



# planes

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OFFICIAL PUBLICATION OF THE AIRCRAFT INDUSTRIES ASSOCIATION OF AMERICA

## U. S. NEEDS PROTOTYPE TRANSPORT PLANES

### Aircraft Industry Improving Methods And Cutting Costs

The aircraft industry of the United States is actively engaged with the U. S. Air Force in an organized and closely integrated program for improving production methods and fabricating techniques to bring about substantial cost reductions. Almost 200 separate projects have been proposed by the industry for joint industry-Air Force consideration.

The principal goals are:

1. To substantially reduce the time and cost of manufacturing aircraft and components.
2. To provide effective industrial preparedness should any future emergency require quick mobilization for large-scale airplane or missile output.

#### Practical Studies

To achieve these objectives, a Production Methods Committee of the Aircraft Industries Association was established to work with the Manufacturing Branch of the Air Force's Air Materiel Command. Through a carefully coordinated program, originally begun under the guidance of Lt. Gen. K. B. Wolfe, now Deputy Chief of Staff for Materiel, USAF, these agencies analyze and investigate problems and difficulties encountered in current production techniques. Whenever practical, action is then taken to develop new machining operations, materials forming, assembly techniques, joining methods or processes which will provide an efficient and economical solution to those problems.

#### Industrial Ability

Where the developments involved are too large for any one company to undertake, the Air Force has agreed to consider sponsoring contracts from available AF funds.

Industrial capability, they agreed, is largely controlled by the "five M's": man hours, material, machine tools, management and money. Working in close coordination, the aircraft industry and the AMC are developing methods, processes, new tools, and manufacturing redesign to achieve maximum utilization of these five factors.

The projects are highly technical in nature, involving, for instance, better processes of hand—  
—See CUTTING COSTS page 4—

### STATE OF MODERNIZATION OF THE AIR FORCES

#### U. S. AIR FORCE



5,200 Planes Annual Procurement Required for 70-Group Air Force.\*



1,760 Planes Annual Procurement Required for 48-Group Air Force.\*\*



1,383 Planes Provided in 1951 Budget.

#### NAVAL AVIATION



3,760 Annual Procurement Required for 14,500 Plane Program.†



1,180 Planes Annual Procurement For Operating Forces Proposed to Be Maintained under 1951 Budget\*\*



769 Planes Actually Provided in 1951 Budget.

\* Source: Report on H.R. 1437.

\*\* Assuming attrition and obsolescence requires replacement every five years.

† Source: Congressional Record, Aug. 7, 1948.

 or  = 400 Aircraft

"PLANES"

## Government Finds 1,119 Airplanes Necessary in Day by Day Activities

Eleven departments of the Federal government, by the end of the coming fiscal year, will have acquired and put into use for a wide variety of purposes a total of 1,119 airplanes, exclusive of those used for military purposes.

In most cases, the work done by these government-owned aircraft could be accomplished in no other way, and the steady expansion of the government's day-by-day uses of planes is indicative of the growing role aviation is playing in many types of business, commerce, travel, research and the building up of the country.

Purchase of 90 new aircraft in "civil" categories is planned under the fiscal 1951 budget and over a thousand used in previous years will be continued in service.

The story of the government's increasing reliance upon the use of planes probably is told best by a brief outline of the number of planes operated by each department and their principal uses:

*Atomic Energy Commission* (5)  
—Operates a fleet of five planes for transportation, air patrol of prohibited areas, and public-health mosquito control.

—See GOV'T. PLANES page 3—

### New Types Are Vital Now, Says Rep. Sheppard

By  
Hon. Harry R. Sheppard  
Democrat, Calif., Ranking Majority  
Member, House Sub-Committee on  
Military Appropriations

Both because of military considerations and to insure our continued leadership in air transportation, our military establishment should be encouraged to embark upon a program of developing advanced cargo and turbine-powered transport aircraft without delay.

The vital role of air transport in our defense was first dramatically illustrated in the last war when



Rep. Sheppard

our industry produced more than 24,280 transports including 1,560 four-engine types, for the Air Force, the Navy, and our allies. Last year the Berlin Airlift taught us again that adequate air transport can effectively prevent isolation and blockade.

The aerial transport arm of a nation that desires to survive must be equipped at all times with the latest and most advanced equipment. Those concerned with aerial logistics must constantly seek to safeguard their transports from interception and to increase their ability to deliver supplies and personnel quickly and economically. For these reasons there is no doubt but that high-speed, turbine-powered transports will be essential to the military transport services of the future.

#### Turbine Power Essential

In addition, there are many specialized uses for high speed transports that clearly call for prompt action by our military establishment to develop specialized designs for such missions. General Devers, commander of the Army Field Forces until a few months ago, has several times declared that turbine-powered airplanes will be required for the effective conduct of operations of the ground forces. This nation must produce and test such high speed transports to develop their full potentialities in future military operations.

—See SHEPPARD 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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ALL MATERIAL MAY BE REPRODUCED—MATS OF ALL CHARTS ARE AVAILABLE

## The 70-Group Program, The Industry and the Public

By DeWitt C. Ramsey (Admiral, U.S.N., Ret.),  
President, Aircraft Industries Association

Throughout the debates in Congress over the 70-group program during the past two years, the aircraft industry has at all times avoided taking any public position on this issue. Any other course would be inappropriate because only the Congress, the Defense Establishment and official agencies constituted to study this problem possess the information contributing to an intelligent decision upon military requirements in this field of the national defense effort.

The industry has disseminated information about defense requirements that in its judgment was authoritative. It was based upon the best official information available. Thus, the findings of the President's Air Policy Commission, the Congressional Aviation Policy Board, the Air Coordinating Committee and those of the responsible committees of the Congress dealing with this subject have been distributed widely.

Virtually all of these findings and reports clearly support the need for the 70-group program of the United States Air Force and for a strong aerial arm of the Navy. It is difficult to imagine that anything else should be the case since air power is universally recognized as our first line of defense or since, as Winston Churchill put it, "For good or ill, air mastery is today the supreme expression of military power, and fleets and armies, however necessary, must accept a subordinate rank."

President Truman and the Defense Establishment have decided that the country cannot afford the 70-group Air Force and that the strength of the Naval air arm must be further reduced. In effect, their decision is that the country must take the calculated risk of an inadequate defense to the degree of maintaining only a 48-group Air Force instead of a 70-group because of the cost involved. The aircraft industry, aware of tax burdens and of the importance of maintaining a healthy national economy, just as is any other group of citizens, cannot oppose this decision. The industry can and will, however, continue to point out what the distinguished and impartial survey groups have found to be the minimum aviation requirements for our defense. We thus will remind the public of the calculated risks we as a nation are taking.

This course seems essential because of the industry's own important responsibilities as a key unit of the national defense team. The industry must maintain a large and a balanced organization of scientists and engineers who must cope continuously with the problems attending technical and revolutionary developments. Such an organization is essential if our air forces are to be kept abreast of the rapid advances in aeronautical science.

In addition, the industry must remain a healthy production nucleus which in an emergency can be rapidly expanded to produce the enormous volume of aerial equipment necessary in war.

Our national war plans are obviously based on the industrial potential of the nation rather than maintaining adequate forces in being. Equally obvious is the fact that we will never again be allowed much time to mobilize that potential and must therefore maintain an adequate base for rapid expansion.

Should this nation fall behind in the aeronautical race or maintain so small a nucleus that the large production required in an emergency would not be ready when needed, the industry, for reasons beyond its control, would have failed to carry out its assigned mission. Therefore, it is in the national interest that we continue to disseminate information about the requirements for our national defense and the obstacles to the fulfillment of those requirements.

## PLANE VIEWS

BLUE PRINTS REQUIRED FOR ONE  
OF THE AIR FORCE'S BIG  
BOMBERS WOULD COVER  
125 FOOTBALL FIELDS!



ONION SKIN THE METAL SKIN ON  
ONE OF OUR FIGHTERS IS  $\frac{3}{16}$   
INCH THICK AT THE FUSELAGE.  
IT TAPERS TO  $\frac{1}{32}$  INCH AT THE TIP  
TO AVOID FLUTTER



NAVY RESEARCHERS  
HAVE A ROCKET THAT CLIMBS  
MORE THAN **51** MILES IN  
LESS TIME THAN IT TAKES  
TO COOK A SOFT BOILED EGG



BY AIRCRAFT INDUSTRIES ASSOCIATION OF AMERICA

### SHEPPARD

(Continued from page one)

It is clear also that high speed turbine-powered carriers and advanced-type cargo planes will be required for such specialized missions as the transportation of executive personnel; special military and civil missions; and the movement of urgent emergency cargo of many varieties.

For the foregoing reasons alone it seems beyond question that our military establishment should promptly initiate the steps necessary to the development of prototypes of the required aircraft.

#### Delay Will Be Costly

Many times our Government must invest money to save money and I believe this will be the case with prototype transports. If our Government now develops prototypes, the new transports will be in production and will have been tested should war break out. Consider the huge cost of starting up a production line on a plane not yet designed or engineered for production under wartime conditions. Then compare these costs with the expense of merely ordering large quantities of a plane already tested and in production.

We are certain to need thousands of transports in any future war. These cannot be obtained by requisitioning planes from the airlines, which now operate a total fleet of just 1,100 planes. We should therefore move now to insure that the needed planes can be produced on time and with the

maximum economy. The way to do that is to encourage design and production of advanced type craft now.

But in addition, the requirements of our airlines argue for the development of such aircraft. No American can look with complaisance upon the prospect of Great Britain re-equipping the world's airlines with turbine-powered aircraft while our own lines plod along 100 miles an hour slower with conventional equipment. But apart from national pride, economies are also involved. If our domestic and international airlines have to compete for the world travel market with slow and obsolete equipment, they will lose business. Costs will increase, and it is conceivable that higher subsidies would be required.

On the other hand, lower operating costs are in prospect when the new equipment has been developed and has gone into operation.

### Facts and Figures

Aircraft manufacturers have overcome a major scientific problem by developing a method of welding inconel x, a very high nickel steel.

The U.S. is getting a good start on its early warning radar defense screen because the Air Force cut back its budget for other projects to divert \$50,000,000 to begin the construction.

## Air Quotes

"After the go-ahead is given, it requires at least a year to start turning out pilots; two years before we get them in quantity.

"It requires a year to start the wheels of industry moving for the production of airplanes, and another year before we hit real quantity production if we start with approved, well-tested airplanes. If we want a new plane, anywhere from an additional year to 18 months will be required.



Arnold

"We must not allow ourselves to be blinded with any ideas that an Air Force, for instance, can be created in a matter of months.

"The Air Force with which we start the war and which we will have for at least many months, is just that Air Force that we have in peace time."

—The Late Gen. H. H. Arnold, General of the Air Force (Courtesy of McNaught Syndicate)

## Facts and Figures

During fiscal 1951 the U.S. Air Force will complete the equipping of three of the four heavy bombardment wings and two strategic reconnaissance wings with B-36 aircraft. The fourth heavy bombardment wing will be in the process of conversion by the end of the year. These are all the result of prior years' appropriations.

U.S. airlines operating internationally had a perfect safety record in 1949, flying 2,139,000,000 passenger miles without an accident.

## PLANES QUIZ

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

- Injection of water in airplane engines can sharply reduce the length of run required for take off. True? False?
- The record altitude reached by a helicopter is (a) slightly over 9,000 feet; (b) 16,000 feet; (c) 21,000 feet?
- A single-engined lightplane has reached a top altitude of (a) three miles; (b) four miles; (c) five miles?
- The U. S. Military and Naval Academies now allocate to the Air Force: (a) one-half of all graduates; (b) one-fourth; (c) two-thirds?
- The longest time a jet-propelled aircraft has remained in the air is: (a) 12 hours; (b) eight hours; (c) five hours?
- Total number of certificated pilots in the U. S. is now over: (a) a quarter-million; (b) a third of a million; (c) a half-million?



- Navy air combat units have been reduced since 1949 by (a) 33 per cent; (b) 20 per cent; (c) 45 per cent?
- Scheduled passenger flights across the Atlantic Ocean now average (a) 10 per day; (b) 20 per day; (c) 30 per day?
- Total number of airports in operation in the U. S. is approximately (a) 4,000; (b) 5,000; (c) 6,000?
- Actual construction of a modern jet fighter on an efficient and going production line requires at least (a) three months; (b) four and one-half months; (c) six months?
- In the manufacture of military planes, one inspector may be required for: (a) each 100 direct workers; (b) each 40 direct workers; (c) each 10 direct workers.



## GOV'T. PLANES

(Continued from page one)

**Tennessee Valley Authority (10)**—Will buy two more planes for a total of ten, used principally for transporting TVA employees on official business. One plane is used mainly for photography, mapping and reconnaissance. One helicopter will be used for power line patrol and one helicopter and four planes will be used by technicians and engineers in malaria control larvicide and insecticide application and for survey of construction and malaria control projects in remote areas.

**Federal Security Agency (4)**—Its Public Health Service uses four planes for technical development and epidemic control activities, including air dispersal of insecticides and larvicides.

**Department of Agriculture (52)**—The Bureau of Entomology and Plant Quarantine will acquire six more aircraft for a total of 22 used in the application of insecticides to crops and forests, both in its long range program and to suppress emergency and incipient outbreaks of insects.

### More for Forest Service

The Forest Service will buy three more aircraft for a total fleet of 18 used for transportation of men and supplies, including "smoke jumpers," to inaccessible areas, for reconnaissance of large fires, and for detection services in remote areas and after lightning storms. Forest Service also will buy four other aircraft, increasing to twelve its fleet used for control of destructive insects attacking forested areas.

**Department of Commerce (109)**—The Civil Aeronautics Administration has 85 planes used by its personnel in making investigations and inspections, conducting engineering tests, and checking and maintaining facilities. Five others are used specifically by technical personnel in connection with flight test operations. The Civil Aeronautics Board has 17 planes for official business. The Coast and Geodetic Survey uses one aircraft on loan from the Coast Guard for photographic operations in the U. S. and Alaska. The Weather Bureau has one plane used by its

## Airplane for Atomic Energy Commission



The Atomic Energy Commission is one of 11 government departments using a total of 1,119 airplanes in their day-by-day activities. "A surprise tactic by Hanford, Wash., patrol planes is to swoop low over an unidentified automobile inside the Hanford perimeter and land in the road directly ahead," said the AEC in releasing the above picture. "The pilot then waits for the autoist to drive up and questions him as to identity, purpose in being there, etc." AEC planes are used for patrolling, transporting employees, for mapping and for mosquito control.

central office staff for field inspections and surveys.

**Department of Defense (760)**—The Department of Defense operates over 760 transport aircraft in providing transportation for important Government officials representing Congress, various other Government agencies and foreign dignitaries. It provides the air transportation for military personnel, rapid evacuation of sick and wounded, high priority mail and cargo, and for specialized air missions. Eight new planes will be purchased this year to modernize the Military Air Transport Service. The Army's Corps of Engineers, which now has four, will buy five new planes to be used largely by division engineers for inspection work.

**Department of the Interior (56)**—Bonneville Power Administration has one plane, will acquire two more, to be used for line location, reconnaissance, aerial photography, acquisition of land, transmission-line patrol and administrative activities.

### Land Management Uses

Bureau of Land Management has one plane, will buy two more, for transporting management personnel, fire crews and supplies and for fire patrol in Alaska.

Bureau of Reclamation has five planes, will acquire three more, for use by Washington and Denver, Colo., supervisory employees.

Geological Survey has one plane for geophysical exploration.

Fish and Wildlife Service will add 10 new planes to its fleet of 30. They are used by agents for enforcing fish and game laws, for predatory animal control, by aquatic biologists for fishery research in Alaska, for waterfowl surveys and for game management.

The Alaska Railroad has one plane, currently on loan to Fish and Wildlife at Juneau.

**Department of Justice (8)**—The Immigration and Naturalization Service will double its fleet of four planes this year. They are used by border patrol pilots and inspectors for air-ground liaison for prevention of illegal entries; pursuit of suspected violators, and transfers of small task groups of inspectors to points of emergency.

**Department of State (2)**—Two aircraft are maintained for use by

the air attaches at American Embassies at London and Rio de Janeiro.

**Treasury Department (101)**—The Coast Guard has a fleet of 50 aircraft, 18 of them helicopters; it will buy 51 more craft this year, five of them helicopters. All are used in the assigned duties of the Coast Guard and for carrying passengers in connection therewith.

**National Advisory Committee for Aeronautics (12)**—Its fleet of 12 airplanes includes eight on loan from the military services. They are used for research activities and transportation to remotely located research stations.

## 600 Aerial Ambulances Now in Use in the U.S.

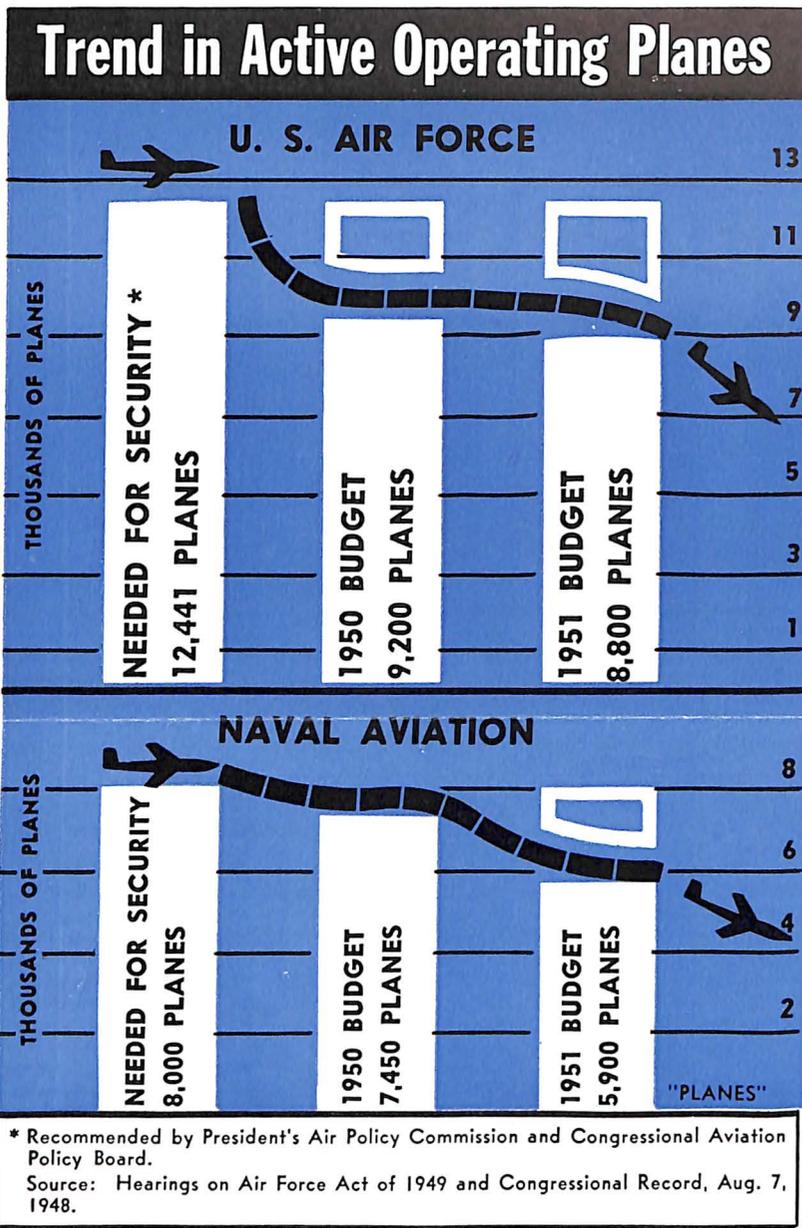
There are now at least 600 airplanes equipped as aerial ambulances in active operation in the United States and stationed at strategic points throughout the country, according to a special survey made by the Civil Aeronautics Administration.

CAA will have ready for distribution about March 1 a complete listing of these hospital planes. Data will include such pertinent information as their size, speed, facilities carried—such as oxygen for patients—and the number of attendants who can be carried.

Distribution of the ambulance plane booklet will be made to hospitals, medical associations, and other potential users. Ambulance planes are being used more and more in both emergency and routine cases, the survey shows.

### 4-Passenger Planes Popular

Four-passenger personal planes are becoming more and more popular—nearly 16,000 of them having been sold during the past three and one-half years. During the first seven months of 1949 sales of four-place aircraft accounted for 69.5% of the total number of lightplanes sold, as compared to only 8% in 1946, the Personal Aircraft Council of the Aircraft Industries Association reports.



### CUTTING COSTS

(Continued from page one)

ding the multitude of highly-refined materials and metals that go into an airplane, development of greater strength and heat resisting characteristics for supersonic planes and engines, and many other engineering and processing problems.

A striking example is one proposal for the development of an aircraft wire preparation machine.

A typical production model bombing plane now entails approximately 6,500 individual pieces of wire for a total length of approximately 80,000 feet involving some 20 different gauges of wire, to say nothing of the various types of insulations.

#### Great Savings Proved

At present each step in the operation is done separately—involving many handlings, set-ups, and a considerable number of people in each aircraft factory with the subsequent increase in margin for error and waste.

After a thorough analysis of the problem, engineers in the aircraft industry concluded that an automatic machine could be developed to do this work. Obviously a machine that would be fast, accurate, cheap, and easy to operate would almost entirely eliminate waste by being automatic, would save on factory space and the number of operators required—tremendous savings for the entire aircraft industry.

Another dramatic proposal is for development of a "liquid hon-

ing machine" for use in fabrication of production parts and tools where a fine finish is necessary. The process involves blasting at tremendous velocities abrasives suspended in emulsion against the surface to be cleaned or finished.

Early experiments showed cutting tool life increased up to 200 per cent, and in another case the number of milled parts produced between resharpening of milling cutters increased from 17 to 300. A forging die made in the normal manner produced average runs of 5,000 parts, whereas a similar die produced 25,000 parts on the first run after liquid honing.

From experiment to practical every-day use is the goal for these and many other new and refined methods proposed and being worked on by engineers in the AIA-USAF program for development of manufacturing methods and processes.

#### Industry Praised

At a recent meeting of the Board of Governors of the Aircraft Industries Association, Lt. Col. Carl W. Andrews, head of the Air Materiel Command's Resources Planning Section, said: "The reduction of aeronautical industrial production problems which stand in the way of high volume, low cost production of aircraft and accessories by a combined AIA-USAF team, where both of us have a definite common interest from the intrinsic standpoint and also as taxpayers, will result without question in advancing the goal of industrial mobilization productive planning success."

## Air Power Budget Lacks Provisions For Obsolescence

The national budget for the fiscal year 1951 provides for the procurement of 1,383 new planes for the Air Force and 769 new planes for the Navy, to support an Air Force operating 8,800 airplanes and a Naval air arm aircraft inventory of 5,900 planes. This budget would support a 48-group Air Force compared to the 70 groups recommended as the minimum necessary for national defense by authoritative impartial surveys such as the President's Air Policy Commission and the Congressional Aviation Policy Board.

Measured in terms of airframe pounds, the proposed procurement will be 21,300,000 pounds for the Air Force and 8,100,000 for the Naval air arm, a total of 29,400,000 airframe pounds. This compares with the minimum procurement levels of 63,000,000 airframe pounds for both services recommended by the Congressional Aviation Policy Board.

A survey by the Labor Department's Bureau of Employment Security based on 83% of the industry's work forces, discloses that employment in the aircraft industry is expected to decline almost 6% by March of 1950, reflecting a reduction in military production under the 1950 and 1951 budgets.

Because of both obsolescence and attrition, an air force to stay modern must replace its equipment every five years. To keep the 8,800 plane-force of the USAF modern would thus require purchase of 1,760 planes a year as compared to the 1,383 scheduled to be bought during fiscal 1951, and to keep the 5,900 plane Naval air arm up to date would require purchase of 1,180 planes compared to the procurement schedule of 769.

The obvious inference is that the equipment for our Air Forces will become increasingly obsolescent or else another curtailment in those forces will be required.

### Answers to Planes Quiz

- True. With one 28-cylinder engine maximum take-off power is rated at 3,500 h.p. at 2,700 revolutions per minute and 750 feet with water injection; it is 3,250 h.p. at 2,700 r.p.m., and 1,500 feet without water.
- (c) 21,220 feet is the world's altitude record, held by an American-made helicopter.
- (c) The world lightplane altitude record of 26,400 feet is held by a woman, Mrs. Mildred Zimmerman of Reading, Pa.
- (b) One-fourth.
- (a) A British jet fighter stayed aloft 12 hours and three minutes and covered 3,000 miles, being refueled in the air 11 times.
- (c) 510,000.
- (a) Approximately 33 per cent.
- (c) Trans-Atlantic airlines flew about 11,000 scheduled flights across the North Atlantic, or an average of 30 per day, during 1949.
- (c) 6,484 airports.
- (c) A leading aircraft builder says: "On an average jet fighter part, the in-plant process requires about six months from the time the raw material is issued from the warehouse until the part goes out the factory door on a finished airplane."
- (c) One big builder of jet fighters uses on an average one inspector for each 10 direct workers.

## Aircraft Electrical Manual Is Published

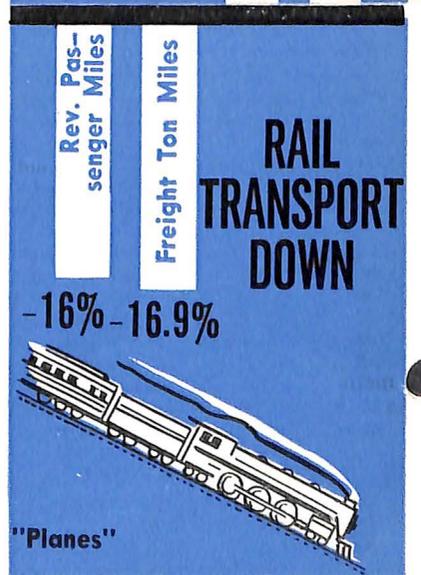
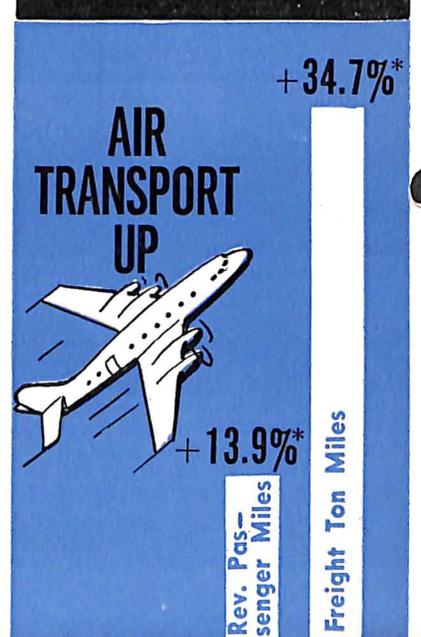
A new manual designed to provide an up-to-the-minute design guide on electrical system installations for transport aircraft has been prepared by the Aircraft Industries Association, the second in a series of AIA technical publications.

This "Design Manual on Aircraft Electrical Installations" is available at the Aircraft Industries Association, 610 Shoreham Building, Washington 5, D. C., at a unit cost of \$1.75.

Based on the practical experience and design knowledge of leading industrial engineers, the manual contains comprehensive data not available from any other source. Also, the manual is presented in a practical and usable form for the every-day operations of design engineers, maintenance engineers, electrical equipment manufacturers, and students.

The State of Iowa has more registered pilots between the ages of 55 and 60 than between the ages of 15 and 20 years.

## Air Transport vs. Rail 1949 COMPARED TO 1948



\* Domestic trunk lines only. Air figures estimated for last two months of year, rail figures for last four months. SOURCE: Air Transport Association and Association of American Railroads.