

a note to Editors . . .

EMPLOYMENT. American aircraft producers are establishing an industrial record in the hiring of new workers. (See Cols. 6, 7 and 8.)

TEST PILOTS. Movies and the radio have painted these men in glaring colors. What are they really like? What do they do? "Aircraftmen Around the Clock" tells you the true story. (See Cols. 1, 2 and 3.)

BIOGRAPHY. Tom Morgan of Sperry has had a colorful career. It is told in a new illustrated feature—"Aviation's Who's Who." Life stories of other aeronautical leaders will appear in subsequent issues. These sketches make timely features. And they are invaluable for "morgue" purposes. (See Cols. 4 and 5.)

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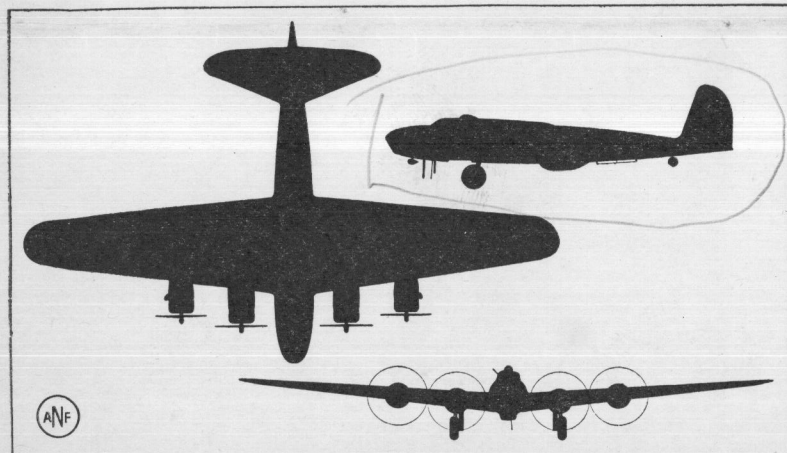
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RELEASE FEB. 15

Know America's Planes

BOEING FLYING FORTRESS



A silhouette of this huge airplane against a bright cloud background could be quickly identified by one important characteristic—the four-engine nacelles, or "power eggs," along the wing. This is the Boeing B-17C, the famed Flying Fortress, called the fastest heavy bomber in the world. The genius of American aeronautical engineers in creating aircraft for this vast nation's defense is typified by the Flying Fortress.

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Noted Scientist Comes to Plane Plant to Direct Study of Metals

New Department Ponders Problem of Stainless Steel for Use in Bracing

This is the sixth of a series of articles illustrating by example the manner in which research and engineering keep the aircraft industry ahead of the prevailing need.

BURBANK, Calif., Feb. 00.—(ANF)—One of the first jobs of the recently created Structures Research Bureau of the Lockheed Aircraft Corp. will be to attack metallurgical problems. Details of Lockheed's plans for extension of research work were given here with the arrival of Dr. V. M. Krivobok, who will head the bureau.

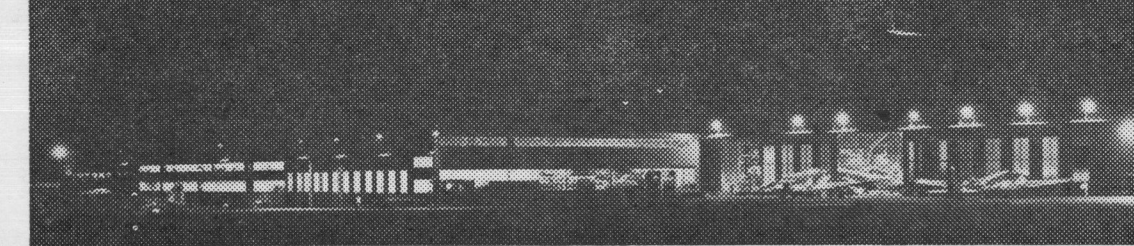
Lockheed called Dr. Krivobok, internationally famous metallurgist, from Carnegie Institute of Technology, where he specialized on the effects of stresses on metals and alloys. This move parallels advanced research efforts being made throughout the aircraft industry. Before joining Lockheed, Dr. Krivobok was collaborating with company engineers on metallurgical problems. A method was developed for coating aluminum alloy castings with pure aluminum by electrolysis to prevent corrosion.

An important problem now under study is that of devising new structural designs to allow more extended use of stainless steel in the construction of struts now made of aluminum alloy. "The test of any metal's worth," Dr. Krivobok said, "is primarily the weight strength ratio." He added that stainless steel is

3½ times heavier than aluminum alloys but has a strength of 180,000 pounds a square inch to 45,000 pounds for the aluminum alloy. This gives steel four times the strength for only 3½ times more weight. Possibility of use of stainless steel replacing aluminum in construction of certain parts was hinted by Dr. Krivobok, who said this could come by redesigning parts constructions.

AERIAL GOOD WILL
WASHINGTON, Feb. 00.—(ANF)—Twenty South American college students—one from each of the Pan-American republics—are to receive U. S. pilot training this year as a "good will" gesture, according to the Civil Aeronautics Administration. The students will win their wings in U. S.-built aircraft, recognized as the finest in the world.

AIRCRAFTSMEN AROUND THE CLOCK



Test pilots do not try to tear the wings off airplanes. Test pilots do not spend all their time diving ships toward the earth at 500 to 600 miles per hour.

And, most emphatically, test pilots do not rush from work to the nearest night club to get drunk and forget their hazardous occupation.

Fiction and the films sometimes portray these men as roistering daredevils. To learn the truth about them, AVIATION NEWS FEATURES went to the chief test pilot of a leading West Coast aircraft factory.

"Actually the test pilot is far more cautious than the average flyer," he explained. "He has to be. His job is to verify the calculations of the engineering department. A smashed plane and a dead pilot won't verify anything."

Here are some of the things a test pilot does: He does dive airplanes at terrific speeds and when he "pulls out" of the dive he undergoes tremendous physical strain. But he may not be required to make a terminal velocity dive more than two or three times a year. For, with rare exceptions, only new models are subjected to this type of test and one such dive per model is generally considered sufficient.

He does put certain types of military aircraft through the most difficult and hazardous aerobatics, but only after he has "felt out" the ship very cautiously and is convinced things are going to hold together.

He does spend more of his time on the ground than in the air. During a typical day a test pilot probably spends half an hour pre-

U. S. Planes Prove Worth in War Trials

Observers Returning From Abroad Laud Performance

NEW YORK, Feb. 00.—(ANF)—America's latest fighting airplanes can out-perform German and British combat craft, in the opinion of observers who have just returned from England.

Cold statistics back that opinion and add weight to the recent evaluation of Yankee bombers and fighters by Lord Beaverbrook, British minister of aircraft production, who said: "They are magnificent aircraft!"

BOMBERS EXCEL

In the heavy bomber class, the later American models are far superior to anything the British or the Germans have displayed in action. Bombers of the Boeing B-17 series and the Consolidated B-24s—both four motored—illustrate this superiority, with their combination of long range, large bomb load and high service ceiling. They will meet Britain's need for bombers which can carry heavy gasoline loads for the long raids into Germany, and still reach the objective with a large bomb load.

In the field of combat planes, American models compare favorably with the best of the British and German pursuits. All speeds given here are those of the American Aviation Writers Association, noted for its conservative performance appraisals.

BEST FIGHTING PLANES

America's leading fighters and their speeds include: Curtiss P-40 (360 mph.); Bell Aircraft P-39 (385 mph.); Lockheed P-38, twin-engine (390 mph.); Vought-Sikorsky XP4U-1 (400 mph. plus). These airplanes are faster than the leading German models, which include: Messerschmitt (360 mph.); Messerschmitt 110, twin-engine (370 mph.); Heinkel 112 (360 mph.); Focke-Wulf 187 (360 mph.).

And the American ships are faster than the British: Hurricane (336 mph.); Spitfire I (365 mph.) and Spitfire II (385 mph.).

EARLIER TYPES INFERIOR

Such statistics, plus the opinion of most military and civilian observers, outweigh earlier statements by a few who had watched the aerial arena over Britain and reported that American aircraft was inferior. In war's early months, France and Britain ordered everything they could get from America that had a propeller. Such ships were not represented as ultra-modern fighting craft, but later United States models incorporated the improvements dictated by combat experience—more speed, more fire power, more armament, revolving turrets, self-sealing gas tanks.

One observer summarized the situation with the statement that: "The only thing wrong with American airplanes is that the British haven't as many of them as they want—but the flow from the United States plants is increasing daily."

TRAINING

LONG BEACH, Calif., Feb. 00.—(ANF)—An aircraft vocational training school for 4,500 young men is planned here. Building plans are drawn and the school board has asked for bids on \$100,000 of equipment. Nearby aircraft plants, including Douglas Aircraft, which is erecting a huge plant here, Vultee Aircraft, North American Aviation, Lockheed and Northrop have agreed to aid in sponsoring training programs.

NEW ASPHALT RUNWAY

Existence of a new, ultra-resilient type of asphalt designed to meet stresses imposed by bombing of airport runways was revealed at a recent meeting of the Western Asphalt Association.

QUOTE and END QUOTE

"Aviation is the most important subject now facing every nation of the world, because it is changing the lives and thoughts of men and our whole concept of government and power."—Dr. George W. Lewis, director of aeronautical research, National Advisory Committee for Aeronautics.

"I am amazed at the remarkable progress being made in Pacific Coast aircraft factories. It is all very pleasing."—Undersecretary of War Robert P. Patterson.

"By the beginning of next year, when American aircraft deliveries to this country will have started on a grand scale, the RAF should be on its way to a definite air mastery over all comers."—London Daily Telegraph.

"In my opinion, a wonderful job is being done by the aeronautical industry."—Adm. J. H. Towers, chief of Navy's Bureau of Aeronautics.

Engine Production Increases Rapidly Wright Now at Million Horsepower Monthly

One million horsepower in new airplane engines each month! That's the satisfactory production record now being hung up by the Wright Aeronautical Corp. of Paterson, N. J., during a period when the company is engaged in a huge expansion program which will enable it to contribute more than its bit to America's emergency defense needs.

The significance of this new record-horsepower production figure, Guy W. Vaughan, president of the Curtiss-Wright Corp. points out, may be judged by comparing it with the company's average production of about 264,720 horsepower monthly two years ago.

Peak production is expected late in the spring of 1941, to be further increased by midsummer, when the recently projected middle western factory at Lockland, Ohio, is completed.

PLANE FACTS: Instruments Get Mass Testing

To meet the needs of the National Defense Program mass testing of aeronautical instruments has been evolved by the Sperry Gyroscope Co. Eighty instruments at a time are placed in a machine which simulates the rolling and pitching of an airplane in rough air.

A feature new to dive bombing aircraft is found in the Curtiss SB2C-1, an all-metal midwing monoplane powered by a 14-cylinder Wright engine which recently underwent preliminary flight tests. Other dive bombers carry their bomb load on a cradle beneath the fuselage. In the SB2C-1, the bomb load is completely housed within the fuselage.

By summer, half a million workers will be turning out aircraft and aeronautical equipment for national defense.

A huge anti-aircraft practice range is to be built by the U.S. Army in the Mojave desert in California.

Aviation's Who's Who

THOMAS A. MORGAN

Sperry spells many things to the American public—gyroscopes and automatic pilots—safety and comfort to mankind on land, at sea and in the air. To business executives throughout the world, to ship designers, to aeronautical engineers and Army and Navy experts, Sperry also spells Tom Morgan.

Thomas A. Morgan began his career as an electrician's apprentice in the U.S. Navy. Today he is president of the vast Sperry Corp., a vital cog in the American rearmament program.

Born in North Carolina, Mr. Morgan got his electrical training in America. He joined the U. S. S. Delaware in 1910. There he met famed Elmer A.

Sperry and helped the latter install that revolutionary piece of equipment—the gyrocompass. And it wasn't long after that Mr.

Morgan left the Navy to join the Sperry organization.

Aircraft Dollars Spent in Every State of Union

Entire Nation Contributes Parts, Materials to Boeing Ships

SEATTLE, Feb. 00.—(ANF)—Seattle dollars, on the wings of the national defense effort, are flying to Michigan, to Southern California, to nearly every state in the union.

Boeing Aircraft Co.'s sub-contracting and supply operations illustrate how national defense contracts spread purchasing power over the nation. Boeing has a backlog of approximately \$195,000,000 in orders. This, like the backlog of other manufacturers, is impressive. But many of those millions will go from Seattle to other states for sub-assemblies, engines, propellers, instruments and other parts and supplies which go into the manufacture of the famed "Flying Fortress" bombers.

INDUSTRY MOBILIZING

Some of the flying dollars will go to Detroit, where the airplane division of Briggs Manufacturing Co. has a large Boeing contract for wing flaps, cowlings and wing tips. Other dollars will go to Hawthorne, Calif., where Northrop Aircraft is building engine nacelles and ring cowls for Boeing.

The surge of new production everywhere is designed to mobilize the entire country to the defense needs. Excess capacity of manufacturing plants—large and small—is being speedily converted into plants and instruments for America's air fleet. Small machine shops are working overtime to fill orders; seasonal industries are planning to fill in their idle months on defense orders; closed factories are gearing their gears and tuning up their plants to participate in the new demands for parts, accessories, and basic materials.

HEAVY SUB-CONTRACTS

To hasten production, the aircraft units have entered into extensive sub-contracts. Automobile plants and other factories are turning out, completely constructed, such important airplane parts as wing sections and tail groups.

Beaverbrook Cables Thanks to Aircraft Firm

LOS ANGELES, Feb. 00.—(ANF)—A transatlantic cablegram testifying to the efficiency of American aircraft production methods was received the other day by J. H. Kindelberger, president of North American Aviation, Inc. Said the cablegram:

"Please accept my warm congratulations and thanks on the completion of your program well ahead of schedule. I am happy to know that you have surmounted many difficulties which stood in the way of this triumph. My relations with you have been so pleasant and agreeable that I send this message from a satisfied customer."

The cablegram was signed by Lord Beaverbrook, British minister of aircraft production. What pleased and satisfied him was the manner in which the company completed 1940 production of training airplanes for Great Britain and Canada ahead of schedule.

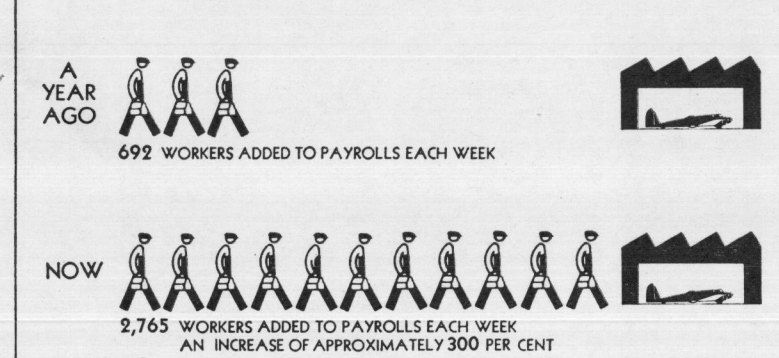
MARTIN BOMBER

It was an American-made plane—a Martin 167F reconnaissance bomber—which soared over the Italian naval base at Taranto while its crew took the now famous pictures of damage done to Italian fleet by British air attacks.

Pacific Coast Aircraft Units' Weekly Hiring Rate up 300% over Year Ago

RELEASE FEB. 15

AMERICAN AIRCRAFT'S MARCH OF DEFENSE EMPLOYMENT



THE WEEKLY INCREASE IN EMPLOYMENT OF EIGHT WESTERN MANUFACTURERS, CONSOLIDATED, BOEING, DOUGLAS, LOCKHEED, NORTH AMERICAN, NORTHROP, RYAN, VULTEE, WHOSE PRESENT TOTAL EMPLOYMENT EXCEEDS 83,000 WORKERS

(EDITORS: IF YOU ARE NOT RECEIVING AVIATION NEWS FEATURES' MATS OR GLOSSY PRINTS, PLEASE WRITE TO AVIATION NEWS COMMITTEE, 7046 HOLLYWOOD BLVD., LOS ANGELES, FOR THIS SERVICE.)

AEROQUIZ Who Pioneered Big Bombers?

Q—Did the Nazis pioneer the use of four-engine bombers, such as the Focke-Wulf "Courier," reported in action over the Atlantic?

A—No. The four-engine bomber is an American development, particularly fitted to American defense needs. The U. S. Army Air Corps has been using four-engine Flying Fortresses for many years. Another four-engine type is the new Consolidated B-24. A third is the Douglas B-19, world's largest airplane.

Q—What is extrusion?

A—The process of forming a metal airplane part by forcing it through a die opening of the proper shape.

Q—What is a "Lulbergy Circle"?

A—A maneuver credited to the World War I ace, Raoul Lulbergy, in which a group of airplanes, if attacked while flying in echelon, shift into a circular formation, each ship thus protecting the tail of the one ahead.

Movie Camera Used in Warplane Tests Instruments on 'Lancer' Are Photographed

The movie camera is doing its bit in the drive to arm America in the air. This fact was revealed recently in the trial flights of the "Lancer"—the U. S. Army Air Corps' new P-43 pursuit interceptor being produced by Republic Aviation Corp. at Farmingdale, Long Island.

All official instrument readings during the testing of the new plane were recorded photographically on moving picture film while the plane was in the air. A clock, which was photographed along with the group of delicate instruments aboard the ship, provided the time element in the film which is of utmost value to the engineering and technical staffs in determining just how the ship was performing at any given minute during the test flights.

This means of eliminating pilot error, possible misreading of instruments or inexact reporting of results was perfected, according to Republic officials, by the company's chief test pilot, George W. Burrell.

MORE AIRPORTS

The number of airports in the United States and Alaska increased by 205 during 1940.

AIRCRAFT MAKERS ADD MORE PLANTS TO SPEED OUTPUT

Expansion of factory space and facilities to meet vastly increased defense production schedules is continuing throughout the aeronautical industry, the Aviation News Committee reported today.

Some recent expansion developments: Ryan Aeronautical Co., San Diego, announced a 100,000 square foot expansion to bring the total factory space to 240,000 square feet. Cost, \$350,000. New area will be used for production of Ryan S-T type training planes for U. S. Army and Navy.

Brewster Aeronautical Corp., Long Island City, purchased 367-acre factory site near Harbor, Pa., will erect \$5,000,000 factory for production of "Buffalo" dive bombers for British.

Vega Airplane Co., Burbank, has completed job of moving from old quarters to new \$2,500,000 plant adjacent to Union Air Terminal. On immediate schedule are production of Vega's "Ventura" 37 bomber for RAF and 35 primary-secondary trainer Menasco-powered. Plant adds 1,090,410 square feet.

Private Pilots Start New Flying Clubs

Private flying clubs, spreading rapidly, are evidence that the average American has found a new and exhilarating recreation.

The Aviation News Committee of the Aeronautical Chamber of Commerce estimates that there are now between 3000 and 4000 of these clubs scattered over the country. Membership is increasing daily under the stimulus of the government's civilian air training program.

Private plane construction is an important unit in airplane manufacturing, and indirectly an aid to national defense. One company has orders for 900 planes, valued in excess of \$1,000,000.

AHEAD OF SCHEDULE

VULTEE FIELD, Calif., Feb. 00.—(ANF)—Indicative of rapid production strides being made in the airplane industry, Vultee Aircraft, Inc., has completed its first defense contract with the Government 40 days ahead of schedule. This was attained when Vultee delivered the 300th BT-13 trainer to Army officials.

'Eternal Vigilance Is Price of Safety'

That's Rule Followed by Inspectors in U.S. Aircraft Plants

"Eternal Vigilance Is the Price of Safety." That motto—which hangs over the desk of the chief inspector in more than one American aircraft factory—guides one of the most vital phases of production of airplanes for national defense—inspection.

Standing guard over each operation in every department in the nation's aircraft plants during every working hour are thousands of inspectors, whose job it is to eliminate all possibility of defective raw material or faulty workmanship.

The work of inspection starts the moment raw materials are delivered to the factory stockroom and continues until the completed ship has been serviced and delivered to the customer, whether he is a private pilot, a commercial airline, the R.A.F. or the U.S. Army or Navy.

TWO DIVISIONS

Inspection, according to one chief inspector, falls logically into two divisions: first, the testing and checking of all raw materials and of the process known as fabrication until the first frame is hung in the fuselage jig; second, the su-

Inspection, an important factor in the superiority of American airplanes, is the subject of this article, the first of a series of two on the subject.

pervision of workmanship from subassembly through the final "twice over" and servicing.

As there are more than 100,000 different phases of inspection involved, this and a subsequent article can only hope to touch the highlights.

RIGID STANDARDS

All materials are purchased and accepted only if they are in complete compliance with specific Air Corps, Navy, Federal and individual aircraft factory standards. These rigid inspections fall into a number of categories—visual, magnetic, dimensional, metallurgical, chemical, etc. There are numerous other tests for tensile strength, wearing qualities, corrosion resistance and ability to withstand shock.

Small parts, such as rivets, nuts, bolts, etc., receive a "lot" inspection; i.e., a specified number of the pieces are picked at random from each shipment and tested for strength, finish, etc. If they meet the tests, the entire shipment is accepted; otherwise, it is rejected.

Particular care is taken to see that such essentials as steel and

Fast Pace Is Set Adding Employes to Speed Output

Coast Plants Adding 2765 Each Week—692 Year Ago

RELEASE FEB. 15

LOS ANGELES, Feb. 15.—(ANF)—A 300 per cent increase in the weekly hiring rate of eight major Pacific Coast aircraft manufacturers today was reported by the Aviation News Committee of the Aeronautical Chamber of Commerce.

With similar increases in the Eastern plants, to be reported March 1, an unparalleled march of men for national defense is found in America's aircraft industry.

WEEKLY HIRING RATE

Current weekly hiring rate in the major Pacific Coast plants is 2,765. A year ago the combined rate in the same plants was 692. Plants reporting are Boeing at Seattle, Consolidated and Ryan at San Diego, and Douglas, Lockheed, North American, Northrop and Vultee, all in the Los Angeles area. These plants now employ in excess of 83,000 men.

Other hundreds of men are being added to the payrolls of sub-contractors, parts and accessory makers and other suppliers of the prime aircraft contractors. The effect on payrolls and purchasing power is nationwide.

EXPANSION NEEDS

The western manufacturers' hiring of new personnel is geared to an unprecedented plant expansion program, as a part of the aircraft

FAMILIES

SEATTLE, Wash., Feb. 00.—(ANF)—As a direct result of the increased employment at the Boeing Aircraft Co. plant in Seattle, the person to every 12 families in this city is now on this aircraft company's payroll. Seattle has a 426,000 population, including adjoining residential districts, or about 127,000 families. The ratio of one person to every 12 families is based on Boeing's present 11,000 employment, which is expected to be increased to 18,000 by summer.

industry's defense effort. Having approximately doubled plant capacity during 1940, these builders of military planes expect to double even this enlargement of working floor space during 1941.

As plants expand further, hiring will take greater strides. One western plant expects to be adding 1,000 men a week to its force, within a short time.

PERSONNEL PROBLEMS

Creating this army of craftsmen to build the planes needed by America and Britain has developed an acute problem of personnel training. The Aviation News Committee's survey showed the skilled labor available long since has been absorbed.

The experience of one large unit is typical. About 65 per cent of the men being hired are unskilled. They are not considered skilled in the industries in which they last worked. About 35 per cent might be classed as semi-skilled.

So the aircraft industry must train its own craftsmen—and is doing exactly that. Part of this effort is in the form of part-time vocational class work in which the manufacturers cooperate with public schools and a limited number of carefully selected private schools.

All Materials & Processes Given Thousands of Rigid Tests

aluminum forgings, castings, rods, bars, extrusions and sheet metal are free from microscopic cracks and fissures and have proper physical properties.

An elaborate test, known as the Magnaflux, reveals any defects. The part is magnetized, then immersed in an oil bath in which finely-divided magnetic powder adheres to the metal and clearly outlines the flaw. An X-ray machine is used for spotting defects away from the surface on castings and forgings.

CAN'T HAVE WAVES

Sheet metal stock is inspected for flatness, gauge, physical properties and general appearance. This material, used for the skin or outer covering of the plane, must be free from "waves" or "buckling." Tests have also been developed for accessories made from fabric, rubber, glass, wood, plastics, brass, bronze, etc. Then there are tests for engines, propellers, radio sets, rubber life boats, parachutes, flares and every other bit of equipment which goes into the completed ship.

Next: Following the inspectors through the factory.