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planes

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MILITARY AIRCRAFT PRODUCTION DECLINING

Rails, Steamships Losing Travelers To U.S. Airlines

The past 10 years have brought a revolution in the travel habits of Americans.

The airlines have captured the biggest part of the Pullman-airline travel market. And they have also gone into a substantial lead over ships in carrying travelers between the United States and foreign countries.

Only a decade ago, the airlines accounted for a small fraction of this total traffic.

Air Lead Jumps

In 1953, the latest year for which complete figures are available, the airlines flew 14.7-billion passenger miles while Pullman travel in the United States amounted to only 8.2-billion. In carrying this 64 per cent of the airline-Pullman total, the airlines for the third straight year captured more than half of the combined mileage.

The same pattern held true for air and sea passenger travel between the United States and other countries. The U.S. Immigration and Naturalization Service reports that 60.7 per cent of all passengers coming into or leaving the United States during fiscal 1953 went by air. Airlines carried 1,714,618 while ships carried 1,112,117.

Fly U.S.-Built Planes

In this international transportation field, the U.S. air carriers—using safe, dependable American-built transports—have acquired a worldwide reputation for the safety of their scheduled operations over ocean areas. The international operators at the end of October completed 12 months of flying without a single passenger fatality. During that time, they flew 2,670,000 passengers more than 3,660,000,000 passenger miles on scheduled international flights.

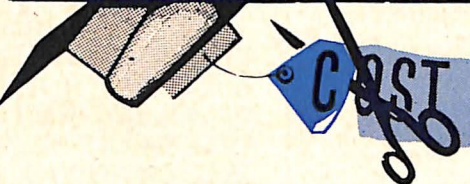
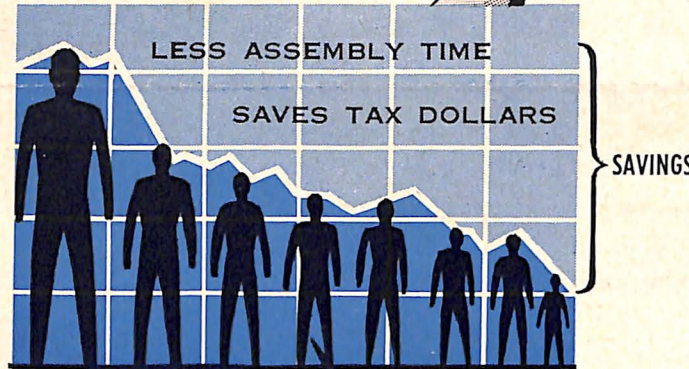
Years of Research

The design of a modern multi-jet bomber required more than 76 times as much wind-tunnel research as the design of a typical World War II bomber.

It took more than 19,000 hours, compared with 248 for a four-engine bomber that was operational in early World War II.

MORE MISSILE FOR THE MONEY

MAN HOURS



Continuing cost control practices in the U.S. aircraft industry save tax dollars—and make the military air procurement dollar go farther. Typical example: a 62 per cent reduction in over-all assembly time on a new pilotless bomber. This reduction in man-hours was accomplished under a Unit Cost Control system which pin-points production delays by allotting specific time goals for each production item.

'PLANES'

Aircraft Industries Association

Long-Range Plan Held 'Essential' For Air Power

By DeWitt C. Ramsey (Adm., USN, Ret.)
President, Aircraft Industries Association

U.S. military aircraft production has started a gradual decline in the past few months, under the nation's long-range plan for an orderly transition from "buildup" to "sustaining" rates of production for the armed services.

Last year, output reached a peak of about 1,000 planes per month. Today, production is slightly less than 900 planes per month, and will continue its gradual decline to a level adequate to maintain full modernization of the planned U.S. military air strength.

Goals for 1957

Although these goals (137 Air Force wings and commensurate Naval aviation strength) are not scheduled to be achieved until mid-1957, military aircraft production is expected to level off several months earlier.

From that point, under present planning, production will be on a level adequate to provide new and modernized aircraft for the military services and to preserve a mobilization base sufficiently broad for rapid expansion in event of emergency. Current goals call for an active inventory by 1957 of 40,000 military planes, more than half of which will be jet-powered.

Outlook for Future

Although planned output of planes will be lower in future years, it is not anticipated that employment will be reduced in proportion to the cutback in unit production. Several factors will tend to keep the aircraft labor force at relatively high levels. Among them are the fact that mounting weight and complexity of modern supersonic military planes require more man-hours per plane. Moreover, the industry is expected to devote increasing effort and time toward guided missile development and production.

The importance of continuity in programming, research and development, and production, once the strength goals are reached, cannot be over-emphasized.

In the past, undue optimism about the course of world affairs and events

(See 35,000, page 3)

'Million Dollar Ideas' Reduce Cost Of Nation's Air Production Program

Most "million-dollar ideas" turn out to be worth considerably less.

But the million-dollar ideas turned out by cost-reduction experts in the aircraft industry have been worth every cent—and frequently more.

And, what's more important, they've all meant savings to the American taxpayer.

Industry-Wide Program

Under continuing cost-reduction programs at aircraft plants throughout the nation, thousands of ideas have paid dividends in lower costs to the Government. A large number of them have paid off spectacularly, in the million-dollar brackets.

Among these million-dollar ideas have been:

A saving to the Air Force of over \$100-million, resulting from an aircraft engine manufacturer's accomplishment in increasing allowable

time between overhaul on a jet engine from 15 hours in 1948 to 1,200 hours in 1953. This permitted a substantial cutback in the number of engines required.

A saving of \$1.5-million at a large aircraft company through an intensive materials conservation and reclamation program.

Improved Techniques

A \$1-million savings in a nine-month period by an engine manufacturer, through improved manufacturing and mass production techniques.

Another \$1-million savings at an aircraft plant, resulting from a new technique in making one small airplane part: a stainless steel end for hot air ducts. The new technique cut fabrication time from three hours to less than five minutes, reducing

(See MILLION, page 2)

PLANES

Planes is published by the Aircraft Industries Association of America, Inc., the national trade association of the manufacturers of military, transport, and personal aircraft, helicopters, flying missiles and their accessories, instruments and components.

The purpose of *Planes* is to:

Foster a better public understanding of Air Power and the requirements essential to preservation of American leadership in the air;
Illustrate and explain the special problems of the aircraft industry and its vital role in our national security.

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Mail By Air

Throughout the years the United States Post Office Department has taken pride in its record of delivering the mail by the fastest and most efficient method possible.

From the post riders of the 1780's through the eras of the stage-coaches, the barges, the pony express and the railroads, the most expeditious means of transportation has been used by the Department.

The time has now come when the airplane should assume its place as the carrier of first-class mail.

The policy which historically has guided the Post Office Department was summed up back on November 29, 1834, when Postmaster Barry stated in support of the "mail by rail" campaign that "the celerity of the mail should always be equal to the most rapid transition of the traveler . . ." At that time, as a railroad official remarked recently, "we wasted no sympathy on the stagecoach and the canal boat."

Present officials of the Post Office Department have recognized the demand for the faster transportation offered by the airplane. More than a year ago, they began experiments in carrying first-class mail by airline on a space-available basis between some of the nation's larger cities.

Letter writers already have been saved nearly 10 billion hours as a result of these experiments and hundreds of millions of letters are reaching their destinations on an average of 11½ hours sooner than those being moved by the railroads.

During the first year of these mail-by-air trials, the Post Office received \$29,500,000 in postage for the air carriage of first-class mail. Of this sum, the airlines were paid \$1,830,000—and 94 per cent (\$27,670,000) was retained by the Post Office.

Additional cities are scheduled to participate in these three-cent-mail-by-air experiments during the months ahead, as the Post Office attempts to determine the value and expense of the service.

Certainly there is a place in the great transportation system of the United States for all types of carriers—air, rail, truck and water. Each can perform certain functions better, more efficiently and less expensively than the others. Each should be concerned with exploiting the opportunities which exist in the fields for which it is physically best suited.

Methods of assuring a stable rail system are of national importance, deserving serious consideration and study. But it does not appear that exclusive carrying of first class mail by rail (which accounts for only about two-fifths of one per cent of the railroads' net income) would prove to be a lasting solution to their financial problem.

Throughout history, few people or organizations have long withstood the pressures of progress and new inventions. It is high time today that the airplane take its full place in the history of mail transportation. The airplane and mail-by-air herald another era of advances for America.

PLANE VIEWS

40 YARDS

5 1/2 MILES

12 SECONDS

IN TWELVE SECONDS A MODERN RESEARCH PLANE CAN FLY 5 1/2 MILES. IT TOOK THE WRIGHT BROTHERS FIRST PLANE TWELVE SECONDS TO FLY 40 YARDS

G GEARED FOR ACTION A MODERN JET BOMBER CONTAINS A THOUSAND OR MORE GEARS

SIX MINUTES OR EIGHT YEARS...

AN 11-TON ELECTRONIC CALCULATOR AT A MAJOR AIRCRAFT PLANT SOLVES PROBLEMS IN SIX MINUTES THAT WOULD TAKE AN EXPERT MATHEMATICIAN EIGHT YEARS TO SOLVE...

by Aircraft Industries Association

4,000 Subcontractors Build Parts That Go Into One Jet Engine

More than 4,000 subcontractors work for a major aircraft engine manufacturer in building the 8,854 parts that go into a new jet engine.

The company reports that 60 per cent of each defense dollar it received during the Korean buildup went to subcontractors and suppliers for parts.

Moreover, 82 per cent of the subcontractors and suppliers were small businesses, employing 500 persons or less. The prime contractor assumed the responsibility for training and integrating these small businesses into the production program.

'Million-Dollar Ideas' Pay Dividends to Taxpayers

(Continued from page 1)

cost of producing new jet aircraft. And, during all of last year, cost-reduction suggestions from workers at 12 typical aircraft industry plants saved more than \$5.3-million.

As part of an unrelenting campaign undertaken by the aircraft industry to produce U.S. military planes at the lowest possible cost, these time- and money-saving ideas help give the nation more air power per procurement dollar.

PLANE FACTS

- Each year, a typical aircraft manufacturer receives and ships 147,352,000 pounds of products and materials. It takes 1,164 freight cars and 14,940 trucks, not counting airliners and ships, to handle the traffic.
- More than 2,500,000 persons arrive or take-off on flights from Los Angeles International Airport each year. That's equal to the entire population of Los Angeles — plus an additional half million people!
- Safety note: Before a modern bomber takes off, the crew checks more than 300 separate items on the plane.
- The Air National Guard today has a strength just under 50,000 men, the highest in its history. There are more than 600 Federally recognized Air Guard units.
- U.S. airlines today have approximately 115,000 employees—and 200,000 stockholders.
- A modern supersonic research plane carries more than half a ton of complex instrumentation to help solve problems of faster-than-sound flight in the stratosphere.

Engineer Shortage Opens Up New Jobs For U. S. Women

American women didn't waste much time getting into aviation after the Wright Brothers made their first flight a half-century ago.

Now they are turning up in the engineering offices of the nation's aircraft manufacturers—a new field for women that appears to offer unlimited possibilities.

Aeronautical Engineering

And the U.S. Department of Labor reports that a study now being conducted indicates that aeronautical engineering may be the most popular course being studied by girl engineering students this year.

The last survey conducted by the agency disclosed that civil engineering, which in the past has attracted the largest numbers of both men and women, is declining in interest for men but is still increasing in importance to women.

At the time of this survey about 24 per cent of the total male engineers were working in this branch of engineering compared to 30 per cent for women. Electrical engineering, which is rapidly increasing in importance, ranked second with women. In fact, the Department of Labor reports that although the number of female engineers is small at present (only 1.2 per cent of the total employed engineers) the field is wide open for women because of the critical national shortage of all types of engineers in the U.S.

Opportunity Unlimited

The opportunities offered in this new field for women is emphasized by the fact that during the scholastic year 1953-54 only 816 women enrolled in undergraduate engineering courses out of a total enrollment of nearly 171,000 students.

There are 210 schools located in all parts of the U.S. offering engineering education. Practically all that are coeducational admit women students into the engineering classes.

And the pay upon graduation is good, too. The Society of Women Engineers says that in 1953 a fourth of its members were paid at a rate greater than \$6,000 per year.

SAFE!

A Navy pilot visited the management office of the National Aircraft Show in Dayton this year during a particularly busy moment when the telephone rang.

All hands being occupied, he picked up the 'phone and listened for a moment to the complaints of an irate resident of Vandalia.

"This is a dreadful thing!" she said. "These airplanes are making so much noise I can hardly hear myself think!"

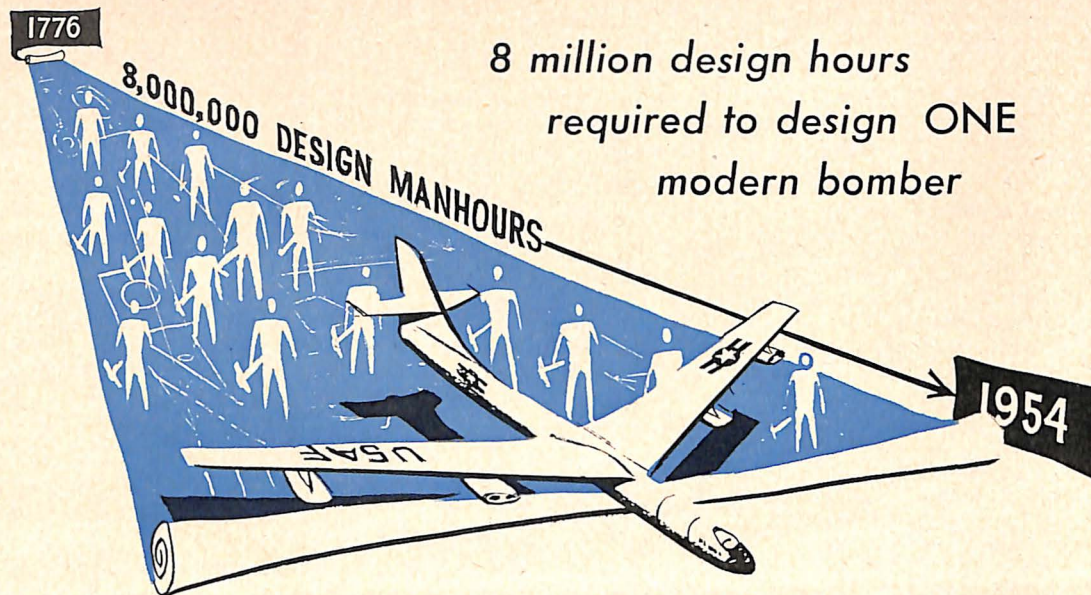
"Are they Russian planes?" the pilot asked.

"Certainly not! They are American planes. I can see them."

"Thank God!" said the Navy flyer, and hung up.



TIME FOR AIR LEADERSHIP...



8 million design hours
required to design ONE
modern bomber

Millions of engineering hours must go into modern aircraft to insure that America's planes fly higher, faster and farther than those of any possible enemy nation. Design of a modern heavy bomber, for example, took about eight million hours. That's equal to a team of 15 engineers working eight hours a day, every day of every year from 1776 to 1954.

'PLANES'

Aircraft Industries Association

35,000 Military Airplanes Produced By Aircraft Industry Since Mid-'50

(Continued from page 1)

has led America to dismantle its defense industries and demobilize its armed forces prematurely. The headlong disarmament and destruction of our defense potential at the end of World War II (even though we had ample warning of the ambitions and objectives of Russia) is a good example.

It is encouraging that, while all programs are subject to change as the international situation develops, the current peacetime schedules provide for the first time in history a long-range blueprint of action for American air power and the aircraft industry. Such a blueprint enables the consistent and orderly planning that is essential for maximum efficiency and economy in the production of aircraft.

America Caught Short

More important, long-range planning is essential today to the creation of strength adequate to meet our defense needs and our international commitments. When the Korean War began, America was caught far short of its requirements both for military air power *in being* and for aircraft production potential. The Air Force had only 42 effective wings, and the aircraft industry was building only 215 military planes per month. The industry, with a work force of about 257,000, ranked 11th among the nation's manufacturing employers.

It took several years, and billions of dollars, to rebuild the industry to the point where aircraft produc-

tion volume could meet the military's needs. The aircraft industry itself invested more than \$1.2-billion in expanding and modernizing its facilities in the years 1950 through 1953.

Output Since Korea

Fortunately, the nation had time to accomplish this task—time which certainly would never again be available in the event of direct attack from the air. As a result of this cushion of time, the aircraft industry has not only been able to produce more than 35,000 planes since the start of the Korean War, but has constantly improved their performance and striking power. The industry also has increased its research and development activity, leading to entire families of new fighters and bombers with unprecedented combat capabilities.

In addition, the industry has recreated the large and efficient management, engineering and production teams that are essential to the volume production of fighting planes. These industry teams provide a solid base from which vastly expanded production could be launched if required.

An assurance that, once rebuilt, our national air power will not be allowed to fall into impotence and disrepair has been given by Adm. Radford, chairman of the JCS, who has said: "Once we reach our strength goals, it is up to us to keep these forces intact and modernized . . . through the critical years which lie ahead."

Industry Studies New Ways to Use 'Wonder Metal'

Every ounce of weight cut from a modern airplane means faster speed, greater payload, and higher maneuverability.

That's one reason aircraft designers today are so interested in titanium—the so-called "wonder" metal that is roughly as strong as annealed steel, yet weighs only 57 percent as much.

Hold Industry Meeting

At an industry-wide meeting held recently in Cleveland, it was estimated that the substitution of titanium for steel in the aircraft built last year would have resulted in over-all savings on the order of 600,000 pounds.

Nearly 400 industry and government representatives attended the National Aircraft Standards Committee's Symposium on titanium standard parts, at which 23 papers on methods of handling titanium in aircraft fasteners (bolts, rivets, etc.) were presented by leading engineering executives and titanium production authorities.

Report Available

A comprehensive report and transcript of the meeting is being released this month by the NASC, which is a committee of the Aircraft Industries Association. Copies of the report are available at \$4.00 per copy from C. H. Bennett, National Standards Association, 527 Washington Loan & Trust Building, Washington 4, D. C.

Nation's 7,000 Agricultural Planes Save Five Billion Dollars Annually

One out of every 10 acres under cultivation in the United States is treated for insect control by agricultural airplanes.

Use of these planes on the farmlands of America accounts for savings of nearly \$5-billion annually.

Planes Save Money

Typical of ways aircraft save money:

- In control of the gypsy moth in Northeastern States, one twin-engine plane sprays a larger area in a single day than formerly could be covered by 40 power sprayers in an entire season. And the work is done more effectively.

- On a comparative timber insect survey in Colorado, one pilot and two observers covered 2,500 acres in 15 minutes' flying time. A survey of the same area by a ground crew required the time of six men for two weeks. (The aerial survey was 75 per cent accurate, considered satisfactory for the purpose.)

Throughout the country, approximately 7,000 planes (worth \$500,000,000) are operated for the application of pesticides. The aircraft range from single-engine utility planes to helicopters and converted World War II bombers and patrol planes. About one half of the planes are older type biplanes, although considerable attention is now being given to development of aircraft designed especially to meet the needs of farmers.

2,000 Applicator Firms

Approximately 2,000 applicator firms are engaged in agricultural work, applying such materials as insecticides, herbicides, fungicides,

Midwest College Pioneers Commercial 'Copter Uses

The air age has brought new vitality to formerly cloistered halls of ivy.

Typical example is the Lewis College of Science and Technology of Lockport, Ill., which has helped pioneer helicopter operations in the United States.

The first school of higher learning to purchase a helicopter, Lewis started operating one of the machines in 1947—the year after the first U.S. commercial helicopter certificate was granted.

Since then, the college taught the first group of helicopter pilots in the Middle West, set up the first scheduled helicopter patrol for the Tennessee Valley Authority, conducted topographical surveys 2,000 miles in length, and handled numerous other pioneering efforts with helicopters. The school now operates three 'copters.

Safety in the Skies

More than 1,300 full-scale research projects to increase aviation safety are underway in the United States and other countries.

These projects cost an estimated \$75-million annually.

cotton defoliant, fertilizers and seeds.

For some of the work, the agricultural airplane has become almost indispensable. For instance, the application of insecticides to forests, mapping of forest areas requiring insecticidal treatment, the spraying of rough range lands for grasshopper control and the application of herbicides and fertilizers to rice fields.

Among the newer uses of agricultural aircraft is the application of granulated insecticides for the control of soil insects.

Business Aircraft Mean More Profits To U.S. Executives

America's fleet of business planes literally save millions of dollars for their operators every year.

Of a total of 21,500 planes owned by businesses throughout the nation, including fixed-base operators and flying schools, it is estimated that approximately 12,000 are used exclusively for flying on business trips by executives and essential business employees.

Variety of Types

These planes range in size from light single engine planes with a seating capacity of just two passengers to large airline-type aircraft seating more than 20 passengers. Their speeds range from around 70 m.p.h. for the small planes to well over 200 m.p.h. for some of the larger ones. The average speed for the entire fleet is around 140 m.p.h. and a fleet-average passenger capacity is almost six.

Studies show that the average plane used exclusively for business travel is operated an estimated 300 hours per year, and in a 12 month period operates nearly 42,000 miles—four times the miles driven by most automobiles in a year.

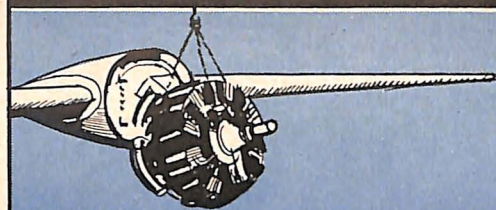
Exact figures are not available showing the average number of passengers carried on each flight or whether the larger or smaller planes do the most flying, but a very conservative idea of just how many dollars are saved each year by these planes can be drawn from an example using one of the smaller planes, with a low seating capacity and slow speed and comparing the cost with rail transportation.

Savings: \$20-Million

For instance, using (1) a familiar light airplane with a cruising speed of 125 m.p.h.; (2) a typical executive with a \$12,000 per year income; and applying these factors to the calculated 3.6 million hours the 12,000 planes flew in 1953, the dollar value in salary savings alone would amount to an impressive \$20 million.

Figured on this basis (the plane costs 7.9 cents per mile to operate)

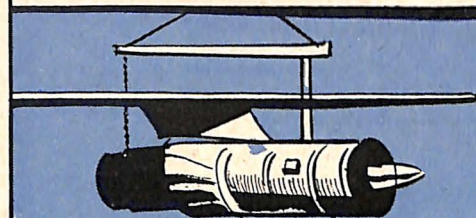
SIMPLE DESIGN SAVES DOLLARS



ENGINE CHANGE ON WORLD WAR II BOMBER



3 HOURS 20 MINUTES



ENGINE CHANGE ON MODERN BOMBER



→ 25 MINUTES

Clean design of modern jet engines saves time and money in maintaining the nation's military air forces. A jet bomber crew recently made one complete engine change in only 25 minutes—about one-eighth the time it took to change a World War II bomber engine. These new jet engines are durable, too. Jet bombers in a typical Air Force Bombardment Wing have flown the equivalent of 15 nonstop flights around the globe without a single engine change.

'PLANES'

Aircraft Industries Association

these traveling executives flew a distance equal to more than 1,800 trips to the moon. The total operating costs amounted to \$35,550,000, but the time saved totaled the astronomical sum of 5,300,000 hours, time which could be devoted to other business interests.

The same distance traveled by rail would have cost \$22.5 million, close to \$13 million less than by plane, but the 5.3 million hours of executive time saved totals \$33 million with a net savings to the flying businessmen of \$20 million.

If figures were available for the faster planes and greater number of passengers actually carried, this amount would skyrocket. And it still would not include the additional business transactions made possible by the extra working hours resulting from the time saved by these planes.

Airport Is Major Factor In Metropolitan Economy

A modern municipal airport gives a shot in the arm to the economy of surrounding communities.

A typical example, the San Francisco International Airport brings millions of dollars worth of sales each year to the San Francisco-Oakland area.

Pay of personnel working at the airport, plus supplies purchased for its operations, account for a \$50-million infusion into the Bay area's economic bloodstream each year.

Moreover, some 2,500,000 persons will use the airport each year. Records show the average visitor stays about three days, spends \$25 to \$30 a day.

Air Quotes

"More than a year ago, the President set the pace for our defense program when he spoke of preparations for the long-term pull.

"Obviously, we do not want war, as our enormous patience in foreign affairs clearly demonstrates. We never have and never will. It is not our nature.



"Because of the militant nature of the Communist menace however, it has become increasingly important

that our preparedness place more emphasis on combat-ready forces for instant action. . .

"Military power cannot be sustained through sporadic effort, nor can our strength be maintained through alternating periods of feast and famine. The wisest course is the steady, consistent endeavor of preparations based on the long haul. Once we reach our force goals, it is up to us to keep these forces intact and modernized, and in a high state of combat readiness, through the critical years which lie ahead."—Adm. Arthur Radford, Chairman of the Joint Chiefs of Staff, October 15, 1954.