growing turbojet program, and tooling up these facilities with the wide variety of equipment needed for jet engine production. At the same time we have had to keep increasing our production of piston engines for the armed forces and for civil aviation.

Beginning in 1947, extensive jet research, development and test structures were built. In 1950 the Navy stand-by plant at Southington was reopened, and the next year, Meriden was leased and put into operation. These two branch plants, plus a number of smaller facilities, totaled more than a million square feet. In 1952 our new North Haven plant was finished and occupied, and substantial additions were made at East Hartford. Pratt & Whitney Aircraft's *manufacturing areas alone* now total more than 4,000,000 square feet.

Yes, it has taken years of hard work to fully expand our plant for the new engine programs. But our new facilities are nearly complete and we are concentrating on the major work ahead—increasing production of our turbojet engines. We are proud of the important part the J-57 and other Pratt & Whitney Aircraft engines are playing in helping to keep America's airpower strong.



THE ABOVE CHART illustrates the huge increase in plant facilities at Pratt & Whitney Aircraft . . . from the immediate postwar period, when our turbojet work began, to the present total of over 6,000,000 square feet. Approximately four-fifths of that total is company-built and company-owned, representing an investment of many millions of dollars in the continuing development of dependable aircraft engines.

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AIR MAIL

Hits and Misses

Gentlemen: Congratulations on your Anniversary issue, and on your article "The Great Debate." You have done much to develop the magazine and to bring facts to your readers.

Those of us who believe that the security of our country lies in a strong offensive and defensive air force should fight with all our strength those forces of special interest that would keep the tools of aviation forever tied to ground armies and surface fleets.

As an Army (Air Corps) paperwork man from 'way back, I must point out a technical error in the article on Nate Twining. The Air Service Personnel Orders of August 27, 1923, reproduced in the article, did not "send" Lt. Twining to the "Air Service." The order merely announced Twining's detail to duty involving regular and frequent aerial flights. This order was required by the Finance Department as a prerequisite to drawing flying pay. The order that sent Twining to the Air Service from the Infantry was issued by The Adjutant General of the Army.

Your article "AF Speedsters At It Once More" also interested me, because I was at Selfridge Field on October 18, 1922, when Billy Mitchell got the credit for setting the first speed record recognized by the NAA. Old-timers will tell you that the credit should have gone to Russell Maughan, who flew the same course in the same airplane and on the same morning just prior to Mitchell's "official" flight. Many say that Maughan's unofficial time was better than that chalked up by Mitchell for the "record."

With best wishes for your continued success.

Harvey H. Hewitt
Falls Church, Va.

Business Flying

Gentlemen: May I extend my congratulations to you and the AFA for your outstanding Anniversary issue. Being a charter member since the summer of 1946, I know you have published many excellent issues, but I believe this one tops them all.

Your Wing Tips section has always interested me for it brings to everyone's attention little known, yet very important facts, statistics, and information. I am particularly interested in your item concerning the number of aircraft operated by business concerns and the number of hours flown. For, after completing my second tour of duty with the USAF as a pilot, I am very anxious to get into this type of flying.

Robert P. Reynolds
Flushing, N. Y.

Whirly Birds

Gentlemen: Congratulations on your Anniversary issue, the best I've read since you began publication. I particularly liked the article "We're Too Busy for Medals," by Flint O. DuPre, because I was in Japan and Korea and personally know something of the work done by those fellows who fly the helicopters. This was the real article, if you don't mind the pun.

I also enjoyed the profile on General Twining by Everett E. Dodd. So my congratulations to all of you on AIR FORCE for a bang-up job.

Bert Ellison

Worthy Salute

Gentlemen: Being one of the older veterans of both civil and military flying, I feel I can honestly say that many people scarcely classify helicopters as flying. I even recall an era when Major Sikorsky was ridiculed for his ideas and invention.

In your September '53 issue, "We're Too Busy for Medals," by Flint O. DuPre, should bring a moment of grateful recognition to the nervy lads who have flown a "gadget" into a practical service to mankind.

The author demonstrates a remarkable talent for amalgamating a solution to the readers' quest for knowledge of

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this particular phase of flying. It was a worthy salute (and a literary medal) for a group of real men, doing a real job of flying.

I salute the writer and magazine which is making their recognition possible.

Tom Bramlett
Fort Worth, Tex.

Non-Com Agrees

Gentlemen: In the article "What's Wrong With the Air Force Non-Com?" (Sept. 1953), I feel that the master sergeant author quite accurately hit the nail right on the head.

No old-timer myself (10½ years), I have still had ample opportunity to observe the wane of the true non-com. All the way down the line he has been sandbagged, not saying that a goodly portion of same was not his own fault. He has only remnants of his former authority; more often he is lumped into the "airmen" category physically as well as on strength reports; hardly a privilege does he have that is not enjoyed by any A/B in his organization. In short, what he now has as a non-com is simply a prettier sleeve that takes on meaning only upon the last day of the month.

The author's suggestions bear merit; it would be fairer to all concerned to return to the specialists ratings system. It would not only tend to eliminate inefficient leadership at the NCO level, but it would also put a premium upon the specialist's mastery of his trade, something that there's too little of under the current T/D system.

Let's have more articles from the author of this one. In this voice from the wilderness there is definitely a flair for getting the point across in colorful, well-chosen phrases. In addition, his nimble mental footwork is quite refreshing.

Technical Sergeant
Bryan AFB, Tex.

Let Leaders Lead

Gentlemen: Your article by the career NCO, "What's Wrong With the Air Force Non-Com?", was the clearest and most accurate piece your magazine has published in months . . . and how timely!

The greatest service you could do the Air Force today would be to run off a few hundred copies of this article and see that they get to the powers-that-be at the Pentagon! If this plan was implemented in the Air Force today, over half of the technically skilled NCOs who are today sweating out the first opportunity for getting out would change their plans in favor of an Air Force career.

I myself am a four-striper, and though I earned them through proficiency in my specialty, I don't kid myself for a moment. As a leader I've got a long way to go. Pay me for my proficiency; I worked hard for it. But for the lovapete —look to a leader for leadership!

I hope a lot of NCOs read this article, and get behind it. It's the solution to one of the Air Force's biggest and most serious problems today.

Staff Sergeant
Mitchel AFB, N. Y.

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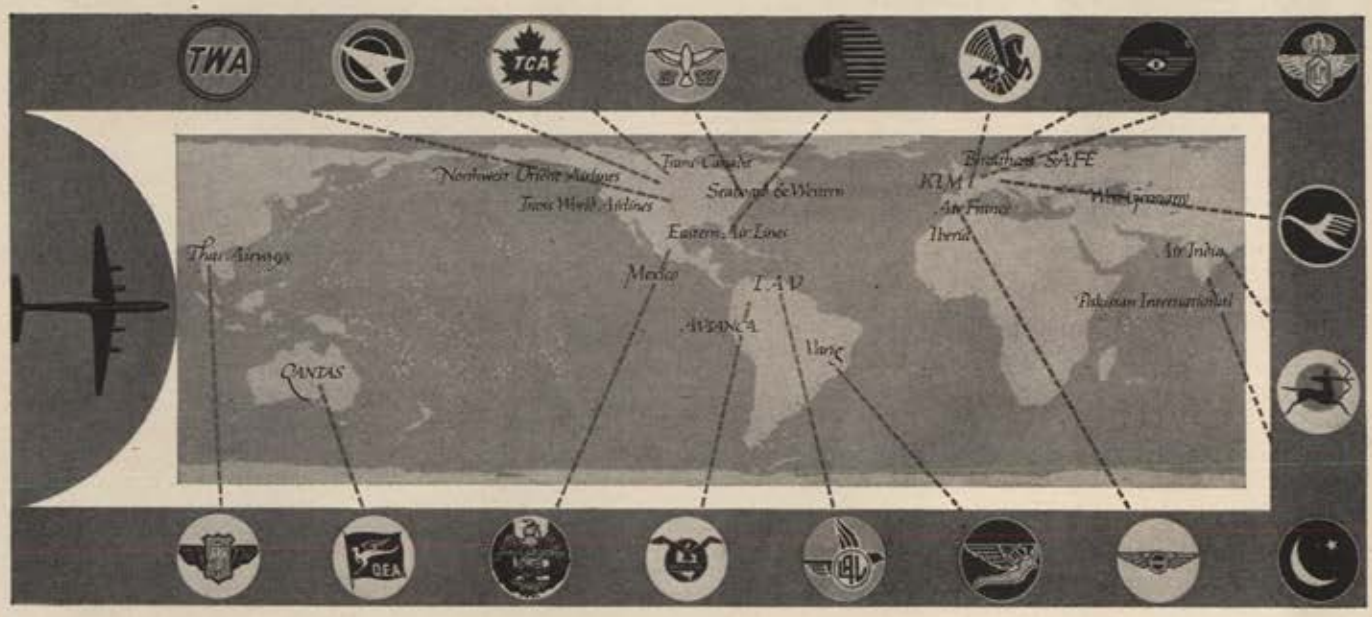

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Lockheed

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Super Constellation sales for the first half of 1953 gave Lockheed a midyear backlog of nearly $150,000,000 in commercial aircraft—a new record. As a result, more Super Constellations are on order and more dollar backlog confirmed than for any other commercial transport of this type in the world.

Lockheed's transport production line is now at a higher peak of activity than at any time in Constellation history, and on the basis of hard cash on the counter the Super Constellation has proved itself the most popular single transport in the world today.

All Orders Are on Schedule

Lockheed production this year will approximate $765,000,000 in commercial and military planes—topping the record for the entire industry for any prewar year. In spite of this tremendous output of 12 different types of aircraft, every single production order is on schedule both in California and at the Marietta, Georgia, plant.

Lockheed News Briefs

A newly formed group of Lockheed engineering scientists will devote full time to the study of aviation trends 10 to 25 years from now.

The Navy's big Lockheed P2V patrol plane will now have a tremendous extra burst of speed for quick getaway in enemy waters. When used for anti-submarine warfare, 2 jet engines will be slung under the wings in quick-detachable pods, giving added thrust to its twin turbo-compound engines. Now experimental, but being considered for wide-scale use on the versatile P2V Neptune.

Military interest is high in the recent operations of turbo-compound Super Constellations as early-warning picket planes for the U. S. Air Force as well as the Navy. U.S.A.F. designation is RC-121C, Navy is WV-2. Each carries 6 tons of latest electronics equipment, accommodates a crew of 31. Gives the U. S. high-flying radar stations that will extend our warning system far beyond the horizon limits of surface radar.

A new Lockheed-developed leak-proof fuel-line coupling is now being installed in Lockheed jet aircraft. Provides greater safety against leakage, is only 20% the weight of former types.

Lockheed engineers have produced a new automatic ejection seat making possible a more fully guided catapult stroke and saving space by compacting the seat and its accessory equipment.

Lockheed has produced and delivered its 25,000th airplane.

PEOPLE IN THE AIR NEWS

Donald W. Douglas, president of Douglas Aircraft, who received an AF award for Exceptional Service, presented at AFA's convention in August by AF Sec'y Talbott. The award is the Air Force's highest civilian honor for non-combat service. The citation said, "This country's leadership in the air has been made possible through the genius of men like Donald Douglas."

Gen. Curtis E. LeMay, commander of the Strategic Air Command, who accepted the 1952 Daedalian Trophy for flying safety from AF C/S Nathan Twining in behalf of the men of SAC. It's the second straight year SAC has won the award made annually since 1937 to the command that logs 100,000 hours and has the lowest accident rate.

Frederick B. Rentschler, board chairman of United Aircraft, and founder of Pratt & Whitney, who received an AF Exceptional Service award at AFA's convention in August from AF Sec'y Talbott. Rentschler, whose P&W J-57s will power Boeing's new B-52, was cited for his foresight and skill, reasons the US has recovered "lost ground in the field of jet propulsion."

Maj. Louis H. Carrington, A/C of the first jet flown non-stop across the Pacific (3,640 miles from Alaska to Japan in an RB-45C last year), who has won 1952's Mackay Trophy for "the year's most meritorious flight." The Tornado was refueled twice by KB-29s in the nearly 10-hour flight. First (1912) winner of the award was Lt. H. H. "Hap" Arnold, wartime AF head.

Col. Walker M. Mahurin, WW II ace (21 Germans, one Jap) and later F-86 pilot in Korea and CO of the 4th F-I Group before being downed by Red ground fire in May 1952, who was among the last Americans repatriated in Korea. Of his capture, Mahuhin said he didn't know "human beings could be so inhuman to other humans."

James H. (Dutch) Kindelberger, board chairman of North American Aviation, who received one of the three Exceptional Service awards given by the AF at AFA's convention in August. AF Sec'y Harold E. Talbott, who made the presentation, said Kindelberger "has no peer" as a producer of fighters and said that Kindelberger's name was "synonymous with airpower."

Capt. Austin J. King, San Rafael, Calif., whose quick thinking saved the lives of his 11 passengers and crewmen on a recent C-46 flight in Korea. Nearing Seoul, King discovered his plane's hydraulic fluid had leaked out. From cargo that included quantities of salad oil, he replaced the lost fluid, lowered the gear, and landed the damaged aircraft safely.

Maj. William T. Whisner, Jr., ace in two wars (18½ planes in WW II and 5½ MIGs in Korea), who won this year's Bendix Trophy. He outflew nine other F-86 pilots in the 1,900-mile race from Edwards AFB, Calif., to Dayton, averaging 603.547 mph. His speed, and that of the other contestants, topped the previous record set in 1951 by Col. Keith Compton.

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Shooting the Breeze

MANY OF you who were here during AFA's Convention in Washington in August are probably concerned with this issue's omissions—omissions we necessarily had to make. We couldn't, or didn't, have room to mention more than casually awards to AFA members and units, the Sunrise Service at Arlington Cemetery, the Fashion Show, and . . . well, to be frank, it was one of those meetings where if you mention what you forgot to mention, you'd still be forgetting to mention something.

We'll pick up the loose ends next month as we get back to the familiar format that includes our full array of departments. There'll also be a piece by the master sergeant who wrote "What's Wrong with the AF Non-Com?" And the author of September's "Too Busy for Medals" will be on hand with an F-94 story. We'll also have a fifty-year resume of commercial transport aviation.

One other thing: if you were here for the convention and want any of the pictures snapped by photographer "Tex" Glazier, for $1 each you can order 8 x 10 glossy prints. Just describe the setting and the occasion, and address your request to Ernest B. Glazier, 1328 K St., SE, Washington 3, D.C.—END

CREDITS

Page 7—photo of Mr. Rentschler—John Haley; page 13 and Symposium art—Arlo Greer; Convention pictures—"Tex" Glazier.

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

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FEATURES

DEPARTMENTS

MEMBERSHIP IN AFA

AIR FORCE Magazine is mailed monthly to all members of the Air Force Association. There are several ways you can become a member. If you were in the Air Force or its predecessor services, you're eligible. The $5 yearly dues include the magazine. Or if now on active duty, you can be a Service Member. Those interested in airpower can become Associate Members for $5 per year. The cost for CAP and AF-ROTC cadets is $3 per year. Details of membership in AFA on page 92.

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AIRPOWER IN THE NEWS — BY JAKE CULPEPPER

CUTBACKS — Reduction-in-force notices resulting from revised AF strength goals have dumped serious morale problem in the AF's lap. Officials are anxious for the 16,500 AF officers receiving RIFs to know that basic cause for such action was a matter of force level, not of individual incompetence. . . . Annual output of AF-ROTC graduates is slated to level off from the 19,000 planned since 1952 to 8,000 by 1954 and will remain at that figure for several years. . . . As another move toward stricter economy, AF bands in the future will rove from base to base. . . . Airmen discharged under the new early release policy (three years service by last Sept. 15 and surplus to local base needs) will be barred from re-enlisting within ninety days. . . . By December 31 of this year, AMC will drop the six Air Procurement District headquarters located in New York, Chicago, Boston, Detroit, Fort Worth, and Los Angeles. These offices handle 14,000 AF contracts with industry. The Middletown AMA headquarters, formerly a separate outfit, will be consolidated with the Olmsted base and Middletown depot organization at Olmsted AFB, Pa. Three Regional offices at Glendale, Calif., South Bend, Ind., and Minneapolis will also get the axe.

POW — US fliers returned during "Operation Big Switch" accused their Communist captors of subjecting them to mental and physical torture in forcing "confessions" of germ warfare (see AIR FORCE, Nov. 1952). Last man repatriated under the prisoner exchange was AF Capt. Theodore R. Harris of Van Nuys, Calif. There were 217 AF men among the 3,597 US repatriates in "Big Switch." Among AF men freed by the Communists were WW II ace, Col. Walker M. Mahurin, Fort Wayne, Ind., and Col. Andrew J. Evans, Jr., of Montgomery, Ala.

RECORDS — New records set by AF at the 1953 National Air Show in Dayton: Brig. Gen. J. Stanley Holtoner, commander of Edwards AFB, Calif., took the Thompson Trophy after flying his F-86D Sabrejet around the eight-pylon 100-kilometer closed course at 690.118 mph; Capt. Harold E. Collins of Port Arthur, Tex., pushed his Sabrejet through the tight 15-kilometer course, averaging 707.188 mph; and Capt. Russell M. Dobyns of Norton, Va., raced his Piasecki YH-21 helicopter to 146.736 mph on a three-kilometer course and also climbed to 26,300 feet, nearly five miles, in one hour twenty minutes. Bendix Trophy was won by Maj. William T. Whisner, Jr., 29-year-old ace of two wars, who flew to Dayton from California in a F-86F Sabrejet at an average speed of 603.547 mph. Capt. Forrest Wilson, South Haven, Mich., from Bergstrom AFB, Tex., won the Allison Trophy race in a Republic F-84G with a speed average of 537.802 mph, and elapsed time twelve minutes, 17.2 seconds for the 110.13-mile simulated fighter scramble from Indianapolis.

STAFF — New assignments: Maj. Gen. William E. Hall, Special Assistant for Reserve Forces to General Twining; Maj. Gen. Robert L. Copsey, director of the Joint Air Transportation Board which operates under direction of Chief of Staff, USAF; Maj. Gen. Roger J. Browne, vice commander of ConAC; Brig. Gen. Joe W. Kelly, director of AF's Office of Legislative Liaison; and Maj. Gen. Robert K. Taylor, commander, Atlantic Div., MATS. . . . New stars (temporary): Maj. Generals Fay R. Upthegrove, Reuben C. Hood, Jr., and Gordon A. Blake; Brig. Generals Oliver K. Niess, William L. Lee, William L. Fagg, Charles B. Dougher, Lewis L. Mundell, Charles B. Westover, William G. Hipps, and John S. Hardy. . . . Recent retirements: Maj. Gen. John DeF. Barker and Brig. Gen. Early E. W. Duncan.

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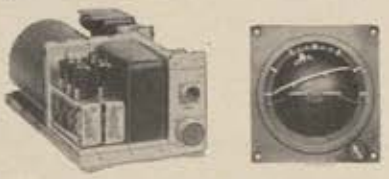

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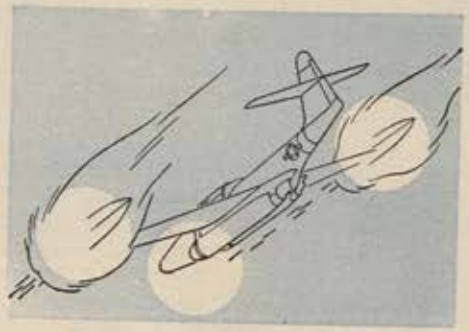

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Rocket pods and nose for the U.S. Air Force's Northrop Scorpion F-89D, pictured here, are products of Rheem.

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RHEEM Manufacturing Company . . . Aircraft Division, Downey, California

Ray Stits, a California aircraft inspector, recently went aloft in his 510-pound homemade midget plane. The wing span is 15 feet shorter than a Piper Cub's, and the midget was airborne in 75 feet.

° ° °

Last year aerial crop control accidents killed 49 people. Half the accidents involved collisions with wires, poles, trees, and fence posts.

° ° °

Ski-equipped lightplanes of the Fish and Wildlife Service went on an airborne wolf hunt last winter to help protect the

dwindling herds of caribou that make good eating in Alaska. A total of 259 wolves were killed.

° ° °

The helicopter has begun carrying inter-city passengers in Europe. Sabena Belgian Airlines has reached an agreement with the Netherlands government to carry passengers between Brussels, Antwerp, and Rotterdam.

° ° °

The first executive-type helicopter, a seven-passenger Sikorsky S-55, is being operated by the Rockwell Manufacturing Company of Pittsburgh. It's used to transport company personnel between the main office and seven outlying plants within a 200-mile radius, where poor rail and air service meant hundreds of lost hours for traveling staff members.

° ° °

Last year was the first time that American flag carriers on the North Atlantic run have carried less than half of all transocean air passengers. In 1952 nine foreign airlines accounted for fifty-two percent of the North Atlantic travel.

° ° °

For three years, record catches of whales have been made possible through the good graces of the helicopter. Taking off from the fantail of a Norwegian whaling ship in the Antarctic, a

Hiller helicopter roams the seas for hours at a time, locating schools of whales and advising the whaling ship by radio.

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American and Eastern Airlines together operate 136 trips a day between Washington, D. C., and New York.

° ° °

In California Larry Hunt, who runs the largest Cessna outlet, commutes to work daily by plane 490 miles round trip.

° ° °

Diesel airplanes may soon be coming off British production lines to provide medium speed flights on 14- to 16-hour hops without refueling.

By Wilfred Owen

LOADS AND UNLOADS ITSELF... NO SPECIAL EQUIPMENT NEEDED!

At far-flung bases from Alaska, Korea, and French Indo-China, Fairchild C-119's are delivering cargoes that no other plane could unload in such tight spots. The "Flying Boxcar" was built to land on fields too rough for other planes —at points where no freight-handling equipment exists. Designed specifically as a *bulk cargo airplane*, the C-119's twin boom provides ample clearance for trucks to back up to the wide-open doors and for vehicles to "roll out" on their own power, without use of cumbersome equipment and with a minimum of manpower and time. Here is a combat proven airplane . . . that loads and unloads itself . . . no special equipment needed!

EXCLUSIVE FEATURES FOR ADVANCE BASE OPERATIONS:

Increased payload • Better bulk Cargo Clearance and Distribution • Shorter Take-offs and Landings • Rough Field Landing Gear • Crew Bail-Out Chute • Provision for External Fuel

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FAIRCHILD
Aircraft Division
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Engine Division, Farmingdale, L. I., N. Y.

GETTING TOGETHER ON AIRPOWER

THIS ISSUE of AIR FORCE Magazine is a radical departure from our traditional format. We have always looked upon Air Force Association conventions as important events on the airpower calendar and have treated them, editorially, as just that. This year we are going a step further and are devoting almost the entire contents of this October issue to convention events, concentrating on the many important and timely utterances on airpower that were made there by top people in aviation. The bulk of the issue is devoted to the Airpower Symposium, in which industry, government, labor, and the military all had their say on the most pressing problem facing the nation—where does our airpower go from here? Other highlights include the annual report of the Secretary of the Air Force, delivered by Mr. Talbott at the Airpower Banquet, Gill Robb Wilson's stirring keynote address, the talk by Deputy Secretary of Defense Kyes to the Symposium luncheon, General Vandenberg's moving remarks upon receipt of the H. H. Arnold Award as "Aviation's Man of the Year," and many others. We begin the issue on the next page with what we believe is the soundest, most forward-looking Statement of Policy that AFA has ever adopted.—The Editors.

AFA's Seventh Annual Convention and Reunion in Washington, D. C., was easily the outstanding event on aviation's calendar during this Fiftieth Year of Powered Flight

STATEMENT OF POLICY

Adopted by the Air Force Association at its seventh annual Convention, in Washington, D. C., August 22, 1953

IN THIS golden anniversary year of powered flight the Air Force Association salutes the thousands of men and women who have been responsible for the birth and growth of the Air Age. Special tribute is reserved for those who have given their lives in the struggle to conquer the skies.

Our aviation heritage is not only a new method of transportation but a new dimension of living; not only new vistas of commerce but a new stimulus to global thinking; not only a new courier of destruction but a new instrument for preventing war and insuring peace.

To prove worthy of aviation's heritage, it is necessary to recognize that the Air Age is only beginning. Travel in outer space will be the inevitable development of the first flight at Kitty Hawk. Today, as in the past, the future of aviation holds promises and opportunities which will continually challenge our vision, our wisdom, and our courage, and our willingness to accept change in established concepts and traditions.

Aviation holds many challenges for America's economic and industrial life:

- Large-scale private flying has yet to be made practicable and financially feasible.
- The absence of a far-reaching airport and heliport program is retarding aviation development and industrial progress.
- Air transportation is one of the basic elements of national airpower. Yet our airlift capacity, both civilian and military, is entirely dependent on piston-engine aircraft and a major fraction of the air fleet consists of aircraft designed before World War II.
- The aerial transport of cargo, although capable of revolutionizing our commerce, is still an infant industry.
- Aviation education is the backward child of our school curricula.
- We are seriously lacking in numbers of scientists and technicians required by the revolution in aeronautical technology.

To the elimination of these barriers to Air Age development the Air Force Association pledges its continued efforts.

Progress in private and commercial aviation will enrich American life and contribute to a continued rise in our standard of living *provided* our government and institutions remain free and the nation secure.

Unfortunately, our survival as a free nation is still an open question. The Soviets have startled—and sobered—the world with their first hydrogen bomb. We know they have the means for delivering this weapon on American cities. Thus, for the first time in history this country is vulnerable to devastating attack. Such attack would come primarily by air, and it could mean our destruction.

We now face weapons of such unbelievable power that as we pay tribute to men who made the first flight, we must also express concern that man might now be preparing to make his last flight. The world now stands on the threshold of an air-atomic era of great danger, in which the following conditions will obtain:

- Soviet Russia will soon possess the air-atomic capability to bring utter devastation and unspeakable horror to a major segment of our civilization.
- As this Soviet capability grows, it may one day become sufficient—if undeterred—to strike a decisively catastrophic surprise attack against our cities and against the retaliatory strength of our Strategic Air Command. Thus, we cannot permit our military resources, especially the deterrent power of the Strategic Air Command, to be neutralized. If we do, the massive conventional land armies and tactical air forces of the Soviets will be in a position to shift the world balance of power in favor of aggressive Communism.
- Soviet aspirations for world domination, when fortified with a sufficiency of air-atomic strength, and when hidden behind an Iron Curtain of secrecy and the heavy smoke screen of repeated "peace" offensives, constitute an intolerable threat to the security and stability of the entire Free World.
- The decisive phase of any future world war would be over in very few months, perhaps weeks. This means that, as the air-atomic era dawns, we must shift emphasis in our defense posture from reliance on our mobilization base to dependence upon adequate *forces-in-being*.
- As the United States and Soviet Russia face each other across vast air spaces, sweeping revolutions in science will

continually change the aircraft and missiles and other weapons of air warfare. These mutations in the "science of destruction" will place an ever-increasing premium upon the *qualitative* aspects of our air strength.

The air-atomic era heralds for all mankind an age of great peril. This age challenges statesmen, soldiers, scientists, industrialists, economists, *and citizens* as never before in history. It places upon each person in every group the heavy responsibility of making the nation's interest the paramount concern of our time. No one person, no one group can see clearly all of the issues which will try the soul of the nation—and the answers which must emerge—as man moves swiftly toward the greatest test of his stay on earth. However, all persons, and all organizations, including the Air Force Association, have a grave responsibility—to help clarify the issues and to help chart a reasonable course of action.

In accepting this responsibility, the Air Force Association reaffirms its status as a group of civilians who place the national interest above personal, political, and commercial interests; whose emotional roots are deep in the Air Force, but who reserve the right to disagree with the policies of all individuals and organizations, including the Air Force. It is from this independent position that the Air Force Association addresses itself to the problems at hand.

The Air Force Association believes that the unprecedented situation which faces the nation today demands an objective reappraisal of all aspects of national life which have a bearing on our survival. This "new look" should embrace national personnel policies, national policy, national strategy, and the national economy.

NATIONAL PERSONNEL POLICIES

Competent people are the basic requisite of our defense structure.

The Air Force Association calls on the Administration, the Congress, and the public to reaffirm their basic faith in the integrity, professional competence, and dedication of the professional soldier. Unjustified criticism, arbitrary changes in economic conditions of service, and exaggerated charges of waste and inefficiency have undermined seriously the morale of the entire uniformed corps of officers and men, at a time when the morale, prestige, and position of the military should be at its best. The Air Force Association calls on the President to appoint a commission to study this situation. The study must be objective and it must be detailed. It should pertain to civilians of the defense establishment as well as military personnel. It must place emphasis on weeding out the incompetents, and must establish personnel standards of the highest order.

The Civil Service Commission has long stopped keeping pace with the times in its handling of professional, scientific, and technical personnel in government service. The outstanding success of the Atomic Energy Commission in attracting competent personnel is largely due to its exemption from the Classification Act of 1923 and the Civil Service Acts. Air Force Association urges that serious study be given to extending similar exemptions to the military services.

There is cause for serious concern that former officers or civilian employees of any one military service might be in a position to dominate continuously certain key positions in the Department of Defense structure. The Air Force Association does not question the motives of the individuals involved, and gladly acknowledges their dedication and applauds their courage. However, it is a regrettable fact that many Department of Defense decisions are made in an atmosphere of undue attachment to one service, and frequently in profound ignorance of the problems of other services. Air Force Association urges the Secretary of Defense to conduct an impartial, objective analysis of his staff, to insure that together they have a well-rounded familiarity with all aspects of all three services.

The Air Force Association calls for the repeal of those provisions of the National Security Act of 1947 which prohibit transfer of officers between the three military services. Rather, the Secretary of Defense should be empowered to regulate such transfers in a manner which will insure optimum integration of the defense establishment and most effective utilization of its personnel resources.

The Air Force Association believes that the military facts of life have made obsolete many of our present concepts for the organization and employment of reserve forces. The nation needs a new concept of reserve readiness. It must have the means to augment the strength of the regular establishment in hours rather than in months.

The Air Defense of the North American continent for years to come, despite technological advances and automatic weapons, will constitute a heavy drain on the nation's manpower. This is especially true now that our air defense system must face the realities imposed by the Soviet possession of the hydrogen bomb. The continental air defense system will require a large variety of special skills—from conventional logistic and administrative duties to skills involved in the application of aircraft, electronic equipment, and guided missiles to the system.

The cost of manning this complex and extensive air defense system with regular Air Force personnel at a level of adequate readiness is almost prohibitive. Yet, our national survival is at stake. The reserve components can economically provide skilled technicians now available to the regular establishment only at great cost and thus greatly increase the readiness potential and endurance of the Air Defense Command. The Air Force Association urges an immediate study of this proposal.

NATIONAL FOREIGN POLICY

As the nation girds itself in face of the growing Soviet threat, the Air Force Association calls on the President and the Congress to consider with bold vision the employment of airpower as the greatest deterrent to war and boon to peace the world has ever known.

The Air Force Association urges that the United States, in concert with the United Nations, seek a worldwide declaration of Freedom of the Air Spaces. Such a declaration could be coupled with the establishment of neutral airports of entry all over the world. After landing and inspection by a United Nations' commission at one of these fields, any airplane would then be cleared to fly over any nation to the next United Nations-controlled neutral airfield. As freedom of the seas once led rapidly to the prosperous maturity of ocean commerce, so the great ships of the Air Age would lead to rapid growth in air commerce, bringing the world closer together in a community of common spiritual values and in a great exchange of ideas, customs, and material goods.

Simultaneously, the Air Force Association calls on national policy makers, in concert with the United Nations, if possible, to recognize realistically that only the threat of immediate decisive military defeat can dissuade the Soviet tyranny from prodding unwitting and unwilling satellites into bloody, expensive local wars. Accordingly, the Air Force Association urges upon the Administration a clearly announced national policy to unleash the full force of our air-atomic power against *armed forces of aggression* in any future Korean-type Communist adventures.

Finally, the Air Force Association restates the traditional American belief that democracy can survive and flourish only if its citizens are well-informed. Sound national policy

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finds its roots in an informed citizenry which understands the basic issues of the moment. We call on the government candidly to inform the nation of the perils we now face.

NATIONAL STRATEGY

The so-called "fresh look" at our military effectiveness, promised by the Administration, is long overdue. This fresh look is to come, according to published reports, from the new Joint Chiefs of Staff. The Air Force Association does not doubt the military capabilities of the new Joint Chiefs, or their sincerity, or their patriotism. But the membership of the Association does know, from first-hand experience, how difficult it is for officers of the Army, the Navy, and the Air Force to sit down together and make objective recommendations without extreme service viewpoints creeping in. We sorely need the best advice of the Joint Chiefs of Staff—advice characterized by high dedication to national rather than service interests.

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.

NATIONAL ECONOMY

The challenge of Communism has placed unprecedented strains upon the American economy, and we face the prospect of maintaining armed forces-in-being of great magnitude and expense for an indefinite period of time.

The nation has felt the impact of stop-and-go preparedness. In 1950 the Korean episode greatly accelerated the United States rearmament program. Consumer prices rose almost ten percent during the six-months buying spree following Korea, creating hardships for many fixed-income groups. Almost simultaneously, the inefficiencies of hastily conceived military programs and the wastes inherent in their rapid implementation began to become apparent. The resulting pressures to reduce the cost of the defense establishment have become enormous.

The new Administration has strongly indicated that the costs of previous airpower programs have been prodigal. In this context, our military planners are being called upon to take the initiative in reducing the cost of defense to reasonable proportions which, in the opinion of the government, can be successfully borne without dangerous economic strains.

First of all, accurate and reliable intelligence on enemy capabilities and intentions remains both the fundamental prerequisite and the most glaring deficiency in the sound establishment of our military force-levels. Beyond this, technological changes in weapons and aircraft are the principal keys to a substantial reduction in the cost of producing, maintaining, and operating the required forces—consisting largely of airpower—for long-term security in the air-atomic age.

It is incumbent upon the Department of Defense to present to the country an airpower program which guarantees national security, takes maximum advantage of technological changes, and meets the required spartan economic standards. The Department of Defense also faces a similar challenge and responsibility to balance realistically and objectively the cost versus effectiveness of the programmed forces of the Army and Navy in the era of hydrogen bombs.

As a group of taxpayers the Air Force Association is vitally interested in economy in government. As a group of veterans it knows that haste in military preparedness inevitably leads to waste. The Air Force Association encourages every constructive effort to reduce such waste and pledges its vigorous assistance in this undertaking. At the same time, it must be acknowledged that austerity cannot always be achieved overnight, or through arbitrary ceilings on expenditures. Experience tells us that the meat axe approach to military waste usually results in a sacrifice of vital projects and a continuation of unnecessary programs.

Further, the Air Force Association is concerned that the emphasis on economy tends to compromise a true appraisal of the military requirement. The Joint Chiefs of Staff, for example, should not, in the opinion of the Air Force Association, be directed to evaluate this requirement within the bounds of dollar ceilings. Our military leaders should not be called upon to serve as economists; our civilian leaders of the military should not be called upon to act as strategists. The military conclusion should be based on a forthright and honest appraisal of requirements. It then becomes the duty of the civilian leaders to evaluate the requirements in terms of economic policy and other factors, and determine the course the nation shall follow.

The defense budget for the 1954 fiscal year does not indicate that the fiscal policy approach to our security has resulted in an allocation of tax money on the basis of the military requirement.

Considering the threat and the implications of continued Communist aggression in this air-atomic age, the military requirement for the nation is clear in at least two respects: the most important elements for national security, and the security of the Free World, are an adequate air defense system and the ability to retaliate against an aggressor with swiftness and with devastating power. The Air Force Association believes that unless these two priority requirements are met, any defense program established will be wasteful in dollars, and perhaps in human life. This is the great challenge the nation faces in this fiftieth year of powered flight, and this first year of the Soviet hydrogen bomb.

Keynoter Wilson drives point home at AFA's Convention.

Speak Out for Airpower

'When you divide our military dollars to preserve the balance of numbers, you are gambling with this country's destiny'

Gill Robb Wilson

BACK IN the days when we bombed the Austrians, I felt that as a youngster we had demonstrated airpower and its significance to America and that nine-tenths of the battle of aviation was over. Then as we moved along through various Congresses and eventually got an Air Force with some independence of thought, my convictions grew that we had vindicated the truth and that nine-tenths of the battle was over.

Then came World War II—the operations over Europe, the island-hopping in the Pacific, the atom bomb—and I wrote time after time that the evidence is now written large and clear—never again will we have to vindicate the character and the potential of airpower; the people understand, the leadership understands. The battle of airpower is won —I thought.

But, you have to live a long time before you learn the abiding truth that the good fathers could have told us had we asked them, and that is that the battle for truth is never won. It is a ceaseless battle. There are no points at which those who pursue the dispassionate truth can sit back and say, "From here on the self-apparency of this truth needs no further justification."

So we stand here in the twilight of a year in which airpower as a fulcrum of our national destiny has reached a new low in comparison to the demonstration of its validity and the effulgence of its capability. And we find ourselves in no position to rest on our oars, glorying only in our history and content with the fact that fifty years of aviation have proven indisputably its place in the affairs of men and of nations.

Probably in the months that lie ahead there is a more important service to be done by those who are members of the Air Force Association than all the aggregate experience of the years that lie behind. Because the nearer you come to the delicate applications, the more you tread on considerations that are extraneous to airpower itself, the more critical becomes the battle.

Not long ago the nation was rocked and the press found new headlines in the aggressive announcement of the potential enemy that it too had reached a point of efficiency in the explosion and in the delivery of the hydrogen bomb. This, on the eve of budgetary and roles and missions

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considerations that stripped away from airpower its significance and importance in the mind of the American people on the pure basis of national economy.

I believe that the Air Force Association has reached a point where it should cry out to the people of this country, put ammunition in the hands of those who form the public opinion of this country, for a re-evaluation of airpower, for a re-estimation of the forces that guarantee the future of the United States of America.

I believe that this organization should reassert the fundamental doctrine of airpower as it has never been reasserted since it was enacted on the battlefields of Europe and of Asia. I believe that the times ahead may be far more crucial than the days in which Tojo made his declaration and struck at Pearl Harbor or Hitler moved into Silesia and plunged Europe into that war.

I believe the evaluation of these doctrines is more vital to the future of my kids than when I sent those kids out to fight the battles of this country on the fields of the world. If I have one thing to leave with you, it would be a reassertion of the fundamental doctrine of American airpower.

I do not care where the President of the United States reaches for his advice. I believe that the American people currently demand a re-evaluation of this whole situation, not merely the equality of anybody on earth.

I believe the American people want the strongest airpower, the most airpower, that exists on the face of the earth today because I believe the salvation of the United States is thereby entailed.

I call upon this Association to assert with no uncertain voice those doctrines that its members have proved on the battlefield, those principles and philosophies that have been enunciated by the great leaders of the past such as our own Tooey Spaatz and Hap Arnold.

We, as an Association, have a mighty voice on this subject. If we do not speak up now, who shall? As it says in the Old Testament, if the leaders do not lead, if the trumpet does not sound, who shall follow? If this Association, steeped in the philosophy and the understanding of this thing, does not cry out now, from whence shall come the voice that shall move these, our people; this, our Administration; and these, our leaders?

If you are a student of military history, you understand thoroughly that the international story is never written on the battlefields. It is written in the thinking that lies behind the weapons and the strategy and the policy before the battlefield is ever reached. Hitler and Japan were licked before they started because they did not understand this. World War II was made possible because the strategists and the political leaders of America did not understand the potential of airpower. Russia was permitted to come into this whole picture because our political leadership did not understand the potential of airpower.

During World War II, I wrote from the islands, fearing that the American people would be weaned into trusting the idea of a secret weapon—the atomic bomb. There never has been a secret weapon that saved any nation or won any war. But they were coaxed into it. We were told that we are five years ahead, we are seven years ahead, we are two years ahead. So we cut back the fundamental engineering.

We lost three years in research and development and when our jets went out to face the enemy in Korea, how astonished we were to run into the MIG. We didn't know it existed, and if its advantages had been pressed home, we would have been swept immediately from the battlefield.

You are gambling with the destiny of this nation when you divide our military dollars between various forms of military power in order to preserve mere balance of numbers, mere balance in political influence, mere balance of expenditures across the various areas and sections of this nation. You are responsible now for rising up and demanding that the percentages be revised and that airpower be set in proper perspective against the missions and roles that are necessary to save this nation.

I have watched you go from the IP into your target time after time because you were going to hit it or die in the attempt. I have watched you when your own welfare and your own percentage did not count. Nothing counted but the job.

Now I call for a reassertion of your vision and the guts and the energy and the intellectual honesty that is in every one of you, whether you were an airman or whether you were a full general. I believe the Air Force Association can save the world, and I believe you have the inherent capacity to demonstrate that fact. So I talk to you bluntly and not as an orator but as a mere squadron commander who holds together fifty guys and month after month teaches because nothing is unimportant that happens at the squadron level.

If you give the same interest, the same devotion, that a Communist cell gives to its job, you would never hear of the pinkos, and the Reds and all this international threat would collapse of its own weight.

This question is as broad as your interest. There are hungry kids waiting out yonder in every community in America for somebody to pull them together, talk to them, show them the way. They are better kids than we were, they have more on the ball, more intelligence, more perspective, more understanding. Millions of them are going unsparked today because we theorize about what happens at other levels and don't get down into the situation of American survival in our own communities.

Start with the kids and then on up through the civic life. There isn't a squadron of the Air Force Association in the United States that couldn't turn its city upside down if it devoted the same energy to it that it did to raiding Munich.

So as an old guy who has put in a lifetime in this business, I challenge you fellows who have more on the ball than we ever had in our day to step up to your responsibility with the same fidelity that you used when you said, "Let's go," and shoved the throttle forward. What is one of the joys of my life today, one of the joys of Spaatz? Every time we get together, God, we think you are wonderful. We never get together, we old fellows, but what we sit around and talk about you, how happy we are that the job can be turned over to such as you.

I make no apology when I stand up here and present the blunt facts to you. This country needs you. There has to be a re-evaluation. We don't have any adversaries; we need not pay any attention to adversaries in aviation. We have the truth. If we talk about our own subject, if we enunciate our own doctrine, if we plow our own furrow, we don't need to care two hoots what any other loyalties amount to, what they say, or what they do, or what they think.

Airpower is great because it is the truth, and the truth shall make us free.—END

(Condensed from keynote speech at AFA convention.)

At the Air-power Banquet.

SITUATION REPORT

'On the efficiency of our magnificent Air Force rests the peace of the world'

The Hon. Harold E. Talbott

IT IS a pleasure to appear before this wonderful Association. Let me say I am proud to serve the Air Force—proud to be a member of the civilian team of the Defense Department—and I take pleasure in the fact that the Deputy Secretary of Defense—my friend Roger Kyes—is here with us.

On behalf of the Air Force, I want to join with our President in expressing our appreciation for your help in keeping the American people alert to the threat that faces our nation.

I have been on the job as Secretary of the Air Force for seven months. Although I learned to fly some thirty years ago and have actively engaged in the aircraft industry and airline development since, I have found that there is a tremendous amount to be learned in this job. I regard this as a learning period. I have traveled some 70,000 miles to see for myself first-hand the many problems that confront the Air Force. I can tell you that the United States Air Force is a magnificent organization. I am proud to be its civilian head and am determined to do everything in my power to maintain it as the world's greatest Air Force. Our basic responsibility is to increase its strength and effectiveness and to do this with common-sense economy.

Thursday morning a group of us returned to Washington after a tour of our forward bases facing the Iron Curtain from North Africa to Iceland. On previous trips I traveled along the other rim of the curtain, from Okinawa and Korea through Alaska to our great, new base at Thule in Northern Greenland.

How We Look to the Reds

On all these trips I have tried to stand for a moment with my back to the Iron Curtain and to look at our country. I have tried to see how the United States looks to the Red Air Force—how well it is defended and whether or not it is vulnerable.

I must tell you, because I believe it my duty to do so, that from these points of vantage our country does appear vulnerable. Modern airpower, combining the tremendous speeds brought about by the jet engine and the enormous power of hydrogen and atomic explosives, overleaps so easily all of the traditional barriers that have sheltered us through our history. If a nation has enough airpower, the destruction it can inflict upon another nation is beyond our imagination.

Let me review with you a few of the facts that stand out as we travel along the Iron Curtain. We are sure that Russia has developed the atomic bomb and you are all familiar with the Russian announcement of a successful hydrogen explosion. The Red Air Force contains better than 20,000 active aircraft. They have medium bombers copied from our B-29s capable of flying one-way missions to any point in the United States. We have evidence that they are today developing and probably producing a heavy turbo-prop bomber comparable to our B-36, both in range and performance. In Europe they have jet light bombers capable of attacking any point in Western Europe from their bases just behind the Iron Curtain. Here also they have thousands of their MIG-15 fighters ready to fight for air superiority and to harass our NATO ground troops. This powerful air force is capable of an immediate atomic attack on any point in Europe and any point in the US. We must, therefore, retain a defense against this threat—a defense that includes a retaliatory attack so vast

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FROM THE PRESIDENT...

The following letter from the President of the United States, Dwight D. Eisenhower, to AFA's President Arthur F. Kelly was read by AF Secretary Talbott.

Dear Mr. Kelly:

I am delighted to offer congratulations once again to the Air Force Association and all its members on the occasion of the Seventh National Convention of your organization. I regret that I am unable to be with you for this important event.

I recall your first convention in Columbus, Ohio, in 1947 when you were good enough to invite me to speak. I told you then that in the Air Force Association the nation has a "wealth of military and civilian talent, that will devote itself to our own defense needs even as it always keeps in view the potential usefulness of the airplane in bringing this world closer together in purpose as well as in time."

I also told you in Columbus that "no real security rests in a second best Air Force." Those sentiments are as true today as they were in 1947; in fact, they have become even more pertinent.

During the first seven years of its existence the Air Force Association has played a vital role in keeping the American people alert to the threat our nation faces from militant aggression. If your Association continues to fulfill its mission as well in the years to come as it has in the past, you will bring to the nation a great and needed service.

Sincerely,
/s/ Dwight D. Eisenhower

and so ready that no nation would dare attack us. This capability, along with the defense of the US, must be regarded as the basic responsibility of the US Air Force.

I now want to tell you what steps we are taking to build up the airpower necessary to give this country security—a security which is so vital to our future. This build-up of Air Force combat units must and will be accomplished with every economy of manpower and materiel we can make without impairing our combat efficiency.

Last year the Air Force had some eighty-five wings, containing sufficient men, aircraft, and equipment to be considered operational. This year the Air Force has ninety-eight wings. During the year the Air Defense Command has continued to expand our aerial defenses. This program is not moving as rapidly as we would like to have it, but it is improving. A growing number of our air defense fighter squadrons are now equipped with all-weather jet fighters. Our air warning radar net has been improved, and its gaps are being closed. The Ground Observer Corps has increased its strength and is doing a most important job on a 24-hour basis guarding the approaches to our country against low-flying aircraft.

SAC Our Principal Guardian

The Strategic Air Command continues to be the principal guardian against World War III. SAC has increased the number of both its heavy B-36 wings and its medium wings. As a most important development, the Strategic Air Command is re-equipping its B-29 medium bomber wings with our six-jet bomber—the B-47. General LeMay, of Strategic Air Command, describes the B-47 as a magnificent fighting aircraft.

The Tactical Air Command has just about held its own. Its units are being improved by the introduction of North American's fine new fighter-bomber, the F-86F, and it will soon receive Republic's new fighter-bomber, the F-84F. The Tactical Air Command has supported the war in Korea and substantially increased the air strength of NATO forces. I was most impressed by this build-up during my visit to Europe these last two weeks.

The development of new and better aircraft for our Air Force has shown marked improvement during the year. Boeing's new heavy jet bomber, the B-52, has surpassed expectations in flights covering more than 700 hours of constant testing. The advance model of North American's new jet fighter, the F-100, has exceeded the speed of sound in level flights during its initial tests. This is the first aircraft in history to accomplish this feat.

The Advantage of Quality

The constant change, the ever-continuing improvement of our aircraft and equipment may appear to be needless and wasteful. It would certainly be cheaper to freeze our models and to make no production-line changes, but we would throw away our greatest advantage—the advantage of quality. It is in the quality field, that we have maintained our superiority over the Communist Air Force. Our scientists and engineers are continuously striving to improve our combat equipment. Our Air Force is also moving towards the production of unmanned missiles. We have some models of guided missiles in production. They are quite expensive to produce and to operate. To insure the minimum expenditure of our Air Force funds, we will go into quantity production of these missiles only when we are satisfied with the capability, the economy, and the reliability of operation of each model.

Now I would like to discuss what I consider to be the most difficult problem in the Air Force today—the problem of people. American technology turns out the finest weapons in the world, but all of these must be operated and maintained by men. It will do no good to provide a supersonic jet bomber with a radius of 5,000 miles unless we are able to navigate the bomber to the target and unless, once having reached the target, we are able to put our bombs on it. It does little good to have the finest air warning system and the finest all-weather interceptors unless we are able to maintain them properly and to have pilots trained to interpret their instrument panels for successful interceptions of enemy bombers entering our borders.

Personnel Problems

The Army Air Corps in the 1930s had very little trouble getting sufficient men to meet its pilot training program. At that time the rates of pay of the military career compared favorably with the pay of civilians, and there were also "fringe benefits"—retirement pay, commissary privileges, post exchange privileges—and even more important the high regard and general respect of the American citizen for the man in uniform. With today's intricate and delicate aircraft and equipment it takes a reasonably well-educated, smart, alert man a period of years to receive the training required to become effective and really do his job in the Air Force. Once having been trained at high cost to the taxpayer, a man's value to the Air Force increases with each year of service. The Air Force, however, along with the Army and Navy, is having more and more trouble obtaining and keeping high quality young men. The services merit the affectionate regard and respect of this country.

Today we find a tendency to downgrade them. We find men in many walks of life applying the words "wasteful, stupid, incompetent, inflexible military mind" to the man in uniform. The faults of the few have been applied to the many. These charges have affected the military services in two ways: first, to a degree they have tended to undermine the morale of the man in uniform; and second, they have caused some American citizens to doubt the integrity and ability of our men in uniform. I can tell you that this attitude is wrong—very wrong. To me the men who make up our armed services are our best citizens. They have dedicated their lives and talents to the service of their country. They are the ones upon whom our very lives will depend should war come. These men deserve the gratitude and respect of every American.

Then there is the matter of pay. For instance, since 1937, the pay and allowances of our officers and enlisted men have fallen far behind the 315 percent increase achieved by labor. Even in Government I find that while all Civil Service employees received a pay increase in 1952, a similar increase was denied the military even though costs of living continued to rise.

Area of Fringe Benefits

In addition to pay, in the area of fringe benefits—which is considered a part of the pay in the military service—we find a distinct change. In the 1930s every man in uniform, along with his family, was provided with adequate medical care. There has been serious doubt in recent years as to whether this practice should be continued, or whether just the man in uniform and not his family should be provided with medical attention. I personally think

Toward the Same End—SECURITY

'Only with complete understanding can the American people be expected to support airpower as the weapon it can be'

Gen. Nathan F. Twining

ON BEHALF of all the Air Force, and especially Headquarters, USAF, I want to thank the Air Force Association for the support you have consistently given us in the past. It has been a great help—help we have come to count upon. I might add that, in addition to supporting us, you have found it necessary to criticize us at times and disagree with us when you thought we were wrong.

This we welcome, because much progress can be made through constructive criticism.

Your understanding of airpower will be needed even more in the days ahead. It is clearly the duty of all of us to continue informing the American people on both the capabilities and limitations of airpower. Only with complete understanding can they be expected to support airpower as the weapon it can be in the defense of our country.

By now, seven years after the founding of the Air Force Association, none of us can have any doubt that we are all working toward the same end—security for the nation.

Whether you are on active duty, or in one of the Reserve components, or a member of the AFA without present military status, you are all part of an organization that your past duty or present support has helped to make a great military service. There can be no doubt that you are proud of the record, and that you as individuals know the importance of airpower to the nation.

Tonight I want to pay tribute to the great military organization in Korea. As members of the Air Force organization you are also members of this great military team in Korea. And on that team you are playing alongside the men in khaki, and blue, and green. It has been a great team in action; now it must be held together in case of future need.

Such spirit as you have shown in this Convention means continued support for it, whatever the future holds.

From the thousands of men of the Korean team, I want to single out for special tribute some Air Force members of whom we have not heard very much. The wonderful twelve-to-one record made by the men in the F-86 units is well recognized by us all.

But the others have received little public recognition for the tough, but professional day-by-day work they have been doing, and too, they are the ones who have taken most of the casualties in the air.

I refer to the fighter-bombers, the light and medium bombers, the B-29s, and the troop carriers. They have done a superb and workmanlike job. And also in calling attention to the unsung airmen of our team, I cannot pass without high praise for the epics of the men flying the rescue and evacuation aircraft.

I too feel that not many people fully comprehend the great and lasting contribution made by members of the Air National Guard and the Air Reserve to our success in Korea. Without their services and local help, the Air Force would not have been able to accomplish what it did—we are all proud of you.

A great many of the B-26s, the F-84s, and the transport planes operating in Korea were flown by pilots of the Air National Guard or the Air Reserve. They responded promptly and eagerly when the need for their services arose, and for the full three years of the war they have done an outstanding job.

I hope they can now go back to their civilian pursuits, knowing their services were and always will be appreciated by the United States Air Force and the people of this nation.

As you know, the President has directed that a detailed study of our defense needs be made. As Chief of Staff of the Air Force I will be your representative for this study and wish to go on record that we will continue to count on the full support and backing of our new civilian heads of the Air Force.

We've got a big job ahead, fraught with grave dangers and responsibilities—with their help we will succeed. Our civilian leaders in the Pentagon believe in airpower; make no mistake about that.

I call upon your continued understanding and support to this end—in order that the United States Air Force may defend the skies of our ever-shrinking globe and meet our responsibility for survival of the free world.—END

TALBOTT — CONTINUED

that if this Government is willing to separate a man from his family and send him overseas for long periods, it should be willing to assist his dependents by providing them with decent care and attention.

The commissaries are another example of a disappearing fringe benefit. The provisions of the Appropriations Act of 1954 will eliminate most of the commissaries in the United States.

And post exchanges provide another example. In the 1930s they were exempt from national and local taxes. The military were able to make their low pay go further by buying in the post exchanges. Items were available at reduced rates without cost to the Government. While post exchanges have not been eliminated, prices are controlled, the number of items to be stocked today has been sharply reduced, and special purchases have been discontinued.

The continued trend to take away traditional benefits of our men in uniform, especially in the absence of any pay boost, comes as an actual reduction in pay. This trend

(Continued on following page)

causes real hardship to our men as well as their families.

Housing is another great problem area—both for our families and for our single officers and airmen. The Air Force inherited many air bases built hurriedly during World War II with tarpaper shacks a standard item. These shacks had a life expectancy of some five years. Many of them have now been in use for twelve years. Last week in North Africa I found our men living in small wooden huts with little insulation in temperatures running above 120 degrees. In family housing, especially in isolated areas both domestic and overseas, the situation is deplorable.

This Year's ROTC Graduates

At the moment, we are struggling with a difficult problem that became unavoidable as personnel is held at substantially present strength. Some 9,600 young men graduated from our ROTC colleges in June. These young men should be called to active duty, but to do so today means that room must be made for them. We are postponing the call of most of the ROTC graduates for some months, but taking any part of this group left no choice but to liberalize provisions covering voluntary release of officers, and also to undertake the unhappy task of actually forcing some officers out of active duty. We are trying to do this with a regard for the interest of the Air Force and of the officers. It cannot be accomplished without some individual hardship and without criticism. I am glad to state that it will not be necessary to cut as deeply as was originally thought necessary.

I have gone into the reasons for the turnover in Air Force personnel in some detail because we are deeply concerned about the men in the Air Force. We must also consider the high cost to the Government when skilled men are forced to quit military service.

Failure to Re-enlist

It is estimated that in the next year the Air Force will lose 180,000 airmen by failure to re-enlist. The minimum cost of bringing each of these men into the service and training him in a particular skill is estimated at $14,600. The basic cost of replacing the 180,000 leaving us next year will be better than 2.6 billion dollars. Think of that: 2.6 billions of dollars in one year. Many of these men could be saved for long, useful careers in the Air Force, the efficiency of the Air Force would be greatly improved, and the over-all number of personnel in the Air Force reduced if we could just spend a portion of this 2.6 billion dollars for improving the pay and the "fringe benefits" of our men in uniform. This trend of the last few years is penny-wise and pound-foolish. An increase in benefits to our men in uniform represents a field of great potential savings. We consider it an area of true economy and are determined to reverse this present trend.

We are now studying this personnel problem, involving as it does the morale, the pay, and as a consequence the careers, of our men in uniform. We hope shortly to come up with a program, a program to improve the position of our men. Let us make service in the Air Force a career sought after and competed for by the best young men in America.

Before closing, I would be remiss if I did not say a few words about the 1954 Air Force budget that has been approved by our Congress and the President.

When I arrived in Washington it hurt my sense of good business to see the annual federal budget deficit. This deficit still bothers me. We have a question of fine balance to determine in terms of the future of the United States. The question is, "What are the total military forces we must keep ready for instant action to prevent a war or to prevent national disaster should war occur?" Once this determination of force levels has been made, we will then be able to determine how much money is required to maintain such forces from year to year.

Forces Must Be Maintained

In my opinion, these forces can be and must be maintained within our national income. If, on the other hand, we continue deficit spending, we will eventually destroy the economy of our country. This would accomplish the aims of Communism without a war.

The force structures of the Army, Navy, and the Air Force were established in the fall of 1951. Since that time there has been a very rapid advancement in the development of weapons, particularly atomic weapons.

With these factors in mind, when the proposal came up to establish an interim Air Force program of 120 wings, pending a restudy of our over-all military force structure by the Joint Chiefs of Staff, I agreed.

Interim AF Program

I would like to make some comments about this widely publicized interim Air Force program. To begin with, it is not a fixed program. We are not tied to 120 wings. It is a program to permit the Air Force to continue its expansion during the resurvey by the Joint Chiefs of Staff. The total force structure of the Armed Services is being closely examined by our Joint Chiefs of Staff. It will be examined in the light of the requirements of the United States to provide its share of the forces which, along with those of the other nations of the free world, are required to oppose the threat of Communism. When the new force levels have been established and approved by our highest authority, then and only then will we know the size that will be required to be maintained by each of the services. Only then we will be able to assess the amount of money that is necessary. We know now, however, that money will be tight. The enormous speeds, the fantastic destructive power of modern weapons, are not bought cheaply. Therefore, we have already started the most intensive effort, throughout the Air Force, to obtain *more* combat power for *less* money. We are securing all possible advice from private industry that may help us to run the Air Force more efficiently. I can assure you that the Air Force is not too proud to accept advice when it can help us do a better job.

Air Force's Readiness

In conclusion, may I repeat that our Air Force is a magnificent organization. On its efficiency—by that I mean the quality and readiness as a combat team—rests the peace of our world. Believe me, we must maintain our Air Force as the greatest in the world.

I salute the loyalty and devotion to duty of our airmen and officers. We owe it to them to provide them with the pay, the benefits, and the living conditions comparable to their contributions. We count on the support of the Air Force Association for our Air Force program, and we call on you to assist us in maintaining a sense of trust, confidence, and respect between the military and the people whom they defend—the men, women, and children of America.—END

Complacency vs the Rising Peril

'The United States is no frail reed to be bent by a single blast'

Gen. Hoyt S. Vandenberg

Vandenberg accepts award from Board Chairman Stuart.

OF ALL THE honors that may come to a man, none can be more deeply satisfying to his spirit than that accorded him by his own kind. My professional career has been spent in a realm of ideas and action familiar to most of you. You and I are animated by a common faith arising from shared experiences. That you, my one-time brothers in arms, fellow-toilers in the vineyard of the airpower idea, should do this for me now, when there are so many others more deserving of the honor, makes me humble and also proud.

After all, retirement is still for me a new and occasionally disquieting experience. There comes inevitably to a man who has carried certain responsibilities a momentary loneliness when he wakes up one morning to find that he no longer possesses the familiar task and he must find new work for himself. Now, in this splendid gathering I feel acutely the continuing sense of kinship, the common purpose, the shared sense of responsibility for the nation's security. Whatever you may undertake, rest assured of this: I stand ready to join you and to help in any way I can.

It is hardly a secret that various things I had to say in this city not so long ago were contrary to views earlier expressed by other sincere and honest people. Having served my country so long as a professional soldier, it was difficult and painful for me to make the required decision. There can be an honest difference of opinion over what constitutes an adequate defense for this nation. The moral thing in our democracy, I hope, will always be for a responsible military man to respond candidly when Congress asks his opinion, even though his opinion may not be comforting.

What I now fear most is complacency in the midst of inexorably rising peril. There occurred the other day a happening that should give us all serious pause. I refer, of course, to the explosion of a hydrogen device in the depths of the Soviet Union.

Whether this explosion was a test article or a bona fide weapon is, in the long run, academic. If Russia does not now actually have such a weapon, she will soon have one. And its addition to Soviet Russia's already vast accumulation of armaments, both conventional and unconventional, will further narrow the margins of power on which we Americans have so far counted for safety.

When I read that news, my memory went back to the year 1949. The government had come into indisputable evidence that the USSR had broken the secret of the atomic bomb years ahead of the date calculated by many of our scientific experts. There was an intense debate at the highest levels of the government over whether this country should proceed at once with the hydrogen bomb, in order to maintain our advantage. And once again many wise and experienced men argued against the idea our enemies would ever catch up.

Well, the pace of events is certainly quickening.

I am not one of those who face the future with despair. The United States is no frail reed to be bent to the ground by a single blast.

But if we doze, if in our complacency we forget the deadly earnestness of the enemy, his ever-increasing technical competence, and his undoubted ability to deliver his new weapons, then, I say, our strength will not avail us.

You, my friends in the airpower community, understand this better than most. God speed you in your task of arousing our countrymen.—END

H. H. ARNOLD AWARD

HIGH point of AFA's seventh annual Airpower Banquet was the presentation of the H. H. Arnold Award to Aviation's Man of the Year—recently retired Air Force Chief of Staff Gen. Hoyt S. Vandenberg. In accepting the award before more than 1,500 persons of "his own kind," General Van's voice was audibly shaking with emotion. His acceptance was received with a standing ovation.

Other awards and presentations were made to: Mervin J. Kelly, Science Award; Milton Caniff, Arts and Letters Award; Col. Klair E. Back, for the men of the Third Air Rescue Group, Flight Award. As a fillip to the awards presentations, Gen. "Tooey" Spaatz presented AFA's Air Age Award to AFA's elder stateman James H. Doolittle. **(More award details on page 26.)**

General Vandenberg's citation:

"In the last decade the USAF has met the challenge of world war and of limited conflict, and has served as the primary deterrent to further aggression on a global scale.

"Gen. Hoyt S. Vandenberg has provided inspired leadership, first as a combat commander and then as Chief of Staff of the Air Force. During all of this difficult period he has courageously fought for the development of the airpower concept.

"For distinguished service contributing to national security and world peace, the Air Force Association designates Gen. Hoyt S. Vandenberg as Aviation's Man of the Year and presents him its H. H. Arnold Award for 1953."

It was a "completely surprised" Jimmy Doolittle, Eighth Air Force's wartime commander, who received AFA's Air Age Award from his wartime boss, Gen. Carl A. Spaatz.

Jimmy Doolittle (right, above) presents Milton Caniff with Arts and Letters Award. Col. Klair E. Back, commander of the 3d Air Rescue Group, receives Flight Award on behalf of his men (below). Dr. James B. Fisk (not shown) accepted Science Award for his absent colleague, Dr. Kelly.

AIRPOWER AWARDS

Distinguished service trophies for 1953 presented at AFA Banquet

IN ADDITION to the H. H. Arnold Trophy (see page 25), AFA presented four other awards at the 1953 Airpower Banquet, and five persons were given AFA citations for their work for airpower:

● The Air Age Award, to Lt. Gen. James H. Doolittle, USAF, ret.:

"James H. Doolittle has had a distinguished career as a test pilot, aeronautical engineer, soldier-scientist, combat leader, and Air Force commander. He has made aviation history. In 1953 he has served as chairman of the President's Airport Commission, as chairman of the National Committee to Observe the Fiftieth Anniversary of Powered Flight, as special assistant to the Chief of Staff of the Air Force and the Secretary of the Air Force for technical matters, and as vice chairman of the Scientific Advisory Board."

● Science Award, to Dr. Mervin J. Kelly, President of the Bell Telephone Laboratories (accepted for Dr. Kelly, who was in Europe, by Dr. James B. Fisk):

"As a vice chairman of the Scientific Advisory Board of the USAF, and as chairman of the Defense Department committee which brilliantly analyzed our continental air defenses, Dr. Kelly has displayed wise and vigorous leadership in dealing with our most vexing security problems."

● Flight Award, to the Third Air Rescue Group:

"In more than three years of Korean combat, the 3d Air Rescue Group flew more than 16,000 sorties. It rescued and evacuated from battle areas about 10,000 personnel of the United Nations forces. Almost 1,000 of these rescues were accomplished from behind enemy lines."

● Arts and Letters Award, to Milton Caniff:

"Modern airpower is complex. Its translation into story form capable of holding a mass audience requires genius. Milton Caniff has this genius. Through the medium of the daily comic strip, he presents the airpower requirement to many millions of avid readers with great artistic skill, technical accuracy, and dramatic impact."

In addition to honoring Vandenberg, Doolittle, Caniff, Dr. Kelly, and the Third Air Rescue Group, AFA also cited Tex and Jinx McCrary, stars of radio and television; Miles Clark, Elizabeth, N. C., President of the Kill Devil Hills Memorial Society; Beirne Lay, Jr., co-author of "Twelve O'Clock High" and screen-writer of "Above and Beyond"; and Brig. Gen. Bonner Fellers, USA (ret.), author of "Wings for Peace."—END

AF Sec'y Harold Talbott congratulates AFA's new President, Gen. George Kenney, as new Board Chairman Kelly looks on.

WASHINGTON ROUNDUP

The 1953 Convention is now history but in becoming so, it made history

DELEGATES to Air Force Association's Seventh Annual Convention and Reunion climaxed a series of fruitful business sessions by unanimously and enthusiastically electing Gen. George C. Kenney, New York, N. Y., as President for the coming year. In the same election, retiring President Arthur F. Kelly, Los Angeles, Calif., was named to succeed Harold C. Stuart, Washington, D. C., as Chairman of the Board of AFA.

General Kenney, wartime head of the Far East Air Forces and now President of the National Arthritis and Rheumatism Foundation, proved a popular choice, as evidenced by the noisy, standing ovation which the announcement of his election evoked. He has been a Director of AFA since his retirement from the Air Force in 1951.

Kelly's election to Chairman of the Board was the final step in a career of steady progression of service to AFA through Squadron, Wing, and National levels.

Julian B. Rosenthal, New York, N. Y., was reelected Secretary, and Samuel M. Hecht, Baltimore, Md.,

(Continued on following page)

AIR FORCE ASSOCIATION'S NEW LEADERS

Elected for the year 1953-54 at Washington, D. C., August 22, 1953

PRESIDENT
George C. Kenney
New York, N. Y.

SECRETARY
Julian B. Rosenthal
New York, N. .

TREASURER
Samuel M. Hecht
Baltimore, Md.

REGIONAL VICE PRESIDENTS

New England Region *Thomas C. Stebbins*	Northeast Region *Randall Leopold*	Central East Region *George D. Haray*	Southeast Region *Jerome A. Waterman*
Great Lakes Region *George A. Anoerl*	North Central Region *Merle S. Else*	South Central Region *Frank T. McCoy, Jr.*	Midwest Region *J. Chesley Stewart*
Far West Region *James H. McDivitt*	Rocky Mountain Region *Wm. Thayer Tutt*	Southeast Region *Thomas D. Campbell*	Northwest Region *Ashley Greene*
	Pacific Ocean Region *Roy J. Leffingwell*		

NATIONAL DIRECTORS

Chairman of the Board—Arthur F. Kelly, Los Angeles, Calif.

John R. Allison *Redwood City, Calif.*	James W. Aston *Dallas, Texas*	Edward P. Curtis *Rochester, N. Y.*	Warren DeBrown *Red Bank, N. J.*
James H. Doolittle *New York, N. Y.*	Ira C. Eaker *Culver City, Calif.*	Dr. Cortez F. Enloe, Jr. *New York, N. Y.*	Joseph J. Foss *Sioux Falls, S. D.*
John P. Henebry *Park Ridge, Ill.*	Robert S. Johnson *Garden City, L. I., N. Y.*	Thomas G. Lanphier, Jr. *San Diego, Calif.*	Stanley K. McWhinney *Lansing, Mich.*
Dr. Jerome H. Meyer *Dayton, Ohio*	William F. Mullally *St. Louis, Mo.*	Charles W. Purcell *Baltimore, Md.*	Mary Gill Rice *Huron, Ohio*
C. R. Smith *New York, N. Y.*	Carl A. Spaatz *Washington, D. C.*	Thomas F. Stack *San Francisco, Calif.*	Harold C. Stuart *Washington, D. C.*
Hoyt S. Vandenberg *Washington, D. C.*	T. F. Walkowicz *New York, N. Y.*	Ennis C. Whitehead *Newton, Kan.*	
Gill Robb Wilson *New York, N. Y.*	Morry Worshill *Chicago, Ill.*		

Miss Olivia Twining, named AFA's Miss Airpower, appeared at the Fashion Show in the Cassini-designed Airpower Gown. Above, right, with three of her airline hostess attendants, she chats with toastmistress Jinx Falkenburg McCrary.

chairman of the Convention, was named Treasurer. Also named were full slates of regional vice presidents and national directors (see page 27).

The elections climaxed what was undoubtedly the finest Convention AFA has ever staged, from any point of view—top guest speakers, meaty business sessions, rousing reunions and cocktail parties, dinners, luncheons, celebrities, press, radio, and television coverage. AFA made its voice heard, not only in the nation's capital but across the country, and in so doing reached new heights of prestige.

Top event was the Airpower Symposium, in which labor, industry, government, and the military let down their hair before AFA delegates and guests. All Symposium sessions were packed. Between sessions more than a thousand persons filled the Hotel Statler's Presidential Room to eat lunch and hear the Hon. Roger M. Kyes, Deputy Secretary of Defense, explain the Administration's approach to the ticklish and explosive airpower problem. AFA's own Jimmy Doolittle was toastmaster and Secretary of the Air Force Harold E. Talbott chose the

KOREAN COMBAT TEAM

Introduced to AFA'ers by AF Vice C/S General White

IT IS A distinct pleasure and honor for me to be at this Symposium luncheon to introduce some of the truly representative people of the Air Force.

First, a representative of that vital and humanitarian mission, air evacuation, Capt. Lillian M. Kinkela. She participated in more than 175 combat-zone evacuations in Korea. Prior to that, in World War II, she completed more than 250 combat missions. She represents the ladies in the Air Force today.

Next, fighter-bombers, Col. David T. McKnight, representing the men who flew the tough missions in close support of our ground forces and in the interdiction campaign. Colonel McKnight flew eighty-two missions in Korea in Republic F-84s and North American F-86s. He is the former wing commander of the 49th Fighter-Bomber Wing in Korea.

Next we have air rescue. T/Sgt. Edward Boggs, an aero-medical technician who flew 130 helicopter missions on daring rescue operations behind the enemy lines. He was a member of the Third Air Rescue Group which evacuated almost 1,000 military personnel from behind enemy lines in Korea.

Next we have medium bombardment, 1st Lt. Bernard A. Gallaher. Flying from Okinawa, he flew seventy-four missions totaling 751 combat hours in less than one year, the all-time high for medium bomber pilots in Korea. Lieutenant Gallaher, of the 320th Bomb Wing, March AFB, Calif., flew Boeing B-29s and B-50s in Korea.

Next, tactical reconnaissance, Capt. James A. Hoag. Flying the North American T-6 for tactical air control in support of our ground forces, Captain Hoag completed 107 missions in Korea, identifying targets, spotting them with smoke bombs, and so forth, so that our fighter-bombers could properly identify their targets.

Fighter-interceptors, Capt. Joseph McConnell, the world's leading jet ace with sixteen MIGs to his credit. The absence of Communist aircraft in the skies over Korea was due mainly to the courage and skill of our fighter-interceptor pilots such as Captain McConnell.

Maintenance, T/Sgt. Warren K. Sloan, a real maintenance man, an F-86 crew chief who received the Bronze Star for keeping his jet fighters free of mechanical trouble for sixty-eight consecutive combat missions. He represents the men who really keep them flying.

Night intruders, Capt. John J. Croston. Representing our Douglas B-26 crews today, Captain Croston flew fifty missions over Korea in the first five months of this year. All but two of these were night interdiction missions. He now hails from Langley AFB, Va.

Combat cargo, Capt. Weldon C. Reeves, of the combat cargo units, who has flown more than ninety-six combat cargo missions in Korea—more air evacuation and aerial resupply missions than any other pilot over there.

Now these other men I have asked to stand are the technical representatives of the various companies, who have served with distinction along with the Air Force in Korea. I have asked for this privilege of introducing them as a tribute to all industry representatives who have participated in the Korean war by helping to keep our equipment in first-class fighting condition.

occasion to present Air Force Exceptional Service Awards to aviation industry pioneers Frederick B. Rentschler, Board Chairman of United Aircraft; J. H. Kindelberger, Board Chairman of North American Aviation, and Donald W. Douglas, President of Douglas Aircraft.

That same Friday noon the ladies were having their day in an elaborate and impressive fashion luncheon at the Mayflower Hotel. High spot of the affair was the presentation of Miss Olivia Twining, daughter of the AF Chief of Staff, as Miss Airpower. Before a packed house she modelled the Airpower Gown, designed and donated for the affair by Oleg Cassini, well known New York designer. Fashions from five leading Washington stores were also featured, and eight airlines sent their prettiest hostesses to act as a court of honor for Miss Airpower. Mrs. Jimmy Doolittle and renowned aviatrix Jacqueline Cochran spoke. Jinx Falkenburg McCrary doubled as toastmistress and commentator for the Fashion Show.

In their business sessions, delegates adopted a thumping Statement of Policy (see page 16) and a number of forward-looking resolutions (on which we'll say more next month). They heard Lt. Gen. Leon Johnson, Commander of ConAC, discuss the Air Reserve, and Maj. Gen. Earl T. Ricks, Chief of the Air Division, National Guard Bureau, give

(Continued on following page)

Out of the well-attended business sessions of the 1953 Convention came the forward-looking Statement of Policy and a number of constructive resolutions.

The McCrary's, Tex and Jinx, added luster to the Convention. They emcee'd the Airpower Ball floor show, and Jinx was the Fashion Show toastmistress.

Shown here with the "boss," Gen. Nathan Twining, are members of the AF "Korean Combat Team" introduced at the Symposium luncheon by Gen. Thomas White, Vice C/S. From left are Col. David McKnight, an F-84 pilot, representing close support; 1st Lt. Bernard Gallaher, a B-29 pilot, representing medium bombers; Capt. John Croston, a B-26 pilot, representing night intruders; Twining; T/Sgt. Warren Sloan, an F-86 crew chief, representing maintenance; Capt. Lillian Kinkela, a flight nurse, representing air evac; T/Sgt. Edward Boggs, an aeromedic, representing air rescue; Capt. Joseph McConnell, top jet ace, representing F-86 fighter-intereceptors; Capt. Weldon Reeves, representing combat cargo; and Capt. James Hoag, a T-6 pilot, representing tactical air control.

a progress report on the Air Guard. Jet aces were around, as usual, including such old Convention hands as Col. Francis S. Gabreksi, Maj. Jim Jabara, and Lt. Jimmy Low. With them this year were top jet ace Capt. Joe McConnell and his runner-up, Capt. Manuel Fernandez. Especially honored was a group of Korean veterans, an across-the-board slice of USAF combat people, including representatives of the fighter-bombers, air rescue, crew chiefs, flight nurses, reconnaissance, night intruders, fighter-interceptors, and medium bombers. Capt. Zach Dean, first Air Force officer to be repatriated as a prisoner of war, was on hand, as was Lt. Col. Bill Barns, who had just set a new world's speed record in an F-86D.

At the Airpower Ball, Tex and Jinx McCrary emcee'd a fine floor show that featured Pat Rooney in his famous soft-shoe routine, and the Air Force dance band and drill team. As one Washington paper headlined it, "When AFA throws a party, it's a good one."

Once the final business session was over on Saturday, delegates flocked to the big event of the Convention—the Airpower Banquet. Again the house was packed as the Hon. Harold E. Talbott delivered the Secretary's traditional report on the state of our airpower to the nation's largest airpower organization (see page 21). USAF Chief of Staff Twining also spoke, and AFA's top airpower awards and citations were presented. In addition to the usual awards, a new precedent was set with the naming of Julian Rosenthal as "AFA's Man of the Year" and the San Francisco Squadron, Robert A. Dobbins commanding, as "Squadron of the Year."

Next day, Sunday, a more solemn mood prevailed as AFA officers and delegates and top representatives from the Air Force and the Department of Defense trekked across the Potomac to Arlington National Cemetery. Here, at a Sunrise Memorial Service, President Kelly dedicated a plaque in honor of the Unknown Soldier and laid a wreath on the grave of the late Gen. H. H. "Hap" Arnold while Air Force jets screamed overhead in a roaring tribute to the wartime leader of the AAF. Wreathes were also laid on the grave of the late Gen. Muir S. Fairchild and at the Tomb of the Unknown Soldier.

A late Sunday Brunch at the

AFA and the AF pay tribute to a great leader as taps sound in Arlington Cemetery at the grave of Gen. Hap Arnold.

Statler wound up a great Convention. Here the new officers were installed and AFA's "family" awards were presented to the local leaders who had earned them through outstanding work during the year gone by. (More on these awards next month.) It was at this brunch that you caught the real flavor of the Convention. Here were the people who make AFA tick, the people who take unsparingly of their own free time to work for airpower on the local level and who, once a year, come together to make the decisions, draft the resolutions, formulate the plants, and elect the new leaders.

Behind the four eventful days of the Convention itself lay months of planning and toil by the men and women who made it all possible—Sam Hecht, Convention chairman; Harold Stuart, host committee chairman; George Hardy, Convention vice chairman; Walt Savage and his host Capitol Squadron; Tillie Gamble, who made the Fashion Show the outstanding success it was; and the committee chairmen and members who gave their time and talents.

The credit list is a long one. It includes Headquarters, USAF, which did everything in its power to help; the Air Force Dance Band and Drill Team; Headquarters Command, Bolling AFB; the Washington Convention Bureau and the Greater National Capital Commision; the 3d Infantry Regiment and Maj. Gen. E. K. Wright, of the Military District of Washington; the government of the District of Columbia, and particularly the Metropolitan Police; the eight airlines—TWA, Pan American, National, American, Capital, Eastern, United, and Western—whose hostesses participated in the Fashion Show; the five Washington stores—Hecht's, Woodward and Lothrop, Jelleff's, Kann's, and Lansburgh Brothers—whose fashions were shown; and to many others. A special debt of gratitude is owed AFA's list of Industrial Associates who were co-sponsors of the Convention. The Hotel Statler, too, deserves a bow, for helping make the Convention the smooth-running operation it was. And the Washington press, radio, and television corps cooperated in a fashion that made the public relations effort a comparatively simple thing.

This, then, is how it was in Washington. The 1953 Convention is history now. But in becoming history it also made history. Never before had so many been made conscious of the airpower aims of the Air Force Association in such a dignified and impressive manner.—END

ABOUT the RESERVE

Condensed from a speech to delegates at AFA's Convention in Washington

Lt. Gen. Leon W. Johnson
Commander, Continental Air Command

ABOUT SIX weeks ago, Gen. Thomas D. White called me and said that General Twining wanted a board appointed to go into Reserve matters in the Air Force and that I would be the chairman. The board consisted of Gen. Bill Hall, Vice Commander of ConAC; Maj. Gen. Leonard Thomas, of the National Guard of California; Col. Roy Hatch, of the National Guard of Alabama; Gen. John Bennett, of the Reserve of San Antonio, Tex., and others.

We met in Washington for five weeks to see what could be done to make a satisfactory program, both for the AF and for individual Reservists.

The following are basic principles which the board believes are essential to the success of any Reserve forces plan:

- First, it must be objective.
- Second, it must be wholeheartedly accepted and supported as an integral part of the US Air Force at all echelons.
- Third, it must be within our capabilities.
- Fourth, the scope must be within the potential Reserve manpower, and emphasis must be placed on quality rather than quantity trained.
- Fifth, it must be simple. The plan must be readily understandable.
- Sixth, it must be acceptable to the Reservist.
- In the seventh place, it must have public acceptance and support.

We made a total of about thirty recommendations. Some are:

We discussed at great length having a Deputy Chief of Staff for Reserve Forces, to put aside a man responsible entirely for Reserves and to whom all Reserve problems should go. We concluded that this would be entirely wrong; that you want an integrated program in the air.

We found capability in the National Guard to expand tactical squadrons, and we recommend that the National Guard take on additional squadrons as equipment, facilities, and support become available. But we believe that we should stay within the structure of the twenty-seven National Guard wings and twenty Reserve wings.

We recommend that, in those places where we are having difficulty manning units, we try squadrons for awhile, as well as numbered wings.

Our corollary squadrons have never been entirely satisfactory, and there may be some drawbacks to them, but we want to give them another chance because we see no reason why they would not work.

We believe that we are getting too many headquarters and that we ought to simplify things. Instead of having Air Reserve districts and specialist training centers, we propose Air Reserve centers.

We have asked that the present construction program of the Air Force Reserve be reviewed and approved for immediate implementation.

We came to the mobilization assignment. That has dropped off, as you know. We feel you cannot complete a satisfactory year with even twelve drill periods. We said there must be at least twenty-four drill periods.

We find that the utilization of aircraft in the Reserve brings us a lot of criticism. However, in June, of the 287 aircraft that we now have operating in the Reserve wings, we had an average flying time of forty hours per airplane, and we were training close to 2,000 pilots.

I believe we are going to come out of the woods and get a Reserve which we have to have, because as the Regular establishment goes down, the Reserve must go up and the country must depend on it more and more.—END

PLANNING for the LONG RUN

'We must be realistic and objective in our approach to national security. There is no place for emotion or indifference'

The Hon. Roger M. Kyes, Deputy Secretary of Defense

I DEEPLY appreciate your invitation to participate in the gathering of the members of the Air Force Association assembled from all parts of the country and to renew associations and friendships that date back to days of service in the Air Force and for the serious purpose of making a contribution toward the progress of airpower. I have had a vital interest in airpower ever since I joined the aviation industry in 1928, and that was a quarter of a century ago.

I remember particularly well the difficult problems that had to be surmounted in the development of the early dive bomber.

I recall, too, the struggles in design and manufacture that accompanied the shift to metal aircraft, the pioneering that had to be done in engines and instruments.

Until recently, I have been associated with an organization which has been actively participating in the aircraft industry.

Today, as the men in the Air Force will tell you, I am tremendously interested in the entire aircraft program, from basic research to combat operations.

I share with gratitude the pride of our people in the magnificent all-American combination of aircraft and airmen which has, time and again, played a stellar role during the wars in which we have been forced to participate.

The superiority of our pilots and crews, who believed in their weapons, themselves, and their combat leaders, has been demonstrated repeatedly.

Our country is indeed fortunate to have men of great capacity and courage, such as Secretary Talbott, General Twining and their associates, both military and civilian, guiding the destiny of the United States Air Force. I admire the strength of their convictions in behalf of their service; I respect them for their loyalty to their country; and I have great confidence in them as men. I should like to take this opportunity to express my personal appreciation for their cooperation and the privilege of being associated with them.

Today, our country is faced with many decisions which will profoundly affect the course of history. These decisions must be well and carefully made. The men and women in the Department of Defense are well aware of the great responsibility they carry with respect to the security of our nation. They are working together in close cooperation to secure the facts necessary to arrive at sound conclusions, and to make effective plans available for the implementation of any action that may be necessary.

In this country there are many different views on the problem of national security which lie between those of the extreme proponent who has the almost fanatical belief that disaster can be the only possible consequence if his suggestions and ideas are not adopted, and the pacifist who would do nothing. With the welfare of one hundred and sixty million people involved, neither extreme is acceptable. Nor can we take a middle ground for the sake of not offending either point of view.

We must be realistic and objective in our approach to national security. There is no place for emotion, promotion, or indifference. National security must be carefully considered with respect to its every element, as well as its total complex structure, in order that we may be certain of building effective and coordinated strength.

The Hon. Roger M. Kyes

Roger Kyes, 47, was born in Ohio, graduated with honors from Harvard in 1928, and became assistant to the president of Glenn L. Martin Co. He joined General Motors in 1948 after working for various manufacturing concerns. Before his Defense Department appointment in January of this year he was GM's vice president and general manager of the GM Truck and Coach Division.

The United States must integrate its military, economic, political, social, and moral powers into a single flexible weapons system, if we are to achieve optimum strength capable of successfully meeting any challenge to our way of life. The manner in which these forces are tied together, and harnessed by ourselves and our allies to provide the most effective over-all world posture, will largely determine the destiny of free men.

The path ahead will not be an easy one. It will not only require strength but endurance as well. Therefore, as never before, we are faced with the necessity of taking a positive approach to our problems, as well as applying every ounce of our energies to constructive efforts.

Since the burden of national defense has become a heavy one, it becomes imperative that whatever may be its requirements, these should be achieved with the greatest possible efficiency in order to minimize the drain upon our nation.

These are critical days. This fact is emphasized by the announcement by the Chairman of our Atomic Energy Commission of the Russian hydrogen explosion.

Our Commander-in-Chief has recently pointed out that the period of tension and confusion is not likely to end in the near future. He has made it clear that we must prepare for a long period of danger and uncertainty. We must, therefore, gear our preparation to the long run.

If we prepare only for the short dash, for a D-Day, we are likely to have prepared for the wrong kind of race—and in doing so, to have squandered our resources, and to have imposed an economic burden that might bring collapse, which, of course, is exactly what our enemies are banking on.

If, on the other hand, we guard our resources, plan our defense for the long run, discard outmoded concepts, and maintain a sound economy and monetary structure, we will protect our own interests, while offering little temptation to an aggressor.

A sane program, then, that will permit a build-up of strength, on a logical and sound basis, seems to be indicated. It seems to me that our job is not only to be prepared for immediate emergency action, but also to be engaged in long-range, thoughtful planning for future action. Both these tasks require that we give full and realistic consideration to our actual and expected stockpiles of resources, and these are not limitless.

In order to do objective planning for the future, we must start with an objective evaluation of our present forces and the concepts for their future use. We must be certain to squeeze out of our system anything which is wasteful in the present, or which will be useless in the future.

Such a review is being undertaken by the new Joint Chiefs of Staff. The Joint Chiefs' task is not an easy one. There will be many difficult problems and issues to be resolved. Many factors must be weighed and evaluated. They must guard against discarding proven weapons until glowing promises for the untried are proven.

On the other hand, they must be alert to every possible advance in science, technology, and military tactics that may contribute to the enhancement of our military strength.

When I mention military strength—when the Joint Chiefs review our military strength—when any individual or group of individuals reviews our military strength today—airpower is the keystone—make no mistake about that.

But, as I stated beforehand, any objective study or review must be just that—objective. It is almost certain to lie somewhere between the position of the extreme proponent of a particular concept and the conservative who argues for the status quo. You, as military men, recognize the responsibilities of leadership. And I am sure you share with me that complete confidence in our present Commander-in-Chief, which recognizes that under his leadership we shall make rapid progress to the answers of policy and forces that we all seek.

I have a strong conviction that these competent men who are our Joint Chiefs have the courage of decision, the spiritual strength to rise above usual limits of mental and emotional capabilities, and the wisdom to emerge from their studies with sound national war plans which will be a credit to themselves, and to our nation.

These men will be supported in their studies, decisions, and recommendations by many capable military men from each service—a priceless asset of the American people.

If we are to effectively implement our plans and programs, we must be diligent in our efforts toward improving the organization of the military establishment. Many constructive changes have been made possible as a result of the President's Reorganization Plan relating to the Department of Defense, which became effective on June 30, 1953. The Secretaries of the Military Departments and their Chiefs of Staff are studying ways and means to achieve better organization within their respective service.

Through the cooperative effort of the military and civilians, much more progress is being made toward the improvement of our Defense Establishment than is apparent to the casual observer.

Before closing my brief remarks, I wish to say a word on a subject in which we are all interested, and that is the men and women in our military services. Though time will not permit me to say more, I should like to point out our obligation to them and to their families. These people are dedicated to their profession in the service of the United States. We must be ever mindful, however, that they are entitled to proper compensation and proper protection for their families now and after their retirement.

In closing, I should like to quote the words of President Dwight D. Eisenhower:

"We owe it to all the people to maintain the best military establishment that we know how to devise. There are none, however, to whom we owe it more than the soldiers, the sailors, the marines, and the airmen in uniform whose lives are pledged to the defense of our freedom."—END

Report on Tomorrow's Airpower

ON THE following pages, AIR FORCE Magazine presents the Second Airpower Symposium, which took place August 21 at AFA's seventh annual Convention in Washington, D.C. AFA's first venture into such a symposium—in which service, labor, and industry representatives convene to discuss ways to implement the airpower concept envisioned by AFA—was last year at Detroit. Its success insured this year's repeat performance. The standing room only signs this year attested to the symposium's similar success. We believe this sort of cross-fertilization of ideas is essential to airpower supremacy in this highly technological era, and we publish this material as a public service.—The Editors.

LABOR

Al Hayes

President, International Association of Machinists (AFL)

I THINK perhaps it is advisable for me to correct any misimpressions which any of you may have with reference to my ability to speak on the subject assigned to me. I want to make it very clear that I do not profess to be a technical expert in aircraft, and certainly I am not a military expert in aircraft.

I would like to speak with you here as a representative of a labor organization, not necessarily expressing the views of the entire labor movement of the country, but at the same time being certain that the overwhelming majority of the people in the labor movement agree with the sentiments I express.

I would like to speak to you also as a citizen of the United States because sometimes I think that those who make the decisions with reference to airpower, with reference to other important matters that affect our citizenry, forget all about the views of our citizens.

I am one, probably because of the experience that I have had and the vocation which I have chosen, who believes that the way to solve a problem, particularly an acute problem, is to deal with it realistically, without ambiguity and without sugar-coating. That isn't the way we always deal with problems.

Fifty years ago the Wright brothers pinned wings upon mankind and revolutionized the ways of peace and the methods of war.

Today, even as we celebrate the golden anniversary of flight, we are called upon to determine whether our airpower shall soar to the heights of which it is capable, or whether, weighed down by the ballast of ignorance and pettiness, it will be forced to hedge-hop—gaining altitude to surmount each passing national crisis, then being dragged down again to skim the surface.

We of the International Association of Machinists are pleased to have the opportunity of joining with you in a discussion of this vital topic.

Our roots, like yours, are deep in aviation.

Five of the seven mechanics who built the Langley Aerodrome were members of the Machinists' Union and were largely responsible for the success of that venture into aircraft, and I think history subsequent to the trial of the airdrome at that time proved its success.

From that time on, our roots have spread until today the Machinists' Union represents two-thirds of all employees in the aircraft industry. However, as I previously stated, I am not here as a spokesman for a special interest group, whose members' prime concern is that of protecting their income regardless of the welfare of their nation. They, and I, have faith that when war and threat of war are past, there will be ample work for Americans in meeting the peacetime demands of our dynamic economy. We have no vested interest in international discord.

I am not here primarily as a spokesman for organized labor. If I were, I would devote my remarks to the important subject, and I think it is important, of industrial relations in the aircraft industry. I daresay that the employer representatives here and I could develop—out of our separate experiences—a very interesting and enlightening discussion of that subject. And, when we had finished, I believe you would appreciate the fact that good faith and mutual understanding are fundamental to good industrial relations. That may sound obvious, but you would be surprised to know how many times its truth is learned only by experience.

I am here as an American who is deeply concerned with his country's safety in these turbulent times, and whose job brings him face to face with the impact of our changing defense policies upon the lives and morale of the men and women who produce aircraft—our first line of defense.

As a citizen, I am puzzled by the vacillations in national policy which place airpower now high, now low, in our list of defense requirements.

As a member of the machinist's trade, which places a premium on skill and mechanical progress, I am unable to understand a policy at any time which gives high emphasis to the brute force aspects of national defense, to the detriment of the technological superiority which has made America as great as she is.

As a representative of hundreds of thousands of workers in the aircraft industry, I am worried about the financial and economic loss, and the sheer inhumanity involved in budgetary peregrinations which change the pattern of aircraft production with almost the seeming speed of blinking lights on a theater marquee.

If that comparison seems overdrawn, consider what has happened to our airpower and our aircraft industry in the eight short years since V-J Day, since that day when one of the mightiest military nations in history was brought to its knees by airpower, its proud shores undefiled by the print of the conqueror's boot. Our combat troops went ashore only after Japan surrendered.

As a citizen I believe that if we are to be strong in our defense of peace and freedom, we must have an Air Force of sufficient strength and efficiency to:

Give a potential aggressor pause in any plan to attack us or any of our allies; I don't think we are living alone in today's world.

Fend off any air blow undertaken by such an aggressor for the purpose of crippling our military potential, and;

Retaliate immediately and decisively.

In this respect I find myself in complete agreement with the statement made in May 1952, by one who commanded the greatest combined military operations in history. This is what General Eisenhower said then:

"Airpower is the dominant factor in war today. It cannot win a war alone, but without it, no war can be won. Our goal is to create air strength capable of answering immediately the onslaught of an aggressor and covering, at the same time, the mobilization of reserve forces. Since we cannot predict when an attack might be launched, air forces must be operationally ready at all times. . . ."

I agreed with that statement six-

teen months ago. I still agree with it.

And in that agreement I am baffled by a defense budget which completely ignores the advice and recommendations of our military experts and seeks to save money solely at the expense of our airpower. I want to make this very clear, that I am not a fanatical extremist.

Don't misunderstand me. I am in favor of economy in defense spending, and in other phases of governmental operations. Workers and their representatives in the labor movement pay taxes, and from some of the recent expressions of sentiment on Capitol Hill, we are liable to wind up paying a greater proportion of the taxes than we now do.

But there are some ways of saving money that are uneconomic. There are some things whose value cannot be measured in terms of tax dollars. Peace and freedom are among them. And a dollar saved at the cost of whittling away the sinews of defense may cost us thousands of dollars in wartime expenditures, and possibly our freedom as well in the future.

We must have an Air Force tailored to the needs of our defense. This I believe as an American who values his freedom and the peace which will enable us further to protect it.

In my job as a representative of wage earners, I know that we must proceed toward our goal of adequate airpower steadily and according to a predetermined plan. We cannot longer afford — we never could afford—the vacillation that has marked our course over the past eight years. We must face realities —not the realities of politics, which sometimes compromise principles to satisfy pressure groups or woo constituents with promises of tax reductions—but the stern, cold realities of a world whose peace is constantly threatened by a dictatorship with an insatiable lust for power; that is difficult if not impossible to satisfy. We must not sell our birthright of independent strength for the pottage of false economy.

I said I was in favor of economy. And one of the best ways I know to practice economy in the field of airpower is to end for all time the shifts in policy which start a project today, abandon it six months from now, and reactivate it a year later. There is waste for you—the tragic waste of indecision.

The gentlemen here representing the aircraft industry can tell you the extent of that waste far better than I. But I can tell you the damage it does to the work force upon whom our nation and our aircraft industry must depend to build the planes when we need them.

In March 1951, the old B-29 plant in Marietta, Georgia, was reopened for the production of B-47s. As it has done in many other cases, the International Association of Machinists helped recruit the staff of journeymen who comprise the small but essential core of any aircraft plant. Subsequently we became the bargaining representative of all the employees in the plant. As such, we have been constantly aware of the hardships incurred by employees who traveled long distances—sometimes with their families—to take jobs in Marietta, who lived in trailers or temporary and inadequate housing, and who finally managed to obtain more suitable dwellings in the then booming community. Then, just as the employees were getting settled down, word came that the Secretary of Defense was considering closing the plant.

Al Hayes

Albert J. Hayes, 53, was born and educated in Milwaukee, Wis. At 17 he was chairman of the Apprentice Boys Committee of the Milwaukee railroad shops. He joined I.A.M. in 1919, and at 24 was elected president of district 7, covering all machinists on the Chicago & Northwestern RR. He was elected general vice president of I.A.M. in 1944, president in 1949, and re-elected in 1953.

It doesn't take much imagination to conceive the state of mind of the employees in that plant. It doesn't take much imagination to figure the effects on their work. I understand that there is a high turnover rate among employees in the aircraft industry. I have heard it said that productivity in the industry is not all it should be. Is that any wonder? What employee wants to jeopardize his future in an industry which depends upon the changing whims of legislators and administrators in Washington? What man can produce his best when he is wondering whether he will have a job a few months hence in a certain community?

Certainly, the longer the situation which has developed over the past eight years continues, the more difficult it will become to recruit and hold a competent work force in the aircraft industry. There is already a shortage of some of the skills necessary for an adequate and efficient industry, particularly in the engineering fields. Can we honestly expect the situation to improve until such time as the industry can offer some promise of a stable and successful future to the people it seeks to recruit?

I can sympathize with management's problems under the existing circumstances, although I suspect that at times the feast and famine aspects of the industry have been used as a management tool at the bargaining table; in fact we know they have.

The fact is that wages in aircraft, while relatively good, are somewhat lower than the average for the transportation equipment industry in the United States, and that, as many managements have found out, can be a very disturbing factor, especially in plants located in established industrial centers where competition for skilled workers is keen.

We had a case, several years ago, of an aircraft management in such a section which took advantage of a temporary weakness in one of our locals to refuse what we believed a justifiable increase in wage rates. Perhaps that was smart bargaining on management's part, but the result was that management voluntarily offered a better than six percent increase in wages less than half a year later, because the plant had been losing employees to other industries around the city.

We cannot build an adequate Air Force if we continue to follow the changing pattern of defense policies which have marked our course since the end of the last world war. And, what is equally serious, every day we continue on that course, we are weakening the base for a skilled and adequate work force in the aircraft industry.

Some fifty years ago, the late Justice Brandeis, then a practicing attorney in Boston, discovered the importance of stability of employment and production to good industrial relations. He was asked by

(Continued on following page)

a friend in a shoe business in New Hampshire to help straighten out a bad industrial relations situation. Every year, just at the peak of production, his employees struck.

Brandeis discovered that his friend's plant was producing only on order, with long periods of idleness, and long periods of overtime work. He finally convinced his friend that he should produce for stock in the off seasons, thus leveling out the employment curve. When this had been done, unrest among employees almost vanished, and the plant become a model for good industrial relations in New England.

I believe that aircraft plants which have agreements with the Machinists Union will testify that on the whole we are anxious to do everything we can within reason to assist in developing and maintaining efficient and profitable production. Historically, we have been leaders in this type of activity. Thirty years ago we proposed the joint labor-management activity which became famous as the "BAO Plan," and served as a model for the joint production committees during the last war.

After all, we realize that our members can prosper only as their employers do.

In the case of the aircraft industry, however, the important factor of stability is probably beyond the reach of either management or labor. And in that industry there is more at stake in my judgment than the dividends of stockholders and the prosperity of employees. The ultimate stake is the future safety of our country, and the preservation of the freedom we cherish.

There may be those in positions of responsibility who believe that we can afford further delays. I don't think so. Certainly our antagonist does not think so. While we let our airpower drop off by eighty-four percent, and our aircraft production fall off ninety-five percent, after V-J Day, Russia dedicated itself to becoming the world's dominant air power. And today, according to our best information, eight years later, Russia is still dedicated to that goal.

We cannot afford to let that happen. We have not the manpower to match the hordes under Communist domination on the field of battle. Our sea lanes will be imperiled by the Soviet Union's mounting fleet of submarines. But we have the genius, and the facilities, to outstrip Russia in the air—if only we will.

I have been asked if I would forecast the airpower future, and of course you know I am not qualified to do that. I have no relish for the soothsayer's role. I do know what the future is if we do not mend our policies. And it is a bleak one—from the viewpoint of national defense, and from the viewpoint of our aircraft industry and labor force. I think I know what our airpower could be, if we had the means to achieve it. But that is not pertinent.

'We must set as our immediate goal an adequate Air Force—adequate according to the majority of the experts. I mean the real experts, those in position to know. We must attain that goal—143 wings—as quickly as possible, holding to a production schedule'

I do know what the future must be. We must set as our immediate goal an adequate Air Force—adequate according to the majority of the real experts in this field, and I mean the real experts, those in the best position to know — no less than 143 wings. We must attain that goal as quickly as possible, developing and holding to a production schedule. We must maintain our present program of dispersed production facilities. We must continue or intensify our programs of research and development, especially among aircraft producers, for the purpose of constantly advancing the quality and performance of our aircraft.

If we do these things, we will develop as an efficient and stable work force, and we will see, I am sure, an improvement in employee morale and industrial relations in the aircraft industry. And in doing these things we will also be laying the foundation for leadership in the production of aircraft for civilian use both commercial and private. It would be a tragedy in my judgment if our preoccupation with the needs for airpower blinded us to the developing opportunities in civilian aircraft and resulted in our sacrificing leadership in that field to others.

You men of the Air Force Association should have the gratitude of every American for your untiring efforts to awaken our country to a realization of its airpower requirements and possibilities. I hope that my voice here today will lend to the success of your program. We of the International Association of Machinists appreciate this opportunity of participating in your discussions. You will find us your constant allies in the achievement of your worthy goal.

QUESTION: Mr. Hayes, you indicated there was a growing shortage of technical personnel and skilled personnel. What is being done to alleviate that shortage? I understand there is a growing lack of aircraft and engine mechanics and fabricators and other highly-skilled personnel in the aviation industry. Is anything being done by your organization to help?

MR. HAYES: Yes, I think there are many programs in progress. Unfortunately I don't think enough is being done to alleviate that situation. First of all, I think everything possible is being done to encourage more technicians to study for the aircraft field.

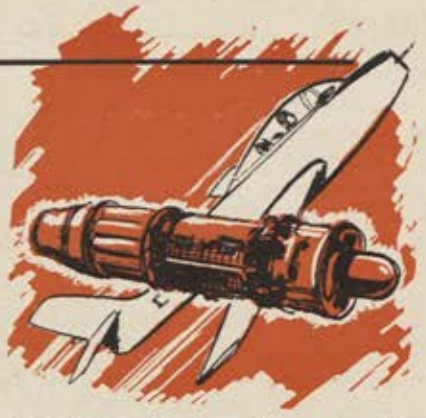
With regard to skilled employees, we have been trying to interest the managements of the airframe industry and the aircraft industry in making more journeymen mechanics, more versatile mechanics. In that direction we have been cooperating with President Eisenhower's Manpower Conference.

Just recently we conducted a conference in Washington of the Manpower Council, and we had people from all over the United States from all industries participating in this conference in the hopes of making them more conscious of the needs for highly skilled and technical employees for all industries but particularly the industries essential to our defense and to war.

I think we need much more education along those lines and while things are being done, I don't think enough is being done.—END

ENGINES

C. W. LaPierre
Vice President, General Electric Co.



WHAT WE are trying to do today has never been done before. No one can predict the future of airpower—but that's what we shall attempt to do. No one really knows—or has ever known—what can be accomplished. The ceiling is unlimited. But we would be foolish if we didn't *try* to look into the future.

While attempting, let's remember that man seems to have been created with a "built-in" snicker. Because he does not have the eyes to see into the future, he covers his shortcomings with a snicker when new ideas reach his ears. The Greeks snickered when Archimedes suggested that great feats of strength could be accomplished through the use of science.

"Give me a lever long enough and strong enough and I will move the earth!"

"But, Mr. Archimedes," they scoffed, missing the principle he was trying to prove, "where will you stand?"

More snickers when Leonardo da Vinci said, "There shall be wings. If the accomplishment be not for me, 'tis for some other."

"Stick to your brushes, Leonardo. Only the gods can fly!"

Many years later, other knowing people shook their heads at Edison. Said they, "Poor Tom. Trying to change nature's plan. Our day is done with the setting sun."

Archimedes and da Vinci are still familiar names after many centuries while their scoffers are long since forgotten. Edison with his lamp started a new industry which nowadays lights the world and powers much of it, besides. Edison's scoffers have joined the others.

We shall have to tread carefully today lest we join them too, for aviation has had its share.

The Wright Brothers weren't free of snickers when they performed their remarkably scientific experiments with wire, wood, and canvas. And their enthusiastic telegram announcing the first successful flight to their sister was somewhat abbreviated when it first appeared in the Dayton papers. It merely read, "The Wright Brothers, Wilbur and Orville, plan to return to Dayton Sunday."

The Brothers started the age of flight, but they foresaw almost none of the things that have happened since. They were not alone. After being pressured into supporting some test flights in 1908, the Army proclaimed that the only possible military application for aircraft would be to carry mail.

Aircraft engine development has been no different from the rest. After World War I, people took a dim view of combat aircraft because altitude limitations made them vulnerable to ground fire. But, a simple, obvious thing like a supercharger enabled Maj. Richard Schroeder to set an altitude record of over 33,000 feet in 1920 and the Air Force didn't get shot down after all.

In World War II, other barriers fell—such as sustained daylight bombing, in all weather, altitude, and combat conditions. Speed climbed to 450 mph, and the doubting Thomases were certain that this was the limit. Why? Simple. They had innumerable charts and absolute facts that a piston-driven propeller just wouldn't go any faster.

A few people had heard of jets, but they were considered in the realm of Never-Never Land, even though jet engines had long been a pet subject of knowing experts. Von Ohain had developed a jet engine in Germany in 1937. It was greatly improved and flown two years later at private expense because he could not get military support.

Fortunate were we that Hitler proved all too human, and it was not until too late that they began to smash our bomber formations with their ME-262s.

On the Allied side, Frank Whittle built and ran his engine before gaining government financial support of the project.

It was the Whittle engine that spurred this country to action, and the first American jets flew in a P-59 almost eleven years ago.

The life of all early jets was discouragingly short. Many British designers began to see a ceiling on thrust at around 2,000 pounds until this country's I-40 or J-33 went on test at 4,000 pounds. America had made her first major contribution in the new field and broken another imaginary barrier set up by the minds of men.

The next such barrier was set up by imagined limitations of frontal area. The scoffers said we'd reached our zenith because if you wanted more thrust, you had to keep building larger and larger compressors, causing greater and greater drag.

The answer was the axial flow compressor. It lets us pour much greater quantities of air through the engine, with greater efficiency and without increasing the frontal area. The progress of the first series of engines can be strikingly shown in terms of the speed of the planes they powered.

The first 1,400-pound thrust engines flew the P-59 at about 450 mph. The 4,000-pound J-33 engine forced the Lockheed Shooting Star to 580. The North American F-86 Sabrejet with an axial flow engine flew at over 670 mph, and the D model of the Sabre, equipped with afterburner, recently flew at over 715 mph.

Level flight for jet propulsion is now at the threshold of the sonic barrier. There was a time, of course, when our minds had surrounded this barrier with a long list of terrifying and mysterious properties. These imaginary limits have gone the way of others. What remains is a sudden increase in drag in the transonic region, which means that you can't pass this region without a large increase in thrust. New jet engines are designed to produce the extra thrust required and the supersonic era of jet propulsion is close at hand.

Until very recently many authorities honestly believed that the turbojet engine, like the piston engine, had reached its zenith. They felt that some device such as the ramjet would have to be used if man was to exceed 1,000 mph. Thanks to research and development, that fear has been proved false.

Right now industry has engines taking shape that will push a plane to Mach two or beyond.

(Continued on following page)

We know that this future depends on men, materials, and ideas. The men involved will be found in government service, in industry, and in educational institutions. The future depends to a considerable extent on how well these men work together to apply the ideas to the materials.

This meeting is primarily interested in the development of new weapons. The basic principles to be used in such weapons should be demonstrated by research and development groups in industry, government, or education. In the past, and currently, we force so many additional responsibilities on the research and development groups that they lag on their most important job, that of *demonstrating principles*. A hard-bitten designer shouldn't be expected to accept new ideas for production until they have been demonstrated in the laboratory.

Specifically, it is recommended that the demonstration of principles be competely separated from production control, appraisal, or approval and that a full-time important segment of the Air Force and industry be teamed up to try as many new things as possible. The cost of such experimental work is not great. If the objectives of each project are strictly limited to a demonstration of principles, a modest budget will go a very long way. When research groups try to solve all the ultimate production problems, large expenditures occur. Research and development should be a career in itself.

NACA is an outstanding example of a government agency which has laid the groundwork for many technical advances throughout the industry. Conversely, it would be very helpful if the production and procurement agencies could be decentralized in the same way that industry has tended for some years, so that the decisions could be made at the point where decisions are required. Much has been said in the past about accomplishing this objective but more remains to be done.

We mentioned a few minutes ago that the three elements of progress are men, materials, and ideas. We've discussed men. Let's move on to materials.

At present the industry is feverishly engaged in a multi-pronged effort to develop materials that will answer the high-temperature problems associated with supersonic propulsion.

For example, the industry is working with what might be called the "old faithfuls"—alloys that are doing a satisfactory job in our present engines. We are trying to coax more strength at high temperature out of these alloys by altering their composition or changing the design or forming methods. These well-known alloys have provided the advances in high temperatures for many years and we have good reason to believe that they can be exploited even further.

Another approach concerns the use of materials with remarkable qualities but certain limitations, such as molybdenum, tungsten, and cermets. These materials have many of the high temperature properties we seek.

C. W. LaPierre

C. W. LaPierre, 49, joined General Electric in 1924, as a member of General Engineering and Consulting Laboratory, after attending the University of Missouri. He was in charge of the Electro-Mechanical Division, 1936; won a GE award, 1937, for developing photo-electric recorder. He became general manager of GE's Gas Turbine Div., 1949, and vice president in 1953.

Great progress has been made in the use of titanium which is now being included in production engines. It has the three good characteristics of light weight, high strength, and allowable temperature.

The third element of progress is ideas, and there seems to be no limit on their number. They range from the most minute design feature to completely new engine concepts.

For example, big progress has been made in cooling, where the knack is to redirect air for cooling purposes without detracting too much from engine performance.

Also, engines are increasing in size without a corresponding increase in combustion volume. The reason is that we've learned how to burn more fuel in the same space.

Pressure ratios of compressors are increasing markedly with improved stall and efficiency characteristics.

A better understanding of the aerodynamics involved has also permitted greater air flow per frontal area.

The associated design work points the way to lower weight.

These ideas and improvements are in process today. Now let's take a far look into the airpower future.

How much thrust can we expect a jet engine to deliver? Long experience with steam turbines points toward a very high limit; a hundred thousand pounds is certainly feasible if it is needed. Of course, here again experts will raise the question of weight. But during the last few years, the controversy over the optimum weight has spread over a wide range. And in view of the other startling advances made elsewhere, it would be risky to predict that high thrust units could not find major application.

In short, whatever thrust the airframe builder wants—even enough power to drive a plane ten times as big as the B-52—the engine industry will be able to build the power plants needed.

Plenty of questions have already been asked about fuel consumption. Fuel consumption is relative. What really counts is, "What is fuel worth in terms of business profits or—more important—in terms of national defense?"

For example, a modern transport uses a far greater amount of a more costly fuel than a diesel locomotive. But the air transport still is capturing an ever-increasing percent of the passenger volume. Speed in itself is of great value. An airplane, for instance, at twice the speed could carry twice as many passengers between given points.

The implications to national defense are plain. A relatively small, high-speed transport group might well be the cheapest way of protecting remote areas. Think of the deterrent to aggression this mobility would provide—with a major striking force ready to move into any danger area in a few hours. This method is in sharp contrast to the practice of using a vastly larger force thinly distributed around the world.

The Air Force Association policy

'No one can predict a limit to future jets'

statement on this subject is very gratifying as are the remarks that have preceded me.

Future jet engines are basic to this concept. Their value is not measured in fuel consumption alone. But this does not mean that fuel consumption has reached an impasse. Fuel consumption has been cut in half during the first ten years of jet history. Each basically new jet engine shows further substantial gain. No one can predict a limit.

Nuclear fuel is being investigated. The problems appear formidable—but don't they always?

To summarize the cost picture, let's mention that there is a tendency to compare present aircraft with World War II vintages, and on the surface, it appears that we are paying exorbitant prices. But let's take a closer look. Today's engines are giving us more thrust, more horsepower per dollar. Today's aircraft are giving us more speed, higher altitudes, and more striking power per dollar. This coupled with the fact that we are rapidly learning better and faster manufacturing methods paints a promising cost picture for engines.

What will be the over-all results of constantly improving engines? Speaking for the aircraft engine builders, I can confidently say: We can go almost any place you choose. If there is one thing the past eleven years have taught us, it is not to put limits on the engineering miracles that can be accomplished.

We can and will smash barriers as they are dreamed up. If flight at twice or three times the speed of sound is what is needed, we will have it. If altitudes of over 100,000 feet are deemed necessary, we will have them. If vertical take-off is the thing, we will make our planes take off vertically. If it is required that passenger transports roll only a few hundred feet after landing, that will be accomplished.

No doubt we shall hear snickers.

May I summarize? First we have never been able to predict what will happen in aviation. We have consistently erected mental barriers to progress which our engineers have circumvented with great ingenuity and effort. They have always pushed to undreamed-of performance.

Second, this forward push would be expedited if important segments of the Air Force and industry were freed of production participation and dedicated to the uncovering in Government, industrial, and educational laboratories the new technical principles on which this forward push depends. The demonstration of such new principles is the one outstanding contribution that research and development agencies can make to production. Such new principles will be incorporated freely in major production after they have been demonstrated.

Finally, the tremendous thrust and other potentials of turbine aircraft engines dictate a raising of our sights for airpower. We must carve out for airpower an undisputed place of economic defense for world-wide areas through the mobility and concentrations which only airpower can give. No doubt we shall hear snickers.

But, as Henry David Thoreau said, "Man's capacities have never been measured; nor are we to judge of what he can do by any precedents; so little has been tried."—END

COMPONENTS

J. C. Garrett
President, The Garrett Corporation

IT IS BOTH a privilege and a problem to speak for the component manufacturers before this Association today—a privilege because of the size of the component industry and its mushrooming importance in our weapons system—a problem because of the difficulty of defining what is or is not a component, and the overwhelming complexity of the subject.

For the purpose of this paper, components may be defined as follows: They are generally highly technical products which are fundamental, functioning parts of the airplane, electronic equipment, engine, or missile. They are designed by the component manufacturer and sold as completed articles to the airframe, electronic, or engine manufacturer to meet certain specific problems and conditions in his airplane, missile, or engine. They are also sold to the Government to be furnished as Government-furnished equipment to these manufacturers.

When Orville Wright made his first powered flight fifty years ago this December he used only five components—a stop watch, a veeder counter, an anemometer, a magneto, and a radiator. Fifteen years later components comprised about ten percent to fifteen percent of the cost of the finished airplane in World War I. Today a conservative estimate of the cost of the components in a modern jet fighter would be approximately fifty to sixty percent of that fighter's cost, less engines and radar equipment. If we were to include radar and guidance equipment the total would easily exceed the cost of the airframe.

Statistical figures on the component industry are most difficult to obtain, inasmuch as the component manufacturer furnishes equipment to many different sources. A conservative estimate of the number of component manufacturers serving our aircraft industry today would be approximately 1,600 to 1,800. One major aircraft manufacturer lists 1,200; another over 2,000. I would estimate that approximately 600,000 people are employed in the component industry today.

During the past year there has been much thought and considerable debate on the subject of components and their practical value in modern aircraft. One school claims that they overload and complicate our airplanes intolerably; the other that the fine combat record of our military aircraft—about eighteen to one in favor of the Sabre over the MIG—is

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directly attributable to the numerous components which they carry.

As usual the truth lies between the two extreme views, but it is an indisputable fact that a large proportion of the components carried are absolutely essential to successful operation. Even at present combat speeds and altitudes pressurization and air conditioning are vital to the pilot's very existence. Progressing from Mach one to Mach two and from 40,000 feet to 80,000 feet multiplies the problems all out of proportion to the simple speed and altitude increase.

We have already reached speeds in our fighters that far exceed the range of human perception and reaction time. I would be the last one to recommend the use of non-essential components which would increase the cost or weight of any of our aircraft or missiles, and I can assure you that the component industry is striving valiantly to find simpler solutions to the problems of higher and faster flight. Certainly you will agree that when a force of over 18,000 pounds is required to move the flying tail on an F-84, no pilot alone can do this job manually. It is thus necessary that a mechanical boost be used to handle this load.

Let's take a fighter of today and see what components we can take out and analyze whether or not some of the complexity is necessary. In World War II a high speed pull-out on a Mustang fighter required approximately a pull of 200 pounds on the stick. The same pull-out at high speed in a Sabrejet without a boost system would require the pilot to exert a pull of approximately five tons. Certainly there is no question about the fact that the pilot of today is approaching the status of a superman, but I still do not believe that he is capable of exerting five tons of pull on the control stick.

The only serious temperature problem experienced in World War II was that of keeping the pilot warm at altitude. Today in the modern fighter the big problem is heat. This heat barrier may be man's biggest single problem in his never-tiring efforts to fly higher and faster.

For example, if we should take a hypothetical turbojet-powered fighter flying at an altitude of 60,000 feet at 1,500 mph we would find an outside air temperature on a normal day of approximately minus 67 degrees Fahrenheit. When we add the heat load of all the electrical equipment in the cockpit such as radar, and so forth, we have a cockpit temperature of at least plus 500 degrees Fahrenheit, without some form of refrigeration. If we should get up to Mach three at this altitude we would require about six tons of cooling air per hour plus a cooling system equivalent to fifty household refrigeration units to keep the cockpit livable.

As we analyze these problems we can see that we are rapidly reaching the last frontiers of manned flight for fighters, and possibly bombers. I personally have been tremendously impressed with the sincerity and untiring energy of the armed forces and industry in tackling jointly these most difficult problems. Certainly you can take out a number of components in some aircraft and missiles, but in many cases you will find that you have reduced the utility of the aircraft. If our military planners feel they want a special-purpose fighter or interceptor there is no doubt that it can be built a great deal lighter than some of our current models. However, I believe we should recognize that we are not eliminating a lot of non-essential gadgets. We are merely changing the requirement of that aircraft or missile and the same components may have to be installed in some other aircraft to do the job.

It is true that a certain type of component can be left on the ground at some sacrifice in over-all weapon mobility. It is thus eliminated from the airplane but not from the weapons system. Auxiliary electrical sources—starting equipment, even including the starter itself and similar elements all essential to effective operation, can be packaged for ground use only.

Certainly a component manufacturer is out of place in debating the merits of what is required in the fighter, bomber, or missile of today. However, we are convinced that whatever the mission may be, there will be an increasing demand for lighter, more compact and more reliable components to take over where man leaves off.

This never-ending chase for lighter, simpler, and better components reminds me of the little old lady who was traveling to the Pacific Coast by railroad heading toward Utah, and as the train kept rolling along, she reminded the conductor to tell her when they got to Utah. Finally after the third reminder, the conductor got curious and said, "Well, lady, I will be happy to tell you when we get to Ogden, Utah, but why do you want to know when we get there?"

She said, "I want to see a Mormon."

J. C. Garrett

J. C. (Cliff) Garrett, 45, is president and general manager of the Garrett Corp., makers of more than 800 aircraft components. Born in Seattle, Wash., he attended University of California at Los Angeles. In 1928 he joined Lockheed, leaving in 1929 to join John K. Northrop, where he was in charge of procurement and production. He left that company in 1936 to form the Garrett Corp.

He said, "That's easy. I'm a Mormon."

She said, "How many wives do you have?"

He said, "Oh, I only have one."

He could see that she was very much disappointed at that, so he quickly added, "But my grandfather had eight."

She said, "How did he get along with eight wives?"

The conductor said, "He had a house on the top of the hill and then built eight houses around the foot of the hill. He had a young boy to chase around and bring a wife up whenever he desired."

The lady said, "The poor man, he must have died young."

The conductor said, "No, quite on the contrary, he lived to be over 100. The boy died in his twenties. My grandfather often said that it was the chasing and not the getting that was hard on a man."

At the risk of boring you, I would like to revert for a moment to a theme ably presented before this Association last year by Mr. Malcolm P. Ferguson, President of the Bendix Aviation Corporation—namely, that of standardization. The present trends are frankly frightening to those of us most deeply concerned with supply-

ing the aircraft industry's needs for specialized components.

At our own AiResearch plant we are building over 850 different models of components for use on airplanes and missiles today. Of this 850 we are in production on over 250 types of electric actuators alone. We are also in production on over 350 different models of air valves and regulators. We have in production over forty-five different types of cooling systems.

The last count that was made by our sales department of competitors in all our fields totaled over 148. When you add the equipment produced by our competitors to our total, you can well imagine the staggering spare parts problem this poses. The logistic problem, of course, is horrible, and the cost problem is staggering. Remember also that each new model requires separate development and engineering and separate testing even before it goes into production.

Our average cost for developing and qualifying a new model of hot air valve today—and incidentally, some of them are being required to operate at temperatures around 1,000 degrees Fahrenheit—is approximately $30,000 to $40,000. It costs us over $100,000 to develop and qualify a new cooling turbine.

After careful consideration and due allowance for the necessary complexity of the modern weapon, I am still convinced that a conservative estimate of possible reduction in numbers of types would be one-third. I hesitate to guess the hundreds of millions of dollars and vital production man-hours that thus could be saved in an all-out emergency. I hope some of the industrial and military leaders in my audience will be sufficiently impressed by our problem to take some steps toward a solution.

Our theme today is "The Airpower Future" and this leaves me no alternative but to crawl out on a limb along with many sadder and wiser prognosticators of the past. The best brains of our company have differing views on this subject, and I must hasten to disqualify myself as a technical expert, I can testify, however, to the increasingly vital part the component manufacturer must play in the airpower future and the mushrooming complexity of the problems he must solve.

I believe that we are rapidly approaching the last frontier of manned flight for certain military missions.

As we exceed speeds of Mach three and altitudes of 70,000 to 90,000 feet, a whole new approach to the cooling and pressurization problem may be necessary both for the equipment and the pilot—if he is still aboard.

It may be that smaller, pressurized, hermetically sealed compartments will become increasingly attractive. We may find that a stored coolant may be advantageous for flights of short duration. The use of expendable refrigerants such as water or the use of vapor cycle systems may be extremely attractive in the future.

I believe we can look forward to solving some of our heat problems in the future with a small component which has no moving parts whatsoever and requires no outside energy source other than inlet air under pressure. Our own research on this item has shown that as we introduce plus 100 degrees Fahrenheit air into it we get minus thirty-eight degrees Fahrenheit air out one end and plus 160 degrees Fahrenheit air out of the other end.

Insofar as passenger and cargo transports are elements of future airpower, there is no reason to expect radical departures from present trends in pressurization, air conditioning, and auxiliary power. The radical changes in thinking seem most closely associated with the delivery of a warhead or the interception thereof.

I believe we can look forward to considerable simplification in flight instruments, and this trend has already started with such items as the Sperry zero reader, the Bendix flight path indicator, and the Collins integrated flight indicator, and others. I believe the trend in this development will be accelerated tremendously in the period ahead and will relieve the pilot of many of his problems.

You will find three or four instruments combined into one which will compute and give the pilot his final answer automatically. We can look for an automatic pilot that will do just about everything but think for us, and if we give it the problem it will do that also. Certainly navigational equipment will be available before long which will visually pinpoint the pilot along his route and keep him informed at all times exactly where he is, with no computing or complicated mental calculations by the pilot.

It is obvious that we are rapidly approaching a time when flight control into heavy traffic centers such as New York, Chicago, Washington, et cetera, will be handled by automatic computers. It is also quite probable that we shall see components which will make it possible to control and route traffic automatically much more accurately than man would be able to do. Complete approaches fully automatically controlled from the ground will be quite commonplace, with the pilot merely monitoring the course.

Great strides have been made within the past few years in the miniaturization, operating efficiency, and durability of many components. The efficiency of fans used in aircraft cooling systems alone has increased from thirty percent to ninety percent in the past seven years. The cabin pressure regulators of World War II weighed ten pounds. The cabin pressure regulator of today does that same job under much more severe operating conditions at a weight of only one pound. It operates with three times the accuracy, and costs one-fourth what the World War II regulator cost.

Refrigeration systems have increased 700 percent in capacity per pound of weight in a few hectic years. Ram air turbines for emergency power supply for jet aircraft control systems weigh only one-tenth as much as the emergency systems of four years ago. Certainly we can look forward to the continuation of these healthy trends.

A whole new art and science of auxiliary power transmission and supply has been developed since 1946. We find the so-called low pressure pneumatic power transmission system becoming more and more attractive, and I believe it will be increasingly used in the future at least up to altitudes of 75,000 feet. In this system we have air turbine drives, starters, and gas turbine drives weighing as little as one-fifth pound per horsepower, and in some cases even less.

I believe we can look forward with anticipation to very reliable and safe operation of all component turbo machinery, even at speeds exceeding 100,000 revolutions per minute, with overhaul periods of 1,500 to 2,000 hours for units at these speeds. Our own company has expansion cooling turbines in operation on commercial airlines which rotate at cruising speeds of approximately 19,000 revolutions per minute, with an overhaul period of 6,000 hours. This type of service is one result of the more than 2¼ million development hours and over twenty-seven million service hours which our company alone has experienced in this field.

In closing I should like to make a plea that the component industry be given the planning and consideration in the future airpower program that

(Continued on following page)

its size and importance deserve. Certainly it is one of the most competitive and highly specialized segments of our industry, and it represents in the future airpower strength of this country one of the greatest reservoirs of specialized skills and know-how that we have.

Let us not adopt any system of procurement or planning that will injure or deter the initiative or competitive spirit of this industry. Let us give due recognition to the patent and reproduction rights of those manufacturers who have developed their products with their own research money.

Let us recognize that with this great increase in the number of manufacturers who have entered the component field—many for the first time—that there will be lapses in performance.

These lapses are relatively few compared to the accomplishments. There is such a thing as false competitive evaluation, and we should continue to encourage those whose performance and reliability in engineering and production have contributed so much to the aircraft program.

We are facing a future in the building of our airpower where the component will play an increasingly important role, and I am sure it will not fail you. May I wish success to this great Association and to the principles for which it stands and to each and every one of you clear skies, tail winds, and happy landings —and I am sure that if the skies should be cloudy you will find that a little component from our industry will bring you in to a safe landing. —END

Department of the Air Force

The Hon. Roger Lewis
Assistant Secretary of the Air Force

UNLIKE President Eisenhower at the Quantico conference, and you may have heard this story, it is kind of amusing, he wrote a speech during one of the discussions in the morning, and at lunchtime when he looked for his speech he didn't have it, but he went on from there to make what was certainly the finest talk I ever heard him make, and something that was an inspiration to all the people who were there.

My situation is a little different today because I have two speeches. Being a little bit new at this business, I roughed up my ideas and put them on a piece of paper, and then I proceeded to get helped. By the time I finally got the printed piece back I couldn't really understand it.

So this morning I have been grappling with my thoughts that I would like to talk out with you here, and I have a whole new speech. Here it is.

I want to talk about the problems that we face in the Air Force some time ahead. I am going to talk about the general problems, the money and to some extent the political problems.

There are some things that strike the newcomer like myself to Washington and to the Air Force hard, and I think it is worth something to get them out and talk about them here with you all who are interested in airpower. There are two general things I would like to say which don't have much to do with the Air Force program.

The first is that I would like to say the joy that you get from working with military people and the satisfaction that you have in working with people who are dedicated, intelligent, imaginative, far-sighted, and above all, loyal and patriotic citizens of this country, and the experience is something that every citizen should have.

I think the Board of Directors of the Air Force Association is the finest single group of men I have seen anywhere. I feel highly honored and enjoy my association with them.

The other general thought that I would like to express is what seems to me a very, very great responsibility of the Air Force Association. The colossal fact of our generation is the coincidence of the development of atomic weapons and long-range airplanes. It has been said so many times it is trite, but it is something we have to keep saying again and again.

A single man in a single airplane with a single bomb can go anywhere in the world now and be infinitely destructive. It has posed a whole set of problems to the country which are only now being understood at the professional level and which, while sensed in the civilian population, haven't been fully rationalized.

The public understands this threat, and they have demonstrated that by their very generous appropriation of funds in the past, but I don't think the public really understands the full implication of airpower. They don't understand that it has to be balanced and it has to be hooked into the national economy in a way that we can afford it and that it is not a matter of men or airplanes alone; it is a matter of research and development, a great industrial structure, and many, many things of a highly complicated nature.

I think it is a great responsibility that each of you men, now civilians, has. Each of you is emerging as a leader in your community and it is essential that you carry the message and the rationalization of this enormous thing that has happened to us in the last generation across the land into every social and economic level.

My discussion of some of the problems that we face wouldn't be complete without a little inventory of where we stand. As you all know, as every school boy knows, we let the place fall apart at the end of the war, and then in December 1950, we madly scrambled to rearm and deal with an immediate threat.

The mobilization program that we embarked on was a wartime mobilization. We tried to do it with the guns and butter psychology, and I think it is a miracle of American ingenuity and production that we were able to accomplish both of those things simultaneously as well as we did and in the time that we did.

And today, about three years after the start of this program, we can breathe a little bit easier. Our industrial structure is tooled up; we have good airplanes now coming off the

(Continued on page 44)

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lines at very near maximum production rates. The inventory is filling up, and we are replacing older airplanes with new airplanes. We are getting the airplanes that we were a little adventurous about.

In other words, the airplanes that we plunged into production on before they were fully ready and the engines that we plunged into before they were fully ready; those vital components are now getting in good working order, and the materiel is coming off the line and is plentiful, and it is good.

That is fine, but we have to get down and face the fact that this is a turning point in the industry and in the growth of the Air Force just as important as the start of the build-up following Korea.

The Hon. Roger Lewis

Roger Lewis, 41, was born in California, graduated from Stanford University in 1934, and went to work for Lockheed. During WW II he was the company's director of material; from 1945-47 its assistant general sales manager. He joined Canadair Ltd. in 1947, Curtiss-Wright in 1950 as director of sales activities in all divisions, and became Assistant Secretary of the Air Force in April of this year.

We have with us the old faithful problems of making certain that we have a balanced Air Force; that we have the right number of fighters and the right number of bombers and that we operate in the same regimes; that we have the spare parts and the handling equipment and the logistics and all the other things that make the Air Force an effective weapon.

Now we have some work to do on that front and a great deal of work has been done and a great deal of work is being done. We are going back over things, weeding out some of the things that have marginal usefulness or cost too much or are inappropriate to the way things finally worked out, and we are stripping down to the bone and muscle and fighting weight.

The effort is going to go on and on, and we are going to see more airpower and at a lower cost as a result.

The other old faithful is the problem of qualitative superiority. But I am interested in the problem of how you keep this research even and intense. We all saw what happened between the wars from about 1945 to 1949. The Air Force wasn't able to buy a single new experimental airplane. The sources of funds shriveled up. The engineering and technical communities on which we must live because, in addition to the direct appropriations we make for research, we use the great resources of the country, the NACA, the Atomic Energy Commission, the universities.

We use these same facilities with our friendly allies, the Canadians, the British, and so forth. When you aren't embarked on a program, or you are on a stop-and-start basis, these sources of information and technical knowledge shrivel up and something is lost. We had a close call as the result of the gap between the wars, but we had time, and we were able with a great deal of effort to get the research activity and the production engineering actively up where it belongs, and we are rolling along.

We are not where we would like to be, but we are all right.

Now the problem that we have to get across to the country, to the Congress, and this is where you fellows have a job, we simply must think far ahead and program and finance and tie the whole thing into our production and our operating concepts so that as technical knowledge becomes available the Air Force gets it and can apply it.

You know, this business of technical superiority isn't like building a Chevrolet, or it isn't like running a race or something like that. When you go to war there are only two of you. If you are second, you lose; you get licked. We have to simply develop a system here where we are technically and qualitatively on top at all times. That is going to take a lot of thought, a lot of planning, and a lot of understanding because this is a complicated business, hard for people to understand.

The third fundamental we have to work on is our industrial posture. In each of the preceding emergencies, and there have been three, the United States was fortunate to have time and distance working for it. In each case the industrial resources of the United States finally returned to balance, but they were only able to come into play as a result of early years of war having been fought a long way from our shores. We know that isn't going to happen next time. The next war is going to start right here. We have to build and maintain an industrial structure that, like our Air Force, is ready for push-button war.

No longer can we let plants go back, depreciate, and deteriorate. No longer can we let fine engineering and manufacturing pools of know-how dry up and go into other things. We have to find some way to preserve at some cost something that would be disastrous or at least very, very expensive not to have.

Now this brings me down really to what I think is the important thing, the important new thing, for everybody to understand. We are building to 143-wing strength. Just to get you straight on the numbers, we have the combat airplanes and materiel coming along for 143 wings, and we are planning the manpower and other things for 120.

After the Joint Chiefs of Staff have selected the proper role for the Air Force and the number is determined, we can then jump either way because manpower is a little easier to get than materiel. So we are ready, and that is coming. But it was always planned that after we had the build-up there would be something lower as a maintenance rate.

Now in order to get to that 143 wings, we are presently planning on a production rate, monthly production rate, of about 800 airplanes. The maintenance, re-equipping rate is going to be on the order of 300 or 350 a month, and that is going to come in about two or three years. It will begin to show up in the parts making and in the planning and in the financing and other things very quickly. It is very important that all of us see this, understand that we are very close to the peak, and we have now to think of the back side of the mountain and the floor of the valley, and we have to be sure that the precipice is not too steep and the floor is not too low.

Today is the day that we must start to plan and think and do something about that.

(Continued on page 49)

MY COUNTRY, 'TIS OF THEE

SWEET LAND OF LIBERTY . . . .

Home of the ice cream cone . . . the hamburger on a roll . . .

and one's preference right off the ice . . . yours by the spending of just those few American pennies, which in vast areas of our world today are the grim exchange for mere existence.

For only in this country . . . where government of . . . by . . . and for the people . .

is perpetuated solely thru the will of the people . . . are these simple habits . . . and a thousand similar pleasures of a free and independent land . . . just around the corner.

This is America . . . Let's preserve it!

Character is the vital measure of a nation's strength and stability . . . and as with the state, so it is with those who contribute to its maintenance and safety. ➢ By 1927 American aviation had begun to fulfill the promise of its ultimate stature in defense, transportation and business utility. ➢ Air Associates, comprised of research and development, manufacturing and marketing, was founded in answer to those needs. ➢ Today, the character of our organization is the motivating force which makes available the finest aviation products the world has ever known.

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NUMBER ONE IN A PATRIOTIC SERIES • REPRINTS ON REQUEST

1. Point of departure: USAF Narsarssuak Air Base of 51st Air Rescue Squadron. 2. Fjord on which the Grumman SA-16 landed and broke through the ice, then made a spectacular take-off. 3. Frozen Tasuissaq Fjord, Egedesminde, where the sick school teacher and her daughter were taken aboard. 4. Crew discovered the nose wheel was jammed with ice and would not lower even though a hole was chopped in the deck plate above the nose gear and ice chunks removed. 5. Water landing at Grondal where boat stood by in case plane sank. 6. Returning to base for wheel landing on runway.

To Make an Arctic Rescue, They Flew a Grumman Albatross From . . . . . .

A layer of clouds over Egedesminde forced the crew to rely completely on their APS-31 radar. Pinpointing the village on the radar scope, they made an instrument let-down through the undercast. They then had to find a fjord not marked on their maps.

The school teacher, suffering from a spinal disease that made evacuation by dog sled impossible, was carried to the plane by Danish Police. At the request of the villagers, the teacher's tubercular daughter was also taken aboard to be flown to a hospital.

When unable to lower their nose wheel due to ice, the Grumman SA-16 was brought into a sheltered bay for a water landing. Unable to tell if their icebreaking run had damaged the hull, a boat stood by in case the plane leaked. The landing proved her still watertight.

To the seven men flying up Greenland's west coast, it was a flight of mercy. They were to land their Grumman SA-16 triphibian on a frozen fjord above the Arctic Circle, and fly out a school teacher.

They flew for six hours. It was February, and the weather bad. When they pinpointed the village of Egedesminde by radar, they had to let-down through the clouds, then find an unmapped fjord.

Seeing people on one fjord, they made a landing pass and took off again. The ice felt solid, so they decided to land. But as the ski touched down, and the plane slowed, they felt her sink. The pilot rammed the throttles forward.

"Up ski!"

Engines screamed as she floundered, but the props pulled her up on the ice. Then it broke and her nose ploughed, pushing aside thick cakes. She porpoised for a mile, cutting a swath like an icebreaker, before mushing into the air.

Then Egedesminde radio came on the air and directed them to the right fjord. The landing was routine, and the patients were taken aboard.

Back in the air, they discovered the nose wheel was jammed in the full-up position. When the emergency systems failed, their base radioed: *Make a water landing near Grondal and beach if hull leaks.*

They landed and were surprised to find her watertight. Also the landing loosened the nose wheel, so they took off again for their base at Narsarssuak.

The Grumman SA-16 Albatross, originally designed for the U. S. Navy, was chosen by the Air Force as their standard long range rescue amphibian. As such, it has saved more than 900 men in Korea. Then Grumman ingenuity wedded a retractable ski to the keel and created the first *triphibian* able to fly off ice and snow as well as land and water.

This heroic rescue is but one of many made by the Air Rescue Service of USAF.

GRUMMAN AIRCRAFT ENGINEERING CORPORATION • BETHPAGE • LONG ISLAND • NEW YORK

DESIGNERS AND BUILDERS ALSO OF THE PANTHER AND COUGAR JET FIGHTERS, AND THE S2F-1 SUB-KILLER

Missile with a "one track mind" ...Bomber Defense

Defensive guided missiles launched from supersonic aircraft will depend upon electronic marvels that come as close to simulating human intelligence as any mechanism ever devised. Important functions of these "weapons of the future" are typical of those entrusted to systems made by Arma Corporation.

Complex electronic and electro-mechanical controls from Arma are an integral part of many of America's most advanced weapons. In basic research, design, development and manufacture, Arma Corporation has worked in close cooperation with the Armed Forces since 1918—and more recently, the Atomic Energy Commission. *Arma Corporation, Brooklyn, N. Y.; Mineola, N. Y. Subsidiary of American Bosch Corporation.*

ARMA ADVANCED ELECTRONICS FOR CONTROL

Now we have started to do some things in the Air Force, and I think each manufacturer, each accessory builder, everybody essential to this industry, has to begin planning and thinking to do the same things because as we shrink back we have to be sure we preserve the right things. We can't be happenstance and foolish; we have to preserve the right things.

Now some of the things that we are doing first off are in the field of research and development. The Secretary's office is organized differently now than it has been in the past, and Mr. Talbott has a special assistant, Mr. Trevor Gardner, responsible for keeping him informed and monitoring our research and development programs.

Trevor Gardner has had a long career in this technology, and he is going to be a great asset to all of us, and he is going to help us keep straight on this very fundamental job. In the staff itself and in the commands, as you all know, we have a Deputy Chief of Staff for research and development, General Craigie, who has devoted his life to it, and we have a command under General Putt, which is specifically charged with responsibility for research and development.

They answer to the Chief of Staff and are responsible for proper recognition of reports of research and development in the Air Force. They are busy now trying to bridge this technological peak and valley problem.

Now in the production front we can do some things. One of the things that we can do is to bring in new types a little slower. At the start of the Korean difficulties we had to do a little gambling, and we did it, and it paid off, but it was expensive, terribly expensive. We have a little time, and we will be sure of our engines and airplanes before we put them into production. We can always change that policy if the situation requires, but in the interests of prudence and economy we are going to do that, and we have done that in a couple of cases already.

Another thing that we have done is that we have actually pulled out of the Air Force program some things which were very desirable; maybe they will prove to be necessary, but they did seem to be expensive things which did not add materially to our fighting strength and for which we could better use the money somewhere else.

As an example of that, I think the action we took on the heavy press program is good. We had quite a problem with that one, but it was certainly the right thing to do. The press structure was too big, was going to cost much too much money for any conceivable use, and it was better to measure up to the problem and cut it to size before any more money was spent.

The Air Force believes fervently in having presses, and they are certainly going to find a useful place in our program as we go down the road; but they were too big, too many of them, and we didn't know enough about them to warrant the size of the expenditure we made.

The cancellation of the T-36 airplane was another thing. That was a very painful thing to do because it upset two of our finest manufacturing companies, but we found ourselves where we had an airplane coming down the production lines which was costing us more than we thought it would. It filled a fairly narrow place in our over-all program, and by making do we felt we could do the same job with the airplanes we had that we could get for less money, so that seemed to be the sensible thing to do.

It was painful, but we felt it was better to step up and face the pain of surgery than to suffer along with something that would just drain our resources which could be used on something else.

We have also gone into being more businesslike about some things. In the build-up in the guns and butter era, we had no choice; we had to have the materiel, and we had to pay whatever was asked for it. That is a tough sentence, and I know the many implications it has, but it is a fact that we were so desperate and the country was unwilling to make the decision between guns and butter, so we tried to do them both, and the military paid the bill. That situation is changing a little bit. Things are a little easier around, and we are able to get our materiel for more reasonable prices.

In the case of the C-119 at Willow Run is an example of what has been done there. For many good reasons, late start, crash basis of operation, and so forth, the airplane was costing several times what we could buy the same airplane for from another manufacturer.

Under those circumstances where we could cancel out and still save a little money by ordering airplanes some other place, we felt that it was our responsibility to the taxpayers to do it. We are going to continue to do this kind of thing. We are going to measure, and if it doesn't fit and is costing too much and we can get it some place else, we will act as you fellows would in the conduct of your own business.

Another thing is the industrial structure. We have been rocking along here with broad mobilization base, and it costs a lot of money to buy things at three or four places simultaneously. We always have to have a couple of places, competition, but where it is too unproductive we have to do something about it.

So to sum up, we are at another corner, another milestone of the Air Force. Historically, when we have been faced with the problem, we have not done well. We are a boom or bust crowd, win the war and throw the peace away. The Secretary of the Air Force, Mr. Talbott, Under Secretary Mr. Douglas, the Chief, Deputy Chief, are all determined that we are not going to let this sort of thing infiltrate into the Air Force. We are going to get around this corner and do the sensible thing, and we will start on it today.

We would like to have your help and cooperation and suggestions. Above all, we would like to have you carry the gospel out that airpower is not a simple unit concept; it is something that requires study and imagination to understand, but it is very, very important.

QUESTION: Mr. Secretary, I would like to ask you, you probably know more about the strategic concept of the narrow base against the broad base for the safety of the country. If you go to a narrow base and have one producer and the enemy knows about it, he can bomb it like we try to do them. What about the security of the country?

MR. LEWIS: That is a very good question, and I am glad you asked it. In the first place, we are not talking about a broad versus narrow base. We are talking about two broad bases. The broad base concept started in 1950 when the then Secretary of Defense, General Marshall, wrote a letter.

There was a direction to get a fast build-up and at the same time avoid a shock to the economy; that you would have an extraordinarily wide base. Now the other thing that is important to remember is that the broad base concept was dedicated

(Continued on following page)

toward a later doubling of production when we were thinking of a low wing strength. In other words, ninety-five wings at the time. History sort of ran out on that one. Guns and butter took over, and we began to think about 143 wings. So we ended up having two or three sources and two or three times as much as we needed, and we are trying to get back to something rational. We are trying to have at least two of everything and have it separated over the country. We are going to try to have everybody working with us either with a dual plant or otherwise so that they can make a contribution.

QUESTION: Mr. Secretary, what is the Air Force policy toward the acquisition of civil airports? The Air Force has been accused of going in and high-pressuring city fathers to provide airports for their use, and also they have been accused of running over the civil aircraft operators, running them off the field. What is the country's policy in that regard?

MR. LEWIS: You have to go back a little bit and look at the history. Of course, the whole airport situation is very tough all over the country. In many cases the airports that we have in municipalities were financed during the war by the Air Force, and these airports—I have to use words, loose words, like "many cases"—but in many cases, these airports were given to a municipality with recapture clauses.

The struggle comes because with a recapture clause on an airport, the municipality has difficulty in financing improvements of the airport. On the other side, the Air Force has a list of airports which are important to its mobilization plans and which under the Joint Chiefs' direction we cannot relinquish, and this creates an area of friction.

The airport development cannot take place, which is desirable from the Air Force point of view, as well as ours, because of the financing problem brought about as a result of the recapture. On the other hand, the Air Force must retain the right to those airports in case we go to war. It is an area of considerable friction and one that we are getting set to work out as best we can on an airport-to-airport individual problem basis.

I don't see an easy answer to that problem.

QUESTION: Mr. Secretary, your emphasis on long-range planning is very gratifying, but we all know that the basic problem is not in the Pentagon but in the Congress. There is very little which the Pentagon can do to introduce some long-range planning when a program of the magnitude of our defense program is overhauled each year.

People in the Pentagon kill themselves to put together a budget, which they know is inadequate, to the Congress, and the Congress then sometimes either makes an honest attempt and does a fair job, or does a job which leaves one occasionally ashamed of some of the aspects of democratic government. Is there anybody giving any serious thought to putting the budget cycle on a two-year basis so that a really competent job can be done?

MR. LEWIS: I will answer your last question first. I am a nuts-and-bolts man, and don't know much about the budget process, but I haven't heard anything about the two-year cycle. I think this can be said to you: that my limited and brief experience with the Congress has been that when you got down to it and when they finally got to understand what you were talking about, they were just as reasonable as any of us. It is a problem of understanding and salesmanship, and that is really what I am addressing my remarks to you fellows in this room for, because I think this answer lies with you on a community basis.

The public understands the threat; the public understands the capacity. The public is willing to give the money, but the case does not always hang well. There is a gap between the high-blown idea and the practical working out of so many pairs of this and so many gross of that. Democracies move slowly; they understand slowly; that is their strength, and sometimes it is a weakness.

It is a thing that really has to be attacked not at the Congressional level but at the public level, and you fellows have to help to do it.—END

AIRFRAMES

J. L. Atwood
President, North American Aviation, Inc.

I GREATLY appreciate the invitation to participate in this symposium. I want to tell you something about the technical progress made in recent years and touch on some of the problems that lie ahead. First, however, a few facts about the industry.

At present we are operating at the highest volume since 1945. The airframe manufacturing industry employs about 425,000 today, as compared with 937,000 in 1943 at the peak of the World War II effort, and as compared with 137,000 in 1948 at our postwar low point. In terms of output, I believe it would be correct to say that most companies have reached or are approaching the maximum monthly rates scheduled under the orders placed during the Korean war.

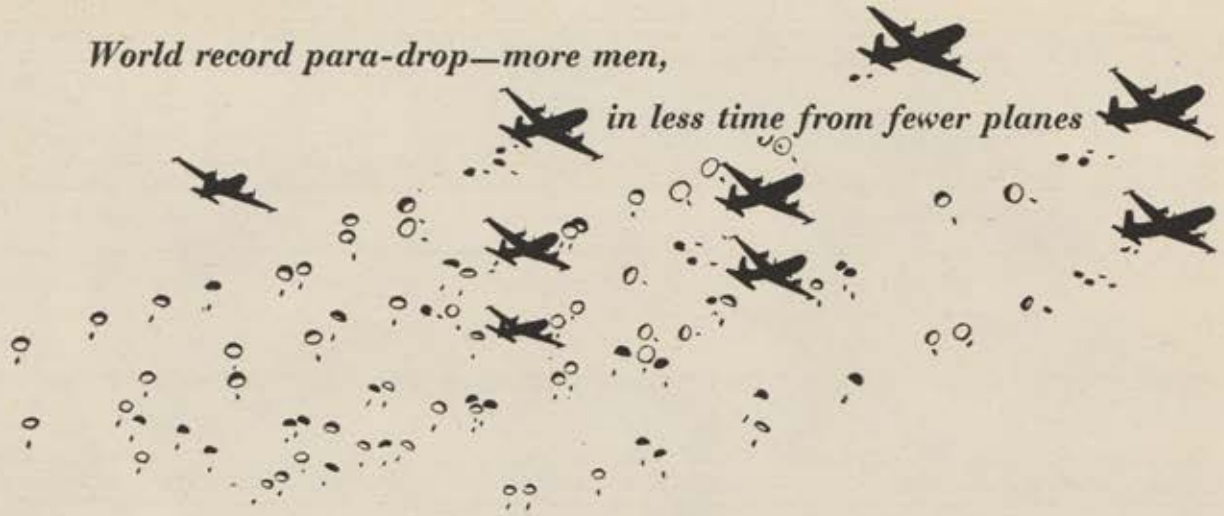
Barring a major change in requirements, either upward or downward, we can anticipate a gradual reduction in production work force as the natural result of progression in experience and efficiency. Later, of course, we can expect a reduction in production schedules as the Air Force and Navy approach their respective programmed strength.

Unless you are directly associated with aircraft production, and I know that many of you are, it may be difficult to realize how large a segment of American industry is engaged in the aircraft program. The airframe manufacturing industry, which has the conspicuous responsibility of designing the end product and putting together all the pieces,

(Continued on page 53)

World record para-drop—more men,

in less time from fewer planes



with the—Douglas C-124 Globemaster

Nine Douglas C-124 Globemasters of the 18th Air Force, 62nd Group, 7th Squadron, cruised above Fort Bragg. Seconds later, more than a thousand paratroopers had hit the silk... were floating down on the drop zone.

For this record-breaking drop, Globemaster—the Air Force's largest operational transport plane—was a logical choice. Clamshell doors, located in the nose, make loading of troops or matériel fast and easy. Load space is two stories high... gross weight at take-off, 87½ tons. A single Globemaster can transport 200 armed troops across the Atlantic—deliver 25-ton loads of tanks, cranes, loaded trucks to fill immediate needs at bases anywhere in the world.

Performance of the C-124 Globemaster is another example of Douglas leadership in aviation. Planes that can be produced in quantity to fly *faster and farther with a bigger payload* is a basic rule of Douglas design.

Enlist to fly in the U. S. Air Force

Depend on *DOUGLAS* **First in Aviation**

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FIRST
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Builders of the F-100 Super Sabre ★ T-28 Trainer ★ FJ-2 Fury ★ AJ-2 Savage

North American Aviation has built more airplanes than any other company in the world

actually performs not much more than a third of the total work. There are first the basic industries that supply the steel, aluminum, titanium, and scores of other raw materials—both to the airframe companies and to the other participants in the aircraft network.

Then there are the manufacturers of the major items of equipment, such as engines, electronics, propellers, hydraulic equipment, and so forth. Many of these companies are industrial giants in their own right, and all of them maintain the development personnel and equipment necessary to achieve the high rate of technical progress required in their particular fields.

When the Air Force buys a jet engine from General Electric or Pratt & Whitney, a radar system from Raytheon or R.C.A., or a gas turbine compressor from AiResearch, it is getting the benefit of years of specialized research and development as well as the production facilities and know-how necessary to build these items.

In addition to these suppliers of major items of equipment, there are the many hundreds of companies, large and small, which supply processed materials and standard parts like fittings, fasteners, bolts, and so forth. These organizations also are vital to the aircraft program, since they have developed design and production skills through the years that we cannot readily duplicate in the airframe plants.

Finally, there are the subcontractors, who share in the total job to an important degree by putting their facilities and labor forces to work against designs supplied them by the airframe companies and the other aircraft specialists I have mentioned. All together, the aircraft job reaches into every major city in the nation and into most of our industries, large and small.

After this description of what other firms do, you may wonder what is left for the airframe companies. Well, one of our responsibilities is to fabricate the structure, get all the components together in working order, and deliver a properly functioning complete airplane to the Air Force or Navy. That is a manufacturing job, and an important one. But as I see it, our most serious responsibility is technical. I can best describe it to you in terms of the progress we have made in recent years.

At the end of World War II we had reached what might be called a plateau of performance in piston-propeller aircraft. Types like the P-51 Mustang fighter were pretty close to the ultimate of suitability for the performance range to which they were designed, and of which their propulsive systems were capable. In terms of Mach number, no aircraft of the period was capable of satisfactory control at more than .7 or .8—that is, seventy or eighty percent of the speed of sound.

The performance limitations of these World War II aircraft were not simply a matter of power. As a matter of fact, the first jet aircraft produced had substantially the same performance limitations. The only difference was that they could approach closer to the limit Mach number in level flight, while the relatively underpowered piston aircraft of World War II pushed their aerodynamic limitations only in a power dive.

J. L. Atwood

J. L. Atwood, 49, joined North American in 1934 as chief engineer after working as an AF engineer at Wright Field. Nine weeks later he was a vice president. He helped design the trainer that brought North American its first AF production contract. In 1948 he was cited for his contributions to the war effort, and in that year succeeded J. H. Kindelberger as president of North American.

So we found ourselves on the threshold of the jet age in aeronautics, with great increases in power becoming available to us, but with the disturbing knowledge that we did not know how to design an airframe to use this power efficiently. In brief, our difficulty resulted from radical changes in the character of air flow at high speeds. Even at airplane speeds of as low as .6 or .7 Mach number, strange aerodynamic phenomena occurred. We now have a whole new technical syntax to describe these phenomena and their causes, but in those days we vaguely referred to them as compressibility effects, and some of the more imaginative aviation writers began to build up the concept of an almost impenetrable wall or barrier that would be encountered at the speed of sound.

Looking back from the vantage point of our present knowledge, I can point out the characteristics of wartime aircraft, other than lack of power, which limited them to low subsonic speeds. The principal limiting factor was that the airfoil section and fuselage were too thick in relation to their streamline length.

Wing and tail thickness ratios were on the order of twelve to fifteen percent. Trying to get around these relatively thick wings and tail sections, the air accelerated to sonic velocity and formed shock waves. The resulting separation of air flow downstream from the shock waves caused changes of aerodynamic load distribution which made the airplane uncontrollable, often in unpredictable ways.

To some extent we avoided this in the excellent wing of the P-51 Mustang by the simple expedient of making the swell of the wing section more gradual, so that the separation of air flow did not occur until the air got close to the trailing edge.

If we had eliminated this thickness characteristic, although there was less incentive to do so because we didn't have the power to go much faster anyway, we then would have encountered a whole series of other problems. Perhaps the best way to give you a quick picture of these technical problems and their solutions is to describe the principal airframe developments which, in my opinion, have contributed most to conquest of the supersonic "barrier."

The list pretty well summarizes the technical activity of the airframe companies during the past eight years. I want to emphasize that much of the work has been assisted and accelerated by the basic research conducted by the National Advisory Committee for Aeronautics, and also by the military services in their development laboratories.

As the first area of accomplish-

(Continued on following page)

ment I would list the reduction of aerodynamic drag at high speeds. One of the principal factors in the reduction of drag has been the reduction of wing and tail thickness ratios from their previous range of twelve to fifteen percent down to as low as five percent. We have done the same thing with fuselages by increasing the ratio of length to diameter.

Many designers, including my company and our contemporaries who contributed the MIG-15 to the recent Korean air war, have adopted another technique of reducing high-speed drag—that of sweeping the wings back. Sweepback reduces both drag and lift by reducing the effective air velocity over the wing normal to the leading cargo, and thus enables an airplane to fly at higher Mach numbers before getting into sonic effects.

Although it creates other problems, including higher landing speeds caused by the loss of lift, we think it is the best solution for the transonic and low supersonic speed ranges. There have been various other refinements to reduce drag, including the elimination of bumps, holes, and other surface disturbances to the air flow.

The second major area of accomplishment has been the solution of stability and control problems for an increased range of speeds. In these and other aerodynamic problems we were seriously handicapped in the early postwar years by the fact that there were no comprehensive wind tunnel data to guide us. Planes were going as fast as the wind tunnels of the time, and we had to do our exploring in flight instead of in the laboratory. The industry's test pilots added to their daily vocabularies such terms as pitch-up, wing drop, snaking, and tail buffet. Not a few lost their lives in contributing to our knowledge of these unpleasant phenomena.

Among the developments that have resulted from our efforts to achieve satisfactory stability and control have been power-operated control surfaces, all movable horizontal tail surfaces, and new refinements in the interrelationship of aspect ratio, taper ratio, sweep angle, thickness, and the location of wing and tail surfaces.

Another area of intensive development has been the science of internal aerodynamics. During the last war our internal air requirements were limited to cockpit ventilating and engine cooling and charging. On the P-51 Mustang this involved handling some ten pounds of air per second. In sharp contrast, the high speed jet airplane of today requires twenty-five times this amount of air per second, all handled through entrance ducts having only about three times the area of the corresponding P-51 ducts. To handle twenty-five times as much air through a hole three times as large means that the entering velocity of the air must be very much greater.

That is the crux of the internal aerodynamics problem, how to handle high-speed air through a duct system, and slow it down enough to perform all the jobs required without creating excessive drag and loss of pressure. We have learned how to do these jobs with reasonable efficiency at sonic speeds, and we believe we know how to do them at supersonic speeds.

Although it is a little difficult to describe in a few words, I feel that one of the important contributions to successful supersonic flight has been the laboratory synthesis of airplane system performance. By this I mean the simulation of the various linkages involved in, for example, the airplane control system.

With the aid of analog computers, we duplicate in the laboratory all the aerodynamic conditions the system must be prepared to handle. To grasp the importance of this work it is necessary to realize that airplane controls are no longer limited to a set of direct cables linking the pilot's hand and the control surfaces.

Today the pilot moves a control which actuates the power devices which move the control surfaces. Then there is fed back to the pilot's hand a force which tells him that he is off neutral on the control. But that is only the beginning of the complications. Tied into this control system, through an autopilot, are the various elements of the flight and fire control system, which in certain designs and under certain conditions actually take over control of the plane and automatically guide it through the pattern of attack.

The complications of electronic and mechanical and human linkages in a system of this kind are almost beyond comprehension, and yet all must function perfectly through an extraordinary range of load and pressure and temperature conditions.

This brings me to the next area of achievement I would mention in our struggle to master the requirements of supersonic flight. I refer to the notable progress that has been made in developing automatically functioning airplane systems. At speeds of more than 1,000 feet per second, it is beyond the capability of the pilot to handle all the decisions and actions that were left to him in slower, less complex aircraft.

As a result systems have been designed and perfected which automatically respond correctly to certain conditions in a fraction of a second. In this category are electronic engine controls, automatic fuel tank selector systems, scores of emergency devices, and all automatic flight and fire-control systems. Most of the design and development work on these vital automatic systems has been performed by non-airframe companies which have specialized in meeting these requirements.

Some people call this equipment "gadgetry" when it gives trouble in the early stages of development. Unfortunately an inference is often drawn from the word "gadgetry" that the equipment is unnecessary. The fact of the matter is that most of the equipment is essential, and works reliably under the most exacting conditions.

As the final area of technical activity necessary to achieve supersonic flight, I feel that I should list innovations in structural design and materials. The problems in this area have resulted from the shrinking of section thicknesses to achieve necessary aerodynamic qualities, coupled with increases in load and temperatures.

One of the major trends that have occurred in the solution of these problems has been toward the use of more integral structural elements. As an illustration, on an early jet fighter we used 462 pieces, put together with 16,000 fasteners, to make up the wing structural box. On a more recent jet fighter wing, carrying incidentally some three times as much bending load, we used only thirty-six pieces put together with 264 fasteners—that is, bolts and rivets. We have done this by sculpturing the necessary stiffeners, ribs, and attachment fittings right on the heavy wing plates, which are also milled to a tapered thickness for the best weight-strength efficiency. This is a complex machining operation of the type that is gradually supplanting much of the sheet metal fabrication

(Continued on page 57)

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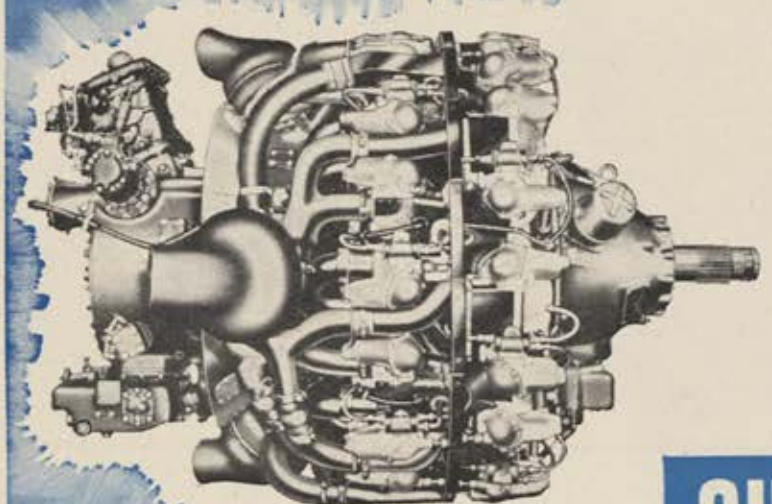

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and assembly that were formerly typical of airframe work.

The same trend toward integral structural elements is indicated in the increased use of large forgings and extrusions, since in most instances these parts replace the old structural assembly concept of cutting out a lot of little pieces of sheet metal and riveting them together. As another aspect of the structural problem, fuselage design now involves putting the smallest possible package around the largest possible pipe, with resulting constriction of the space available for lines, controls, wiring, and structure.

I have outlined six areas of technical activity that we have been engaged in during the past eight years in our efforts to make our airframes capable of using efficiently the power given us by the engine designers. However, I want to point out that high performance for its own sake has never been our objective. In all our development work we strive toward over-all weapon effectiveness, which includes such vital factors as combat suitability, crew safety, ease of maintenance, and producibility.

Also, I have not touched upon the manufacturing problems generated by the innovations in aircraft design, although the highest ingenuity and skill have been required to meet these problems. Out of all this coordinated effort has come the firm basis for the design and construction of operational supersonic aircraft. I feel that no like period in the history of aeronautics has seen such rapid technical progress.

Much of our success has been traceable to painstaking hours of investigation in research facilities—notably wind tunnels—including private, NACA, and service facilities. Since 1945 North American alone has conducted more than 30,000 hours of wind tunnel runs in airplane work as distinguished from missile work. We have used tunnel time wherever we could buy, beg, or borrow it—using six tunnels, including two of our own on a full-time basis. Now we are spending $4 million to build a new tunnel for full-time use in supersonic tests.

The design engineering groups have used the resulting knowledge of high-speed flight conditions to make each design a significant step forward.

I have indicated that we now have the capability of designing and constructing a supersonic operational airplane. As a matter of fact, we already have in production a jet fighter that is operating regularly at supersonic speeds in level flight. We delivered the prototype of this jet fighter, the F-100, to Edwards Air Force Base late in May, approximately one month ahead of schedule. In the first two months at the desert test base, it made the record total of sixty-six flights. I assure you that this supersonic jet fighter is an effective operational airplane in every sense of the phrase. In my opinion, it represents a far greater technical step over the F-86 Sabre than the F-86 represented over the P-51 of World War II.

In production is the F-100 which operates regularly at supersonic speed in level flight

As airplanes like the F-100 go into operational use you are going to be hearing more and more about Mach number. The natural tendency is to be somewhat unimpressed by an increase in performance of, say, Mach .7 to Mach 1.1. After all, that is only .4 of a Mach number. However, the speed of sound at 35,000 feet is 575 knots or 660 mph., so an increase of .4 in Mach number at that altitude actually represents an increase of 230 knots or 264 mph. Even a .1 increase in Mach number means 57 knots or 66 mph.

In only eight years we have succeeded in exploring and mastering the mysteries of the sonic barrier, and today we are ready to operate combat aircraft well beyond that point. But somewhere ahead of us lies another obstacle that may prove much more formidable. I refer of course to thermal effects. As we push airplane performances up to Mach two and beyond, we will encounter tremendous rises in surface temperature that will render present aircraft structural materials virtually useless. Our 75S aluminum alloy, for instance, loses enough of its strength to be inefficient as a structural material at about 250 degrees Fahrenheit—and this temperature would be reached on the airplane surface during a sea level flight at Mach 1.3 on a warm summer day (100 degrees Fahrenheit).

There are many ramifications to this thermal problem. One is the fact that the external heat is supplemented by internal heat from the jet engine; even with present power plants we are dealing with tailpipe temperatures on the order of 1,600 degrees Fahrenheit.

Another is the difficulty of keeping equipment – presently designed for maximum temperatures of 120 degrees to 160 degrees Fahrenheit —cool enough so that it will operate. Still another problem is that of material creep—the phenomenon of gradual deformation of metals under prolonged load. Because the rate of creep is greatly accelerated at higher temperatures, we may ultimately have to limit the service life of certain highly stressed structural parts.

Thus far we have only scratched the surface of the thermal problem. In certain structural assemblies we have used titanium, which has satisfactory strength up to 600 degrees Fahrenheit, but we have been handicapped by inadequate supply, high cost, and deficient quality because the processing of this material is still in the development stage.

We have explored ways of developing transparent canopies capable of resisting higher temperatures, and we have done considerable work in cooling structures and equipment both by ducted air and by refrigeration. In every respect the problem looks more difficult than the aerodynamic barriers to sonic flight looked eight years ago, and I very much doubt that we can work our way through the thermal problem as quickly as we learned how to live with sonic shock waves.

One big reason for this gloomy outlook is that solutions depend in large part upon advancements in basic technologies like metallurgy, wherein progress has never been rapid. More than ten years elapsed between the introduction of 24S aluminum alloy and 75S—the latter representing only a fifteen to twenty percent improvement in strength.

Before concluding my remarks I probably should say a few words about another phase of the industry's development activity—that involving guided missiles. I have intentionally emphasized the aerodynamic difficulties of bringing manned aircraft performances above

(Continued on following page)

the supersonic level, although many of the same problems of drag, stability, and control have been encountered in our missile work, together with unprecedented propulsion and guidance difficulties. I have done so because I believe that manned aircraft are going to be in evidence for a while yet, and because in many respects the development of satisfactory transonic airplane characteristics is more difficult than the development of satisfactory supersonic missile characteristics.

As an indication of the scope of our missile activity, North American has almost as many persons engaged in missile development work as it has in airplane development and engineering. Our company is working primarily in the field of long-range, surface-to-surface missiles. Other companies are specializing in the same field and also in air-to-air, surface-to-air, and air-to-surface missiles. Obviously most of the work and the results to date fall within security classifications. It can be said that we have been very successful in many phases of the development, and it is certain that this type of weapon will play an increasingly important role in the national defense picture.

I think that the most important lesson to be drawn from the recent history of military aircraft development is the absolute necessity for continuity in our technical effort. I am not greatly concerned about our ability to maintain such continuity under the present defense program. The nation is forced by the world situation to maintain an attitude of readiness to defend itself in the air. I believe that the maintenance of a modern, adequate, and properly proportioned Air Force will permit us to continue technical progress at a satisfactory rate, and at the same time will provide a reasonable production base.

Although the Government owes the nation an adequate air defense, and such an air defense will assure a measure of continuity in our development and production efforts, I want to emphasize that the Government does not owe the aircraft companies a living. Quite to the contrary, it is essential to the success of our development programs that the Government award contracts as objectively as possible on the basis of genuine merit. The personnel responsible for procurement must put aside any ideas they may have been encouraged to develop in the past twenty years that they are social planners, economic stabilizers, or anything else but hard-boiled customers with a job to do and a determination to get the best equipment to do the job.

I am specifically asking for maximum realism in procurement competitions. Our efforts in industry will be most effective if the competition is tough, fair, and clearly oriented toward product quality. There is a disproportionate premium attached to winning a design competition. It is the ticket of admission to the production show, but after all a design is just a list of promises based on calculations, which in turn are predicated on assumptions that can vary with the optimism of the designer.

Rarely if ever have there been any real penalties when the glowing forecasts of the design proposal were adjusted downward to the physical facts of the actual airplane. And it is then too late to change. I believe that this is a serious problem that deserves increased study by all responsible officers of both the Air Force and the Navy. If the imposition of financial penalties for non-attainment of performance guarantees is the only workable answer, then I believe such penalties should be invoked.

I believe that most of the responsible airframe, engine, and other contractors would agree wholeheartedly with the principle of awarding contracts objectively on the basis of design realism, economy, efficiency, and whatever other fair and impartial measures of comparison the procurement people can devise. There is really no other effective way to maintain the integrity and effectiveness of American aeronautical development.

The big problem of each aircraft company is to get business. The big problem of the Government is to get maximum defense for each dollar spent.

In the relationship between the parties we must utilize the best principles of competition, clearly stated and constructively applied. I believe this will serve the interests of the industry, the Government, and the nation's security.—END

Trends in Development of Weapon Systems

Maj. Gen. James McCormack, Jr.
Vice Commander, Air Research & Development Command, USAF

BY DEFINITION, a weapon system is an instrument of combat, such as an air vehicle, together with all functioning equipment, the skills necessary to operate the equipment, and the supporting facilities and services required to enable it to be a single unit of striking power in its operational environment.

As for trends in the development of these systems, I should say at the beginning that we don't know exactly where we are going. If we did, it wouldn't be a matter of trends, and it certainly wouldn't be research and development.

However, the general direction is clear in at least four technical areas.

First, airpower is going to be continuously, increasingly more atomic, in its many aspects. The miracles that have happened thus far during the first dozen, brief years of the atomic age are only the beginning. They have not all been American miracles, nor will they all

(Continued on page 61)

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be American miracles in the future.

Second, military air vehicles are going to move on out into the supersonic regime, to speeds many times that of sound.

Third, weapons will continue to become more and more automatic in operation, through the use of electronic, sonic, infra-red and other techniques.

Fourth, we who practice the military art will be governed ever more forcefully, in our thinking and in action, by considerations not just of weapons but of weapon systems.

Let's examine this last point, as a frame for the remainder of our discussion, and use as an example the problem of the air defense of the United States, which means really the air defense of North America.

The relationship which has always existed between the design of an airplane and the design of its engine has now become fundamental and vital as we move into the supersonic regime. The armament system also now presents as one single problem the performance demanded of the vehicle and the performance which must be built into the armament, including its fire-control equipment. Further, the requirements for performance of the fire-control system in the aircraft are intimately related to the capabilities of the ground-based electronic system which vectors the aircraft to the vicinity of the target.

This ground electronic environment is a formidable thing indeed. It must handle friendly as well as hostile air traffic, both domestic and foreign, civilian as well as military, and it must be tied into the existing commercial communications network. It is expensive to install and, when in place, is not readily subject to major change.

In the total air defense system, the fact is that no important element can be jiggled without jiggling the whole system. The time has passed when a proposed new weapon or other component could be judged on its merits alone; it must now be looked at in conjunction with dozens of other equipments.

The systems concept is essential, further, to the businesslike and economical scheduling and management of the development of the weapon which is chosen. Subsequently it provides the basic framework for the manufacturing program to bring the new weapon into being, and for the programs of training and construction to make the new system an operational reality.

Air defense is only one example. The fields of strategic and tactical air are not different in needing systems discipline.

All trends in military technology are mainly fixed by two factors.

One of these is requirements. We try to develop the things that are needed.

The other is technological capabilities. No matter what *should* be invented, the limits of our knowledge at any point in time determine what can be had. Research and development is a humbling trade for the individuals who practice it. The first step on the ladder is the realization that technical problems don't go away when you shout at them.

These two factors, requirements and technological capabilities, of course interact on each other. A valid requirement, or need, is the best of all incentives as we dip into technology and try to pull out and perfect the object or the technique that will satisfy the need.

In turn, progress in technology generates military requirements, as in the case of the atomic bomb where there was no requirement—in any formal sense—until science showed how one might be made.

In the general case, a new weapon system can emerge only from a substantial body of new technical knowledge. Naturally, weapon systems in being are continuously improved as, for example, by adding refueling gear to existing aircraft.

However, the more fundamental task, and the one which lies at the heart of the responsibility of the R&D organization, is the development of new systems and major components to meet foreseen future military requirements that are beyond the growth potential of existing equipment. A good example would be strategic bombing systems needed for the era of supersonic flight and advanced atomic technology which is now dawning.

I would only emphasize here that we are not speaking just of new airplanes and new missiles. In fact, looking at the total problem of the complete systems that are needed, the flying machines themselves are in some ways the easy jobs.

A word about our development planning.

The successful creation of a new system demands that we know quite clearly what it is that we want. We also must have, largely in hand, at the time the new system is decided upon, the basic technical knowledge and much of the actual work of component development necessary for the system. Otherwise, we could only guess at what we can in fact bring forth of real value in any reasonable number of years.

The development cycle therefore begins with the definition of a development planning objective, representing the Air Force's best effort to take into account all of the important and foreseeable strategic, logistic, and technical factors relating to the system. Atomic weapons are of course basic to the problem, not just in terms of their detailed design and performance, but far more importantly in terms of their fundamental meaning in the choice of weapon systems to give best military security for the country.

Development planning has to predict both the progress of free-world science and the capabilities and intentions of a potential enemy who is a past master at obscurity—for five, ten, and more years into the future.

It has to consider national objectives, intelligence estimates, war plans, industrial trends—and cracks in the crystal ball.

The results must be forward-looking, of course, but at the same

(Continued on following page)

Maj. Gen. James McCormack, Jr.

Maj. Gen. James McCormack, Jr., 42, graduated from West Point and Oxford (Rhodes scholarship); holds M.S., civil engineering, from M.I.T. He transferred in 1950 to the AF from the Army, where he was assigned chiefly to the Engineers. He was Chief, Movements Branch, 12th Army Group in WW II. Named ARDC Director Nuclear Applications, he became Vice Commander in 1953.

time they must also be realistic.

Setting the development objective is therefore a stage in the technical cycle where big chunks of the future military security of the country, and the really big money, can be made or lost.

A second stage is of course in the actual work of development, where the question is not so much the cost of the effort, which is relatively small, but of its competence. Often also it is a question of continuity of effort, for the best technical operation can be effectively destroyed if the support is turned on and off like a water faucet.

You can't calculate a cost for failure, or unnecessary delay, in an important development that with good technology, and good management, *could* have been quickly successful. Such a cost, in the ultimate case, might even be infinite, if the weapon that is needed were not available when it is needed.

I have gone to some length in discussing how systems developments are born and raised, mostly to indicate new trends in this business can be delicate, and are equally closely related to military requirements and to technological capabilities. You can't get a good focus on these trends by looking just at science or at industry, at ARDC or at the realities of combat, however pressing they may be. You have to look in a number of places, and trends sometimes have a different appearance when viewed from different angles.

I also wish to leave a related thought in this regard: that with good organization for our job, and with much wisdom, we can influence these trends for the better. I am sure we now have in the Air Force the essentials of the right organization. I believe we have the necessary wisdom.

You are all generally familiar with the present inventory of strategic weapon systems.

In jet bombers, the B-47, as you know, is a high altitude, medium bomber whose range can be extended by refueling. The B-52 has more altitude, more speed, more range. It is also larger, its size is a direct reflection of the requirement for range, which is, of course, the basic requirement for a strategic system: above all else you have to be able to reach the target.

Considering costs, there is a limit to our ability to achieve range by increasing aircraft size. Also, one likes to present small targets to the hostile air defense. Therefore, as our technology improves, the trend should be toward smaller, higher performance aircraft that will still have the range necessary to do the strategic job.

Building these weapons will require that we learn more about aerodynamic and power plant design, and about materials, and that we develop the most effective applications of the knowledge we have.

Electronic gear will be much improved, especially with the help of transistors.

It might be noted parenthetically, that the electronics development problem is often less one of potential quality than it is one of reliable performance in combat. The best radar bombsight, for example, is by no means the one that works most precisely on the bench. It is the one that works reliably and with satisfactory accuracy when the enemy is busy trying to put wrong answers into it.

In due course there will be nuclear propulsion for strategic and other air systems.

To supplement manned aircraft in not too many years, and eventually to replace men in substantial measure, pilotless vehicles will be developed for the strategic role.

In the early stage of this art, where we find ourselves today, there are difficulties, as in automatic devices for navigation and final control to the target, which make the manned aircraft still the most practical solution by far.

These deficiencies will be cured in time. Mechanical navigation systems will have accuracies equalling at long ranges or bettering the precision of our present knowledge of where one point on the earth's surface actually lies relative to another. In this connection, there is room for improvement in mapping techniques as well as in strategic reconnaissance generally.

Among other obviously fertile technical fields for investigation, including fundamental investigation, are: the nature of electromagnetic radiations in the outer atmosphere and beyond; and in power plants having the thrust and endurance which will be required for high supersonic speeds over great distances.

These samples will indicate that the total technical job for strategic air is quite a bill of goods, and it is. However, I would say at least this: that it is well within this country's capabilities during the course of the next generation, and possibly in a much shorter time, to bring forth strategic weapon systems against which an adequate defense cannot now be visualized.

The gloomy thought is that we must necessarily assume a comparable capability for the USSR, although one hopes their time base will be longer.

The technical aspects of tactical air are in large part the same as those of strategic air, as we have just discussed them.

For example, as you are all aware, developments in atomic weapons have long since given fighter aircraft, such as the F-84, an awesome capability for massive destruction. Furthermore, fighter ranges are very impressive in terms of any potential area of land battle.

We need, and will have, fighter-bombers and day fighters that are fast, reliable, and able to operate from forward areas.

The F-100, our latest production day fighter, is designed to give tactical air a supersonic capability.

A new night intruder, the jet-powered B-57, is beginning to roll off the production line.

Reconnaissance is one of the most important tasks of tactical air warfare. An outstanding job has been done in Korea with present equipment, but the equipment now in development, such as that which will operate with the RB-66, will greatly improve our present reconnaissance capability.

Aircraft ground control systems are essential to effective conduct of the tactical air battle. They are not as complex as those needed for continental air defense, but they are still not simple, and we must improve what we now have.

Many targets for tactical air are relatively fleeting in nature. This imposes a requirement for equipment of great flexibility in action as well as simplicity, and the two are not always synonymous.

Pilotless aircraft and guided rockets are coming along for the tactical role. It is not yet clear just how much of the mission they can take over, or on what schedule exactly, but they can surely do a good part of it, in time.

We have already said quite a bit about air defense, and have noted that the technical problems fall generally within two large but rather

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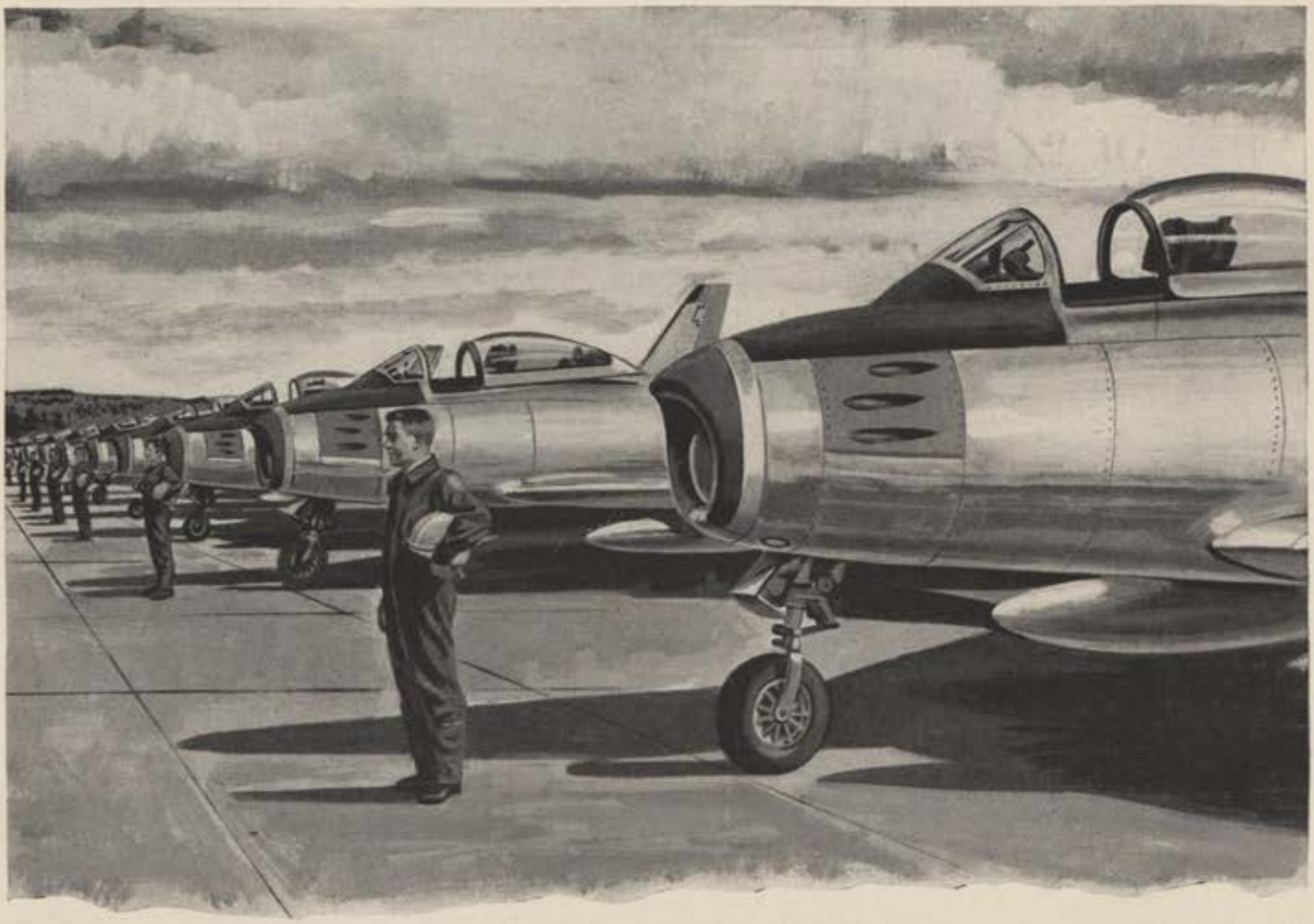

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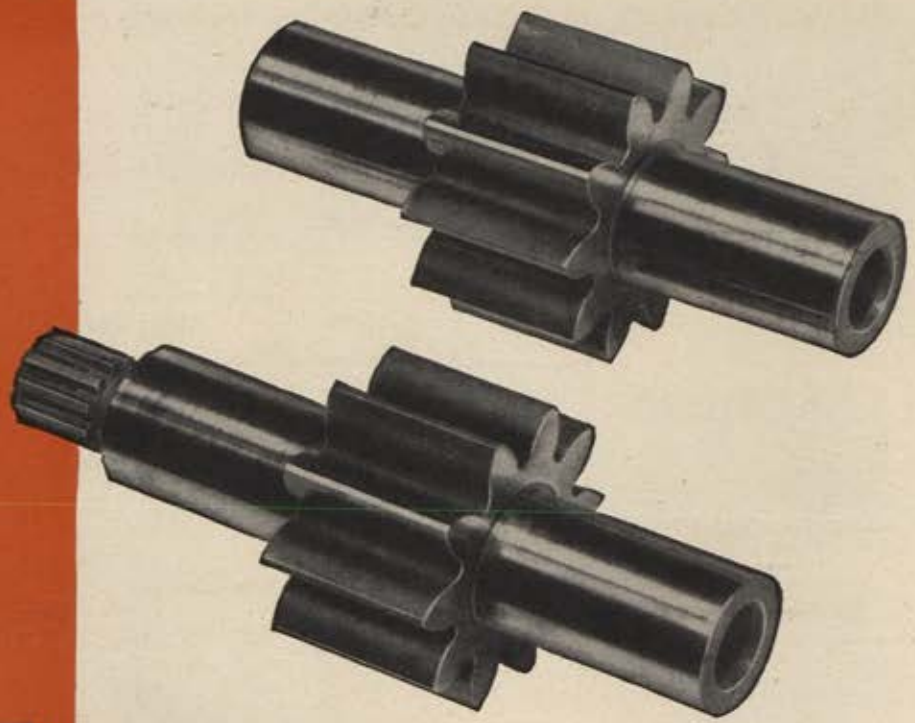

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different technical areas: the ground electronic environment and the air defense weapons themselves.

The ground environment for the defenses of the United States is being improved and will continue to be improved through the years immediately ahead. We need to continue to raise the level of our technical competence not only in the design, but also in the installation, maintenance, and operation of the equipment that is involved.

As for the early warning element of this environment, to which much publicity has been given recently, and the methods for tracking and intercepting hostile flights, which are equally important, the immediate trend is quite clear. It is toward the use of larger numbers of small radars to give more reliable coverage of the air space at all altitudes, and toward a total system which will be much more automatic and will be able to handle much larger numbers of aircraft than is now possible. You are aware of the major effort under way by Project Lincoln for the development of such a system.

The current inventory of first-line interceptors is being built around high sub-sonic, all-weather types: the F-86D, F-89, and F-94. As you know, the F-86D holds the official world's speed record.

As bomber performance improves, so also must the performance of air defense weapons. The delta-wing F-102 will constitute a major step into the supersonic region for interceptors.

Air-to-air rockets, including guided rockets, will become standard interceptor armament, and ground-to-air missiles are well along in various stages of development.

The thought of complexity has arisen so often in this discussion that I should perhaps point out that modern equipment is complicated basically because the jobs it has to do are complicated, often fantastically so. The R&D objective is of course not complexity for the fun of it, but to make necessary complexity work.

The end result will be much like that which has evolved in the telephone system. Dialing San Francisco from Washington is a tremendously complicated operation from the technical point of view, but the customer doing the dialing is hardly aware of it. So also in the air defense system, when it is similarly perfected, the user will be generally unaware of the complicated operations going on in his behalf.

Just how fast the air defense system will grow in automaticity, I of course do not know. It is at least a challenge to us to see how rapidly we can move in that direction because of the obvious desirability of eliminating the need for large numbers of highly trained people to be on constant, instantaneous, and expensive alert in the detection system.

So much for trends in weapon systems.

To be able to do reasonable justice to these systems, I have said very little about other systems, such as those for logistics and training. Neither have I more than mentioned the large areas of science and technology from which systems developments flow; areas in which there is great commonness of purpose and collaboration in action among the NACA, Army, Navy, Air Force, and others. I might mention just one such area, the solid-state sciences.

Until recent years, materials development dealt mainly with the external properties of matter, and explorations of its insides were largely confined to the field of chemistry. Now, it is essential to progress in the advanced weapons which lie before us that the nature of matter—its internal physics if you wish—be understood with great thoroughness. Our efforts in this direction are accordingly very earnest as they are in numerous other areas. This is only an example.

I would like to close by noting that a discussion of machines and gear inevitably leaves a sort of inhuman impression.

Of course, the military security of our country rests primarily on people.

The Research and Development program is directed toward requirements calculated by people, and it operates under policies set by people. It takes technical people to do the work, and the product is useful only in the hands of people who have the skill and courage to use it in battle as need be.

Further, it takes people, such as yourselves, to support the public awareness of the vital connection between technology and the national survival through the years in front of us—a point emphasized by the Rockefeller Committee on Defense Department organization.

You are devoted to maintaining the position of airpower in this public awareness. That is why, especially, it is a pleasure to have been able to discuss with you today some of the affairs and problems of Air Force Research and Development.—END

Department of the Navy

The Hon. James H. Smith, Jr.
Assistant Secretary of the Navy for Air

THE selection of "The Airpower Future" as the theme of this symposium has made me eager to speak to you. As the head of aviation on the Navy's civilian management team, the Navy's share in shaping the future of airpower is a subject close to my heart. But the appeal is double-barreled. In the Navy, the Assistant Secretary for Air is also assigned responsibility for the Navy's research and development program.

Put these things together — my own personal interest in aviation, my abiding faith in the Navy's sea-air team, and my constant concern with problems of research and development—put these together and you will understand why I am happy to be here.

America's sea power is important to you, because the Navy is one member of your National Defense

(Continued on following page)

team. I am sure that each of you is already well aware of the Navy's assigned missions. Rather than recount them in detail, I have selected one — naval striking power — and will show how the technological revolution of the past few years has given it new dimensions. One thing we hold essential is that command of the sea is possible only where we control the air above the sea. Our progress in the task should be of more interest to you.

However, I would be remiss if I did not also point out our advances in our other very important tasks of air defense and anti-submarine warfare. But first let us examine those technological advances in aerodynamics and propulsion and electronics which have broadened the horizons of naval striking power. In these fields each push forward has opened up new problems, challenging problems which must be solved.

To help you visualize the consequent changes wrought in naval aircraft in the past few years—and the performance increments—I have brought along these charts which show at a glance the increase in gross weight, fuel consumption, and speed of take-off and landing which go with improvements in performance — maximum speed, rate of climb, service ceiling, maneuverability and ordnance capacity.

As aircraft characteristics have changed, improved plane-handling capabilities have been made necessary in our aircraft carriers. As every aircraft weapons system has advanced, its base has been required to expand in facilities. Similarly, the aircraft carrier has undergone the necessary increases in catapult capacity, arresting gear capacity, and servicing facilities—such as ordnance and fuel storage. This set of charts shows how we are getting these increases without an inordinate increase in carrier size.

We have found that if we are able to keep airplane size and weight at manageable levels, better performance depends upon one necessary condition—higher minimum flight speed. This means improved landing and launching capabilities. Here the aircraft carrier has shown its ability to keep abreast of the rapid progress in aircraft performance. Not only has it kept abreast—the carrier's improved airplane-handling characteristics have even considerably extended the horizons of naval aircraft development.

Let me be specific in the landing and launching field:

Our new British-developed steam catapult has the power to launch the heaviest attack bomber which we now have under development, and contains a margin for growth. The energy of the steam catapult is greater by a factor of ten than that of the catapults on the World War II *Essex* carriers.

Our newly developed arresting gear will allow us to land the heavier, faster planes of the future. The energy absorption of this gear is greater by a factor of nine than that of World War II equipment. The problems of launching and landing have always received basic consideration in the design of naval aircraft.

'Technology has given new dimensions to naval striking power'

But these two Navy developments — the catapult and arresting gear—are not of use to the Navy alone. We are pleased that with the high-flight speed spectrum of land-based planes, the Air Force is looking with interest upon catapults and arresting gear for take-off and landing operations ashore.

Finally, the two-runway system aboard a carrier—the canted deck—has greatly increased the carrier's flexibility. Now simultaneous take-offs and landings can be handled with less interference. Further, carrier operations are safer. In flight operations during the past few months aboard the canted deck carrier *Antietam*, more than 5,000 landings have been made during daylight, darkness, and low visibility without a single barrier accident.

I may say I have been aboard the *Antietam* recently, and it was a tremendous thrill to me to see the development resulting from these three items, the increased capacity of the catapult and the arresting gear and the effect of the canted deck on carrier operations.

The pressure upon the enemy which a carrier air-group can deliver depends directly upon the cyclic rate of launching and recovery of its aircraft and the speed of the aircraft to and from the target. After delivering its offensive load to the target, each plane returns to the carrier, lands, rearms, refuels, and launches. With the canted deck and improved servicing features, the time required on board will be greatly reduced.

This is the way in which steam catapults, superior arresting gear, and canted decks affect airplane progress. Our carriers can handle the increased minimum speeds which we have accepted to reach our goal of increased performance. This means that supersonic fighter and attack planes can and will be operated from aircraft carriers. The *Forrestal* class carrier embodies all these improvements and has a margin for growth in facilities to accommodate future airplanes.

While engrossed in the problems of improving our aircraft carriers we have not been blind to the possibilities of other means of launching and landing aircraft. Indeed, nothing so corrodes our creative machinery as putting blinders on imagination.

Examples of past successes are JATO and the new seaplane hull design. In the immediate future there are hydro-skis, vertical risers, and convertiplanes.

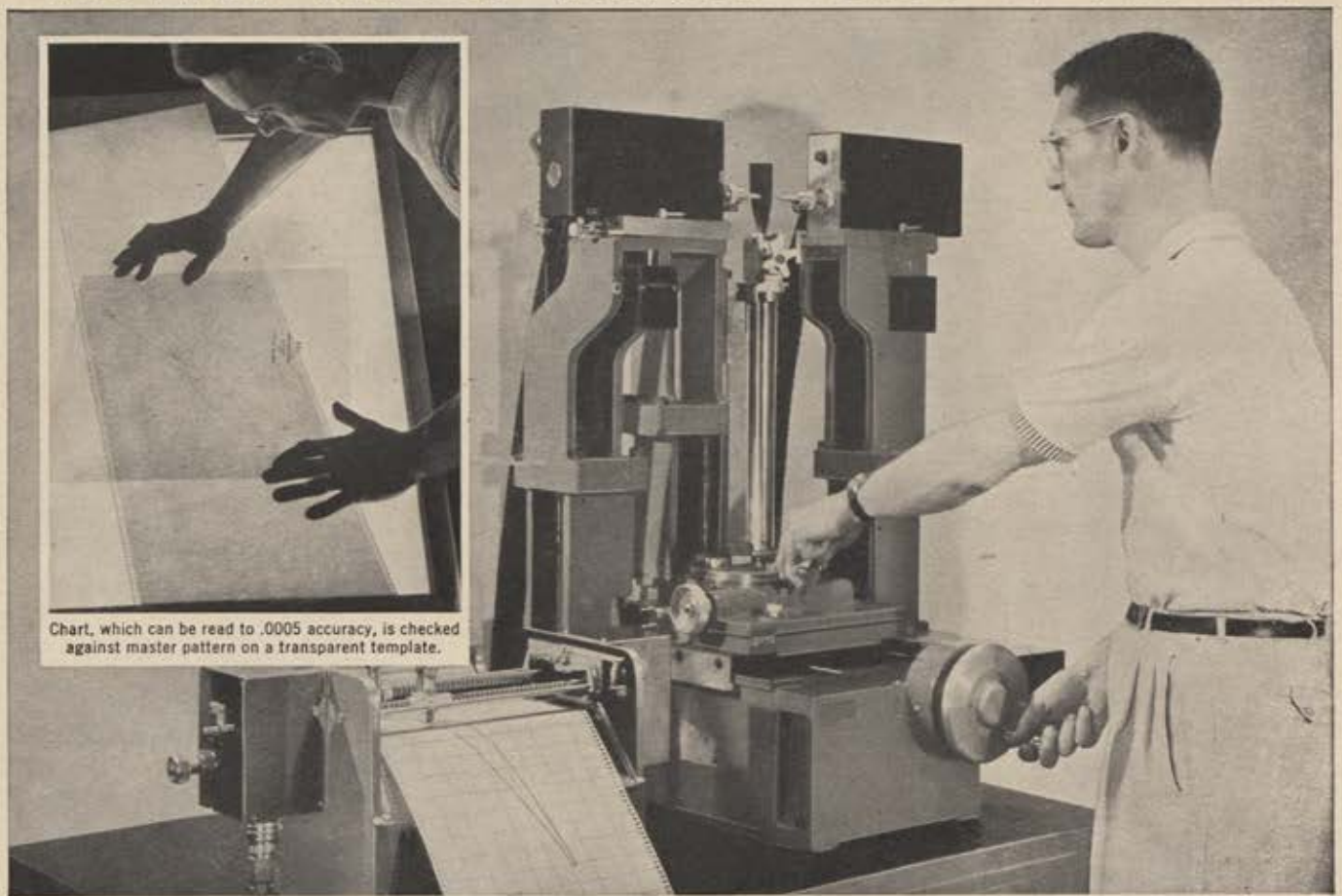
From our extensive development of hydro-skis there has resulted an airplane of maximum versatility. This is the experimental Sea Dart. Here the aerodynamicists and hydrodynamicists found themselves teammates whose efforts directly contributed to solving each other's problems. For instance, the aerodynamicists were delighted with the high landing speeds and naturally existing water runway which became available from the hydrodynamicist's development of hydro-skis. Here is a plane which has the ability to land on various surfaces and to base aboard a carrier, a tender, or ashore. Such operational versatility in a single plane is invaluable.

Let us look at some of the new devices which the future may bring:

To secure effective aircraft weapons systems, seven-league strides in propulsion have taken place. No matter how sophisticated our aerodynamics may become, to make an airplane move fast through the air demands a mighty push. So much thrust is now being wrapped up in so light a package, that—as we approach flight speeds of Mach two with turbojet aircraft—we have the thrust necessary for vertical take-off

(Continued on page 69)

ANOTHER REASON ALLISON LEADS IN THE AIR



Chart, which can be read to .0005 accuracy, is checked against master pattern on a transparent template.

Electronic recording machine traces blade outline on finely graduated chart paper, 10 or 20 times actual blade size, which permits variations to be visually detected.

How we broke a bottleneck

in turbine blade inspection

Five years ago, inspection of turbine blade contours required time-consuming surface plate layouts. Then Allison engineers came up with an idea for a machine which would do more precise checking – one which would trace blade contours at several levels – and automatically record each profile, magnified 10 to 20 times, on charts for easy comparison with a master template.

Here you see the latest machine, built by Allison and General Motors Research Divisions. It is equipped with newly developed electronic tracer heads. This feature enables us to inspect any type of compressor or turbine blade profile without danger of scratching the surface. And by coating plastic patterns with a thin metallic paint, we can also check them for exactness before blades are cast.

Here is another example of Allison and General Motors engineering ingenuity that pays off in more dependable jet performance and lower cost manufacture—typical of the continuous pioneering which maintains leadership for Allison engines in the air.

GM GENERAL MOTORS

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DIVISION OF GENERAL MOTORS.
INDIANAPOLIS, INDIANA

World's most experienced designer and builder of aircraft turbine engines – *J35 and J71 Axial, J33 Centrifugal Turbo-Jet Engines, T38 and T40 Turbo-Prop Engines*

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AIR INTELLIGENCE SYSTEM WITH 7 SENSES!

New AiResearch transducer-computer package feeds facts to any or *all* aircraft electronic systems!

A new electronic air intelligence system, completely engineered and manufactured by AiResearch, provides better flight information and fire control for American jets!

Extremely sensitive transducers measure angle of yaw, angle of attack, acceleration, free air temperature, total temperature, static pressure, total pressure and pressure ratio. The ingenious computer combines this information and translates it into voltage commands for direct use or as correction factors in fire control and navigation systems. This operation is continuous and instantaneous.

The AiResearch system obsoletes many of the sensing circuits now used in military aircraft. Composed of elements which are small, light and highly efficient, this system is reliable and easy to maintain.

Thus AiResearch pioneers another advance in avionics to further accelerate the progress of high-altitude, high-speed flight!

AiResearch Manufacturing Company

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DESIGNER AND MANUFACTURER OF AIRCRAFT EQUIPMENT IN THESE MAJOR CATEGORIES

Air Turbine Refrigeration | Heat Transfer Equipment | Electric Actuators | Gas Turbines | Cabin Superchargers | Pneumatic Power Units | Electronic Controls | Cabin Pressure Controls | Temperature Controls

and landing. When stability and control problems are solved, the operational advantages which can accrue from vertical take-off and landing are obvious.

It is natural—in the research and development business—to think not of the advances of the past, but of the problems confronting us in the future. An example is the temperature barrier to aircraft speed which we now foresee. In our assault upon it, we find ourselves dealing with a "space and time" problem.

In World War II, 450 mph was a respectable speed for fighter aircraft. Today, talk of tripling that speed is commonplace. We know, for instance, that the Douglas Skyrocket has flown at 1,239 mph. Simple arithmetic shows us that when we fly at three times our old speed, we will cover a given distance in one-third of the old time. This introduces the "space and time" problem.

We know that the human mind is the best mechanism for reasoning, but we must also admit that as a computer it is relatively slow—far slower than many mechanical computers on the market. Here is the time limitation imposed by our greatly accelerated speed through space. For instance, in combat a pilot is confronted with a situation; he must assess that situation; he must decide what to do; he must do it. But the time required for the pilot to reason, decide, and act has not changed. So he must start this mental process earlier in space, many miles earlier. So many miles earlier, in fact, that he probably has not yet sighted his opponent. So, to utilize the speeds of which his plane is capable, he must be supplied with mechanisms to reduce space and increase time to the dimensions of 1944 or 1918.

It is here that our progress in electronics has been of the utmost significance. Improved radar has extended the pilot's vision far beyond nature's gift. By improved communications the pilot's response to intelligence or command has been extended. In modern air-to-air combat, ground radar "sees" the distant planes, both enemy and friend. Through electronic communications the controller directs his fighters to the interception. By radar the pilot "sees" his opponent and completes his contact for combat. Then electronic fire control systems come into action. Meanwhile, in many planes, an ever-watchful radar eye is alert to warn the pilot of any enemy who tries to attack from behind. Thus, to a gratifying, yet limited extent, we are solving the "space and time" problem of the supersonic fighter pilot.

This problem is basic in the air defense of our nation. Protection of our continent from air attack through the sea approaches is another of the Navy's important operational responsibilities of which I spoke earlier. It involves detection of enemy attackers sufficiently far from our shores to allow shore-based interceptors enough time to climb to combat.

This same problem of detection is inherent in our task of anti-submarine warfare. Aircraft are essential to this task because of the vast ocean areas that must be searched and patrolled. In applying the principle of economy of forces we are able to combine our early warning for air defense with our barrier patrols against submarine attack. Successful performance of these missions is possible through our advances in electronics. Simultaneously with the air search, we are able to detect schnorkelling submarines. Once detected, their underwater path can be tracked by other aircraft and a lethal blow delivered. Recent development in both helicopters and lighter-than-air craft have helped solve the problem of tracking and killing submarines.

As technology has provided us with improved weapons systems, we have been forced to rely more and more upon complex, intricate equipment. Without assistance in controlling the operation of these devices, a human pilot would be hamstrung. Here the science of electronic controls has made a tremendous contribution. Even the pilot's jet engine would not operate properly without electronic controls.

Although the electronic engineers have done a magnificent job in helping us to solve our problems, we still have not licked one problem—where to put their little "black boxes." As electronic equipment and electronic controls come into ever-wider use in aircraft, we must constantly do battle to make them simpler, make them smaller, and at the same time keep them within the capability of the technicians and mechanics we have to maintain them.

We are, of course, making much greater use of transistors and magnetic amplifiers to do the work of vacuum tubes. Not only are they a fraction of the size of a vacuum tube, but they are more rugged (and have a longer life)—important considerations in combat. Again, many of the systems we are trying to crowd into our aircraft have circuits in common. By combining these common circuits we are able to effect economies in weight and size. It is a constant battle, but we shall win it.

In the major technological fields of aerodynamics, propulsion, and electronics, I have described the recent contributions of each to naval forces at sea—the Navy's sea-air team. The striking power of today's Navy is many times that which we found so valuable in World War II.

With aircraft presently coming off the production lines, operating from our modernized carriers as well as from our shore bases, the United States will have a naval weapons system with the highest mobility, entirely fit for its assigned mission.

As our combat pilots have returned to tell us their weapons requirements we have presented our problems to the aircraft industry. Through industry's aggressive efforts to supply the finest weapons in a minimum time and at reasonable cost, engineers have made immediate use of technological advances. Production has been expedited to the end that the fleet has received a flow of constantly improving weapons.

(Continued on following page)

The Hon. James H. Smith, Jr.

James Smith, 44, was graduated from Harvard in 1931 and became a Navy pilot the same year. In 1935 he received his LL.B. degree from Columbia and was with Pan American Airways before returning to active duty in 1943. He served on Admiral Radford's staff in WW II, later rejoined Pan-Am as vice president. From 1949 until his present appointment last July he was a director of Slick Airways.

This member of your National Defense team has profited measurably from the present technological revolution, and the future prospects for naval airpower are bright.

QUESTION: Mr. Secretary, I would like to know whether or not an instrument landing system has been put into this new carrier, the *Forrestal*, so that they can retrieve aircraft during periods of inclement weather?

MR. SMITH: We are retrieving aircraft under very restricted visibility today even on carriers. The question was whether we have an instrument landing system aboard modern carriers which will recover an aircraft under restricted visibility.

The answer is that we do have that. We are bringing aircraft into our carriers now under bad weather conditions.

QUESTION: Can you tell us whether you plan to use the ski takeoff system on things bigger than fighters?

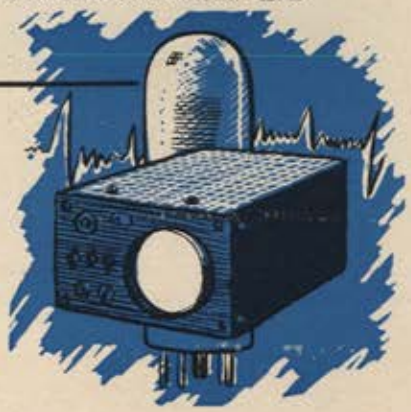
MR. SMITH: About the only answer I could give to that is that mighty oaks from little acorns grow. I really can't predict what will happen.

QUESTION: How feasible has Navy found these convertiplanes to be?

MR. SMITH: Well, we are in the realm of experiment here, and we have a fairly optimistic thought about the future, but as to their feasibility at this particular moment I would be a little hesitant to make a favorable comment.—END

ELECTRONICS

By Dr. Ivan A. Getting
Vice President, Raytheon Mfg. Co.



I WAS ASKED to cover "The Airpower Future," with special reference to problems and prospects in the electronics industry." So indeed, I have three things to talk about: (1) airpower; (2) the future; and (3) the electronics industry.

Airpower, reduced to its simplest terms, is the ability of a military force to deliver by air destructive weapons on an enemy and to prevent the enemy from doing the same in reverse. As such, airpower is a lot more than airframes and engines; in fact, these are merely components in a far larger system in which the weapons, communication, navigation, and other factors play important if not at times dominating roles.

Whenever airmen meet, a toast seems always appropriate to the Wright Brothers and other pioneers of civil and military aviation. Never have I seen a toast on such occasions to the inventors of the atomic bomb—yet it is this technological advance which gives airpower its dreadful significance.

We, as a nation, are now involved in a desperate arms race, a race whose righteousness none of us doubts. Till now we have held our lead by virtue of a large stockpile in atomic weapons and the superior striking power of our strategic air force. In the not too distant future this preponderant advantage will disappear as Russian stockpiles and their means of delivery become sufficient to destroy our cities.

The fact that we have used only ten percent of our stockpile destroying the enemy cities while they used as much as seventy-five percent of theirs in destroying us will give us little comfort. Under these conditions, striking power will not be sufficient. Clearly the Airpower Future will have to emphasize in due proportion Air Defense against enemy attack. For if we cannot survive an airborne atomic attack ourselves, the deterring force of our strategic arm will have lost its meaning. Surely we could not assume a national policy based on suicide; in short, our use of the strategic air arm as a threat to prevent the use by Russia of war as an instrument is predicated from now into the future by our ability to withstand and defeat an atomic attack by her.

Airpower in the approaching era of atomic opulence is characterized by another major consideration: our offensive and our defensive airpower must be in actual being—not in training, not in production, not in planning, and not in research. A devastating attack with atomic weapons can be accomplished in a matter of weeks or at most months. Mobilization build-up is a matter of a year or two. Much has been said about dual production facilities and facilities convertible from the manufacture of peacetime products to those of war. Obviously such planning is excellent for the second phase of a war, assuming we survive the initial impact of an atomic war. In short, first things first—we must have both a striking force and a defensive force in being to claim airpower.

Let us look a little closer at this modern airpower and compare it to the early days of military aviation. In World War I, the pilot's chief function was reconnaissance. He then embarked in a little sport, shooting at his enemy pilot with a pistol. Then he took himself more seriously and used a machine gun. But throughout the war, the pilot was essentially an errant knight.

World War II saw the emergence of significant airpower. Radar, electronic aids to navigation, and electronic communication made possible not only teamwork, but traffic control over vast areas of combat territory and the deployment of vast air armadas under dynamic conditions.

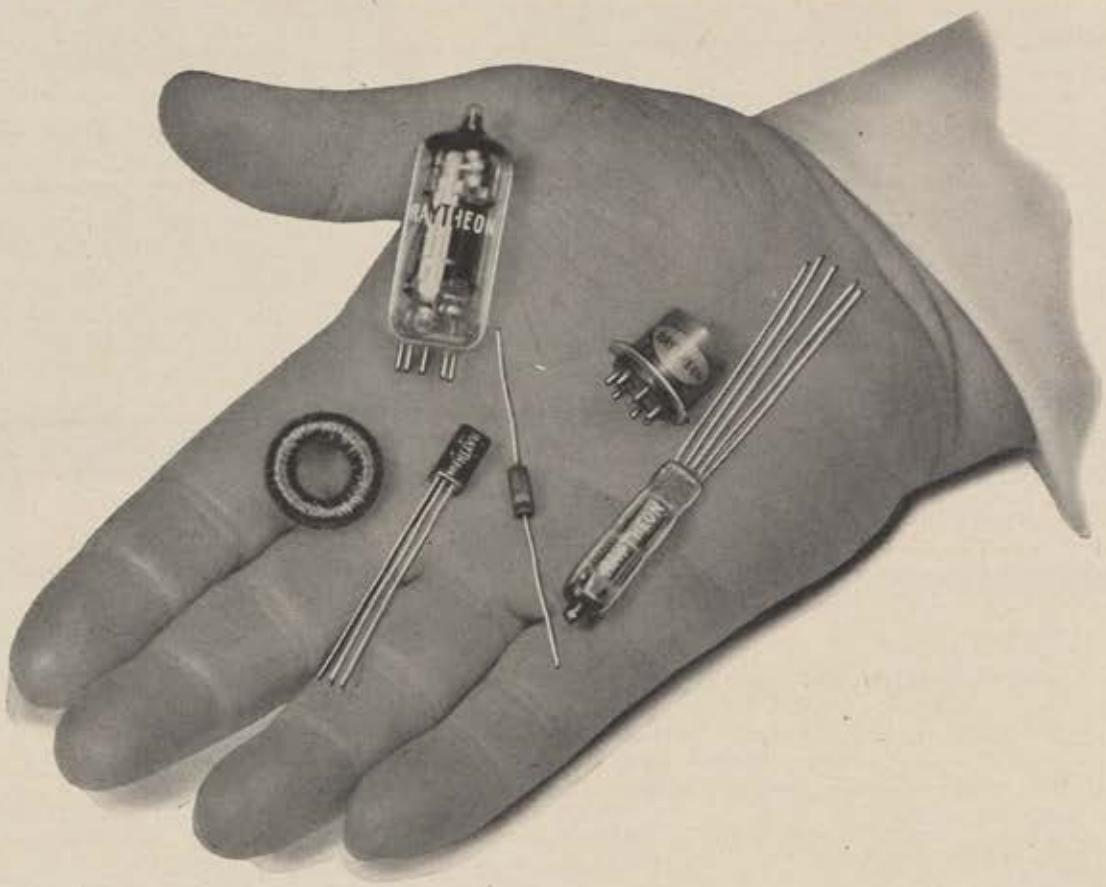
Today these concepts have grown to cover the world—electronics made this possible—and airpower has come to maturity. Today all the world is but a stage and all the airplanes merely actors under the control of a single man—the air-commander. It is this integration that makes "airpower."

What of the future—the second part of my subject? The future of airpower should be governed by the national policies enunciated by President Eisenhower: first, that we shall not try to prepare for a specific date but rather build up to a continuing state of adequate readiness; and second, that we shall attain this ade-

(Continued on page 73)

RAYTHEON

the GIANT *that makes* MIDGETS



Ability to think big about miniaturization problems is only one of the many talents that has set Raytheon apart in the field of electronics. It is an example of how Raytheon is serving the current needs of the Armed Services while paving the way for new and better developments.

Not all Raytheon products are small but all benefit from Raytheon's broad experience with miniaturization. Raytheon pioneered in the development of reliable miniature vacuum tubes, now leads in the production of subminiature tubes, germanium diodes and transistors. Miniature magnetic components are another example of Raytheon's unique ability to pack perfection into incredibly small units.

Raytheon has also pioneered in the application of miniaturization techniques to complete equipments. The benefits are unmistakably reflected in the compact design, trim appearance and servicing ease of *all* Raytheon products which include radar, sonar, communications equipment and other types of electronic equipment used in all branches of the Armed Services.

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WALTHAM 54, MASSACHUSETTS

Gilfillan Radar Traffic Control Saves Airlines $100,000 in One Month's Operation at Chicago's Busy Midway Airport

Formerly, aircraft flew over airport for orientation, circled in to landing beam—a system resulting in aircraft "stacking," delays. Today, Gilfillan Radar guides aircraft direct from 30 miles out to touchdown.

"Delays in landing air liners at Midway airport in bad weather have been virtually eliminated thru the extended use of radar aids by the airport's air traffic controller team, often cited as best in the nation," writes Wayne Thomis, Aviation Editor of the Chicago Tribune.

In December, 1952, without radar control, aircraft lost *283 hours 58 minutes* flight time milling over radio "holding points." In January, 1953, with radar traffic control, "holding time" was reduced to *4 hours 26 minutes*. Weather conditions during the two months were almost exactly comparable.

"As a result," writes Mr. Thomis, "airlines saved $100,000 in this one month; increased schedule reliability and passenger satisfaction; increased safety in Chicago's high density traffic."

Today, incoming aircraft are picked up by Gilfillan Air Surveillance Radar (ASR-1) 30 miles out, guided to final approach gate. There, Gilfillan GCA Radar (PAR-1) takes over, guides or monitors final approach.

During several peak traffic periods, a new record for civil airports was set by landing as many as 10 aircraft in a 15-minute period.

Bob Ziegler, Chicago District CAA Supervisor, commented that combined use of Gilfillan ASR-1 and PAR-1, for traffic control as well as landings, increased safety by pinpointing aircraft position in a 30-mile radius and achieving positive 3-mile separation between aircraft. Gilfillan Radar also allows PPI landings on any runway at the airport. The PPI landing was also pioneered at Chicago.

Credit goes to CAA, the Midway Traffic Controller Team and the Airline Pilots who participated in the six months experimental period that perfected radar traffic control at this busy airport.

In GCA, Radar and Electronics Research, Design and Production—

the FIRST name is... *Gilfillan*

Los Angeles

GCA

quacy not by outnumbering the enemy by men under arms but rather by maintaining a qualitative superiority in weapons and men.

I shall limit my remarks to the second of these two basic policies—maintenance of qualitative superiority of weapons and men. These terms are, in fact, synonymous with research and development on the one hand and training and education on the other.

In 1940, the total amount of money spent by the Department of Defense on contract research with industry and educational institutions was so small that it would not have supported any one of the present guided missile programs. At that time, not only were the monies limited, but the Army and Navy for the most part had little appreciation for the potentialities of this type of activity and indeed were incapable of administrating such activities. There were, of course, exceptions, and some extraordinary work was done within service laboratories.

World War II brought about the creation of the National Defense Research Committee. The wisdom of our leaders of the time, and in particular of President Roosevelt, in establishing this agency gave our armed forces a real introduction to scientists and engineers. Under the enlightened policies of NDRC, these scientists and engineers made contributions which gave, as the war progressed, an ever-increasing qualitative superiority over the enemy—and the edge was the most pronounced in electronics. Night bombing of Germany and Japan, the neutralization of the buzz-bombs, the destruction of the German undersea fleets, and the annihilation of Japanese naval forces by radar-controlled gunfire, are examples of purely one-sided technological victories of that era. Not to be overlooked was the intellectual heritage left by NDRC.

For the most part, all three services had learned a lesson during World War II. The emphasis on research and development after the war was all out of proportion to that of 1940. In fact, the yearly expenditures grew until last year the amount reached the staggering figure of $1½ billion, not counting other billions spent in supporting services within the departments and on various production prototypes and industrial refinement contracts.

In management of research and development contracts all the services showed remarkable progress. In fact, in certain aspects the services exhibited wisdom and statesmanship far beyond any reasonable expectation. I refer explicitly to the support of basic research in universities, nonprofit organizations, and even in industry by the Office of Naval Research, and later by its counterparts in other services.

World War II was concurrent with a tremendous revolution in scientific research and its costs. Before the war, a university research man fared well with an expenditure of under $1,000 a year. After the war nuclear physicists with their large machines like cyclotrons and synchrotrons, electronic engineers with complicated tubes and elaborate test equipment, metallurgists with electron microscopes and X-ray diffraction machines, all needed expensive capital equipment as well as much increased operating costs.

Dr. Ivan A. Getting

Dr. Getting, 41, was graduated from M.I.T. in 1933 and from Oxford in 1935. He conducted research at Harvard from 1935 to 1940 and directed M.I.T.'s Radiation Lab, 1940-45. His wartime work won him a President's Medal of Merit. A professor at M.I.T., 1945-50, and advisor to USAF Air Staff on deveopment planning, he became a vice president of Raytheon in 1951.

Privately endowed institutions and foundations were in no position to pick up the check. While Congress wrangled and accomplished nothing, the Department of Defense stepped in and provided a continuity of financial support. The American people owe to the services a depth of gratitude. Without their farsightedness, university science today would have nearly collapsed from bankruptcy; and many men and women would have been lost from these critical areas.

Today we are again facing a serious crisis in the support of basic research. Qualitative superiority in weapons is dependent on firm foundations resulting from basic research. To one actively engaged in science and creative engineering, these facts are so obvious that too often one is prone to forget the situation may not be as clear to others.

Today you might question the Air Force's spending money on measuring the density of meteorites in the upper atmosphere. Actually these data are fundamental in getting information on the upper atmosphere needed in designing intercontinental ballistic rockets. And certainly, back in the late 30s, economically minded "budgeteers" would have cancelled all contracts on the measurement of slow neutrons, those strange newly discovered particles that didn't even have an electrical charge. Yet within five years these slow neutrons led to the discovery of the fission of uranium, the chain reaction, and thence the invention of the atomic bomb. With all this history to guide us, it is amazing to find in these times directives issuing from high offices forcing the services to ruthlessly shut down basic research without inquiring into the consequences in the long-term haul on our qualitative superiority in arms, or evaluating the effect of these relatively small federal savings upon the universities and other non-profit organizations. I am sure that we all welcome the appointment of Don Quarles to the newly created post of Assistant Secretary of Defense for Research so that these grave problems may receive adequate and immediate consideration.

Basic research is only the first step to qualitative weapon superiority. On it is built a community of knowledge, principles, and methods. Based on these, chemists, physicists, metallurgists, and mathematicians all contribute to the development of the fundamental bricks of electronics: tubes, resistors, transitors, inductors, magnetic materials, ceramics, etc. These are combined with electromechanical units and other elements to make receivers, transmitters, computers, storage devices. These subassemblies are parts of bombing radars, and computing sights, all-weather interceptor fire-control-systems, world-wide communication nets, blind landing and traffic control systems. It is a never end-

(Continued on following page)

ing interlocking procession—and to the first approximation, the amount of development you will get, and therefore the edge over the enemy you can expect, will be proportional to the amount of effort and money you invest.

In this business, it is still true that you get what you pay for. Science is still a boundless frontier which will attract more and more young men and women as long as we can afford it. And herein lies the dilemma—for we cannot afford not to push science to the utmost—it is our basic material defense.

Who must bear this heavy cost—can industry and the universities? Obviously not. The economic plight of endowed universities and science foundations in the present period of inflated costs and small real incomes is well known. Neither can industry adequately support military research. It is basic to military research and development that it reach as far out as possible. It is not governed by the normal economic laws of commercial enterprises.

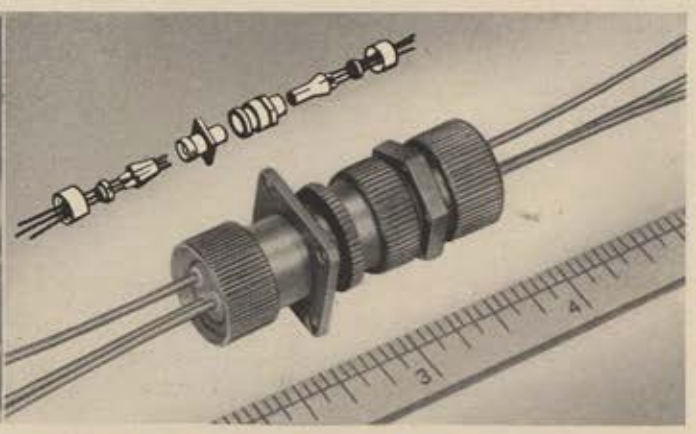
Competitive costs and consumer reaction play a minor role. The dominating force is technical achievement—or, as we call it, qualitative superiority. Therefore, military research calls on extreme techniques: high power, accuracy, light weight, extreme speed, and high reliability. The extent of these extremes is determined by the amount of effort—and the responsibility rests squarely with our government. To be sure there is a tremendous by-product to military research and development; for from it, in time, flow some commercial products and scientific achievements.

This brings me to my third task; the problems and prospects of the electronics industry in future airpower. The electronics industry has a dual character: it is a major element of our peacetime economy, and it is a vital element of our military potential. The relations between the two roles are sometimes subtle and at other times basic. There can be no doubt that the large amount of military-sponsored research during the war on radar gave a strong impetus to television. But beyond this, the exposure of a large number of young men to electronics in the services, with the training these men received, made it possible for this country to have the large numbers of television service men for our peacetime economy. In reverse our large television industry with its tre-

(Continued on page 77)

Four design ideas you can use right now...

DEPENDABLE FUEL FEEDING. Fuel for the J65 Turbojet Engine is injected to the burners through Titeflex® flexible metal hose. Tough, lightweight Titeflex—tested for temperatures from —70°F. to +600°F. and for pressures up to 500 psi—reliably conveys fuel to engine nozzles; withstands vibration and rough use; is excellent for complex configurations.



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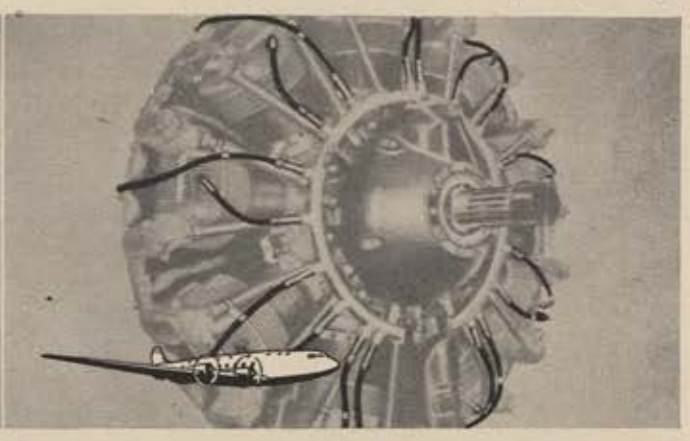

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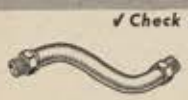

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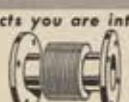

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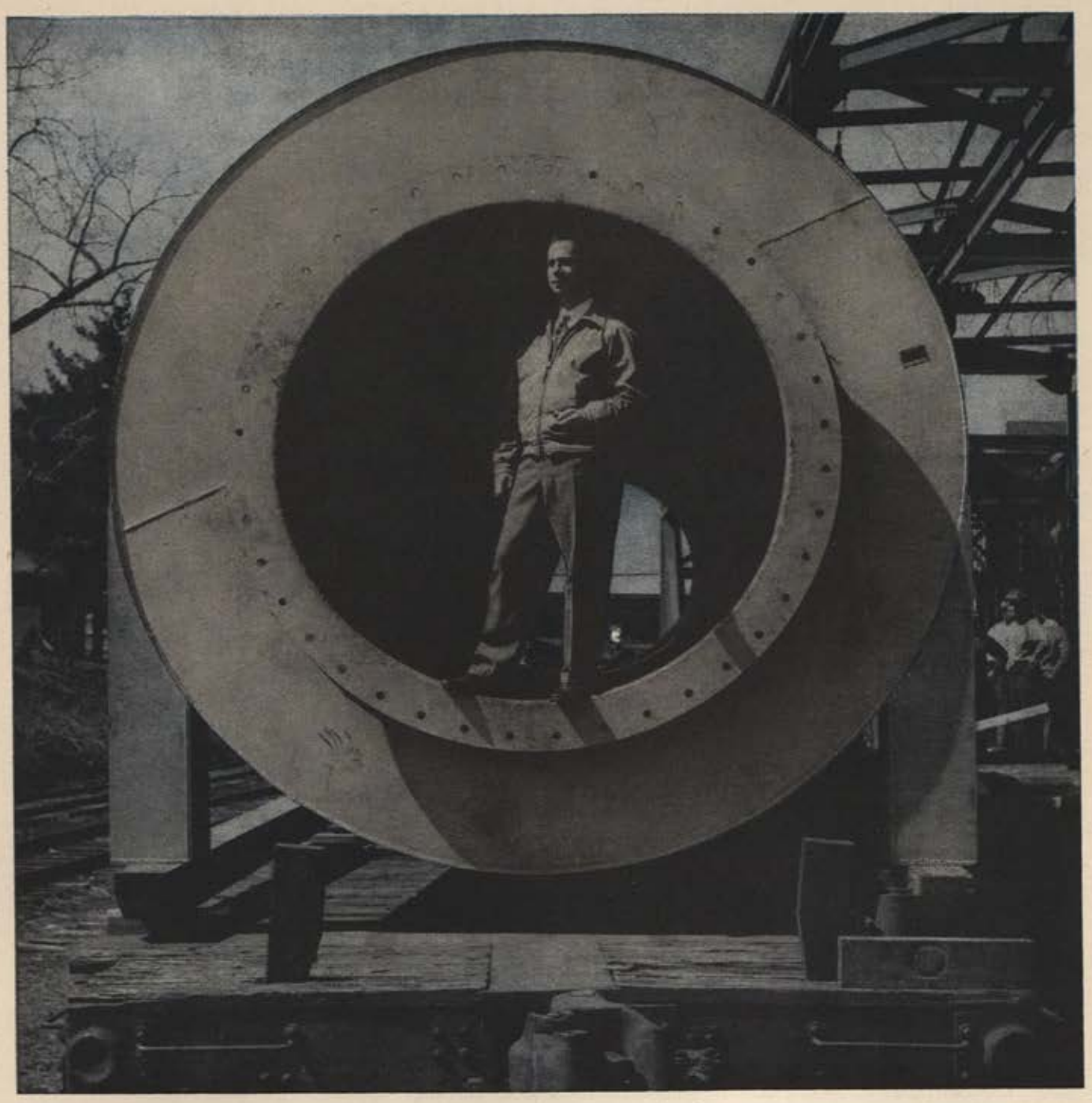

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mendous service establishment and hundreds of TV schools provides a pool of highly trained men for a war emergency. In short, the industry as such has a definite dual role.

Recently the Air Force announced a new policy for "Weapon Systems Development" in which one contractor, presumably the airframe manufacturer, is to be given the contractual responsibility for the development of a complete airplane with all its elements. By this means the Air Force is attempting to obtain integrated, combat-ready weapon systems. It is in part a recognition of the intimate relationship of the elements that go into a fighting aircraft; but it is also a recognition of the administrative problems which existed when the Air Force itself tried to provide the technical and contractual coordination.

It is not at all clear that swinging all the way in the new approach of contracted systems responsibility will either solve these problems, nor is it clear that new ones will not rise to rear their ugly heads. Over the long run there are a number of dangers. One of these is the possibility of severance of the intimate intellectual relationship which now exists between the Air Force and the electronics industry. This relationship has been mutually stimulating, and will undoubtedly be reduced by the insulation of dealing through prime contractors. Another possible danger is the growth within the airframe industry of specialized electronic facilities, lacking the advantages of stabilizing peacetime and commercial support.

Granting that military expenditures are bound to fluctuate, such facilities become in effect expensive and detract from the concept of dual facility plants which Mr. Wilson advocates. Finally, there is always the danger, and it is particularly evident right at this time, that projects not directly associated with end-item objectives will be cancelled.

It is inevitable and proper that prime contractors under the weapon systems concept take the short-time view. They are required to produce an integrated machine in a finite time. Consequently they must start with available building blocks. This incentive toward conservatism will reduce waste but perhaps at the cost of advanced performance. Thus, over the long haul we shall stand to suffer in qualitative superiority, and unless effective steps are taken to continue

(Continued on following page)

direct contracting between the Air Force and the electronics industry not only on new components, and techniques, but also for major elements like fire-control systems, auto pilots, and automatic landing systems. It is interesting to note that to date every successful anti-aircraft guided missile, whether ground-to-air or air-to-air, was developed with systems responsibility in an electronics organization.

I sincerely hope that the Air Force will approach their new weapons system contractual policy with care, and that the Air Research and Development Command will continue along the lines of relaxing on channels of communications between contractors and the using branches of the Air Force, provide for better coordination, streamline their contractual procedures, and above all zealously guard the long-term projects and their research programs, and support component developments.

The Air Force is unique in having a centralized organization, the ARDC, which can devote its full energies to the task of assuring qualitative superiority. It is a difficult assignment—one which requires an appreciation of the problems not only of the Air Force, but also of industrial and university research organizations. ARDC has made a valiant start through its enlightened policies and it deserves our vote of confidence.

Electronics has much to offer to airpower future. With increasing speeds, airplanes become more and more dependent upon electronic flight instruments and controllers; bombs, rockets and guns are useless without radar and electronic computers; all-weather flying and even visual navigation requires electronics.

And finally, airpower in the sense of integrated striking and defensive power has no meaning without the "nervous system" provided by electronics. The future will see the use of smaller components, like transistors, and the introduction of new techniques, such as digital computers. Undoubtedly from a technical view, air-warfare will become a lot more complicated. This will be forced upon us by the capabilities of our enemy. Let us hope that through research and development, we as a nation can meet this challenge for overwhelming qualitative superiority, which President Eisenhower has so clearly stated as our national policy.—END

(Continued on page 81)

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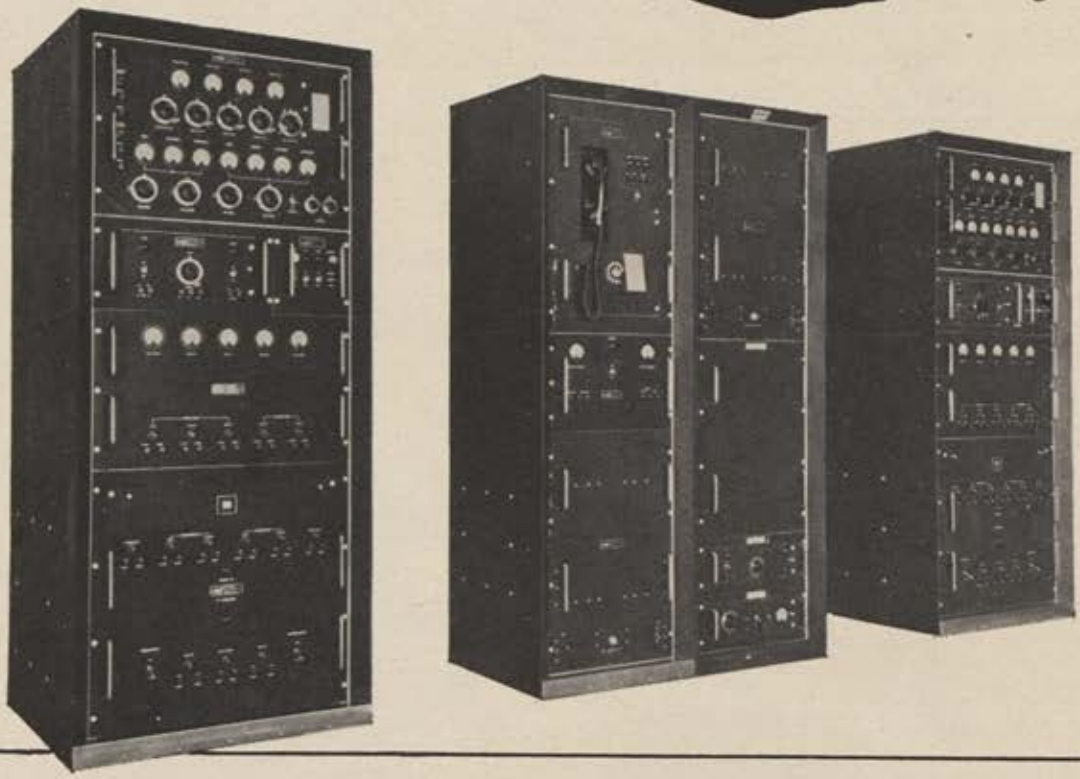

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Total Weight: 2250 pounds less antenna) equipment.

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Department of the Army

The Hon. Earl D. Johnson
Under Secretary of the Army

I WOULD like to stress that while I am in the Army I still am not out of the Air Force Reserves, so if I get thrown out of the Army maybe I can still get back on active duty with the Air Force.

When Art Kelly asked me to introduce the Department of the Army on this symposium, I was delighted to accept if for no other reason than to meet some old friends. Actually I have been going at it now for my fourth year and I hate to think of that; it is almost a college career.

Since I have been in the Department of Defense I have had an ample opportunity to see the Army, the Air Force, and Navy working together, both the civilian and the military working in the air field, and I like to think that in some small way I have been able to add to the fusion of thought, not confusion of thought, on this subject.

I suppose it is always said that in the event of war you have to have plans. That is said by every leader of every nation, I suppose, and today we are principally engaged in planning, planning not for a war, but planning what we are going to do first to deter a war and, secondly, how we are going to meet it if it does come.

Now as C. R. Smith said, I was in the Air Force, and that was for a period of some twenty years. Now I have gotten into the hallowed category of being available for pension when, as, and if I reach the advanced age of sixty-five. But in the twenty years and before that in the Artillery Reserve, you continually hear this statement, that in the last analysis somebody has to walk in in a war and walk in all the way.

Well, the day is going to come when this method of fighting can disappear; at least he may not have to walk in all the way. So I want to tell you something about the Army's plans, the same Army which in your memory, and in my memory of course, was horse-drawn and then converted to truck-borne.

I likewise want to tell you about some of the lessons we have learned in Korea which should cause us in our time to see an important transformation in the foot soldier and his way of fighting. Throughout this, what I want to stress is the Army's attempt to achieve mobility.

Now we have learned that in the age of megaton weapons that are unfortunately capable of producing megadeaths, the creation of any weapon which is gigantic and which cannot be disassembled, hidden, moved, and by that I mean dozens and perhaps hundreds of miles, if it lacks defense of mobility it lacks surprise and it may lack the capacity to achieve what we expect of it.

This applies to forces of men as well as to the weapons given these men to use. Mobility in space and in time is the key not only to waging an actual war but also should be an integral part of the planning for that war.

The struggle with which we are potentially faced encompasses such vast areas and makes it absolutely essential that we build into the striking force of our Army the mobility which this nation is capable of going into. After all, we have relatively limited manpower, and we have limited resources. While I want to preserve a good life here and therefore keep our forces down and not put all of our wealth and substance into material, there are nations around the world which are bent entirely on producing, storing, deploying much greater quantities of weapons at the cost of individual liberty and individual dignity.

This does not imply that our position is hopeless but simply that we cannot match them man for man. That is said too frequently and sounds trite, but I want to emphasize that again. But we can win, if forced into war, by being able to move rapidly through the dimensions of space and time. And by that I mean moving on the land, sea, and air. We can win if we are forced to fight by exploiting our strength, which is solely and uniquely developed in the United States.

I refer to the strength that lies in the capacity of American industry to contrive, operate, and maintain the machinery of mobility. This capacity is just now about to be tapped as America's fighting team begins to utilize the full potential of air mobility. However, I am not sure that in our instincts for specialty we have not become confused in our response to mobility needs.

A jeep is such a poor flying machine; an airplane is so useless on the ground. Neither do well on the Arctic ice, on muskeg, swamp, or in the jungle. Yet in past wars we have found ourselves in all of these places dragging vast tonnages of materiel awkwardly over ice, snow, coral reefs, and beaches and always with great spoilage, waste, and sheaves of manifests, bills of lading, parts lists and mimeographed forms, all of the things that go in to make a war.

Therefore, the key to our plans must be mobility; that is, fast, dependable, and ever-present capacity for mobility—land, sea, and air mobility. It is a mobility which is capable of confusing and outstripping enemy intelligence. We need, and dreadfully need, the capacity to deliver relatively powerful forces of men and materiel rapidly to any part of the world.

The concept of envelopment, the tactical end-run, in battle must be freed from the limitations of mud, mountains, morasses, yes, and even roads, and has to be a surprise action. It has to be both vertical as well as horizontal in its movement over all types of terrain by which it is possible for our ground forces to be augmented or withdrawn or redisposed or deployed rapidly. In short, we must be able to hit our enemy three times for each blow we receive.

In effect, this multiplies the effective use of what limited quantities and limited men we do have.

All of us who were in the last war and even those who have seen the newsreels have vivid memories of the vast tonnages which had to supply the men in the last war and which continued in Korea. Believe me, it continued in Korea in a larger percentage in terms of the men involved.

(Continued on following page)

Now the last thing the Army wants to do is to build up an air force, and therefore, the Army has to tackle this problem from a different angle and one of those angles is to tackle it from the standpoint of lightening the infantryman's load. I don't mean to just lighten it so as to ease the burden on his back or to give him more personal mobility, but ease not only that infantryman's load but the ammunition, the jeeps, and the trucks, everything that goes with him to make him a striking force.

We are trying to reduce it for the sole purpose—sole purpose is too strong—but for the major purpose of making him air-liftable.

Now the familiar GI plodding through the mud is really an internationally recognized symbol. Whenever I think of that symbol I think of a helicopter flight I had the opportunity of making in January of 1951 with the then Commander of the Eighth Army, now the new Chief of Staff of the Army, Matthew B. Ridgway. We flew—this is against the flying school lessons—slowly and low over terrain in Korea.

It was January 1951, and we had just started Operation Killer, and we were driving the Chinese back north across the Thirty-eighth Parallel. One thing impressed me on that flight as we went along. There were about three or four inches of snow on the ground; and up one knife-ridge and down the side and up the next one and down the next one, endlessly, went those infantrymen's tracks approximately twenty yards apart, moving, driving people out step by step.

Now if ever anybody had a determination to get the infantryman off the ground and making him more mobile, you could have it indelibly deepened if you saw that particular exercise, and believe me, it stretched all the way across the waste of Korea as far north and south as we flew.

Fortunately for the Army, the new Secretary of the Army, Mr. Robert T. Stevens, is equally air-mobile-minded, and from the long-range aspects of saving money for this country, from the long-range aspects of easing the burden of the Army, easing the individual soldier's load, I think that the attitude of Mr. Stevens is extremely important and will prove most beneficial to the Army.

Now I mentioned earlier this basic problem of weight reduction. I mentioned also the GI who was mud-bound. Whether or not he remains mud-bound, whether or not we realize the full potential of our capacity and know-how, depends to a very great extent upon the American air industry and its application to our problems. With its help we should be able to achieve skillful blending of the fighting man and his weapons with the airlift he needs for mobility.

Now this problem of becoming airborne and mobile is not just an exercise. So many problems that go on in the Pentagon are labeled as exercises and then labeled as "filed." Then the exercise is repeated. But this is a considered basic purposeful policy on which we want to place unrelenting pressure.

It is often said that the next war may be won or lost quickly. If this is true in any substantial degree, our preparation now and our planning for deployment will have to be reoriented. I am not making a forecast that it will be won or lost quickly. Preparations and planning, based on D plus so many months, becomes quite unrealistic. D plus so many days—yes, even D plus so many hours may be the correct and crucial basis for planning.

When you start talking speed you have to think in terms of the air.

It might be well at this point to mention briefly some of our experiences in Korea. Although history may show that campaign to have been a strange one, limited in scope, unnatural in boundary, and a planner's nightmare, it did teach us some lessons, and the Army has been compiling, studying, and interpreting those facts in order to learn something from it. We hope to glean enough to add something to our basic doctrine, and I am going to refer to my notes because it is quite impressive.

I am speaking only of Army pilots in this. They flew during Korea 500,000 hours, of which they undertook over 140,000 combat missions of reconnaissance and artillery spotting, aside from administrative flights and others flights—500,000 hours of flying and 140,000 missions. It is small in terms of what the Air Force does, big in terms of the future probability of what the Army will do.

About forty aircraft were lost to enemy fire, and about fifteen pilots, not to mention casualties, but fifteen pilots gave up their lives. Within this impressive record of flying there are unlimited tales of heroism to be found among the men who flew at low altitude week after week over enemy lines, their lives and their work linked closely to the savage ground fighting immediately beneath them.

We have learned well the lesson of the close relationship between the aircraft pilot and the ground commander and how many different ways the aircraft can serve the soldier on the ground.

Another aspect of Army aviation which was firmly established in Korea is the use of helicopters for aero-medical evacuation, which everybody has read about. By the end of the campaign the Army had airlifted from the battlefield over 16,000 casualties. This is exclusive of Marine Corps aircraft or Air Force airlift.

Even so, toward the end, helicopters actively proved themselves in the combat theater in yet another way; namely, by actually moving hundreds of soldiers and hundreds of tons of supplies over difficult terrain in incredibly short periods of time and often to commanding mountain heights inaccessible in any other way, where the forces controlled vast mountain areas and multiplied the effectiveness of the

(Continued on page 85)

The Hon. Earl D. Johnson

Earl D. Johnson, 47, became an AAF pilot in 1932. Until his recall in 1942, he was a vice president of Loomis, Sayles and Co., economic consultants. He left the Air Corps in 1946 as a colonel and Deputy Commanding Officer, Ferrying Division, ATC. He was appointed Army Assistant Secretary in 1950 and Under Secretary in 1952 by President Truman, and reappointed by President Dwight Eisenhower.

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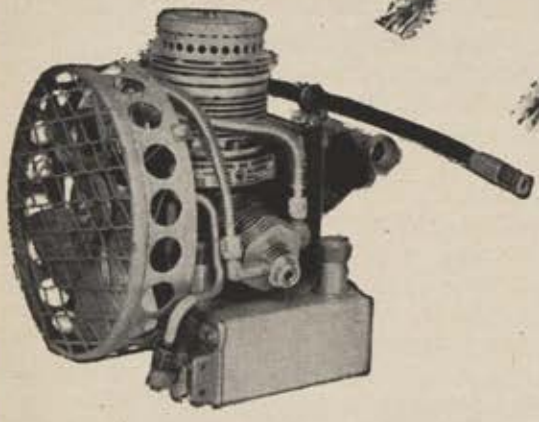

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weapons which they had in their hands.

Now we in the armed forces have supported strongly the development of the helicopter and the development of what is equally essential, the development of production facilities. They are an established tool as far as the Army is concerned. They are just as established in our doctrine and in our operation as the jeep and the truck, not as broadly, but they are as basic.

Because of this peculiar adaptability to the Army's needs, the Army is pressing through every channel at its command to get the helicopter developed. I could speculate here on the many diverse uses to which we are likely to put it and what types and in what numbers we are likely to employ it. Actually, how soon, how many, and how varied the types will be will depend on the success of our present research efforts and the manner in which the helicopter industry meets the challenge.

Naturally we are hoping that the civilian use of the helicopter will in itself produce, support, and develop an industry comparable to the present great fixed-wing aircraft industry.

Now speaking of civilian support of the aircraft industry, I believe it is pertinent to call to mind something we did in the last war and which again we had to resort to in Korea. You will recall we had to fall back on the civilian airlines for emergency lift to Korea. The Pacific Airlift used some sixty crews diverted from their normal civilian runs.

The Army is fully aware of the potentiality of the airlift involved or available to it in the civilian fleet, but I think we have to reorient our thinking a little bit on just how we are going to use that and whether or not it is going to be available to us to use. We all know that the tempo of life today has picked up something phenomenally.

Business used to operate in terms of messengers on foot, the postman and the telegraph, and we have now progressed to where we are dealing in terms of the telephone and radio and air mail. Business itself is now geared, the business operation of this country is now geared, to air transport and travel. If C. R. Smith has his way, and a few other people here have their way, the freight business is going to be geared to air speed.

(Continued on following page)

ARMY — CONTINUED

Now the economy has moved from buggies to automobiles and aircraft. Here are a few figures. Last year—many of these are more familiar to you than they are to me—domestic airlines flew 12,528,000,000 passenger miles. Passenger miles on railroad cars owned by the Pullman Company totaled 9,335,000,000.

In other words, twelve billion in the air and nine billion in Pullman cars. Within this country about twenty-three million people were carried in parlor and sleeping cars while twenty-five million people were carried by airplane. Now think of those figures and what that means in the way of impact and the speed with which business moves and is transported.

Dr. Getting before talked about the electronic industries and your computing machine. American Airlines has a machine up there in New York where you don't have to stand in line so long. You press a few buttons and some signals come across there, "Do you have it?" Usually to me, it is "No."

You have this in reserve, but how, in that condition when it prevails, how are you going to reach in at that time when industry is going to be called on to produce at the maximum speed, in ever increasing speeds, how at that time are you going to reach into the civilian economy and take away this new form of transportation which is turned over to them? I know we will reach in and take a lot of it.

Yes, a lot of it is unnecessary travel, and the Air Force is going to have it, but believe me, we can't do like we did during the last war when every ferry pilot was given a priority, too. I don't think we will get it in the next war. Therefore, I want to see some top planners turn some major and constant attention to that problem because we want to be airlifted and we will need an airlift in being when we get started.

So far, I have been expressing mobility in air transport. I could talk for endless hours on tactical air support; everybody in that phase likes to talk about tactical support, but I can assure you that the Army and the Air Force and the Navy have been working together in a way which would make your hearts glad if you had a chance to see it every day like I do.

The Air Force isn't satisfied with how we are doing it; I am not satisfied; the Army isn't satisfied, but I guarantee you that we all see the path before us that we should progress down, and we are moving that way just as fast as we can. Therefore, in the few minutes that are remaining to me I would like to touch a little bit on the cost. I would like to touch two aspects on the cost. I know the airlift is expensive; I know that, everybody knows it, but I also think you have to take a look at it in two ways; you just can't look at it in terms of that large dollar sign they put in front of you.

You have to look at it in terms of perspective. Airlift of men and materiel as a result of poor planning is extremely expensive, for then we have let time overtake us to such an extent that we are forced to make haste wastefully. I admit that is an expensive type of airlift. But there are qualifications to keep in mind.

Rightly or wrongly, under the philosophy by which we live we have turned over to any potential enemy the initiative in any war we get into. We have said to him, "You can strike first; you can call the shot as to how it is going to be fought." That is a tremendous disadvantage.

Now unless you want to adopt what I call the "stash" method where you put yourself into an armed state of readiness all over the world, produce tremendous quantities of equipment, stash them here and stash them there and put your men with them, you are bound to end up with a great deal of your substance in men that are idle and materiel that you will never use, and it will be at the wrong place at the wrong time.

Now how do you overcome that? You use limited men as opposed to unlimited manpower, limited supplies as opposed to unlimited supplies, and you put them in a strategically located position and provide them with the mobility which air can give them, and then you can get them quickly and rapidly to the point of conflict.

Now to me maybe that costs a lot per man, per weapon there, but to me, over-all, that is a very sound approach and when you start determining what is expensive and what isn't expensive, it can be quite practical.

One other thing. I would like to go back to the statement about D plus days and D plus hours as against D plus months and air mobility comes into that, too. One other facet, and that is the Army has at any one particular time, as long as it is at

(Continued on page 89)

The PROTECTION of ALUMINUM

"ALODINE" PROTECTS BOTH PAINTED AND UNPAINTED ALUMINUM

"Alodine" forms an amorphous non-metallic surface on aluminum which is thin, tough, durable, continuous with and a part of the basis metal. The "Alodine" film (or skin) anchors paint, prolongs paint life, and protects aluminum exposed unpainted to the atmosphere.

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3. Coating with "Alodine."
4. Rinsing with clean water.
5. Rinsing with warm "Deoxylyte" (acidulated rinse).
6. Drying.

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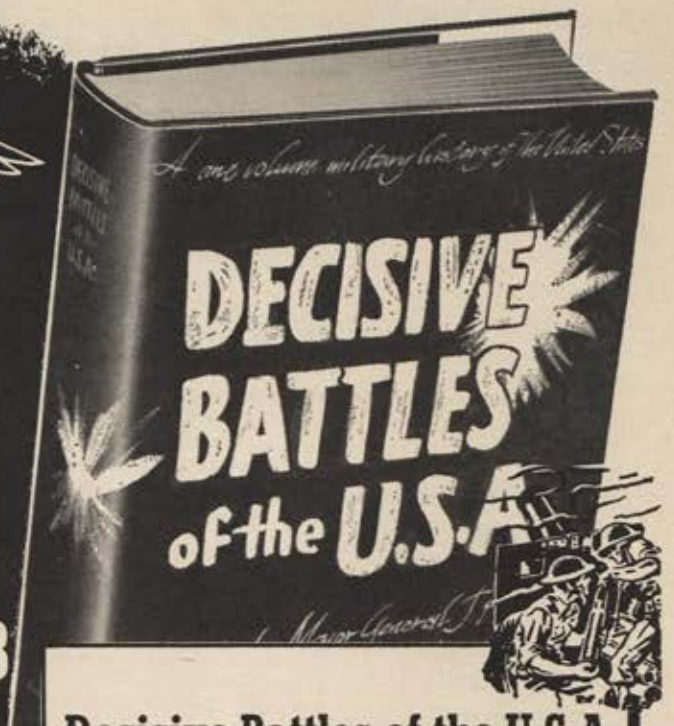

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its present size, which is 1½ million, the Army has in a travel status about 100,000 men.

Now if we can move them twenty percent faster by moving them by air, twenty percent of 100,000 is 20,000 men. That is more than a division. When they are in that travel status they are no good to anybody; we have to take care of them, administer them, feed them, and clothe them, and everything else.

If you move them twenty percent faster, which isn't too tough for air to do, you have the use of a division which you are otherwise denied. I don't know what the use of an extra division is worth to you, but it is worth an awful lot. Measured in terms of the number of divisions we have, it is a pretty high percentage of your total budget cost.

Now I would like to go on and talk up here, and I would like to get in a corner and talk with people that I know are disagreeing with me and some that are agreeing, but time is running out. All I can say is that given the opportunity to proceed as we are proceeding at the present time with the Air Force and Navy cooperation, we are going to make this concept of air mobility available, airlift-in-being a part of the entire Army doctrine, a part of the entire Army's operation; and I am sure we are going to get the men out of the mud a lot of the time.

QUESTION: I would like to ask Secretary Johnson how he squares —I don't want to embarrass him— how he squares the atomic cannon with the emphasis on air mobility.

MR. JOHNSON: Very easily, just as soon as we get the air mobility maybe we can drop the atomic cannon, I don't know.

QUESTION: Maybe it is a little embarrassing, the question I have. How long is it going to be before the Army is in the tactical business?

MR. JOHNSON: You mean tactical air support?

QUESTION: That is right.

MR. JOHNSON: I don't think we ought to be in tactical air support. I don't know anybody at the top of the Army who is pressing for it. I can assure you that we have a need for better tactical air support, and nobody recognizes that more than the Air Force. We cannot hope to get the amount of tactical air support for the entire Army that it is possible to concentrate for a small division of the armed forces.

It is just at the present time, at least, so fantastically expensive that it cannot be done. Therefore, and remember the Army is an elephantine thing, the Army has to plan on the Air Force tactical air support only so close to the front line.

As long as we can do it cheaply and sufficiently, it would be a mistake that the Air Force should be at the beck and call of the Army. We have only so many dollars to spend, and the country can only spend so much in materiel and production facilities. We are thoroughly agreed with the concept of the priority to SAC and we recognize that we have to offset any deficiencies by ground weapons. Basically I am sure that we will never have the amount of tactical air support from the air or Navy or anybody else that the field commander would like to have. But at the same time there is absolutely no intention, and I for one would fight it strongly, that the Army should go into the tactical air field, and I am sure that the Secretary feels the same way, and I haven't heard anybody else speak differently; everybody I've talked with is against it.

QUESTION: I was very much impressed with the Secretary's remarks about helicopters. One of the questions I have long had is the vulnerability of helicopters to ground and air fire. I was wondering if that was a fair test in Korea as compared to if we were up against Germany with good pilots and whether a helicopter would stay in the air?

MR. JOHNSON: This is one of the questions which is bothering us. We don't know that. We know that they have been shot down. As you know, if we lose a part of that rotor, and not much of it, you don't have much to glide down with to a belly landing, and furthermore, you don't have a chance to bail out as far as the personnel inside the helicopter are concerned.

If you will pardon a personal reference, I flew in north of the Han in those early days. An outfit was cut off nineteen miles from the front lines. We flew in at not too high an altitude, and as you proceed along, it was 4:30 there, and you could see the ripple of gunfire as they were shooting at you. However, it has not been too effective in losses. So there must be something to the stories about the difficulty of hitting them.

I also know that the Germans are not the Chinese Communists. However, we are counting on not fighting the Germans. The Russians may have something, and this is one we have to learn, and it is a tough one that hasn't been solved.—END

ANGuard ANGLES

IN HIS report on the Air National Guard to the AFA convention, Maj. Gen. Earl T. Ricks, Chief of the Guard Bureau's Air Force Division, said the Air Guard's more than 500 federally recognized units include eighty-seven tactical squadrons, organized into twenty-seven wings. This force, the veteran flyer said, "represents a very important segment of the total airpower in the US."

He sketched the record of the Air Guard in Korea: eighty percent of the entire force called to active duty, two fighter-bomber wings (116th and 136th) sent to Big K as units, thousands of officers and airmen who went there as individual replacements, three Air Guard jet aces. That the ANG performed so well in combat proved, the general thought, "the merit of having on hand a strong, well-manned, well-equipped organization of this kind."

Well, Korea is over and, except for individuals who elected to remain on active duty, the ANG is back home. How does it look? General Ricks thinks it looks *ding hao.*

The Guard Bureau, the general told AFA delegates, had estimated only ten ANG wings would undergo field training this summer. But when NGB polled the states—including those whose units had just come off active duty—and asked whether their ANG people wished to go into the field for fifteen days, "To our surprise," said General Ricks, "all but one state not only asked—but demanded—that their units be scheduled for field training."

So instead of ten wings, twenty-seven went into the field—with resultant complications. "We were forced," said the general, "to open interim training sites, to pool equipment and aircraft." Equipment was short, spare parts few, personnel limited. Despite these handicaps, he reported, "this year's ANG field training was the finest I have ever seen. Wings were operating as wings, gunnery scores were higher, aircraft utilization and in-commission rates were higher."

What of the future of the ANG? General Ricks sees the Air Guard playing an increasingly important role as a member of the defense team.

"Barring unforeseen circumstances," he said, "we expect that in fiscal 1955 we will have the necessary facilities to equip eighty-one squadrons with jets." This equipment, the general said, will be diversified. It will include F-80s, RF-80s, F-84s, F-86s, B-57s, and RB-57s. Further, he went on, some units will be equipped with all-weather fighter aircraft. He disclosed for the first time that thirty-four states have said they can organize another sixty ANG tactical squadrons—if Air Force wants them to do so.

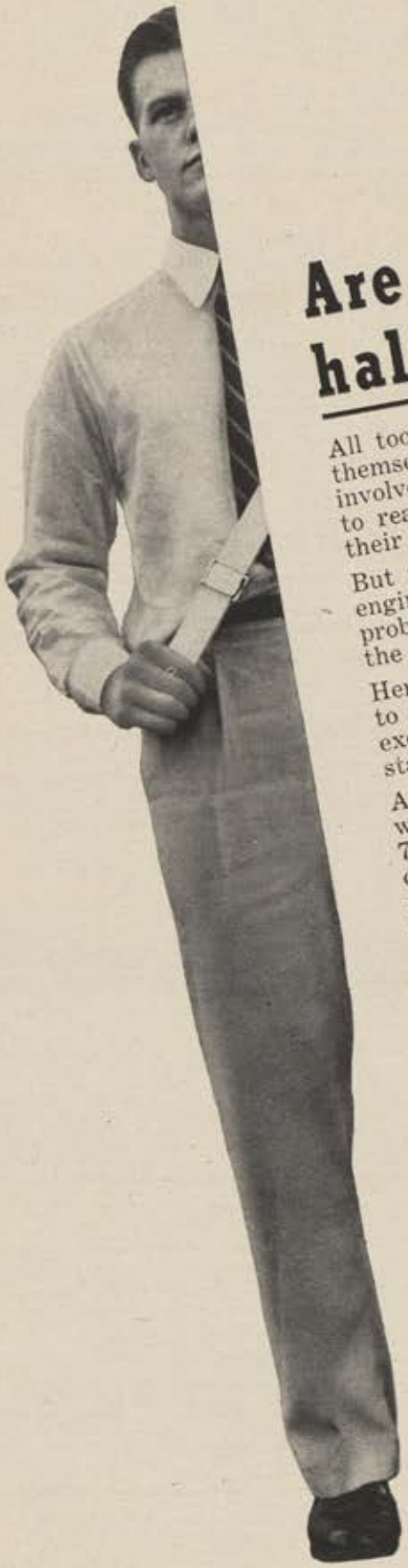
Problems? While competition for recruits is keen, ANG's major concern is with the procurement of young pilots. ANG's Aviation Cadet training program is double-barreled. High school graduates between 19 and 26½ can enlist for the pilot program and go through as cadets. Young men in the same age bracket with two years of college behind them can be commisioned second lieutenants and go through training in grade. In either case, the graduate returns to his unit as soon as he wins his wings. He is not required to spend any time on active duty with the Air Force.

"I know of no group so close to the pulse of young America's interest in aviation than the Air Force Association," General Ricks concluded.

° ° °

Notes on the back of a Form 175. . . . ANG's "back-to-jets" movement is progressing at a rapid pace. By the end of the year thirty-six squadrons will each have a T-33 for transition and more than 500 pipes in three types—F-80, F-84, and F-86. . . . Meantime, Air Guard strength continues to soar. In a year it has gone from 15,000 officers and men to approximately 40,000. Program calls for 53,000 by next July 1 with an eventual ceiling of 85,000. NGB attributes the growth to the large number of veterans of the Korea war who are joining again and to the interest created by ANG combat record in Korea. . . . ANG planners are giving increasing attention to the formation of 168 replacement training squadrons.

By Capt. Edmund F. Hogan, ANGUS



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• To assist in obtaining and maintaining adequate airpower for national security and world peace. • To keep AFA members and the public abreast of developments in the field of aviation. • To preserve and foster the spirit of fellowship among former and present members of the United States Air Force.

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