



# planes

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## HELICOPTER PASSENGER LINES DUE IN 1953

### Plane Industry's Working Capital Held in Jeopardy

An operating loss of only four per cent on military orders could wipe out the working capital of 12 representative aircraft manufacturers, the National Credit Office recently reported.

Calling for a more efficient government aircraft procurement policy, the NCO also pointed out that the 12 companies which reported on their operations for the first half of 1952 "disclose a 77% sales increase but only a 30% gain in earnings. The ratio this year is 2.1% on sales, after taxes, compared with 2.8% a year ago."

The low earnings are explained by a number of circumstances, the organization reported, which "combined to retard output, reduce productivity and consequently distort budget expectations."

The report said:

"The priority system did not always function smoothly—inevitably some components were delivered too late to be incorporated into the planes at the proper station in the assembly line. Installation at an improper time is always more costly. Delivery schedules were altered to accommodate design changes."

"Simultaneously a major re-employment program was in progress. . . . The absorption into the factory organization of such an influx of trainees temporarily lowers productivity."

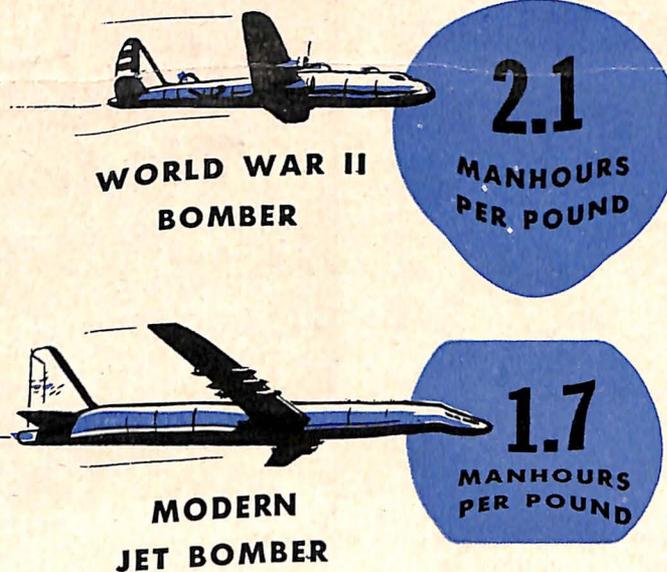
"Similarly, plant facilities were undergoing urgent alterations or additions. More space is required to build the present-day airplane because of its larger physical dimensions."  
(See CAPITAL, page 2)

### Airlift Plays Big Role In Building Thule Base

During construction of the strategic U.S. polar air base at Thule, Greenland, approximately 2,100 round trips were flown from the U.S. to supply workers and equipment.

More than 19,000 passengers, including 3,000 workers, were transported—and 12,500 tons of cargo. During over 65,000 hours of flying in one of the world's worst flying areas, only two minor aircraft accidents occurred.

### MORE EFFICIENCY PER POUND



New machines, new production techniques developed by management, and modern methods have cut pound-for-pound manhours in airframe production to a level below that of World War II. This industry achievement is a positive step in cutting costs of aircraft that today must have increasingly higher performance and greater pilot protection in air combat. The savings, passed along to the taxpayer, serve partially to offset the high costs of (1) millions of additional engineering hours required for sonic and supersonic planes, (2) greater quantities of materials needed for the larger planes of today, and (3) the intricate equipment and components essential for operation of revolutionary new aircraft.

'PLANES'

Source: Typical Aircraft Manufacturer

### Cost-Cutting Program Gives Nation One 'Free' Plane Out of Every Six

The American taxpayer gets one free fighter plane for every six aircraft produced by a major East Coast manufacturer, as a result of a continuing all-out drive to cut production costs on modern warplanes.

If cost-cutting methods had not been devised and put into effect, this manufacturer estimates that each plane would cost taxpayers 15 to 20 per cent more at today's prices.

The aircraft industry's cost-reduction effort is aimed at partially offsetting the nationwide price rise which has jumped the cost of all ingredients which go into modern

planes. It already has saved the American taxpayer "millions of dollars," according to an Aircraft Industries Association survey.

These millions in savings, however, have been more than absorbed by an accelerated spiral in prices which are outside the aircraft manufacturers' control. For example, labor rates in the aircraft industry have risen 60% since the end of World War II, copper has gone up 75%, aluminum 25%, steel 64%, chemicals 55%, textiles 60%, building materials 97%, machine tools

(See INDUSTRY, page 3)

### 'Copter Air Mail Now Reaching 92 U.S. Communities

Written Especially for PLANES

By L. Welch Pogue

Three major helicopter operators in Los Angeles, Chicago and New York today are furnishing helicopter mail service to 92 American communities—and will, in the immediate future, expand this service to include the entire New York City metropolitan area.

These three operators, currently using a total of 13 rotor craft, already have carried more than 28 million pounds of mail while flying almost 2.5 million miles.

Next year, at least two of the operators—and possibly all three—plan to begin the nation's first scheduled helicopter passenger and freight service. Already armed with authority for carrying passengers

L. Welch Pogue, author of this article, is one of the nation's leading authorities on aviation. Head of the



Pogue

Washington law firm, Pogue & Neal, he is legal advisor to the Helicopter Council of the Aircraft Industries Association. From 1942 to 1946, Pogue was head of the Civil Aeronautics Board, the Government's highest agency for supervising and regulating air transportation. His interest in helicopters has led to his becoming an outstanding specialist in this field.

and freight, Los Angeles Airways, Inc., and New York Airways, Inc., expect to begin passenger operations sometime during 1953. Helicopter Air Service, Inc., in Chicago has an application for authority to carry passengers, but as yet the Civil Aeronautics Board has not held hearings on it.

These operators are pioneering a dramatic new field for the commercial helicopter, which already is being used in such jobs as agriculture, police work, forestry, mining, high-

(See HELICOPTER, 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

## Lyndon Johnson's "Point 10"

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

Some three months ago, members of the Senate Preparedness Subcommittee urged that the American people be given a plan for achieving minimum long-range air preparedness at the lowest possible cost.

"We have long been aware," the committee's discerning report said, "of the many inadequacies in America's defensive position. These inadequacies are born of many factors. They can be traced to the too-hasty demobilization that followed World War II; the relative tardiness with which many of our leaders recognized the aggressive intentions of the Soviet Union; the national distaste for armaments in a period that can technically be called peace.

"But whatever the reasons, weaknesses undoubtedly exist. They are present — as a potential column of enemy strength — in the air, on the ground, in the seas."

This able group of senatorial leaders, headed by Sen. Lyndon Johnson of Texas, pointed out ways to preserve the aircraft industry's emergency capabilities. In "Point 10," the committee recommended that Congress be furnished with:

**"... recommendations to maintain the aircraft industry in a healthy state in periods of peace as well as in periods of defense mobilization."**

This request is not a new one; nor does it carry with it the stuff of which headlines are made.

Yet it shows a penetrating recognition of two of the basic long-range problems of military procurement: (1) the pattern of wasteful build-up and tear-down to which our defense establishment has, of necessity, been tailored in the past, and (2) the fact that a quick transfusion of big money cannot force a weakened industry into high production overnight.

One of the greatest wastes of tax dollars today — the loss of millions, perhaps billions, of dollars — stems from the military's lack of authority to undertake consistent, long-range programming. It is significant that, in the years between the end of World War II and the start of the Korean War, less than four per cent of Defense Department funds went for aircraft procurement. During these same years, *almost half* of military expenditures were for liquidation of World War II costs, dismantling and crippling the greatest military production machine in world history.

It has been conservatively estimated that America could have saved some \$2 to \$3 billion *since Korea* had year-by-year planning been supplanted by a long-range air power program.

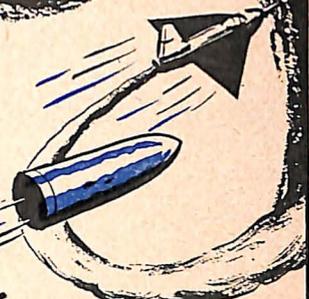
Authoritative voices long have pointed to the tragic waste attendant in stop-and-go planning built on the sands of international political fluctuations. The Morrow Board of the 1920's, the Congressional Aviation Policy Board and the President's Air Policy Commission of the 1940's, the American Legion Policy statements of recent years — all have pointed to the tremendous savings to be derived from adoption of a sensible and consistent aircraft procurement program. A sound, privately-owned and operated, and competitive aircraft industry — capable of rapid expansion to meet national defense emergencies — has long been recognized as a cornerstone on which America's future security rests.

Detailed recommendations on this subject by the Munitions Board, and subsequent enactment of a legislative base for future planning, would be a positive step leading toward long-range economy and sustained preparedness in these critical — and costly — years of international tension.

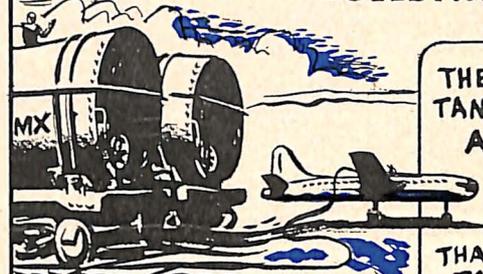
## PLANE VIEWS

**BEATS BULLET!**

A SUPERSONIC U.S. RESEARCH PLANE FLIES TWICE AS FAST AS A PISTOL BULLET...



THE SIX TO TWELVE TANKS IN A MODERN AIR TRANSPORT PLANE HOLD 10,000 GALLONS SLIGHTLY MORE THAN TWO RAILROAD TANK CARS...



**Big Job...**  
EACH NEW PRODUCTION MODEL OF A JET WARPLANE REQUIRES SOME 10,000 ENGINEERING DRAWINGS



PLUS  
**25,000 NEW TOOLS!**

by Aircraft Industries Association of America

## PLANE FACTS

- Approximately 1,000 different kinds of skilled and semi-skilled jobs, not including professional or supervisory skills, are required to produce a modern aircraft.
- It takes 15,000 wires to hook up the complex electronic equipment installed within the pressure shell of a flight crew compartment in a late-model bomber.
- Jet engines built by a single U. S. manufacturer have flown more than 600 million miles.
- Manhours on a typical jet bomber have been reduced by 88 per cent from those required to build the first production model of the plane.
- Use of helicopters for power line patrol by the Bonneville Power Administration has saved BPA \$1.35 for every mile patrolled. Ground methods of power-line inspection cost \$2.75 per mile, while helicopters cover the facilities at an average cost of only \$1.40 per mile.

## Working Capital Held in Jeopardy

(Continued from page 1)

mensions and since its growing complexity in design slows down the production rate.

"New machine tools are needed. Higher speed, with its greater stresses, necessitates use of more steel than heretofore. Different equipment is used in its fabrication.

"All of these developments are reflected in the demand for more space, larger and more expensive machine tools, extensive new laboratories. The acquisition of these facilities, their installation and integration into the manufacturing process have been costly."

In a separate survey of 14 leading aircraft companies, the National Credit Office reported a combined indebtedness of 2½ times their net worth, which amounted to \$644,214,000 in 1951. Last year, working capital fell off \$40,000,000 (and has been reduced \$200,000,000 in the last seven years). Earnings of these companies dropped 36% in 1951, said NCO, despite a sales increase of 45%.

Over 60 combinations of engines and configurations were investigated in developing an advanced supersonic research plane.

# Industry Efforts Cut Tax Burden For Air Power

(Continued from page 1)

100%, and miscellaneous hardware 43%.

The industry has also been faced with the problem of building extremely larger and more complex aircraft in order to meet the ever-rising requirements of the military establishment and the threat of Soviet technological advances.

In the face of these heightened requirements and the impact of inflation, the industry has embarked on an intensive internal economy program designed to hold the rise in costs to a minimum.

## Outlines Industry Objective

The basic industry objective was outlined recently by a major helicopter manufacturer who introduced a plant-wide drive to cut five per cent of the time and materials used in building his product. "Every employee is a taxpayer," the company president pointed out, "and the money we spend is our own. We do a lot of grumbling about taxes, and if we stop and think we will realize that every time we waste 15 minutes or damage some material it is money out of our own pockets."

Aiming at long-range economies, another aircraft executive pointed out:

"The engineering and production know-how of the American aircraft industry is one of the nation's most valuable assets. But we must be given a chance to apply this know-how systematically and continuously—without the insecurities generated by the ups-and-downs that the aircraft industry has been put through in the last six years. Then we'll be able to keep our air forces strong—and at a reasonable price to the American taxpayer."

## Broad-Scale Drive

The cost-reduction drive extends from top management to the assembly line. In one plant alone, more than 1,100 experienced shop workers have served six months as "conservation committeemen." When the program started, rivets and other "hardware" swept up from the production floor and scrapped amounted to \$22 per month for each employee. Today, the same figure is only \$2.75.

Typical of other economies aimed at reducing the nation's air power tax burden are the following:

- An advance in automatic welding at one company that saves at least \$195,000 per year.

- Introduction of 150 plastic parts in a modern fighter, with a 65 per cent average saving in the cost of plastic parts over comparable metal parts.

- A new method of setting up jigs and fixtures that cuts major tooling costs by 30 per cent.

# Mammoth Bomber's Wings Must Be Able to 'Flap' Through 20-Foot Arc to Withstand Sonic Winds

A modern 600-mile-per-hour jet bomber must have wings that can "flap" in mid-air.

Unlike the flapping wings of a bird in flight, which serve to propel it through the air, the wings on this 92-ton goliath must be built with elasticity to withstand the battering and pounding of tremendous aerodynamic forces. Rigid wings, incapable of bending, would snap under the violent gusts and stresses of today's flight speeds.

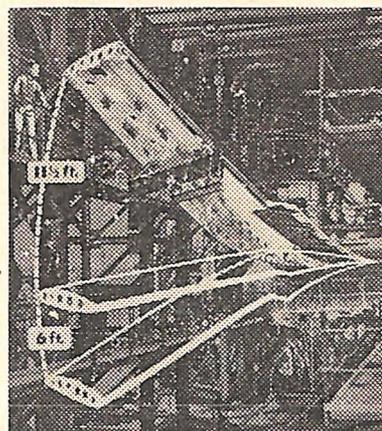
The problems faced by this plane's manufacturer are typical of design complexity and high cost requirements faced by the aircraft industry during a period of revolutionary developments. The manufacturer had to devise a means of combining extreme thinness of wing, required for flight at high speeds, with enough elasticity to take bending without breaking from the fuselage.

The problem was solved by creating a wing that can withstand deflections through an arc of more than 20 feet without structural failure!

This bomber proved in static wing

tests (see photo) that it could take structural strains and stresses far greater than would ever be encountered in actual flight.

The photo shows the wing de-



Bomber's wing deflected upward more than 11 ft. in static test.

flected upward more than 11 feet at the tip. The phantom lines reveal normal position of the wing, and the downward deflection of six feet that occurred during the tests. The wing-tips described an arc of more than 20 feet in later overload tests.

# PLANES QUIZ ✈️

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

1. A typical aircraft engine manufacturer's base labor rate increased 250 per cent from 1941 to 1951. Yet this manufacturer, through cost reduction efforts and production efficiency, was able to hold labor cost per horsepower to an increase of: (a) less than 100 per cent; (b) less than 50 per cent; (c) less than 30 per cent?
2. In mid-1952, strength of the Chinese Red Air Force was estimated at over 1,450 warplanes. Since that time, additional Soviet deliveries to the Chinese have swelled this number to: (a) 1,800; (b) 2,200; (c) 2,500?
3. Two years ago, production of two of the major USAF jet fighters averaged less than three per day. Now the combined production of these two fighter types is more than: (a) 4 per day; (b) 13 per day; (c) 9 per day?
4. In spite of tremendously increased flying activity, the Air Force safety record during the first half of 1952 showed a constant improvement. For these six months, the major accident rate declined: (a) 2 per cent; (b) 5 per cent; (c) 9 per cent?
5. One of the newest aviation tires, built for high-speed jet aircraft, is capable of withstanding landings at a speed of: (a) 250 miles per hour; (b) 190 miles per hour; (c) 125 miles per hour?
6. The Civil Air Patrol operates the largest organized non-military mobile radio system in the United States. The network is composed of 9,500 stations, of which: (a) 1,000 are mobile; (b) 7,000 are mobile; (c) 4,000 are mobile?
7. In the first two years of the Korean War, United Nations Pacific Airlift flights covered a distance equal to: (a) 2,000 trips around the world; (b) 4,000 trips around the world; (c) 6,000 trips around the world?
8. Celebration of the 50th Anniversary of the Wright Brothers' successful flight at Kitty Hawk, N. C., will conclude a year-long national observance of the impact of aviation on the world's economic and social life. The Wright Brothers' historic flight took place on: (a) December 17, 1903; (b) July 4, 1902; (c) December 20, 1901?
9. One of the modern airline types now in service on U. S. airways consumes only 8.9 pounds of fuel per mile. Estimated fuel consumption for a jet transport of about the same size, despite its higher speed, is: (a) about 12.4 pounds per mile; (b) about 15.1 pounds of fuel per mile; (c) about 20.4 pounds of fuel per mile?
10. For every sweptwing Air Force jet shot down by Communist planes in Korea since July American pilots have destroyed: (a) 8 MiG-15's; (b) 10 MiG-15's; (c) 15 MiG-15's?



# Businesses Own More Transports Than U.S. Airlines

One of the most revolutionary transportation trends in recent years has gone virtually unnoticed by the American public.

Corporations—which in the past have relied largely on public transportation for executive travel—are turning to the use of company-owned aircraft in increasing numbers.

## Multi-Engine Fleet

Today, U. S. corporations own an estimated 9,500 planes—of which some 1,700 are multi-engined. This constitutes a multi-engined corporation fleet larger than that operated by all U. S. scheduled airlines combined.

This business fleet flew a total of 2,986,000 hours last year, some 730,000 more hours than were flown by the domestic airlines during the same period, according to the Corporation Aircraft Owners Association.

The CAOAA itself reflects the rapid growth of corporation aircraft in the country. The association's size has doubled every year for the past three years and now stands at approximately 200 member corporations.

## Total of 18,000

These companies are not the only businesses which operate aircraft, however. About 18,000 civil aircraft in the U. S. today are operated by business and professional users, says the Civil Aeronautics Administration. With operating costs chargeable as business expenses, most of these companies are able to write off the initial cost of their planes in four to five years.

This tremendous fleet of business aircraft is considered a reservoir of emergency transportation potential in event of war. The company-owned planes not only would relieve the burden on public transportation facilities in time of war—but could in emergencies serve on civil defense and mobilization missions.

## Manufacturer Cuts Costs By Shredding Blueprints

Old blueprints are saving tax dollars at a major U.S. aircraft plant. Over 179 tons of discarded blueprints have been shredded into "hay" for packing shipments of close-tolerance metal parts. Ammonia in the blueprints neutralizes acid in the paper, making it ideal for packing parts subject to corrosion. An equivalent amount of specially-treated acid-free paper would cost about \$18,000.

## Heavy Press Symposium

More than 1,500 aircraft industry engineers and executives are expected to converge on New York on December 2 for a major symposium on heavy presses—one of the latest developments in improving structural strength and reducing the weight of modern aircraft.

# PLANE POWER JUMPS 125 TIMES

## WORLD WAR I



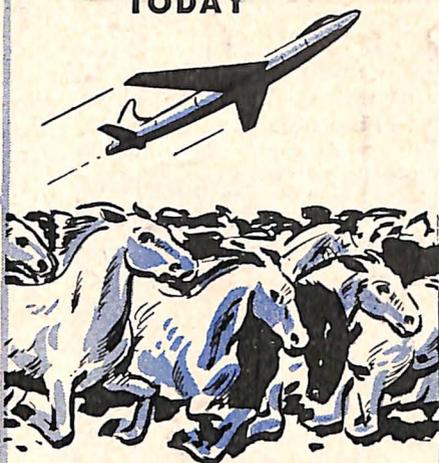
400 horsepower

## WORLD WAR II



4,000 horsepower

## TODAY



50,000 horsepower

With some of America's latest fighter aircraft, military pilots have available 12½ times as much horsepower as at the end of World War II—and 125 times as much horsepower as during World War I. During World War I, with the Liberty engine, a fighter pilot had 400 h.p. at his command. By the end of World War II he could have 4,000 h.p., and with some of the latest designs he now has 50,000 h.p. available.

'PLANES'

Source: Typical Engine Manufacturer

## You're Twice as Safe in an Airliner As Riding in Your Family Automobile

It's at least twice as safe to fly on a scheduled airline today as it is to travel an equal distance in a family automobile. And latest safety statistics indicate that current airline safety records exceed those of the nation's railroads in 1951.

These tremendous advances in aviation safety have made airline travel on U. S.-built transports one of the safest forms of public transportation.

Constant improvement in aircraft dependability has been attributed to improved flight qualities and handling characteristics of modern planes, new devices for poor-weather flying, new types of fire protection equipment, and emphasis on safety engineering by aircraft manufacturers.

### New Safety Mark

During the 12-month period from October 1951 through September 1952, the U. S. domestic scheduled airlines registered the lowest fatality rate in airline history. For the one-year period, fatalities were 0.38 per 100 million passenger miles flown. This compares with 2.4 deaths per 100 million passenger miles in automobiles and 0.43 per 100 million passenger miles in trains during 1951 (latest year for which figures are available for these two forms of transportation).

While amassing this unprece-

dent safety record, the domestic scheduled lines in 1951 carried 22,101,792 passengers—equal to the combined population of 22 states: Maine, New Hampshire, Vermont, Rhode Island, Connecticut, North Dakota, South Dakota, Nebraska, Kansas, Delaware, West Virginia, Arkansas, Oklahoma, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada and Oregon.

### Constant Improvement

The recent record-setting safety mark follows a trend toward increased safety which has continued for the past 20 years. For the five years 1932-1936, the domestic scheduled airlines had 15 fatalities per 100 million passenger miles. In the next five years, the rate came down to 6.1. For the period 1942-1946, fatalities were cut to 2.4 per 100 million passenger miles. And in the past five years, a still further reduction was accomplished to a rate of 1.7, culminating in the 0.38 figure for the past 12 months.

This same trend has prevailed in military aviation, despite the hazards of flying warplanes in combat areas and in marginal weather from poor fields. Major non-combat accidents in the Air Force for the first six months of 1952 showed a 9 per cent decrease from the preceding six months.

## Helicopter Mail Service Furnished To More Than 92 U.S. Communities

(Continued from page 1)

tension wire and pipeline patrol, rescue, photography, geological and geophysical mapping, fishing, and inter-plant transportation.

In the past 10 years, capabilities of this versatile machine have increased enormously. Payload has jumped nearly 15 times, range has increased six times—and cruising speeds have nearly doubled.

### Deliveries Approach 500

Commercial deliveries since 1946 are approaching the 500 mark, with three of the nation's 10 helicopter manufacturers engaged in commercial production at the present time. The bulk of output, of course, continues to go to the armed forces—but limited numbers of helicopters are available for commercial operations.

began an era which may well revolutionize the time element in air mail service.

The helicopter has many advantages that no other vehicle ever enjoyed. It can stand still in the air take off and land vertically, and proceed at any speed up to its maximum. Laws and regulations generally have been made for fixed-wing aircraft which must move forward fast to avoid stalling, and take off from long runways in order to acquire lift. As a result, these runways have been located in many cases outside of congested areas.

### Legal Considerations

Helicopters, however, are naturally fitted to fly low and to sit down and take off from small areas—or heliports—which can be located in the very center of congested areas. In order to permit the helicopter to

### NATION'S THREE HELICOPTER MAIL SERVICES

	Los Angeles Airways, Inc.	Helicopter Air Service, Inc. (Chicago)	New York Airways, Inc.
Date Service Inaugurated	Oct. 1, 1947	Aug. 20, 1949	Oct. 15, 1952
Equipment	3 4-place, 2 12-place Helicopters	7 3-place Helicopters	1 12-place Helicopter
Total Mileage Accumulated*	1,473,464	1,000,626	480 (3 days)
Total Mail Pounds Carried	19,723,364	8,640,117	8,682
Percentage of Schedules Completed	94.96%	96.1%	100%
Number of Communities Served	42	50	**
Number of Take-Offs and Landings	200,000	216,000	48

\*As of October 18, 1952.

\*\*LaGuardia, Idlewild and Newark Airports at start. Service to be expanded throughout New York City metropolitan area.

Most commercial helicopters in use today are two- to four-place models, but one 12-place type with a range of about 500 miles is also in commercial production.

Sometime early in 1953, an experimental 40-passenger military helicopter, adaptable to commercial use, will make its first flight. And within the next four years, large machines designed to carry from 20 to 30 passengers at cruising speeds of over 120 miles per hour should be operational.

### Experienced Operators

When the third member of the Los Angeles-Chicago-New York helicopter team inaugurated service in New York on October 15, it represented the fulfillment of a plan proposed in 1946 by the Post Office Department. The Los Angeles service, which commenced flight schedules on October 1, 1947, has had over five years of experience, and the Chicago service has been in operation for over three years.

With the inauguration of helicopter service in the New York area, the two major terminal cities on transcontinental air routes—plus the major mid-continent air hub—

develop the huge short-haul potential for which it is naturally adapted, and to serve the public in its new field as has the automobile on the surface, the Government (including states and municipalities) should be careful not to make fixed-wing laws and regulations automatically applicable to the helicopter. Any such necessary laws and regulations should be adapted to make possible services such as now are being operated in the New York, Chicago and Los Angeles areas.

And with introduction of passenger service on helicopter routes, airport commuters and mail and cargo service will be released from the maze of traffic shackles that reduce urban transportation to the common denominator of street vehicle speeds.

### Answers to Planes Quiz

- (c).
- (c). About one-half of these planes are believed to be jets.
- (b).
- (c).
- (a).
- (b).
- (c).
- (a).
- (c).
- (c).
- (c).