



planes

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OFFICIAL PUBLICATION OF THE  AIRCRAFT INDUSTRIES ASSOCIATION

'Copter Industry Produces 2,800 In Seven Years

The youngest member of the aircraft family—the helicopter—already has accumulated several lifetimes of flying experience.

The estimated 2,800 helicopters thus far produced in the United States have flown some 1,200,000 hours—equal to about 137 years of flying by a machine that first went into commercial production only seven years ago.

Small Segment of Industry

In fact, the first production-type helicopter flew only 14 years ago—in 1939.

Although a small segment of the U.S. aircraft industry, the rotor-plane manufacturers are now in active production on 13 helicopter models. Current helicopter industry employment is less than 2 per cent of the total aircraft & parts employment in the nation.

New Models

Manufacturers report a wide variety of models in various stages of design and development. They range in size, according to the International Air Transport Association, from one to 60-place craft. In experimental stage is the first of the so-called "flying cranes"—or heavy weight-lifting helicopters. Power plants of the newer models include piston, gas generator, turboprop, and tip-jet units. Cruising speeds are expected to range from 75 to 170 m.p.h.

Estimated total payroll of the six U.S. companies now in production on helicopters is \$51,900,000 annually. Employment by these companies is currently 13,789. Plant area in use for helicopter production is 2,087,000 square feet.

Aircraft Standards Committee Compiles Metals Handbook

A recently-compiled listing of the almost 2,000 different types and sizes of metals required for modern airframe production is expected to pave the way to "substantial savings" in aircraft costs.

The listing—part of the cost-reduction effort of the National Aircraft Standards Committee of the Aircraft Industries Association—is intended for use by aircraft metals warehouses.

It already has considerably reduced the number of stock items (See 2,000, page 4)

DRIVE TO REDUCE AIRCRAFT SOUND LAUNCHED BY AVIATION INDUSTRY

All Air Groups Join Campaign

U.S. aviation has launched an all-inclusive community service campaign in an effort to reduce the sound of aircraft in airport communities.

The program—underway on the broadest scale of any such project in U.S. history—is sponsored by every segment of the industry, including manufacturers, airlines, airport operators, pilots, government agencies, and the military. Important advances already have been made by adjusting traffic patterns, relocating training flights, revising operational procedures, changing ground run-up locations, and muffling ground tests of new engines. In addition, manufacturers and government researchers are investigating means of reducing engine sounds at their source.

Wide Cooperation

The national campaign, undertaken slightly more than a year ago, has—according to Civil Aeronautics Administration—brought together "all elements of the industry that can make some contribution" toward sound abatement.

In the New York area—a hub of worldwide air activity, where sound abatement measures have a high priority because of the unequalled volume of air traffic and the high-density populations surrounding its airports—a special group, the National Air Transport Coordinating Committee has been established to coordinate the wide-scale sound reduction program.

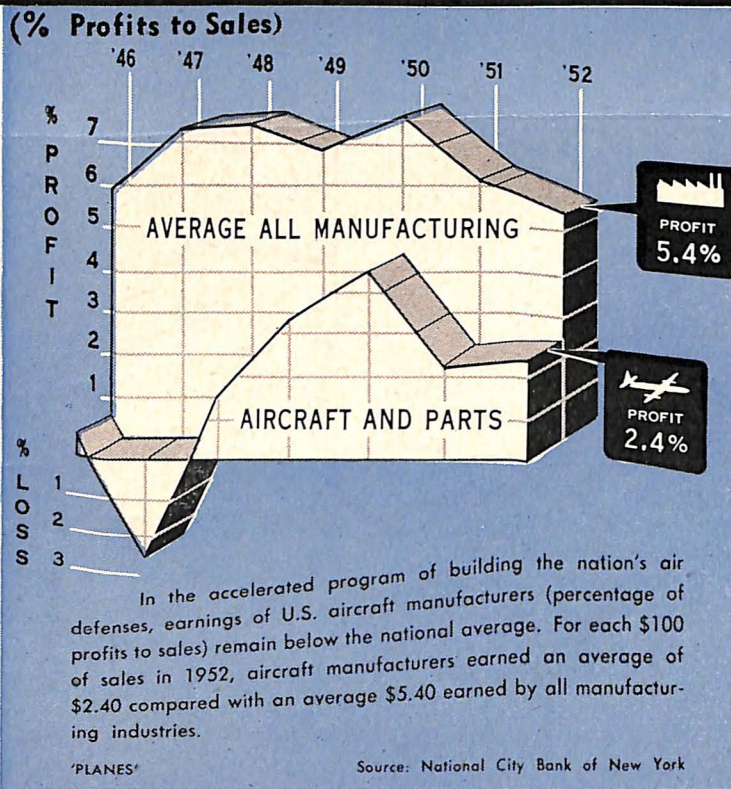
The NATCC activity in New York is expected to set a pattern for other such programs throughout the nation. It has involved, according to its executive director, Vice Adm. C. E. Rosendahl, "the most far-reaching adjustments of air operational procedures ever undertaken by the air industry."

Operational Changes

Already, as a result of voluntary cooperation by aviation groups, more than 25,000 transport training flights have been transferred from major terminals in the New York area to outlying airports. Vigorous day-by-day action is emphasized by NATCC in readjusting flight procedures and operations. By telephone, staff personnel maintain constant touch with chief controllers, chief pilots, airport

(See SOUND, page 3)

AIRCRAFT PROFITS FAR BELOW U.S. AVERAGE



85 Billion Passenger-Miles Flown By Scheduled Airlines Since 1926

The scheduled airlines of the United States have flown more than 85 billion passenger-miles—the equivalent of a giant airlift transporting every living human on earth a distance of 34 miles—since civil aviation was officially recognized by Congress 27 years ago.

And during this brief span of years over 166 million passengers—a number greater than the entire population of the United States—have been carried by these airlines.

Today, U.S. airlines have a lift capacity greater than the rest of the world's air carriers combined.

Set Record in '52

In 1952 alone, America's fleet of 1,269 modern airliners carried 27,381,801 passengers a total of 15,546,247,000 passenger miles. In fashioning these fantastic figures in mass transportation, the airlines last year averaged a landing or a take-off of one of their big transports 13,000 times every day—one every seven seconds day and night.

Since the Air Commerce Act was passed in 1926—23 years after the Wright Brothers' first flight—air transports built by the American aircraft industry have consistently set the pace in the world air commerce.

Flew Million Miles in '26

From a meager beginning in 1926, when the eight certificated companies engaged in carrying revenue passengers flew 5,782 passenger miles, the scheduled airlines have grown to the point where today they carry more overseas passengers than do the steamship lines and carry about 55 per cent of all first class travel within the United States.

The little craft of 1926 averaged around 125 m.p.h. Only three of the 28 passenger planes which made up the entire fleet carried as many as 10 passengers. Most of these planes had open cockpits, where "paying guests" were allowed to travel only in the event there was

(See AIRLINES, page 4)

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

The Nation Learns A Lesson

A Healthy Industry— Key to Security

By

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President, Aircraft Industries Association

Recent events have shown that the nation has profited from the experience of the past—and at last has come to an appreciation of the waste and inefficiency inherent in repeatedly destroying production potential, then attempting to re-create it overnight.

While appearing before Congress in recent weeks, Defense Secretary Charles E. Wilson has spoken emphatically of the need for maintaining the health of the aircraft industry in peace as well as in time of war. At a time when it appeared that the cease fire negotiations in Korea would be brought to a successful conclusion, Mr. Wilson made it clear that it would be his purpose to eliminate by any feasible means the peak and valley character of effort which has militated against the efficient and economical operations of the aircraft industry in the past.

On Armed Forces Day, he reiterated that "an essential part of the mobilization base" is a "healthy aircraft manufacturing industry so that its potential production capabilities are reasonably retained over a period of years."

The history of aircraft production effort in the United States has been one of abrupt and massive mobilizations, followed by precipitate demobilizations.

The cost of this up-and-down, stop-and-start production history has been fantastic. It has meant, on recurrent occasions, the rebuilding of factories, the re-tooling of plants, the re-hiring of technicians, the re-training of workers. And it has, of course, had a spiraling effect on the cost of the aircraft required for national defense.

A unanimity of thought prevails throughout the nation today on the need for long-range programming. Members of the Congress have strongly supported a program of consistent, long-range aircraft procurement as one of the most important means of attaining additional military economies. Several months ago, the Senate Preparedness Investigating Subcommittee, headed by Sen. Lyndon Johnson, recommended that steps be taken "to maintain the aircraft industry in a healthy state in periods of peace as well as in periods of defense mobilization." The subcommittee pointed to the inefficiency stemming from the "off-again, on-again, gone-again" scheduling of the past.

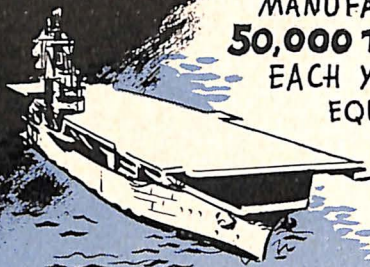
In the late 1940's, the Congressional Aviation Policy Board called for "a five-year plan for aircraft procurement" as "the most efficient method of stabilizing procurement and of promoting a healthy industry available for mobilization in an emergency." Shortly before this report was issued, the President's Air Policy Commission asserted that "year-to-year planning of aircraft production which has been forced upon the services by current budgeting practice must give way to long-term planning."

And only last year, the Defense Department reported that "hasty and excessive demobilization, as well as hasty mobilization, greatly increases costs, unnecessarily disrupts our economy, and generally tends to increase the demands of the military services, which have experienced again and again the painful process of feast and famine."

Whatever the outcome of the current deliberations in Congress on the strength levels of United States military services, certainly all Americans appear to agree with President Eisenhower's recent statement that "... our strength, which is already very real, must now be made stronger, not by inefficient and expensive starts and stops, but by steady and continuous improvement."

PLANE VIEWS

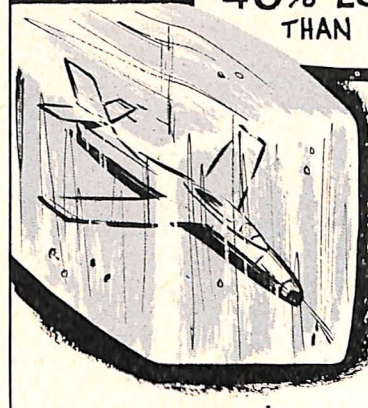
50,000 TONS



A MAJOR AIRCRAFT MANUFACTURER PURCHASES SOME 50,000 TONS OF MATERIALS EACH YEAR! THAT'S ROUGHLY EQUAL TO THE DEAD WEIGHT OF THE MIDWAY, ONE OF THE LARGEST CARRIERS IN THE WORLD!

FLIGHT BARGAIN

IN TERMS OF THE 1939 DOLLAR, DOMESTIC AIRLINE FARES ARE 40% LOWER TODAY THAN IN 1939...



TO OVERCOME EFFECTS OF AIR FRICTION AT HIGH SPEEDS, A REFRIGERATING SYSTEM IN A MODERN JET FIGHTER MUST HAVE A FREEZING CAPACITY EQUAL TO 176,000 ICE CUBES A DAY!

by Aircraft Industries Association

In the knowledge that weakness at any time is an invitation to aggression, the President has said that U. S. military policy "will not be tied to any magic critical year... but will be based on the sounder theory that a very real danger not only exists this year, but may continue to exist for years to come."

PLANE FACTS

- The engine and nacelle on a single modern airplane weigh more than 16 times as much as the first aircraft flown by the Wright brothers in 1903.
- A new process of "precision investment" casting has cut manufacturing time on one guided missile part from 750 hours to about eight hours. Cost was reduced from approximately \$4,500 to \$150.
- A major aircraft manufacturer reports that approximately half of a new Navy fighter, now coming off assembly lines, is produced by some 250 subcontractors who have plants located in 15 states and Canada.
- One transatlantic communications circuit (between the Netherlands and New York) operated by a major international airline carries an average of 40,000 messages each month.

Streamlined Aircraft Deceptive; Thousands of Parts Under Skin

Every cubic inch underneath the skin of today's military aircraft is crammed with equipment needed to guarantee the efficiency and accuracy of the plane, and the safety of the pilot. The streamlined exterior of a typical fighter hides thousands of parts, without which it would be unable to fly and fight in today's sonic era.

A typical jet fighter airframe contains about 13,000 manufactured parts.

These are exclusive of the thousands of parts in the engine, electronics and armaments systems, and other components furnished by the military services.

In addition, the airframe contains thousands of standard items—such as screws, bolts and rivets—and countless components purchased in an assembled state.

SOUND-ABATEMENT DRIVE LAUNCHED

(Continued from page 1)

managers, airline executives and others concerned with the project. A special Technical Committee, part of NATCC, meets at least once a week to discuss new proposals and review measures already adopted.

Executive Director Rosendahl has pointed out that the "same technology and the same enthusiasm from which the aviation industry sprang in so brief a period of time" is now being devoted to "constant and comprehensive effort toward the objective of sound abatement. Measured by any standards, civil air transportation is one of the greatest developments in the entire history of the United States. The present program's already creditable progress can be attributed, I believe, to the voluntary joint action on the part of every segment of the aviation industry and related governmental agencies."

Preferential Runways

Thus far, a primary effort of NATCC in the New York area has been operational. For example, a system of preferential runway use has been established, with priority given to runways leading generally over water or industrial areas. Within safety limitations, the system has reduced the number of take-offs and landings on runways which would lead over densely-populated areas. Its success is indicated by the fact that, even during the months when the year's worst weather conditions prevailed, well over 40 per cent of all take-offs and landings at the three major New York airports were made on these preferential runways.

Limits Ground Sounds

Another general operational rule introduced by NATCC requires pilots to climb to 1,200 feet as fast as possible following take-off, a practice which reduces the sound level on the ground. Prior to landing, pilots retain 1,200 feet of altitude as long as possible, eliminating many low drag-in approaches.

While emphasizing these in-flight procedures, NATCC has taken a series of positive steps to limit sound of engine run-ups on the ground. Areas for maintenance run-up have been established where resultant sounds can be most effectively controlled. In addition to restricting engine run-ups to certain parts of the airports, an effort is also being directed toward gaining maximum use of present and future buildings and field facilities as sound barriers.

New Runways

With readjustment of operating procedures under continuing review, a series of new and improved runways has been placed in operation at New York airports at a cost of several millions of dollars. Their use has made possible elimination of additional flight paths over surrounding populous areas.

Each of these steps, undertaken in the community program, has involved the active cooperation of some 25 major operators of aircraft, 7,500

scheduled airline pilots plus thousands of other pilots, the Civil Aeronautics Board, the Civil Aeronautics Administration, the Port of New York Authority, the Air Line Pilots Association, and other elements of the aviation industry.

All Groups Cooperate

NATCC itself is supported by the above groups, as well as by the Aircraft Industries Association, the Air Transport Association, the Airport Operators Council, the American Association of Airport Executives, the Corporation Aircraft Owners Association, the Aircraft Owners and Pilots Association, the Air Coach Transport Association, and the Independent Military Air Transport Association. In January of this year, heads of major airlines and representatives of other aviation groups met in New York to examine all aspects of the aircraft sound reduction program, and to lay plans for continuing efforts.

Service Center

A major contribution toward the industry cooperative drive has been given by NATCC through establishment of a complaint center designed to work directly with residents of areas near New York airports. In the knowledge that the desire for constructive sound abatement practices held by residents of aircraft communities is shared equally by the aviation industry, NATCC set up a central clearing-house to receive all phone calls and messages concerning aircraft sounds. On receipt of the calls, the aviation industry representatives institute immediate "follow-up" action, notifying aircraft operators and airports of specific needs for corrective action or new sound reduction practices.

Sponsoring Studies

With the New York area serving as a pattern region for operational readjustments, other national activity is coordinated by a CAA National Aviation Noise Reduction Committee. The Administrator of Civil

Aeronautics reported recently that "the Aircraft Industries Association, the National Advisory Committee for Aeronautics, the Massachusetts Institute of Technology, the Navy and the Air Force are among those sponsoring studies, tackling such diverse aspects as noise-measuring instruments, mufflers, water absorption, after-burners, etc." The CAA's national committee has a subcommittee on Aircraft and Powerplant Design and Research, which is keeping in close touch with all these developments so that all groups can be made aware of what has been done, and what still needs to be done.

Sound Control Committee

Aircraft manufacturers, working through the Aircraft Industries Association, have set up a Sound Control Committee, and are working on design, construction and use of suppression devices for ground operation of jet, rocket and supersonic propeller-driven aircraft and engines. Conferences are held regularly to pool knowledge of manufacturers, government agencies and scientists engaged in vigorous efforts to seek practical solutions.

For more than a year, this AIA committee has been working on a wide series of recommendations for a research program aimed at easing the external sound of aircraft.

Long-Range Research

At manufacturing centers themselves, aircraft and engine builders have relocated engine run-up areas and have oriented the directional pattern of propeller sounds in such a way as to give maximum sound-reduction to residential areas. At many plants, high-cost mufflers have been installed for test work.

To supplement immediate steps intended to lessen sound in airport communities, the Government's National Advisory Committee for Aeronautics has established a Special Subcommittee on Aircraft Noise, doing basic long-range research which can be expected to contribute to future progress.

Survey Shows 1,100 Research Projects On Aviation Safety

American air transport manufacturers—companies that have built 80 per cent of the high-speed aircraft in use on world airways—have a 50-year history of emphasis on flying safety.

Last year, crowning their efforts, the U.S. domestic scheduled airlines achieved the lowest accident rate (0.38 passenger fatalities per 100 million miles) ever recorded by commercial aviation.

\$60 Million for Studies

And there are 1,100 good reasons for believing this safety mark will be bettered in the future.

Today, more than 1,100 research projects aimed at increasing aviation safety—and representing an annual expenditure of over \$60 million—are underway in this country, Canada, and abroad. More than 92 per cent of these projects are being conducted in the United States.

This information is contained in a recent survey of aviation safety research projects, compiled by the Cornell-Guggenheim Aviation Safety Center.

Cornell-Guggenheim Report

The Cornell-Guggenheim report points out that last year's domestic airline safety record was three times better than in 1951—and that for a period of 12 months ending in February, 1953, no fatalities were incurred during the 13 billion passenger-miles flown by the lines, and the 13,000 takeoffs or landings averaged each day.

The advances in air safety are not confined to domestic airlines, the study indicates. During 1952, the Air Force reduced its major accidents per 100,000 flying hours to 29, from the preceding year's 33.

Production Efficiency

By employing a new method of overhead conveyance, one manufacturer now produces two jet engine components in about one-third the time formerly required, simultaneously slashing parts handling time 66 per cent and manpower 13 per cent.

THE PRICE OF PERFORMANCE



Without complex electronic equipment, flight at sonic speeds would be impossible. These components, required to control high-performance aircraft under combat conditions, are a major factor in the cost of modern planes.

	NUMBER OF ELECTRONIC SYSTEMS	NUMBER OF ELECTRONIC TUBES	WEIGHT OF ELECTRONICS POUNDS
World War II Bomber	9	150	530 POUNDS
Modern Jet Bomber	14	650	2,500 POUNDS

'PLANES'

SOURCE: Typical Aircraft Manufacturer

Business Planes Cut Travel Costs Of Corporations

There is no waiting around the station for the owners of today's 11,000 corporate aircraft. These men fly when they want to and where they want to—and generally do it at an impressive saving in time and money.

In 1952 they logged well over 422 million plane-miles, almost as many as the 457 million plane-miles flown during the same period by the scheduled domestic airlines. In the same year these craft flew nearly 2.75 billion passenger-miles.

Fly 3.25 Million Hours

In running up these astonishing figures, the corporate aircraft owners flew some 3.25 million hours—equivalent to flying day and night for over 370 years.

These men—and women—operate planes which range from small single-engine aircraft to the newest and largest air transports, equipped with the most modern instruments and electronic aids available.

These aircraft represent a total investment of about \$175 million, an expenditure of from \$30 to \$50 million annually for planes, parts and equipment—and an estimated additional million dollars annually for fuel, oil and maintenance.

Comparable Costs

Surprisingly enough, many of the new planes purchased today actually cost less than their counterparts of pre-World War II. One typical four-place business plane now sells for approximately \$13,000 (depending upon the amount of instrumentation desired by the purchaser). A pre-World War II four-placer—which flew slower, was less comfortable, and less reliable—sold for just about the same price.

But—there's a big difference in the value of today's dollar as compared with the days before World War II. Measured in terms of pre-World War II dollars, the modern four-placer is priced at less than \$7,000.

2,000 Metals Types Cataloged by NASC

(Continued from page 1)

which distributors and aircraft manufacturers are required to carry.

In compiling the list, distributors, mills and plane manufacturers collaborated to standardize on most-used materials—choosing specifications, hardness, finish and size of metals to obtain best use from the minimum number of types and forms.

The catalog ("Aircraft Metals Stock List, 1953") includes aluminum alloys, copper alloys, magnesium alloys, carbon and alloy steels, stainless steels and titanium.

It can be obtained from the National Standards Association, 527 Washington Loan & Trust Building, Washington 4, D. C. Price per copy (in lots of one to four copies) is 50 cents. Lower prices can be obtained for larger quantities.

Air Quotes

"I am confident that if we determine to do so we can stay ahead of the Soviet Union in the pursuit of scientific and technological knowledge. So long as we do, we can avoid an economically crippling all-out armament race that aims at out-producing



the Soviet Union plane for plane. But here I must enter an important qualifier: we can pursue this policy successfully only while we continue to maintain

a modern air force—in-being large enough to assure that a Soviet sneak attack will not be decisive, and capable of an immediate devastating counter-attack. "Our production capacity is one of our great national assets. If we are to take full advantage of it in the future we must devise and design now the equipment that we may wish to mass-produce five or ten years hence. If we do not exercise this foresight, we may some day find ourselves turning out large quantities of equipment that is technically inferior, probably unsuitable, and possibly worthless."—James H. Doolittle, April 18, 1953.

Aircraft Employees Get Extra Benefits With 'Fringe' Pay

In addition to his regular pay, the average employee at a typical aircraft plant receives \$976.96 worth of "fringe benefits" each year.

This extra compensation—paid by the company—includes such items as paid vacations, paid rest periods, overtime premium pay, paid sick leaves, workmen's compensation insurance, company insurance contributions, paid holidays, payroll taxes, and other miscellaneous benefits.

For a typical company, the annual "fringe" payments per employee break down as follows: paid sick leave \$20.45, workmen's compensation insurance \$24.99, company insurance contributions \$27.26, paid holidays \$97.70, shift bonus \$102.24, payroll taxes \$113.60, paid vacations, \$124.96, paid rest periods \$197.67, overtime premium pay \$261.28, miscellaneous benefits \$6.81.

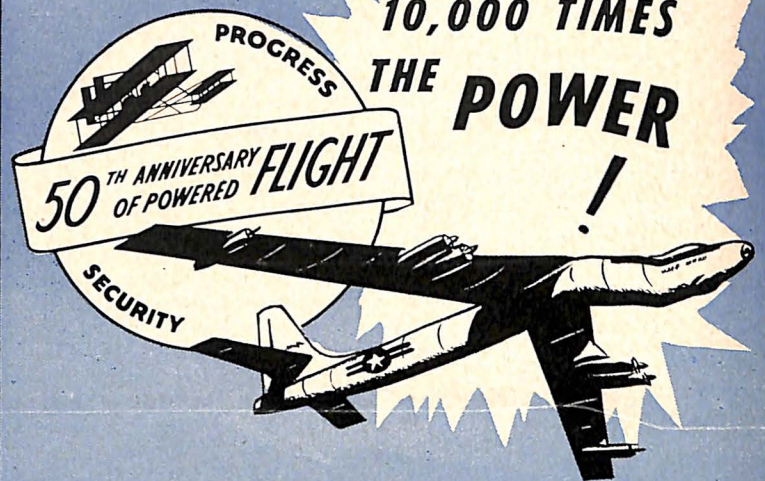
Frigid Tests

Man-made blizzards, with temperatures dropping as low as minus 50 degrees and winds blowing with hurricane force, will be created on the West Coast this summer to test new jet aircraft and equipment.

Engineers will create the sub-zero fury in an "icing wind tunnel," first of its type to be constructed in the West. The 9,600-foot-long installation will require the equivalent of enough refrigeration to chill 776 home refrigerators.

FIFTY YEARS OF FLIGHT

1903-1953



Maximum horsepower developed by a modern jet bomber is 10,000 times greater than that developed by the engine in the first Wright airplane.

'PLANES'

SOURCE: USAF

In One Day, Airline Fleet Could Fly Equivalent of 65 Times Around Globe

(Continued from page 1)

not enough mail to make a full load.

The entire passenger fleet of that first year of certificated air transport could carry but 112 passengers at one time and had a capacity of only 28,875 plane-miles per day.

Now Carry 88 at 328 m.p.h.

The luxury U.S. flag transports criss-crossing the seas and nations of the world today carry as many as 88 passengers at speeds ranging up to 328 m.p.h.—and can fly up to 1,622,100 plane-miles in a single 24 hour period, nearly 65 times around the world at the equator in a day.

In 1926 there were no certificated international passenger airlines. Last year over 2.3 million passengers flew to the four corners of the world in transports flying the American flag.

While developing this sensational history of commercial aviation, more economical airplanes have made possible a steady reduction in the cost of air travel. The average passenger fare in 1926 was 12 cents a mile. Now, with planes more luxurious, faster and safer, the cost is only 6.1 cents per mile—about one-half the old fare. And tourist or coach flights cost even less.

Air Mail Keeps Pace

The growth and world-wide development of airmail and air express has been in keeping with this rapid progress of passenger transportation. In 1926, with but 28 cities certificated for service, airmail cost 10 cents an ounce for distances up

to 1,000 miles. There were proportionate increases for points beyond that radius.

A letter sent from coast-to-coast took 32 hours in those early days and the rate was 35 cents an ounce. The same mail today is sped across the continent in 10 hours and costs but six cents an ounce. The present six-cents-per-ounce rate will deliver a letter between any two points in the United States, its possessions and territories, and Canada and Mexico.

It is estimated by the Post Office Department that 53.7 billion air mail pieces will be handled in 1954—equal to 329 pieces of mail for every person in the United States—more than is handled by all the rest of the world.

Aircraft Weight Mounts As Performance Rises

It takes heavier materials and vast increases in equipment for modern jet aircraft to fight at sonic speeds.

As plane performance has increased in the past 20 years, gross weight of aircraft has risen proportionately. This greater weight is a major factor in aircraft costs.

Twenty years ago, the average fighter weighed about 5,000 pounds. Today's jet fighters gross in the neighborhood of 30,000 pounds.

Weight of the average bomber has increased at an even greater rate. A typical modern bomber grosses about 200,000 pounds—some 13 times heavier than the 15,000 pounds of 20 years ago.