Plan for New Air Fields
Gives Nation New Words

New terms in the American lexicon—the words “airports,” “flightstops” and “air harbors”—are receiving national attention today through the efforts of the Personal Aircraft Council of the Chamber.

The organization has under way a nationwide campaign to bring into reality thousands of landing facilities bearing those titles within the next four years.

Volume production of low-cost, convenient walking distance.

Flightstops: Runways built along highways, equipped with telephone pay stations, automatic fuel vendors and rest rooms. Planned as state and county highway department projects.

Air Harbors: Improved landing places in quiet waters.

The landing facilities described by these terms will thus differ in purpose from airports, a term identified with large commercial landing areas for airline and air freight traffic.

Official recognition of the new terminology has been secured from the Civil Aeronautics Authority.

Planning groups in several sections of the country have approved it tentatively, and plans are getting under way to build several thousand of the facilities immediately after the war.

More Than Two Million
Work in Plane Industry

Today, 2,100,000 workers are employed in the aircraft industry, an increase of 2,100 per cent over the 85,000 employed in January 1940, latest reports reveal.

Sub-industries employ more than 900,000 of those workers.

In spite of a monthly turnover of approximately six out of every 100 employees, more pounds of airplanes per month are being produced per employee due to better production techniques.

The records indicate that approximately 70 per cent of all employees leaving aircraft plants do so for personal and family reasons. Military inductions, deaths, resignations for reasons of health, and dismissals for cause, together account for 30 per cent.

Chamber Gives Postwar Blueprint to Congress

A blueprint for demobilization and postwar adjustment—developed by any industry has been placed before a national audience by the Aeronautical Chamber of Commerce of America on behalf of the nation's leading aircraft manufacturers.

Appearing before the War Contracts Subcommittee of the Military Affairs Committee of the Senate were E. E. Wilson, vice-chairman, United Aircraft Corporation, and chairman of the ACCA; Harry Woodhead, president, Consolidated Vultee Aircraft Corporation, and J. Carlton Ward, Jr., president, Fairchild Engine and Airplane Corporation, both members of the board of governors of the Chamber, and Joseph T. Geuting, Jr., vice-president, General Aircraft Corporation, and chairman of the ACCA Personal Aircraft Council.

Among the points made were:

1. Today American aviation in operation, engineering design and production is preeminent.
2. To hold this advantage—adequate Air Power—this country must maintain a large air force, train youth to fly, maintain strategic air bases, encourage air travel and personal flying.
3. Strong aircraft manufacturing industry and expand research and development.
4. With estimated production in 1944 at $21,300,000,000 and 2,100,000 employees, the industry presently is a major part of the national economy and the nation's number one industrial demobilization problem.
5. Therefore, national policy calls for an orderly termination of contracts, allowing for demobilization and reemployment of employees and avoiding dismantling of the industry's research and production resources.
6. Government contracts should be terminated promptly, with full cooperation among Army, Navy, other government agencies and manufacturers, with full and accurate information being given to employees at the earliest possible time.
7. Cutbacks should be synchronized with demands for increased employment by other industries.
8. Factories should be sold or leased to present operators, or maintained as standby plants or warehouses.
9. Military and naval airports should be opened to commercial and personal use.
10. Surplus aircraft should be disposed of under the control of one central government agency with unusable aircraft and their components scrapped and usable aircraft overhauled by competent manufacturers.
11. Light liaison and observa-
Aircraft Profits Prove Lowest of War Industry

Credited with the greatest industrial expansion and production achievement in American history, aircraft company profits during the war period have been the lowest of any war industry. An erroneous impression of high earnings in aircraft industry had previously been created by certain analyses and statements showing profits in relation to invested capital. A much more equitable way is to show profits in relation to sales or volume of business done. Risks are commensurate with bargains. The higher the bargain, the greater the risk, particularly if capital doesn't increase proportionately.

EFFECTS OF EXPANSION

The aircraft industry has been expanded to fantastic levels in relation to capital. For one of the largest and strongest airframe manufacturers, a loss of 4 per cent on its 1945 business was one of the lowest of any business in the industry. In 1943 the percentage of net income to sales for 24 major aircraft and parts manufacturers was 1.8 per cent, according to a survey by the National City Bank of New York. Other industries, such as non-ferrous metals, earned 9 per cent; petroleum products, 6.8 per cent; automobiles, 3.2 per cent; iron and steel, 2.8 per cent.

The profits of the aircraft manufacturers during the war period are to a large extent bookkeeping figures. The ultimate profits, if any, can be determined only when all final settlements have been made. A very substantial part of the profits is still in the business, largely in the form of inventories and other properties.

Half-Billion Horsepower Mark Is Neared by Engine Builders in 1944

To power the air attack against the Axis, the United States is producing this year an estimated 485,000,000 horsepower in airplane engines—more than four times the power generated by all the steam locomotives in service in the United States.

In March of this year, horsepower output of engines coming off assembly lines totaled 39,200,000, compared with only 6,000,000 in all of 1941.

The need for increased performance in both fighters and bombers is reflected in the fact that in March, 1944, the average horsepower per engine was 1300, almost 50 per cent above the average achieved in January, 1941.

An in-line, liquid-cooled engine developing 3,000 horsepower—more powerful by 300 horsepower than that developed by the average steam locomotive—was recently announced by one manufacturer. This raised the maximum power of aircraft engines far above that believed possible before we entered the war. Announcements of engines of similar horsepower are expected from other manufacturers before the year is ended.

Last year 226,561 airplane engines, valued at $1,413,300,000, were produced. They developed 33,316,000 horsepower. Although a peak up to that time, the 1943 production represents only 15 per cent of the estimated 1944 output.

A variable-pitch propeller for light planes is being developed by a leading manufacturer. It will provide the average light plane engine with the same flexibility that gear-shifts and fluid drives give to the automobile engine.
**Planes Quiz**

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

1. If the war should end in December 1944, how many airplanes will have been produced by America's 16 leading manufacturers since 1940? (a) 50,000; (b) 260,000; (c) 103,500.

2. Name five instruments used in normal flight.
   - (a) a radio map;
   - (b) an oxygen supply;
   - (c) a parachute.

3. It will be difficult to convert bombers to commercial use because (a) they weigh too much; (b) they are loaded with armament; (c) they are not designed to carry bulk loads.

4. In making a jump from an altitude of eight miles the first need of an aviator is (a) a road map; (b) an oxygen supply; (c) a parachute.

5. Productivity per worker in airframe factories today is how many times greater or less than it was in January, 1941? (a) twice as great; (b) half as great; (c) four times as great.

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**Plane Builders Achieve Cuts in Costs, Manpower**

Originally a four-engined bomber required 200,000 man-hours for construction and a typical fighter 35,000 hours. Today bombers emerge from the final assembly line after 10,000 man-hours and the fighter comes off after 4,500 man-hours.

The decline in costs and hours expended is the result of streamlined manufacturing processes, changes in materials and in tooling, adaptation of designs of airframe and components to meet volume production requirements and by exercise of other economies.

**Efficiency is Rising**

This is revealed by a just-completed survey of manufacturers of airframes—the airplane less engines, instruments and other equipment and accessories. The survey shows that in 1940 airframe industry employees each produced an average of 29 pounds of airframe per month. Today, each employee is producing 65 pounds of airframe per month.

This "know how," which will be carried over into the postwar production era, is further revealed by the fact that in 1940 an average of 156 employees worked a month to produce a 3,600 pound plane. Today, 137 workers produce in a month a plane weighing 10,000 pounds, or three times as much.

Such savings of money and manpower have not been confined to airframe manufacture. Engine builders show a similar increase in production with constant reduction of effort.

**Instruments Cost Less**

This is further carried into the instrument making field. Whereas before the war, 15 instruments used on airliners cost from $1000 to $2000 each, approximately 50 instruments are being installed on certain types of aircraft at an overall cost of $15,000—an average price of only $300 apiece, a very substantial saving.

The survey reveals that in all phases of production the economies are being accomplished with no sacrifice of quality.

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**More Landing Areas Needed in Postwar**

If 5,000 Airparks were located uniformly over the land surface of the United States, there would be no point in the country which would be more than 15 miles from such a park.

A large number will be needed. Government officials have estimated that 100,000 personal airplanes will be purchased and placed in service within one year after the war is over.
Plane-Producing Skills to Prove Postwar Boon

Better performance of everything from automobiles to washing machines and from refrigerators to alarm clocks after the war will result from volume precision manufacturing which has been pioneered by the aviation industry during the past three years. This new manufacturing technique combines great output with high precision workmanship on a scale never before achieved. It has resulted in more and more airplanes with an accompanying increase rather than sacrifice of quality.

The application of volume precision production to industrial, farm and household tools and appliances will mean that the products can be more compact and lighter, and yet can accomplish as much or more than similar current devices. They can be more mobile, efficient, powerful and they will last longer, and will be even easier on the pocketbook.

SILVER PLATED PARTS

Precision, as the aircraft manufacturing industry practices it, means machining certain parts for the vitals of engines so finely that the surfaces have to be "held" by silver plating—metal parts in many cases must be produced from ores from the same mines and refined in the same plants to insure uniformity of certain instruments. Jigs used in assembling airframes are set into position with the aid of surveyors' transits so that there will be no variation in finished units.

In the engine field, airplane cylinders today are held to a deviation of plus or minus five hundred-thousandths (0.00005) of an inch over entire length, where automobile cylinders were ordinarily held only to one ten-thousandth (0.0001) of an inch.

PRECISION PLUS!

Army ball bearings for aircraft engines are held to 25 millionths of an inch. Most ball bearings for other uses are held to two thousandths, making the Navy production requirements ten times more precise.

The aircraft industry today is using an "electrigauge" which has graduations of five hundred-thousandths of an inch. It can check errors which if extended would amount to three-quarters of an inch in one mile.

Tolerances of three hundred-thousandths of an inch have become routine in aircraft plants. In general manufacture, tolerances of one ten-thousandth of an inch are considered unusual.

College Interested in Using Training Planes

American colleges, universities and technical schools are anxious to obtain large numbers of both training and combat aircraft after the war for their training and technical courses. This is shown in scores of letters from leading technical institutions revealing their postwar educational plans.

Heads of the institutions were asked if equipment of the air forces would be of value to them providing it was released to them by the government.

OVER 400 SHOW INTEREST

More than 400 answers so far received reported extreme interest in the proposal. Two hundred and ninety asked for suggestions as to courses and for further information in regard to it.

Members of the Aeronautical Chamber of Commerce of America believe that the release of such aircraft and components will

(1) aid in training flight crews
(2) help train ground crews
(3) encourage the already vast interest in ownership and use of personal aircraft, and
(4) stimulate creative thought which will eventually lead to logical improvements to forthcoming types and models of aircraft as graduates assume their positions in the industry.

The replies show that major participation of aircraft in the war has led both to the establishment and expansion of courses in many universities, colleges and technical schools, and that educational executives look forward to even greater expansion in the postwar period.

As an indication of tremendous interest in aviation training, one girls' college located in the middle west now has 800 of its 2,200 students taking aviation courses of one kind or another. Of this group 100 are taking flying courses.

ANSWERS TO QUIZ

1. (b) 2. Airimeter, chronometer, compass, air speed indicator, tachometer. 3. (c) 4. He needs an oxygen supply, lack of oxygen would "stare" him to death before he could reach an altitude at which he could survive. 5. (c) 6. Pass, You would fly longer against the headwind going than with the tailwind returning. 7. 600,000. 8. Wings, fuselage, empennage, nose and undercarriage. 9. (c) 1,700,000 are used by 1,000 heavy bombers on the round trip to Berlin. 10. False, Seaplanes have keels.

All-Metal Plane Built of Many Materials

The so-called "all-metal" plane is far from being structured entirely of metal, paper and, especially, is also important aircraft materials.

In fact, manufacturers of military airframes rank among the leading users of plastics. Virtually every major part of a plane except the primary structure contains at least one possible application of a plastic.

Most aircraft companies have plastics research departments which are constantly investigating the use of plastics of resin and plywood types:

(1) To replace strategic materials, and
(2) To save weight.

The manufacturers have not yet overlooked any plastic which has reached the market. Tests have been run at various times on everything from big parts like plastic wing tips and thick walls to such smaller articles as pilots' escape hatches, seats, map cases and the name plates used in the center of control wheels.

2,500 PLASTIC PARTS

One airframe manufacturer is using 2,500 plastic parts on four military aircraft which are manufacturing. Among the parts are lightweight phenolic flooring, antenna masts, de-icer fluid tanks, and bulkhead doors.

Another reports using more than 250 pounds of various types of plastics in a four-engine bomber which comes off the production line.

The consensus among aircraft manufacturers is that plastics will be used more and more as the war progresses and later in the peacetime period because they have proved themselves in the course of millions of hours of service. Even today, when availability is a problem no longer to be considered, the manufacturers are not abandoning plastics which were originally installed as substitutes for metal.

GIVE MORE VISIBILITY

Outstanding use of plastics, according to research engineers, will be in transparent varieties which are constantly providing more and more visibility for pilots and crew members.

"The use of plastics, other than woods, will not be used primary structure because low weight-strength ratio," a manufacturer has declared. "However, on the other hand, we have only begun to use plastics in aircraft manufacture at points where no great stresses are encountered."