

PLANES

ALL MATERIAL
MAY BE
REPRODUCED

NEWS OF THE
AVIATION
INDUSTRY

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Technical Improvements Speeded Greatly By War

Continuing Aeronautical Research Is Key to Air Power

American aeronautical technology—our key to Air Power—has advanced ten years in the space of three under the impetus of competition with well-prepared and alert enemies. Today's hot-flying fighters, hard-hitting bombers and super-transporters are not the same planes as their pre-war predecessors by the same name.

Aerodynamic refinements, with new shapes for wings, fuselage and tail surfaces has reduced drag, increased speed. One new profile reduced wing drag as much as all previous research since the Wright brothers flight in 1903.

Continuing concentrated research seeks to overcome effects of compressibility, a new problem encountered at extreme speeds at which shock waves upset normal behavior. A new wing flap gives some help toward a solution.

Our aircraft engines today are more powerful, have longer service life, are more reliable than ever before because of improved cylinders, better fuels, lubricants and extensive research on supercharging. The weight per combat horsepower has been reduced about 40 percent.

NEW BURST OF SPEED

New type cylinder fins for one radial engine, achieved better cooling, permitted greater power utilization. A system of injecting water into cylinders of high-speed fighters has given pilots an extra burst of speed in combat.

A new engine cooling fan has resulted in a 20 percent increase in climb rate.

Propellers, too, have been improved. New wide, or "paddle" blades, have added to climb of several fighters. Faster takeoffs and higher speeds also have come with improvements in blade profiles.

Contra-rotating propellers promise increased horsepower absorption and better flight control for several new experimental designs.

Material substitution as conservation measure has proven many substitutes to be superior to the originals. Plastics have found wider use and will be retained. The first airplane using

glass fibre in its structure has flown. Developments in radio electronics, enabling pilots to bomb through the overcast, to "sight" unseen enemies, may hold the key to the all-weather post-war transport with possible 100 percent completion of flight schedules through rain or fog.

GAS TURBINES

While refinements in conventional designs continued to give our pilots an ever-mounting performance edge over the enemy, engineers probed practical possibilities of even more revolutionary developments.

Most spectacular is perfection of jet propulsion. Capable of super speeds, the jet plane was made possible through development of gas turbine.

Without pistons and cylinders, but only a combustion chamber and blower, the turbine can be used for jet propulsion or to turn propellers, or both.

An old principle, the turbine engine was made practical through metallurgical research, which only recently provided metals to withstand necessary heat and power stress.

Another technique for thrust—rocket propulsion—now assists in takeoff of heavily-loaded bombers thus increases range and payload. It may do the same for postwar transports. The helicopter, too, has reached new advanced stages of development under military sponsorship.

Our technical progress today is predominantly superior. Its tempo continues to quicken.

BEEDYNAMICS!

The airworthiness of the bumblebee, alleged on scientific grounds to be unable to fly, has been defended by the Aeronautical Chamber of Commerce.

"According to aerodynamics," wrote Pvt. Lyman A. Saye of San Angelo (Tex.) Army Air Field, "the bumblebee should not be able to fly. Can you give us any proof, either pro or con on this subject?"

The Chamber's technical department, replied: "The laws of aerodynamics as applied to

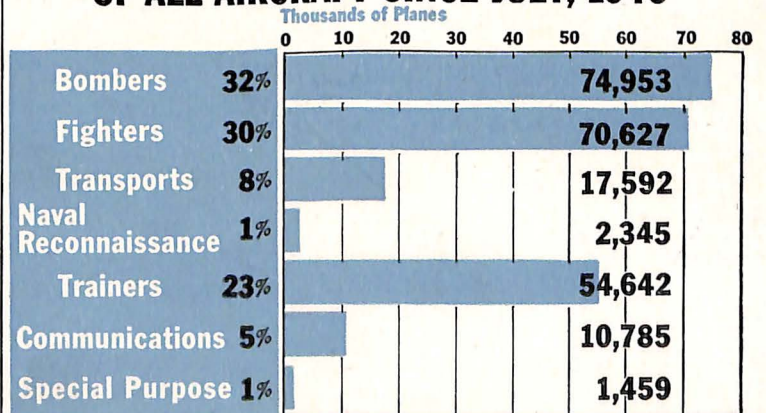
fixed wings would prove the bumblebee unable to fly because of the excessively high wing loading.

"However, a special field of aerodynamics, which might be called 'beedynamics', would very clearly demonstrate the fact that with sufficiently rapid oscillation it is possible for a very small flat surface to lift a much greater weight than can be expected from an airfoil shape under the laws of aerodynamics."

EVERY 20 MINUTES

More than 72 aircraft a day are crossing the Atlantic for the Air Transport Command.

COMBAT TYPES CONSTITUTE 63 PER CENT OF ALL AIRCRAFT SINCE JULY, 1940



TOTAL PLANES 232,403

Hourly Plane Production Up Continued Emphasis On Big Craft

An average of 11 airplanes every hour of the day and night was the production tempo of the nation's aircraft factories during the first nine months of 1944. The average for 1943 was 10 planes per hour.

With a total of 75,497 planes produced up to September 30, 1944 aircraft industry had completed 77 percent of the revised 1944 goal of approximately 98,000 planes. The total for the first nine months of 1943 was 59,993, or some 15,000 planes fewer than the record so far this year.

AVERAGE WEIGHT UP

Other vital production statistics include:

1. Of the 232,403 airplanes made since July 1940, 63 percent were combat types.

2. The average airframe weight has more than trebled since 1940. Average weight in 1940 was 3,020 pounds, compared to 10,270 in 1944.

3. The development of bigger planes has been accompanied by a decline in monthly plane units and airframe weight.

4. By the end of 1944 at present production rate, the aircraft industry will have delivered more than one-quarter of a million planes since January 1941.

Exchange of "Know-How" Key to Aircraft Record

War production has been speeded, thousands of engineering man-hours saved and tons of precious materials conserved by the aircraft industry through the interchange of ideas and practices among companies.

Hydro-press machines of one company have been turning out templates for another. A third company lent a fourth a group of sorely needed engineers. A group of nine companies compared notes, then in five minutes sliced red tape which had been holding up an exchange of supplies for a month.

This unique example of industrial teamwork started shortly after Pearl Harbor when manufacturers formally banded into East and West Coast War Production Councils.

DATA AVAILABLE TO ALL

Working under such slogans as "more air power per hour" and "help win the war faster", the manufacturers sought to get the most out of machines, materials, manpower and minutes through the unrestricted exchange of technical data, operating techniques and test or production facilities.

Today the war production information of one company is available to all others without regard to competitive interests.

Operating through working committees empowered to make prompt and immediate decisions, the manufacturers exchange views on engineering, production methods, manpower utilization, materials, quality control, safety, housing and transportation.

"GIVE ME AN HOUR"

Here is the way it works: One morning, on the West Coast, a factory manager of a bomber plant telephoned the manager of another.

"We need some alloy heat treating" he said. "We need it badly and fast. Can you help us?" "Give me an hour" was the reply.

In less than an hour arrangements had been made, to run three shifts on all furnaces on a Sunday to handle the emergency.

TRAVELED 200 MILES

One large East Coast aircraft manufacturer found a way to increase engineering manhours by utilizing temporarily idle engineers of a non-aircraft company. Armed with blueprints, a group of supervisors traveled 200 miles to put the idle pool to work. Sev-

eral other aircraft manufacturers followed suit.

An East Coast propeller manufacturer, finding his experimental facilities working at capacity, picked up the telephone and borrowed the use of a test cell of a middle western engine manufacturer. Much needed testing time on a new propeller model was thus assured.

The West Coast Council, in its first year of operation, expedited more than 20,000 emergency exchanges of production items.

Both regional groups made exhaustive manpower surveys of all member companies and as a result individual manufacturers have improved utilization of their production employees.

NATIONAL COUNCIL

Frequently, regional problems are industry-wide problems and regional committees meet jointly to solve them. This is handled through the framework of a National Aircraft War Production Council which coordinates and speeds the interchange of information between the East and West Coast Councils.

By helping each other, the aircraft manufacturers help themselves, the government and the armed forces.

Today, America's workers are producing 81 percent more airplanes per employee than they did only two years ago. Pooling of technical "know-how" has helped to make this possible.

MILLION BOMB TONS

The U. S. Army Air Forces has dropped more than one million tons of bombs on the enemy since Pearl Harbor. This means that more than five million individual bombs have been dropped on German and Japanese targets. Almost half of this total has been dropped since D-Day June 6.

Ninety-Three Plants Make Up Basic Aircraft Industry

A total of 93 separate manufacturing plants for airframes, engines and propellers make up the nation's basic aircraft manufacturing industry.

As reported in August 1944 more than 167,000,000 square feet of manufacturing floor space were devoted to aircraft production.

Of the 93 plants, 65 were building airframes, 21 engines and seven propellers. The total figure represented a decrease of eight airframe and two engine plants since the first of the year.

The productive floor space devoted to the three manufacturing categories were as follows: airframe, 108,363,000; engines, 55,220,000; propellers, 3,616,000.

Since 1940, the number of plants has more than doubled while the amount of floor space has increased twelvefold.

Liberalize Air Travel Insurance Restrictions

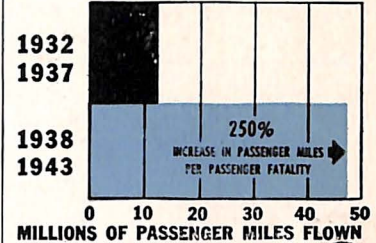
When airline travel takes off on its postwar expansion, it will be accepted as a standard risk in most life insurance underwriting, according to the Institute of Life Insurance, which has just completed a survey of current practices of 200 companies.

Nearly half of the 200 companies now issue their standard policies without airline travel restrictions, at regular rates, regardless of anticipated amount of travel, the survey revealed.

Others have liberalized their underwriting rules recently and issue standard policies at regular rates unless use of air transportation is expected to be especially heavy.

Recent safety statistics reported by the Civil Aeronautics Au-

AIRLINES' SAFETY RECORD Six Year Average



thority confirm the airline safety record. The average yearly number of passenger miles flown for each passenger fatality by domestic scheduled airlines from 1932-1937 was 13,725,096. For the following six-year period, 1938-1943, the average was 47,772,014 or an increase of more than 250 percent in the average number of miles flown per passenger fatality.

A NEW RECORD

American aircraft have flown 13 million hours and consumed two billion gallons of high-octane gasoline in military operations since Pearl Harbor.

MILLION OVERSEAS

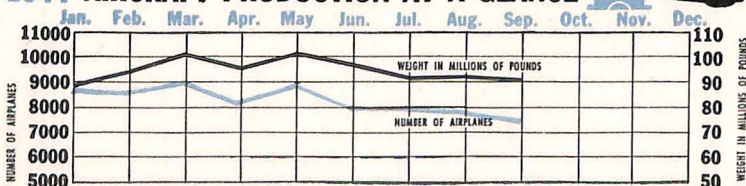
The Army Air Forces now has more than one million men at bases overseas, of which more than 111,000 are combat crews.

LONGEST LINK

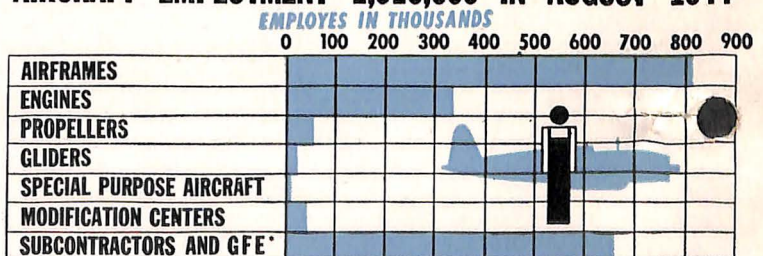
A year of operation without a fatal accident is the remarkable record chalked up for the Central African Division of the Air Transport Command, which has been flying the longest overland link in the supply route to China.

Despite the hazards of flight over jungles, deserts and treacherous coastlines, the African Division operates more planes than any domestic airline and on a "round-the-clock" schedule.

1944 AIRCRAFT PRODUCTION AT A GLANCE



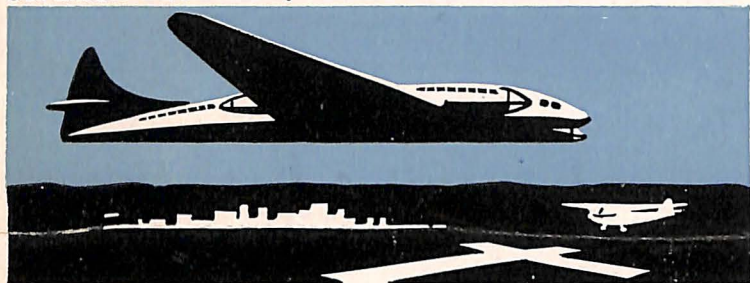
AIRCRAFT EMPLOYMENT 1,910,000 IN AUGUST 1944



AIR POWER: SAFEGUARD FOR PERMANENT PEACE BASIC PRINCIPLES TO ASSURE IT



MAINTENANCE OF A STRONG PERMANENT AIR FORCE WITH SUPERIOR EQUIPMENT, ADEQUATELY TRAINED PERSONNEL



FACILITATION OF THE ORDERLY AND ECONOMIC EXPANSION OF DOMESTIC AND INTERNATIONAL AIR TRANSPORTATION



ENCOURAGEMENT OF NATION-WIDE PRIVATE FLYING AVIATION EDUCATION AND PUBLIC AIRMINDEDNESS



PRESERVATION OF A PROGRESSIVE AIRCRAFT INDUSTRY BASED UPON CONTINUED TECHNOLOGICAL SUPERIORITY

May Pay Extra For Airborne Lettuce

Lettuce, flown from the principal year-around growing center of Salinas, Cal., could be marketed in Detroit in quantity at five cents a head over surface-borne lettuce according to a study of postwar air transport costs made by Detroit marketers in conjunction with the U. S. Department of Agriculture.

The survey revealed that lettuce could be flown to Detroit at a cost of approximately 3/4¢ per pound above that of the rail-borne product and the speed in transit would be 17 times greater

than by rail. The report states that the number of consumers willing to pay a five-cent price differential is sufficient to justify the use of air transport for this highly staple food product.

Handle Aviation Matters

Local commercial organizations (Chambers of Commerce, Boards of Trade) in at least ten large cities have to date established separate departments of aviation.

These municipalities include Fort Worth, Kansas City, Los Angeles, Milwaukee, New Orleans, New York, St. Louis, San Francisco, Seattle and Wichita.

PLANE QUIZ

A 70 per cent score on this quiz is excellent. Sixty per cent is good. Answers on Page 4.

1. The average cost of converting a medium-sized two-engine transport from military to commercial use is: (a) \$10,000; (b) \$25,000; (c) \$50,000.
2. How many airplanes were produced by the United States between December 7, 1941 and September 30, 1944: (a) 180,000; (b) 210,000; (c) 230,000?
3. The troposphere is (a) the lower region of the atmosphere; (b) air which is confined to the tropics; (c) global air map.
4. Oxygen is best used as a safety precaution when ascending starting at (a) 5,000 ft.; (b) 15,000 ft.; (c) 10,000 ft.
5. At what time would you take off to assure maximum conditions of lift: (a) 4 P.M.; (b) Noon; (c) 7 A.M.?
6. The most powerful aviation engine now being produced in volume has a



rating of approximately (a) 4,000; (b) 2,000; (c) 3,000 horsepower?



7. The outstanding development in the manufacture of personal aircraft during the war has been (a) the variable pitch propeller; (b) safety devices; (c) extension of cruising range.
8. Assume that 6,000 airparks have been located uniformly over the land surface of the United States. In this case, no point in the country would be more than (a) 22 miles; (b) 44 miles; (c) 11 miles from such a park.
9. Is the use of helium in tires of projected large aircraft considered practical as a weight-saving measure? Yes. No.
10. Metal tools should not be carried in the cockpit of an airplane because (a) tools are available on the ground; (b) they shift the center of gravity; (c) they are apt to affect magnetic compasses.

Ask Greater Freedom For Personal Flying

The personal plane enthusiast looks to the time when he will be able to get a pilot's license as easily as he can now get an auto driver's license.

The Personal Aircraft Council of the Aeronautical Chamber of Commerce which has taken the lead in seeking simplification of flying rules, has suggested the following principles as basis for a new national policy on freedom of personal flight:

1. Uniform regulations of all navigable air spaces.
2. Federal jurisdiction of crimes involving the use of aircraft in flight.
3. Free use of all public-maintained airports unless equally adequate landing facilities are available exclusively for personal planes.
4. Simplification of rules governing ownership and operation of personal planes.
5. Unrestricted flight from any point without permission, flight plan, clearance or report except on special transport airways.

HITTING THE ENEMY

American Army Air Force pilots have engaged in more than 1,350,000 sorties against the enemy since December 7, 1941, of which 71 percent were flown in the first nine months of 1944.

163,000 PILOTS

Since Pearl Harbor the U. S. Army Air Forces has trained 163,147 pilots (including 5122 glider pilots), 31,293 bombardiers and 31,906 navigators or bombardier-navigators.

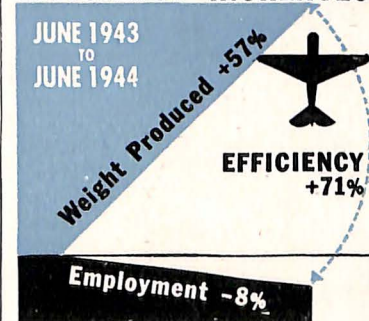
Aerial Freight Tonnage Is Up

The ever-increasing capacity of the world's wartime aerial freight system is indicated by the fact that 22 million pounds of air cargo were flown over global air routes in the first six months of this year.

Consisting of high-priority strategic cargo, all of the material was for the benefit of the United States and her allies, chiefly Great Britain and Russia.

Approximately 12 million gross pounds consisted of purchases by U. S. Government agencies, including the Army and Navy. Approximately seven million pounds were U.S.S.R. and United Kingdom materials while three million pounds consisted of private purchases by U. S. Importers.

AIRCRAFT PRODUCTION EFFICIENCY INCREASES



More, faster, with less: The record of the nation's airframe factories in increasing production with fewer workers shows up dramatically in the above chart, indicative of continuing emphasis on manpower utilization. Savings in manhours were reflected in cost savings to the public.

Farmer Has Need For Light Plane

There are growing indications that the farmer may sprout post-war wings sooner than many of his city brothers. A recent Kansas survey by Dr. F. L. Whan of Wichita University, found that one out of 80 farmers hopes to buy a postwar airplane. On the other hand only one out of every 300 in Wichita is interested, the survey showed, and one out of every 100 in smaller Kansas cities expressed intentions to purchase planes.

There are other reasons to believe that the farmer may be the first to take to the air after the war.

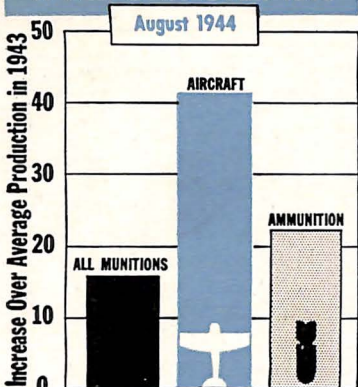
SPACE AVAILABLE

In the first place, the farmer already has the space for a landing facility. He can readily construct a landing strip along the west line fence or down back of the barn. The farmer, too, has a real use for his plane. There is no quicker or more effective way to dust crops, particularly when considerable acreage is involved, than by plane. In Arizona alfalfa has been sown successfully by air. Planes have been used in Texas and Louisiana to plant rice fields. One farmer in Oklahoma already has used his plane to deliver young plants. Cattle ranchers use planes to inspect fences and locate strays.

REPAIR TRIPS

As a matter of fact, the possible uses of the airplane by the farmer are limited only by his ingenuity. Foremost, of course, is the marketing of specialty crops, hurried trips for tractor repair parts.

AIRCRAFT PRODUCTION UP 41 PER CENT OVER 1943



As of August 1944, the aircraft industry was the nation's top producer according to the War Production Board which reported aircraft at 141 percent of its average 1943 monthly production, or 25 percent above the average of all war industries.

- (b) Airline operators have reduced the cost to this figure during the past few months.
- (b)
- (a) The atmosphere is divided into three strata, the troposphere, tropopause and stratosphere.
- (c) Scientific and medical research shows that efficiency begins to deteriorate at this elevation, even without the knowledge of the aviator.
- (c) The cool air of the morning will give greatest lift.
- (c) Five years ago such a horsepower output was not thought possible.
- (a) This is as important to the small airplane, or to any airplane, for that matter, as is the gear shift to the automobile.
- (c)
- Yes. Engineers of one large aircraft now being built estimate a saving of about 140 pounds through the use of helium in landing gear tires.
- (c)

Then if you add to these possibilities the advantages of frequent trips to agricultural experiment stations, educational displays, fairs and distant market centers, the picture rounds out to a more developed rural agriculture after the war.

Seeing Is Believing

Rogers County (Okla.) farmers are getting a bird's-eye view of the soil erosion problem thanks to Jim Rosson, the "Flying County Agent" who recently took 40 farm folks on a flight over their lands to observe erosion damage.

It was the first flight for most of them but a revelation to all who agreed that only by airplane was it possible to obtain a clear and complete picture of the serious effects of erosion.

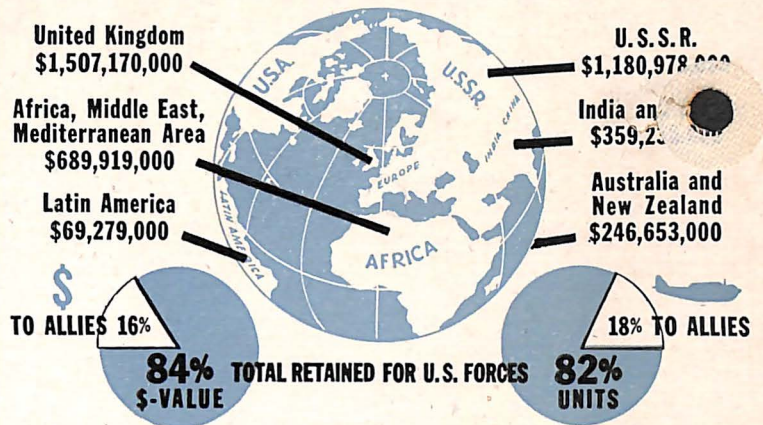
This unique farm education program is being pioneered by Rosson and the Claremore (Okla.) Chamber of Commerce.

Air Courses Planned

At least fifteen New York City high schools have inaugurated two-year basic courses in the fundamentals of flying. The courses are sponsored by the Greater New York Cadet Training Group of the Civil Air Patrol and were established after an experimental course last spring proved successful. Organized into cadet units, the aviation course is designed to prepare young men and women for the Air Forces and for the postwar increase in civilian flying.

Subjects to be studied include aircraft identification, morse code, air navigation, meteorology, and theory of flight.

AMERICAN PRODUCED AIRCRAFT AND PARTS LEND-LEASED SINCE 1941



American-made aircraft comprised more than 20 percent of all U. S. war materials lend-leased to our allies between March 1941 and June 1944.

We have sent 30,900 planes abroad and our allies have purchased another 7,000 planes for cash since the start of lend-lease in 1941. During this time we have retained for the use of our own forces over 175,000 planes.

Lend-lease planes, as great as their numbers have been, amounted to only 15 percent of the total U. S. plane production. Another three percent of U. S. production was sold to allies for cash.

This compares with more than 24 percent of total tank and other vehicle production lend-leased to allies.

The "Ideal" Feeder-Line Plane Would Seat Eighteen Passengers

The feeder airlines, which link the smaller urban centers to the transcontinental and international routes, want a postwar airplane as big as the prewar conventional airliner. The "ideal" plane according to the Feeder Airlines Association would have a seating capacity of 18 to 22 passengers in an all metal, high wing, two-engine monoplane with full-feathering propellers.

It must cruise at 170 miles an hour with a range of 500 miles plus a required reserve and be capable of taking off and landing in 1000 feet on tricycle landing gear designed to handle 20-mile cross winds.

PRIVATE FUNDS

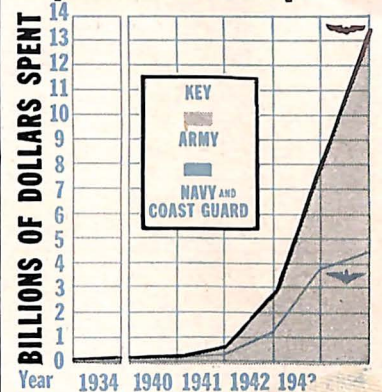
A total of \$293,000,000 in private funds were invested in the aircraft industry in the four years ended June, 1944. Of this amount \$143,000,000 went into buildings and \$150,000,000 was spent for equipment.

THE BOX SCORE

Army Air Force pilots have destroyed a total of 27,000 enemy planes since Pearl Harbor at a cost of 7700 American planes on combat missions and 400 on the ground. This is a ratio of three and three-tenths to one in our favor.

The cargo capacity would be 2000 pounds and all but the last 12 seats in the fuselage could be removed to increase the freight carrying space. Baggage compartments with each seat would permit passengers to take care of their own luggage and eliminate checking. All the flying will be done at 500 to 1000 feet above surrounding terrain.

Army and Navy Plane Expenditures Compared



Nearly half of the 34 billion dollars spent in the past four years by the Federal Government for military aviation has been expended in the past three years to pay for U. S. Air superiority.