



planes

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AIRCRAFT INDUSTRIES ASSOCIATION

DOOLITTLE FORECASTS AGE OF AIR WONDERS

Modern Electronic Brains Do Job That Pilots Can't Equal

Military aircraft now on the drawing board are capable of flying and fighting by themselves, with automatic equipment handling all essential control operations and the pilot riding along merely as a monitor.

In one all-weather fighter now operational, the pilot has only to squeeze a trigger switch when an enemy plane reaches a certain size on his radar scope. At that point, a mechanical brain starts operating. An automatic pilot takes over flight control. A computer goes into action, and at the proper moment, rockets are fired.

In this way, enemy planes can be spotted miles away, the target can be locked into a tracking mechanism, and the U.S. fighter will close, aim and open fire while the pilot and radar operator act only as monitors.

This last step before the true guided missile era is made possible by a science virtually unheard of outside laboratories 20 years ago.

The science—electronics—has become a key to many of the most complicated operations of advanced jet aircraft. In some of America's latest planes, electronics equipment represents 60 per cent of the crafts' total

(See ELECTRONICS, page 3)

Truman Air Travel Sets New Record—Over 135,000 Miles

Air transportation saved weeks of travel time which otherwise might have been spent "getting there" for ex-President Harry S. Truman while he was the Chief at 1600 Pennsylvania Avenue.

At the time of his departure from office this month, Mr. Truman had logged 135,098 air miles in 61 Presidential flights. His banner year was in 1947 when he flew 26,778 miles (well over the distance around the world at the equator) to set a record for 12-month air travel by a U.S. President.

Another "first" aviation historians can mark up for Mr. Truman is his use of the commercial airlines for the press group that always accompanied him on trips. This innova-

(See TRUMAN, page 2)

Flight Simulators Whittle Costs Of Training Modern Combat Crews

It's more than a thousand times cheaper to give a big jet bomber's crew an hour's training in a flight simulator than it is to send them aloft for the same amount of training in the air.

A typical bomber simulator can be operated for only 22.1c per hour, compared with \$242 per hour for the jet bomber's fuel, oil and lubricant alone.

The tax dollars saved by these devices, which are being produced by at least four major companies, help keep the cost of maintaining America's air might at a minimum. At the same time, the simulators enable entire flight crews to be trained in many of the techniques of flying today's complicated aircraft without lifting a foot off the ground.

More important, the growing use of these modern simulators releases many more combat-type aircraft for

line duty, and permits the training of countless additional men.

Simulators that reproduce the flight characteristics of almost all late-model planes either have been built, or are being built, by U.S. companies. At least one manufacturer is turning out separate gunnery trainers. Another has delivered a trainer that simulates not only the flying characteristics of a modern plane, but also simulates an approaching enemy aircraft. Using this device, the jet pilot of tomorrow may make his first "kill" before he ever gets in the air.

One manufacturer recently completed and turned over to the Air Force a flight simulator which duplicates characteristics of one of the latest jet bombers. The cost was \$250,000, compared with a \$2.1 million flyaway price tag on the bomber.

Sees New Vistas As Nation Marks 50th Anniversary

Written Especially for PLANES

By

Lt. Gen. James H. Doolittle

America and the civilized world pause during this momentous year of 1953 to look back on the most astounding fifty years in recorded history. On December 17, 1903, began an era which we have called the Air Age. It has changed our thinking, our habits, our transport, our mails, our commerce, our industry, our agriculture—and our wars.

But more significant, the first fifty years of powered flight have brought the world abruptly into what can be termed the Age of Wonders.

This new era is with us now. In the field of air transportation, we are on the verge of keeping pace with the sun. I do not betray any confidence when I say, for example, that jet transports—on which several American companies already have done design work—will be capable of linking New York and Los Angeles in four hours. In such aircraft, passengers will be able to take off from the East Coast at 6 p.m. Eastern time and land on the West Coast at 7 p.m. Pacific time!

It will not be long before operational jet fighters will be flying at speeds greater than 1,000 miles per hour, and jet engines will develop 25,000 pounds of thrust.

The Department of Defense announced some time ago that modern controlled air missiles have traveled at speeds in excess of 5,000 m.p.h. Secretary of Air Finletter in a recent speech said: "I believe we can foresee the time when we will have rocket engines producing 10 times the thrust of the original V-2, or about 500,000 pounds of thrust. Speeds can probably be obtained approaching 20,000 miles per hour, or more than 15 times the speed of rotation of the earth. Huge distances, perhaps half the circumference of the globe, will be reached by these rockets."

Today's problems—and the even more amazing challenges of the future—stagger the imagination, yet today's pioneers are solving them one by one and pushing outward the horizons of tomorrow.

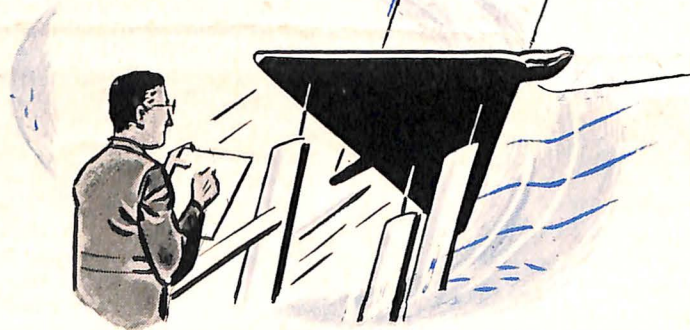
For the year of 1953, while we

(See GEN. DOOLITTLE, page 4)

PERFORMANCE IS THE PAYOFF

SEVEN NEW MILITARY AIRCRAFT MODELS PRODUCED SINCE KOREA.

SIXTEEN NEW MILITARY AIRCRAFT MODELS TO COME 1953-1955.



To insure that America's combat airmen have the world's best planes, 16 entirely new aircraft models will be put into production by the U. S. aircraft industry in the next three years. These models, with speed, range and combat efficiency far exceeding that of present-day aircraft, stem from years of research and development—extending back as far as the first post-World War II year. Research and development underway today similarly will determine the quality of American aircraft in the late 1950's and early 1960's.

SOURCE: Office of Defense Mobilization

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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ALL MATERIAL MAY BE REPRODUCED—MATS OF ALL CHARTS ARE AVAILABLE FREE

Three Keys to Security

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

There is a growing conviction—reflected in the Congress, the military, and in a groundswell of public opinion—that this nation must never again denude itself militarily to the point where aggression is invited. The lessons of the past—when America undertook unilateral disarmament while world conditions remained chaotic—have imprinted themselves upon the national consciousness.

One is moved to wonder whether it was not the free world's military weakness which actually led to World War II and to the war in Korea. In the early phases of both conflicts, billions of dollars were spent in a desperate effort to buy lost time—but in both cases, lives and countless dollars, plus time, were required to regain military strength.

There is little likelihood that America will retrace the well-worn and perilous path of the past. Coupled with the country's recognition of the need for adequate defensive strength, is the growing feeling that the closest analysis must be given to our rearmament effort.

Long-term air strength can be achieved only through coordinated industrial effort in three major areas.

1. To insure that U.S. forces always are equipped with the world's best aircraft, we must have virile research and development programs geared to the high level of effort needed to maintain qualitative superiority.

2. To provide air strength in being adequate to discourage aggression, and capable of retaliation in the event that such strength fails to forestall an attack, we must have continuing production of late-model aircraft by experienced engineering and manufacturing teams.

3. To assure the ability of American industry to produce the weapons of war *in time* and in quantity should all-out conflict occur, we must have manufacturing capacity geared to the output of the most advanced weapons, and capable of turning them out without dangerous delays and interruptions.

A blueprint for attaining the latter objective has been given the nation by a distinguished advisory committee to the Director of Defense Mobilization. This group, headed by Mr. Harold S. Vance, reported this month that:

"Maximum capacity can be achieved with maximum economy by maintaining munitions production plants in a high degree of readiness, capable of rapid expansion of output in event of war, and relying upon such readiness as a partial substitute for stockpiling of reserves of munitions."

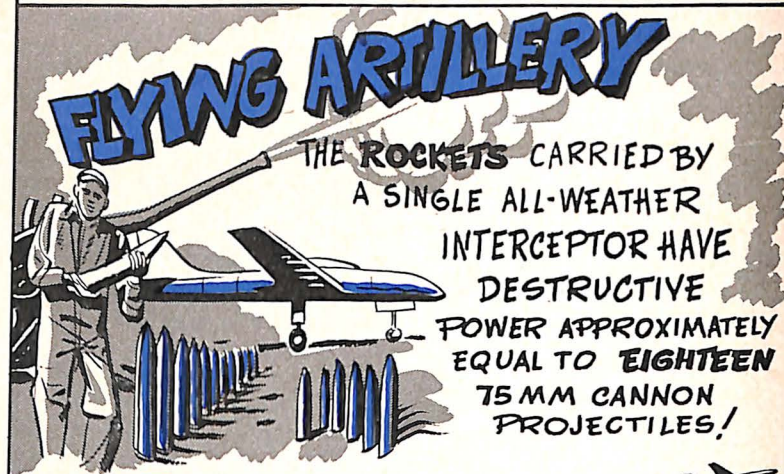
The Vance report calls for standby arms production equipment which would enable the United States to throw its full industrial might almost at once into any future all-out war.

Although such facilities are important, even more essential are the remaining two industrial elements—research and development, and a going rate of production—which contribute to America's air strength. Perhaps the best all-inclusive blueprint for action is contained in reports of the President's Air Policy Commission and the Congressional Aviation Policy Board. Five years ago, both reports urged that the Government adopt a long-range aircraft procurement program to assure adequate production of up-to-date aircraft, and to eliminate the extravagant and violent fluctuations of past history. In such a program, research and development activities would be integrated with going rates of production to achieve maximum efficiency, production readiness, and industrial expansibility.

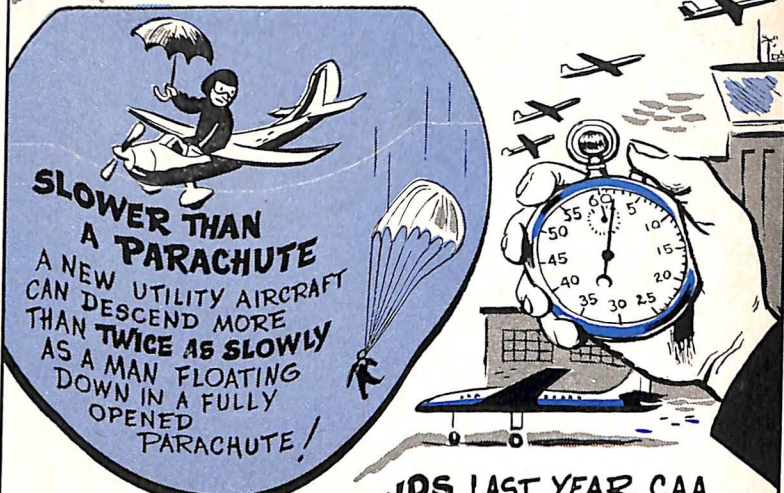
Congress can find no more fruitful ground for economy than that to be gained by adoption of a long-range aircraft procurement program.

Certainly the time is past when this nation can afford to match its direct defense expenditures with almost equivalent funds for recurrent expansions and contractions of defense production facilities.


PLANE VIEWS



FLYING ARTILLERY
THE ROCKETS CARRIED BY A SINGLE ALL-WEATHER INTERCEPTOR HAVE DESTRUCTIVE POWER APPROXIMATELY EQUAL TO EIGHTEEN 75 MM CANNON PROJECTILES!



SLOWER THAN A PARACHUTE
A NEW UTILITY AIRCRAFT CAN DESCEND MORE THAN TWICE AS SLOWLY AS A MAN FLOATING DOWN IN A FULLY OPENED PARACHUTE!



EVERY TWO SECONDS LAST YEAR, CAA CONTROL TOWERS AT U.S. AIRPORTS HANDLED AN AVERAGE OF ONE TAKE-OFF OR LANDING...
Industries Association
by Aircraft

Truman Plane Travel Sets All-Time Record

(Continued from page 1)

tion came on a flight to New York from Washington in 1946—and has continued since.

Although the late Franklin D. Roosevelt was the first U.S. President to take advantage of air transportation, it is Mr. Truman who will be remembered as the first President who really took to the air.

President Roosevelt flew to Chicago to accept the Democratic nomination in 1932, but did not fly again for over 10 years. In 1943, he logged 24,370 air miles; passed up 1944; and then flew his final 2,405 miles on a flight from Malta into Russia and then to Cairo in 1945.

Mr. Roosevelt's first love was the sea. He made as many trips as possible aboard the yacht *Williamsburg* or on Navy ships. But Mr. Truman preferred speedier and more modern transportation and took full advantage of the first Presidential aircraft—"The Sacred Cow." He used it exclusively in his air travels until he took delivery of a newer and larger plane, "The Independence," in 1947.

President Eisenhower's continent-spanning aerial tours during the election campaign indicate that use of aircraft as the prime means of Presidential transportation will be continued.

PLANE FACTS

- Transports built by one major aircraft manufacturer have flown more than 53,300,000,000 miles—far enough to take a plane around the world two million times, or to the moon and back 100,000 times.

- Tolerances on tiny steel balls inside bearings of modern aircraft gyroscopes must sometimes be ten-millionth of an inch—about 1/4,000ths the width of the average human hair.

- A new Navy fighter weighs more than a standard twin-engined commercial airliner complete with its two pilots, hostess, 21 passengers, their luggage and the usual mail load.

- Standardization in the aircraft industry has saved the taxpayer millions of dollars. Typical is the cost reduction on an aircraft speed indicator produced by a major company for use on jet aircraft. The indicators once were built in 260 different models. This number was reduced to 11 standardized models, with accompanying reduction from \$110 to \$90 in the price of the indicator.

Titanium May Be Key in Drive for Ultra-Sonic Speed

Titanium, the newcomer to the metallurgical world that some sources already have tagged the "middle-weight champion" of materials, may be one of the keys to ultra-sonic flight at altitudes higher than any yet reached by man.

Five times as strong as aluminum, 40% lighter than steel, and capable of withstanding extremely high temperatures, titanium has been heralded as one of the possible answers to

the "heat barrier" which today stands in the way of tremendous increases in flight speeds.

Before the metal can be generally used in aircraft, however, much remains to be done—both by materials producers and the aircraft industry. Today, insufficient amounts of aircraft quality titanium are being produced to allow wide-scale research and application to modern planes. Equally important, fabricated titanium costs more than other better established materials.

At present, titanium mill products cost between \$15 and \$22 per pound. Even if they were available at lower cost, aircraft engineers emphasize that much fabricating experience needs to be gained by industry before the material can be used to full advantage.

Increased amounts of sponge titanium are being produced, however, at a price of about \$5 per pound (some \$3 to \$4 higher than steel). It is the conversion of sponge into ingots, then into mill products (the commercial forms) which remains a bottleneck.

The Aircraft Industries Association's Technical Service and individual airframe and engine manufacturers are working side-by-side with Government and private agencies to speed up the development of titanium and at the same time to get the price down to a more practical range.

Some 95% of the fabricated titanium now being produced is flowing to the aircraft industry where it is being used for research and, in limited amounts, for various structural purposes. But this amount doesn't scratch the surface of what can be used when cost is lowered, fabricating experience is gained, and alloys for certain high strength applications are made available.

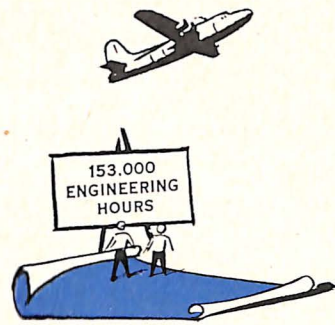
MATS Planes Span Pacific Once Every Forty-Five Minutes

Every 45 minutes during 1952, a big transport of the Military Air Transport Service completed a crossing of the Pacific Ocean. Every 75 minutes during the year, MATS planes averaged an Atlantic crossing or an Arctic flight.

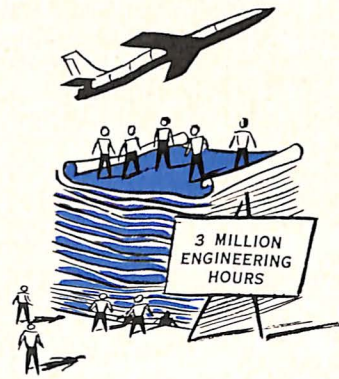
And every hour of 1952, an average of 10 tons of cargo, 58 military passengers and seven medical patients were being airlifted over MATS' 115,000 miles of air routes.

MORE BRAINS PER PLANE

WORLD WAR II



TODAY



Unprecedented demand for engineers in the aircraft industry is imposed by the tremendous technological problems and high speeds associated with modern air warfare. Design and development of a single heavy bomber, capable of today's high performances, requires almost 20 times as many engineering hours as in World War II.

Over 95% of Today's Electronic Aids Developed Since Start of Korean War

(Continued from page 1)

cost. In guided missiles of the future, 75 per cent of the cost may be for electronics.

Developments in the field of military electronics have in fact raced ahead so rapidly in recent years that only one out of every 20 electronic and communications devices now being built was designed, developed and put into production before the Korean War began.

As recently as World War II, fighting planes carried only a few hundred pounds of electronic and automatic devices. Today, a heavy bomber requires tons of equipment to give pilots greater and more accurate firepower, bombing performance, maneuverability, and day and night combat capability.

Such complex electronic equipment adds to the cost of modern aircraft—but saves lives and wins wars by enabling pilots to control their high-powered, supersonic craft during combat.

To help do the job, one late-model bomber must carry more than 1,000 vacuum tubes, compared with only 260 in a World War II plane. These tubes range in price from 56 cents to \$681 each. A newer jet bomber, just coming into production, and with greater performance, needs an estimated 2½ times as much electronic equipment.

With the increasing demands for electronics to take over jobs too complicated for humans to handle, the electronics industry has mushroomed in the past few years. Estimated military and civilian business for the industry in 1953 will be more

than 21 times greater than in 1939.

A leading aircraft executive recently pointed out: "Some of the problems we are working on right now in the field of guided missiles for the armed forces are basically more difficult than that of building a space ship. If we can accomplish the former, and I assure you that we will, then there is absolutely no reason why we can't do the latter."

Air Quotes

"With the end of the last war, air power faced a technological revolution brought about by advances in supersonic aerodynamics, jet propulsion, and electronics. The Air Force did not assimilate this technological revolution as rapidly as possible, because we were unable to give industry the research and development contracts which would have resulted in the prototypes that subsequent history has clearly shown we needed.



At that time there was a mistaken idea held by some that, considering the needs of the civilian economy, there were not enough scientists in the country to spend more

than \$500 million annually on military research and development. In actual fact, however, a large fraction of the Air Force research and development budget was being spent on engineering and manufacturing of prototypes—not on scientific research. Competent engineering staffs were available and, in fact, were begging for work. If we had pursued a sound and continuous prototype program between the end of World War II and 1950, more modern aircraft would have been ready for production much sooner after the outbreak of Korean operations.—Air Force Under Secretary Roswell Gilpatric, August 29, 1952.

PLANES QUIZ ✈️

Seventy per cent score on this quiz is excellent. Sixty per cent is good. Answers on Page 4.

- In World War II, aircraft radio receivers had from six to 20 channels. Today, aircraft components manufacturers are producing standard receivers with over (a) 200; (b) 500; (c) 1,000 channels?



- The electrical energy required for a medium jet bomber is equal to that needed for (a) 300; (b) 30; (c) 3 ten-room houses?
- The first American airplane flight across the Atlantic occurred in (a) 1927; (b) 1919; (c) 1924?
- In the first 2½ years of the Korean War, aircraft of the USAF and attached units destroyed more than 66,000 Communist vehicles. True or false?
- In 1952, the United States aircraft industry produced an estimated (a) 7,613 aircraft; (b) 10,100; (c) 12,600 aircraft?
- The average percentage of profits to sales for all U. S. manufacturing

industries in 1951 was 6.2%. For 1951, the comparable figure for the aircraft industry was (a) 2.2%; (b) 3.9%; (c) 5.1%?



- Last year, the domestic scheduled airlines carried 55% of the nation's first-class travelers (based on passenger miles). True or false?
- A typical wrist watch contains 127 parts. A high-precision gyroscope used in modern aircraft has more than (a) 1,000 parts; (b) 2,000 parts; (c) 3,000 parts?
- In the electrical system of a jet bomber, there are (a) 3,800; (b) 2,100; (c) 1,000 separate pieces of wire?
- In its aircraft procurement program, the U. S. Air Force deals directly with some 18,000 American companies. In addition, the aircraft industry itself has nearly 61,000 subcontractors and suppliers. True or False?

Gen. Doolittle Says Air Supremacy 'Greatest Deterrent' to Aggression

(Continued from page 1)

strive for new achievements, we also review those fifty years which began on the sands of Kitty-Hawk, N. C., when Wilbur and Orville Wright first realized man's age-old dream of flight, and opened the Air Age.

In nationwide observance, we revere the Wrights, and also honor the other pioneers of flight, down to those who today are conquering the stratosphere at speeds faster than sound.

I have the honor to head a committee of distinguished citizens of the United States which is calling upon the nation to join in the celebration of the Fiftieth Anniversary of Flight. This national observance has the blessing of the President of the United States, of the Governors of the States, of the Armed Services, national organizations, and a host of national figures.

Throughout the year, major national events will pay tribute to the pioneers of the Air Age and their achievements. A committee is presently raising funds for a Wright Memorial Museum, to be erected at Kitty Hawk, N. C. The cornerstone of this museum is scheduled to be laid during the Golden Anniversary Year. A giant National Air Show will be held in Dayton, Ohio, the Wright Brothers' home and the cradle of aviation.

In addition to the national observances, there will be hundreds of regional events throughout the year.

We want every citizen in America to think of fifty years of flight in terms of what it has meant to him, his community, his state, and his country. Most of all, we want our schoolchildren to learn and to know the significance of the past, the present, and the future of world aviation.

We live today in a small world,

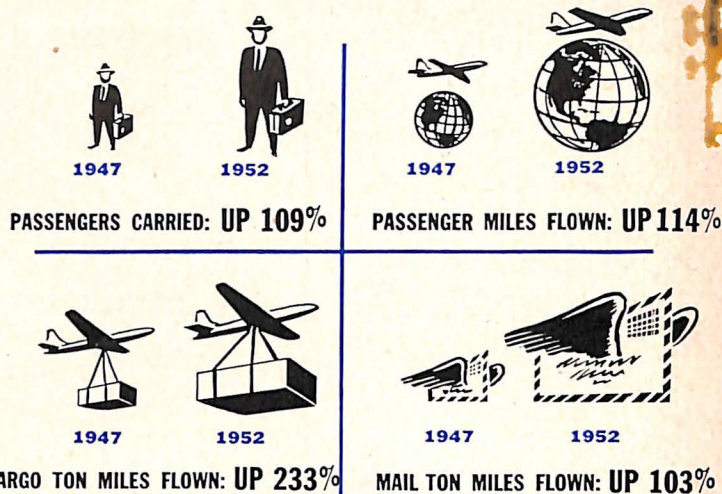
only hours away from the farthest spot on earth. Travel that once took weeks, months, even years, of men's lives now is accomplished in a day or two. Where trading areas once were narrow, today the resources of the whole world are at the command of the average man. Mails move at incredible speeds. The pace and radius of business has increased many-fold. Once-strange lands are within reach in an ordinary vacation span.

From its beginnings as an experimental courier and scouting arm of the surface forces, air power has become the first line of defense. Today, aviation also provides the primary striking arm for national security. Air supremacy has become the greatest deterrent to aggression.

Answers to Planes Quiz

- (c) 1,000 channels.
- (a) 300 ten-room houses.
- (b) A Navy NC-4 seaplane arrived at Plymouth, England, on May 31, 1919, completing the first trans-Atlantic flight.
- True. On January 3, 1953, the Far East Air Forces announced that 66,350 enemy vehicles had been destroyed since the Korean War began.
- (c) Estimated production of the U. S. aircraft industry in 1952 was 9,000 military planes, 3,200 utility planes, and 400 transports.
- (a)
- True.
- (c)
- (a) In a typical jet bomber's electrical system (exclusive of radio and radar equipment), there are 3,800 pieces of wire whose lengths add up to 8½ miles and whose total weight is 650 pounds.
- True.

BOOM IN WORLD AIR TRAFFIC



Safety, economy and dependability of modern airliners have contributed to the vast growth of air transportation on world airlines. In 1952, 45 million passengers flew more than 24.5 billion passenger miles (and more than one billion plane miles) on world airlines. Eighty percent of the aircraft operated by these carriers are built in the United States.

Fifty Years of Flight

Government Didn't Believe Planes Were Here to Stay in January '05

A pot of baked beans, a homemade radio transmitter, and a 48-year-old form letter written by a Government bureaucrat play little-known January roles in the history of aviation's first fifty years. These almost-forgotten sidelights are among hundreds included in a recent chronology of aviation, "Fifty Years of Powered Flight," published in cooperation with the National Committee to Observe the Fiftieth Anniversary of Powered Flight.

The bureaucrat's letter was a negative beginning to one of the 20th century's big stories—military aviation. Forty-eight years ago this month, the Wright Brothers wrote their Congressman asking whether the Government was interested in their experiments with a flying machine. A few days later they received a reply from a functionary on the Board of Ordnance and Fortifications: The Government was definitely not interested in "financing experiments."

Fortunately, the letter did not discourage the two young men from Dayton, Ohio. They continued working—and three years later, the Army agreed to buy one of their machines. The industry they pioneered today is the second largest manufacturing industry in the United States, employing more than 750,000 Americans. The Air Force's Air Materiel Command (one of the evolutionary branches of the 1905 Board of Ordnance and Fortifications) today buys enough aviation equipment annually to make it one of the world's largest single business organizations with yearly purchases exceeding the total of General Motors, Standard Oil of New Jersey, American Telephone & Telegraph Co., United States Steel,

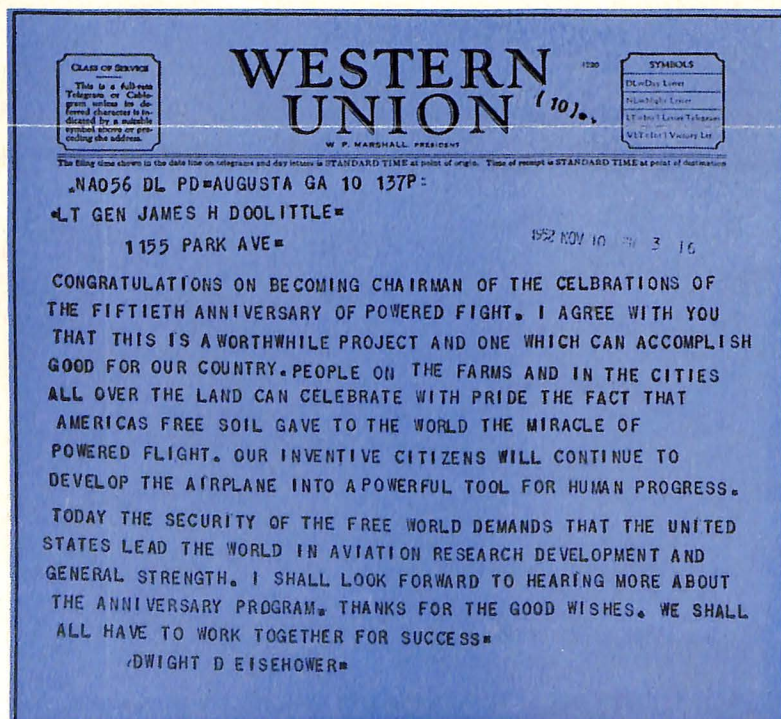
and the I. E. du Pont de Nemours Co.

On January 11, 1911, a short radio message crackled from a flimsy plane 100 feet above Selfridge Field, California, to a station on the ground. From that beginning, with a homemade radio set in a tiny low-powered aircraft, emerged the aeronautical radio industry which today has equipped more than 20,000 operational civil aircraft in the United States with radios. Even more striking is the effect of radio on military aviation. Use of radio and electrical devices by the military has reached such proportions that a typical jet bomber today carries approximately 5,700 pounds of electrical and radar equipment. That in itself is more than four times the gross weight of the 1911 aircraft.

Perhaps no single piece of cargo ever carried by U.S. airlines was as important as a pot of beans flown from Boston to New York by pioneer aviator Harry M. Jones in January, 1913. That pot of beans demonstrated the feasibility of cargo operations; and as Jones delivered the gifts of beans to state governors along his route, he pioneered an industry which last year flew some 623 million cargo ton miles in all parts of the world. The beans were the first of more than 2,000 different kinds of items now carried by cargo lines throughout the world.

More Punch Per Plane

In a 100-mission combat tour in Korea, the average pilot of a modern jet fighter-bomber fires more than 180,000 rounds of 50-caliber ammunition, drops 220 tons of bombs, fires 350 high velocity aircraft rockets, and drops 2,500 gallons of napalm-



President Eisenhower congratulates General Doolittle on assuming chairmanship of Fiftieth Anniversary Committee. He says U.S. must "lead the world in aviation research, development, and general strength."