

## a note to Editors . . .

WINGED DOLLARS—All of America shares in the business stimulation caused by aircraft industry material purchases. Twenty representative aircraft, engine and propeller companies now are spending more than \$37,000,000 monthly for materials, parts and supplies. (See Col. 8.)

WORKING SPACE—To meet new production demands of national defense, American aircraft factories are speeding plant expansion. Here is a report on construction progress at eastern plants. (See Col. 3.)

LIGHT PLANES—Men who build and fly light planes are making an important contribution to national defense, through pilot training. (See Col. 5.)

Vol. 2, No. 4

April 1, 1941

### AVIATION NEWS COMMITTEE

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## Aviation's Who's Who

ROBERT E. GROSS

The narration of Robert E. Gross' activities in the aeronautical field over the past decade is the story of growth to full stature within the industry. In the depression days of 1932, he and a group of associates bought a controlling interest in the company, then almost defunct but with a happy faculty for producing record-holding airplanes. Since then Mr. Gross' personality and career have been closely intertwined with the growth of Lockheed Aircraft which he now heads.

Major test for Bob Gross and his organization came in June, 1938, when the British Air Ministry gave Lockheed a \$25,000,000 order for 250 airplanes, the largest single order placed in this country up to that time.

For a growing organization attempting to achieve volume output, the going at first was hard. For the first time, Lockheed turned to the record of Bob Gross in that he was able to turn out the

remaining 200 British airplanes within the following seven months—weeks ahead of contract schedule.

An earlier career in international banking in New York and London was interrupted in 1923 when Mr. Gross bought for his own account an interest in Stearman Aircraft, disposing of this shortly afterward to United Aircraft & Transport. Convinced of aviation's destiny, it was not long before he had organized the *Viking Flying Boat Co.* of New Haven, Conn., building a four-place seaplane. Public demand for seaplanes was meager in 1929, with the country on the brink of a major depression, and the venture was abandoned. Bob Gross did not lose faith in aviation's future and in the early thirties he was organizing the *Varney Speed Lines* with Walter Varney. It was while he was with Varney that he became interested in the fast Lockheed Orion transports used on the San Francisco-Los Angeles airline. Purchase of the controlling interest in Lockheed followed shortly.

Aviation history has been made since Mr. Gross a little more than a year ago delivered the last airplane on the British order— and ahead of time. Now a major factor in meeting British and national defense needs, his organization's original \$25,000,000 commitment.

### AIRCRAFTSMEN AROUND THE CLOCK

## Specialized Jobs Make an Airplane

Modern aircraft manufacture has created hundreds of its own specialized jobs. Plumbers, plasterers and carpenters . . . sheet metal workers, X-ray technicians and scores of other crafts are now working in aircraft plants to keep the wheels turning day and night.

Absorbing craftsmen from other lines, the task of the aircraft industry has been to fit them for specialized jobs sometimes having little in common with their former work.

For instance: carpentry is an important part of aircraft work. Production on the airplane starts after the carpenters have completed the "mock-up" or full-size wood model. Expert carpenters and woodworkers trained for their special job have constructed the "mock-up" from wood and shaped its intricate contours to conform to blue-print specifications.

**PLASTER PATTERNS MADE**  
A plasterer's job in an aircraft plant also requires specialized skill. His part of a factory with its array of plaster models resembles a sculptor's studio. Section by section, plaster patterns are formed from the wooden airplane model. indentations made in sand by these plaster patterns provide a mold into which is poured fluid metal to form hundreds of dies conforming to small sections of an airplane's outer skin. From these dies the metal pieces to form sections of the airplane are stamped out by hydraulic presses and drop hammers.

**X-RAY FOR PARTS**  
The plumber in an aircraft plant has had to adapt his work to specialized lines to speed an airplane to completion. His task is to install tubing to operate hydraulic equipment and scores of other gadgets inside an airplane. A routine part of shop work, X-ray technicians photograph and examine for flaws thousands of metal parts daily, taking nothing for granted; experts install batteries of instruments and hydraulic equipment. All down the line, the job of making an airplane is highly specialized. Several hundred different types of craftsmen must do their part from the carpenter to the flight inspector who puts his signature on the line and says that an airplane meets all plans and specifications.

And each of these specialized jobs is an important cog in the machinery of modern aircraft production.

**MORE MATERIAL**  
Huge supplies of aluminum alloys must be kept available to keep America's aircraft production moving smoothly. Output of magnesium, an essential in a number of alloys, is being stepped up by the Aluminum Corp. of America. As a result of war needs, output of magnesium products has been increased 20 times normal demands of recent years.

**QUOTE and END QUOTE**

"I think our pursuit planes with their new pilot and gas tank armor and their larger guns are equal to any being produced anywhere in the world. I am certain that our twin-engine attack planes are superior and am positive that our long-range heavy duty bombers such as the Flying Fortresses are second to none."—Capt. E. V. Rickenbacker, President Eastern Air Lines.

"American aeroplanes are being flown across the Atlantic regularly for delivery to the RAF. The crossing is usually made in about 12 hours straight and one pilot claims to have made the trip in 8½ hours."—The Aeroplane, English aeronautical magazine.

"About 30,000 man hours of labor are necessary to make an airplane of a medium-size bomber, exclusive of engines, propellers, instruments and other equipment. It requires about 15,000 shop orders. . . . Before it has flown away, that bomber has 200,000 inspections."—Col. John H. Joubert, president Aeronautical Chamber of Commerce of America.

## AIRPLANES CAN TAKE IT! British Leaders Praise U. S. Types

British Air Minister Sir Archibald Sinclair is the most recent English leader to heap superlative praise on the performance of American-built warplanes in the European conflict.

Following Air Marshal Sir Philip Joubert, Sir Walter Cline, the English labor leader, and Mr. Arthur Purvis, former head of the British Purchasing Mission, Sir Archibald told the House of Commons:

1—American fighter planes such as the Brewster "Buffalo," the Curtiss "Tomahawk" and the "Mohawk" are "comparable to our own single-engine types."

2—Glenn Martin bombers are operating in the Mediterranean.

3—Douglas "Bostons" are fight-

## Aircraft Units Rush Work on New Factories Eastern Expansion Plan Well Under Way to Completion

NEW YORK, April 00.—(ANF)—Awaiting further details of an augmented aircraft procurement program as a result of the passage of the Lend-Lease Act to aid Britain, the nation's aircraft industry is alertly preparing to meet the greater demands likely to be made. Here in the East already well on its way to completion is a huge expansion program, part of the \$232,000,000 total which the industry and the Federal government have set under way for 1941. A similar program is well advanced on the West Coast.

1—At Buffalo, N. Y., Bell Aircraft expects to have its new \$1,200,000 factory ready this month, adding 240,000 square feet.

2—Curtiss-Wright is adding four huge plants for airplane and engine production. Nearing completion at Cincinnati is a \$37,000,000 aircraft engine plant with 2,100,000 square feet of factory space to employ 15,000. Under construction at St. Louis, Mo., is an \$11,000,000 aircraft unit adding 1,200,000 square feet and set for completion by August.

**CURTISS-WRIGHT EXPANSION**  
Adding a new plant to existing facilities, Curtiss-Wright at Buffalo, N. Y., is completing a new aircraft plant with a floor space of 1,196,000 square feet. This plant, to be completed in May, eventually will employ 12,000. Under construction since January is a 1,560,000 square foot aircraft plant at Columbus, O., scheduled for completion in June. Here another 12,000 men will be added to produce Curtiss fighters.

3—The Glenn L. Martin Co. is adding to its Baltimore, Md., plant an entirely new complete unit, which will add to the main plant, will cost \$24,000,000. When expansion is completed this fall, these two plants with a floor area of 3,500,000 square feet will employ 42,000. Under construction at Omaha, Neb., is a third plant which will add 1,250,000 square feet of factory space this fall.

**PRATT & WHITNEY UNIT**  
4—Pratt & Whitney division of East Hartford, Conn., the last of four new units adding 400,000 square feet of factory space. The new plant will be devoted to engine assembly.

5—Stearman Aircraft division of Boeing Aircraft at Wichita, Kan., is completing work on a new plant to add 440,000 square feet to existing facilities. This unit will be used for manufacturing sub-assemblies for Boeing B-17E Flying Fortresses.

## New American Ship Will Surpass Stuka Curtiss to Manufacture Navy Dive Bombers

NEW YORK, April 00.—(ANF)—A new American dive bomber to meet the challenge of the sinister Stuka—a fighting plane which, its manufacturers declare, can out-fly, out-shoot and out-climb anything in the air over warring Europe today, is scheduled to go into quantity production at an early date, the Curtiss-Wright Corp. has just announced.

Developed in response to the United States Navy's demand for "the best ship in the world," the new fighter, designated as the Curtiss XEBC-1, is said to be 100 miles an hour faster than other similar craft. It will carry twice as many heavy bombs as any existing dive bomber, fly twice as far as present models to extend operations 600 miles farther than previously, and carry double existing armament, thus achieving greater fire-power than any other single-engine navy plane.

The plane carries its bomb load inside instead of outside the fuselage, thus eliminating drag. It is powered with a 1,700-horsepower engine, and wings fold upward to facilitate storage on shipboard.

A two-place, low mid-wing, all-metal monoplane, the new ship is reported to have a faster take-off than a pursuit plane.

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## PLANE FACTS: Device Will Keep Airplane Afloat

A means of keeping land airplanes afloat in the event of forced water landing has been devised and proved effective. In each wing of an airplane equipped with this device is a pop-out door inside of which are two deflated rubberized bags. Compressed carbon dioxide gas controlled by automatic valves inflates the bags and keeps the airplane afloat.

Now producing 1,000 military airplanes monthly, aircraft manufacturers in this country will increase this output to 1,500 by summer. Present plans call for a steady increase in output, which should reach 2,500 monthly by mid-1942, or a rate of 30,000 yearly.

High-speed military aircraft now being turned out here in volume are equipped with quick-firing cannon, the most formidable of which is a 37-mm gun. A direct hit with its highly explosive shell would knock an opposing airplane out of the air within a one-mile range.

## Standardization of Warplanes Is Aim Interchangeable Parts to Speed Output

WASHINGTON, April 00.—(ANF)—A drive is on to standardize warplanes to be built in this country for the air services of the United States and Britain.

Participating in the drive, which has as its goal increased production of military aircraft, are the Aeronautical Board of the Army and Navy, the Civil Aeronautics Board, the Office of Production Management, the National Aircraft Standards Committee, the Aeronautical Chamber of Commerce, the Society of Automotive Engineers and other agencies.

All parties involved, while seeking faster production, realize that standardization must be attacked as a long-range proposition in order to avoid new bottlenecks, which might tend to retard production.

The standardization process is being started in small items first—for instance, the "hardware," that is, nuts and bolts. A number of airplane manufacturers, working together, have made substantial progress in this phase of the problem.

Engineering authorities readily agree that the problem of standardizing airplane production is most difficult. It extends "down the line" through subcontractor, each of whose business might be drastically disrupted by the sanction of one simple airplane part.

The Aeronautical Chamber of Commerce, through its technical department, is acting as a coordinating agency and a clearing house for the aircraft manufacturing industry on this vital problem.

## Boeing Completes New Ship for Pan American

SEATTLE, April 00.—(ANF)—The first of Pan American Airways' new fleet of transoceanic clippers, largest air transports in the world, has been completed at the Boeing plant here. The newly completed ship will be delivered before the end of this month. Schedules call for one each month thereafter.

The new equipment will make possible more frequent service between the United States and Europe. Beginning with May Pan American will increase its present tri-weekly service to four trips. By midsummer the airline will be equipped to fly the Atlantic daily except Sunday.

## New Space, Personnel Speeding Vultee Output

VULTEE FIELD, Calif., April 00.—(ANF)—Deliveries on pursuit bomber and observation military aircraft by Vultee Aircraft, Inc., will be materially advanced as a result of rapid additions being made to plant and personnel. Allowed a period of 17 months for delivery of its first U. S. Army order for 200 basic training airplanes, Vultee completed its contract well ahead of schedule. Now the California plant is being loaded and equipped to turn out nearly that many aircraft each month.

Now working on a contract for the largest single order placed by the U. S. Army for basic trainers, Vultee will require metal sheets sufficient to pave a four-lane highway 46 miles long. There will be used 568 miles of metal tubing and 110,000,000 rivets.

## Bombers Get New "Eyes" Through 9-Lens Camera

SAN DIEGO, April 00.—(ANF)—One of the newest weapons of aerial warfare, now being installed in a Consolidated Aircraft PBV two-engine patrol bomber in San Diego, is a specially built nine-lens camera which can photograph an area of 900 square miles at an altitude of 20,000 feet.

Designed to scout enemy territory for gun emplacements, troop concentrations or barge collections, this new camera on its first assignment will make an aerial map of San Diego harbor. Later this summer, the airplane will take the camera to Alaska, where it will photograph vital areas now being improved for coastal defense.

## Light Planes Important in Defense Plan Small Aircraft Needed for Student Pilot Instruction

WASHINGTON, April 1.—(ANF)—Importance of the light airplane in the national defense scheme has been recognized by high government officials with the result that today it is believed that this category of aircraft soon will take over an even larger role in the military training program.

The light plane industry turned out more than 6,000 planes in 1940, and is prepared to double its output for training purposes.

At recent meetings in the capital with light plane manufacturers, Army and Navy officials disclosed that flying graduates of the Commerce department's civilian pilot training program who have entered the military air services are, in a majority of cases, outstanding students. The Navy, it was learned, has appealed to civilian pilot training officials for a large number of flight instructors for its training schools.

## INDUSTRY SELF-FINANCED

In view of this growing defense importance of the light plane industry, an industry which has come to its present stature entirely unaided by government assistance, a full-time light airplane representative in the Office of Production Management has been appointed. He is Harry Shaffer, Minneapolis, executive vice president of the Curtiss-Wright Corp.

Recent Washington meetings, arranged by the Aeronautical Chamber of Commerce of America, brought to the attention of the Federal agencies the scope and value of the work the light airplane has been doing in building a vast reservoir of pilots well-equipped to enter military training during any emergency. Present efforts are directed toward obtaining for the light plane and engine manufacturers adequate supplies of needed materials, including essential metals.

## REQUIREMENTS SLIGHT

A study prepared by the Chamber disclosed that the critical material requirements of the entire light airplane industry are slight when considered in the light of the "all out" defense building program. For instance, the required aluminum totals less than one-third of one per cent of all defense aluminum requirements.

Leading light airplane builders are Taylorcraft, Aerocraft, Luscombe, Piper, Porterfield and Stinson. Leading suppliers of light engines are Aircooled, Continental and Lycoming.

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## 1918 — THEN AND NOW — 1941



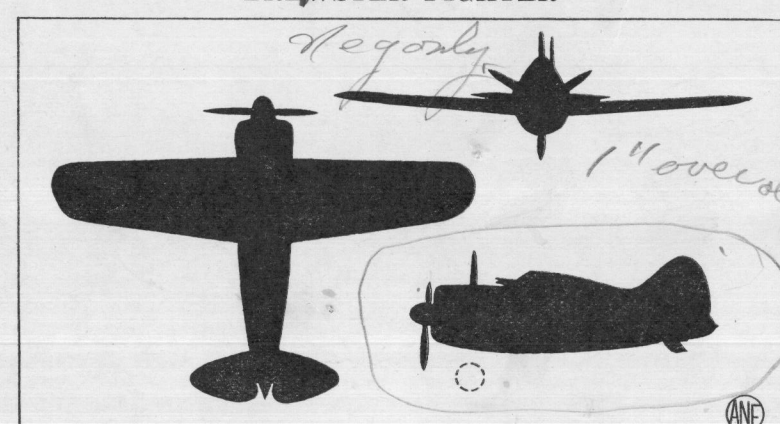
Graphically illustrated here is the progress made by American aircraft builders since 1918 in producing fast combat aircraft. The Curtiss JN or "Jenny" (upper) was powered with a 90-horsepower OX-5 motor. The modern Curtiss P-40, nicknamed the "Tomahawk" (below), is powered with a 1,090-horsepower Allison engine. This low-wing single-seater fighter has a maximum speed exceeding 360 mph, is among the world's fastest combat ships.

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## Aircraft Plants Triple Purchases

RELEASE APRIL 1

## Know America's Planes



Here is shown another of those speedy, formidable combat airplanes which United States manufacturers are building for national defense—the Brewster single-seater naval shipboard fighter, designated the F2A-2 by the Navy. Heavily armed, the F2A-2 carries two machine guns in the engine cowlings with two machine guns or shell-firing guns in the wings. Abroad, the British RAF has installed six machine guns. These fast fighting aircraft are designed primarily to operate from shipboard for reconnaissance and combat purposes. Note the "teardrop" design, rounded nose and sloping lines which suggest speedy air performance.

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## Improved Riveting Methods Aid Faster Airplane Production Swift Automatic Machines Drill Holes, Insert and Punch Rivets, All in One Operation

Riveting processes are an important item in airplane construction because of the large number of man-hours involved. This article, eighth in a series on aircraft research, describes modern methods designed to increase output and add to an airplane's speed.

Winging through space at faster and faster speeds, the military airplane requires constant research and engineering. Improvement in riveting methods, aiding the nation's accelerated aircraft program, has been an outstanding development. Flush riveting means a more speedy airplane; automatic riveting machines increase output.

Riveting technique determines to a large extent the speed of turning out airplanes in volume. More than 350,000 rivets go into the body of a medium attack bomber. Round quarter-inch rivet heads protruding less than one-eighth of an inch above wing fuselage surface would produce enough "drag" to slow down materially an airplane's speed.

**FLUSH RIVETING PROCESS**  
Flush riveting in military aircraft construction is a process using a flat-head rivet and "dimping" the metal used in an airplane's skin so that an entirely smooth outside surface is produced. Many technical problems had to be overcome to replace the round-head rivet, one of which was making sure the metal structure was not weakened by the indentation for the rivet head.

Flush riveting was first tried out nearly two years ago. Since then have come many improvements designed to speed construction, including development of automatic flush riveting machines.

Swift automatic riveting machines in the modern airplane plant bind together aluminum metal sections to form a panel. Requiring only one man who pushes a foot pedal, these automatic machines drill holes, insert and punch the rivet, all in one operation. PANELS PUT TOGETHER

Sections of aluminum metal are riveted together in panels anywhere from 4 to 12 feet long by these machines. The edges are later "buttoned-up" or attached to an airplane's fuselage by portable riveting guns.

Modern automatic riveting contrasts sharply with the older type of fuselage riveting. Here one separate operation requires drilling holes. Attaching small aluminum metal sections to the fuselage, one man within the airplane "bucks up" the rivet while a man on the outside handling a rivet gun "heads over."

Design of future airplanes which will permit the greater use of machine riveted paneling is the trend of aircraft construction today. Using this system, it is probable that up to 85 per cent of the fuselage metal covering can be machine-riveted and then attached in these large panels.

## AIR CORPS FLIGHTS

The United States Army Air Corps chalked up more than 900,000 flying hours to its credit during 1940. In 1921, only 77,000 flying hours were credited to the Army.

## German Fighter Plane Goes To Pacific Coast

NEW YORK, April 00.—(ANF)—A bullet-slashed German Messerschmitt shot down over England has arrived here en route to Los Angeles, where Pacific Coast airplane builders will examine its structure. Taken apart and crated for shipment, the Nazi airplane is believed to be an ME-110, one of Germany's fastest fighting ships.

## AEROQUIZ How Fast Are Our Fighting Aircraft?

Q—How do American-made military airplanes compare with those produced abroad and what are their known speeds?

A—There are several types of interceptor pursuit airplanes produced in this country which are given a level light top speed of approximately 400 mph. These are faster than any aircraft so far used on the European battlefronts, including the British Spitfire and Hurricane types and the German Messerschmitt ME-110.

Q—What is a "tallina lead" maneuver?

A—A flight maneuver in which an airplane in a gliding altitude is made to oscillate or swing and settle (similar to a falling lead) from side to side with no apparent change in direction.

## 20 Units Spend \$37,903,180 in January, 1941

Industry Boosts Nation's Economy by Buying in Every State  
P.M. RELEASE, APRIL 1

LOS ANGELES, April 1.—(ANF)—American aircraft manufacturers are spending three times as much money today as they were a year ago to purchase the materials, supplies and parts needed in the construction of military airplanes for the United States and Great Britain.

A survey released this week by the Aviation News Committee of the Aeronautical Chamber of Commerce of America reports that a group of 20 representative airplane, engine and propeller companies expended \$37,903,180 for purchases during January, 1941, an increase of 180 per cent over the \$13,527,907 spent during January, 1940.

These plants expect to spend more than \$70,000,000 a month by midsummer, almost doubling their January, 1941, purchases—or an increase of more than 400 per cent in the 13 months from January, 1940, to July, 1941.

**MILLIONS FOR SUPPLIES**  
Approximately three-quarters of a billion dollars will be spent during 1941 by the American aircraft industry for parts, materials and supplies essential in the production of warplanes ordered by the United States Army and Navy and the British RAF, according to informal estimates.

Contributing largely to the stimulation of the nation's economy, the aeronautical industry makes

**DOUGLAS PURCHASES**  
SANTA MONICA, Calif., April 00.—(ANF)—During 1941, the Douglas Aircraft Co. expects to spend approximately \$9,000,000 a month for materials and supplies to W. A. Hamilton, chief of materiel. These materials originate in practically every state in the union and about 2,100 vendors are involved in supplying them.

its purchases from all parts of the country. Industrial towns and cities, located hundreds of miles from aircraft plants, have shown increased employment, enlarged payrolls and decreased relief rolls as a direct result of the millions of dollars spent by aircraft manufacturers.

**AIDS MANY INDUSTRIES**  
Benefited by the increase in airplane production have been manufacturers, producers and distributors of rubber, aluminum, machine tools, electrical equipment, paints and lacquers, hydraulic units, sheet metal, steel, instruments, hardware, etc. In all of these industries, production has been increased, plants enlarged and idle men and machinery put back to work.

Transportation companies—railroads, trucking firms and, on occasion, airlines—have also played their part by delivering these purchases to the aircraft plants.

The 20 companies covered in the Aviation News Committee survey include 14 airplane manufacturers, seven on the West Coast—Boeing, Consolidated, Douglas, Lockheed, North American, Northrop and Vultee; and seven in the East—Beech, Bell, Brewster, Fairchild, Glenn Martin, Republic and Vought-Sikorsky division of United Aircraft.

Also included in the report are four engine manufacturers—Allison division of General Motors, Lycoming, Pratt & Whitney and Ranger, and two propeller plants—Hamilton Standard of United Aircraft and Woodward Governor.