



LOCKHEED
Aircraft Corporation

BURBANK, CALIFORNIA

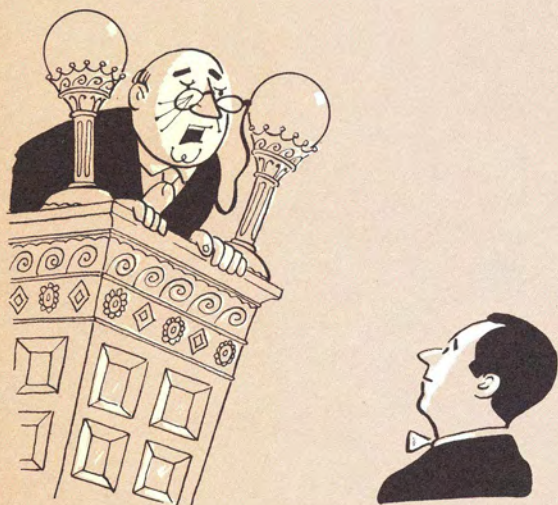
OF MEN AND STARS

Chapter I ★ ★ ★

Gross Hitches His Wagon to a Star

A History of Lockheed Aircraft Corporation

March 1957



"I hope you know what you're doing, Mr. Gross"

To the Men and Women of Lockheed:

For a long time we've wanted to recall for you the history of Lockheed. It's a warm and moving success story in the finest American tradition.

Nearly 500,000 men and women — employees of Lockheed at one time or another — along with their far-visioned leaders have had a hand in writing it. It's an account of triumphs and elation — and occasional setbacks. It's a star-spangled saga of the world's most famous airplanes that have carried the Winged Star insignie.

This year, in which we are noting a quarter century of growth and leadership and setting our sights on greater accomplishments during the next 25 years, seems like an ideal time to take a look at what we've done.

We debated for some time before deciding to present our story in 10 illustrated chapters, issued once a month and distributed free to employees at the gates. This serial method has several advantages over a book or other

forms. It encourages easier and fuller readership. It extends interest throughout the anniversary year. And it simplifies the job of writing, printing, and distributing.

Our history will span Lockheed from its earliest days to the present. Chapter I in these pages tells how Robert Gross and a few associates plucked a company out of bankruptcy and from it formed the Lockheed Aircraft Corporation on June 21, 1932. It describes their unswerving faith in the future of aviation as they struggled to build the business against discouraging financial obstacles.

The next chapters will dip into even earlier history — the barnstorming days of Allan Lockheed, the plane he built and flew in 1913, the early Lockheed companies, and the famous Lockheed planes and equally famous fliers who piloted them in the late 1920s and '30s. Then our history will resume the account of the present company in the mid-'30s and carry it up to its latest supersonic fighters and space-penetrating missiles.

We know you'll enjoy reading these serials, appearing under the title of *Of Men and Stars*. Many of you will want to keep them on your bookshelves at home and invite others to read them. So each issue will have holes punched to make it fit into a standard three-ring loose-leaf binder that you can buy at most stationery stores.

From the history we are sure many of us will find inspiration for the future. In the past 25 years we've not only solved scores of problems that seemed hopeless at the time. We've also had constantly to keep widening our horizons, enlarging our own dreams to keep ahead in a period that someone has called the fastest decades in history.

Perhaps our aim for the future should match that of the famous American philosopher, Henry David Thoreau, who a century ago wrote:

I hear beyond the range of sound,
I see beyond the range of sight,
New earth and skies and seas around.



Varney Speed Lanes flew fast low-wing Lockheed Orions, boasted famous service between San Francisco and Los Angeles. But its supply of Orions was threatened when the Lockheed Aircraft Company went into receivership.

From this factory had come famous planes. But it was idle in 1932.

MID-1932 WAS THE VERY DEPTH of the most crippling depression the U. S. has ever experienced.

Business, prices, and people's spirits were all at a record low. Values had almost disappeared. Money for investment was virtually non-existent. There was no visible recovery from the blow dealt the nation's economic health on that grim Tuesday in October 1929 when the stock market staggered and collapsed.

By any measuring stick 1932 was no time to speculate, even in the most basic of industries. Unemployment was at an all-time peak. Soup kitchens and bread lines and curbside apple vendors multiplied. Bankruptcies and bank failures occurred at a frightening rate. The fledgling aviation industry—booming only three years before—floundered in a tide of red ink.

The depression was stifling ambition and initiative. Yet in the face of this gloomy prospect a group of optimists formed the Lockheed Aircraft Corporation. But even in their boldest dreams they never envisioned the growth of the company they created—an organization that a quarter century later would rank among the nation's 30 largest employers and among the top 50 industrial firms.

Three Men in a Courtroom

It was shortly before 11 a.m. on June 6, 1932, when three young men walked into the somber federal courthouse in Los Angeles and took their seats in the U. S. District Court. Along with a handful of idly curious and other petitioners they rose as Judge Harry A. Hollzer entered and ascended the bench.

The three men were Robert Ellsworth Gross, 35

years old and a realist who could harbor a vision and still keep his feet on the ground, Carl Browne Squier, at 39 one of the world's most successful airplane salesmen, and Lloyd Carlton Stearman, nationally known at 33 as an aircraft designer of more than ordinary ability. Not present in the courtroom were their four associates, Walter T. Varney, Cyril Chappellet, R. C. Walker, and Thomas Fortune Ryan III. Except for Varney, all were under 40—yet all but Chappellet were born before the era of flight began in 1903.

Men With a Purpose

Gross, Squier, and Stearman were in court with a purpose. They and the other four hoped to pluck a bankrupt airplane company from the ashes. All of them were daring young men whose faith in the future of America, even in those bleak days, never faltered. They nurtured hope, optimism, courage, and enterprise during a period when those qualities seemed almost to have disappeared. With odds heavily against them they wagered that they could breathe new life into an endeavor that to all appearances had reached the end of the road.

The Lockheed Aircraft Company, that they hoped to buy, had been organized less than six years before and quickly earned a reputation as a manufacturer of fast and sturdy airplanes. Its founders included men convinced that aviation had no barriers. Among them were Allan Haines Lockheed, self-taught flyer and plane builder who had risked his life many times as a barnstorming pilot when the flimsy contraptions were little more than powered kites, and John K. Northrop, whose skill in aeronautical design was

matched by few men of the time. Outstanding aviators had bought the swift Lockheed monoplanes and with them set, smashed, and re-set speed, endurance, and distance records.

In the summer of 1929, when the financial world was merger-conscious, the organization had become part of the Detroit Aircraft Corporation, a holding company with ambitions to become aviation's answer to General Motors. Lockheed and others of the original management stepped out, and Squier came from the east as general manager of the Lockheed division. For two years the factory in Burbank operated under the twin handicaps of absentee ownership and an acute world-wide depression. Despite Squier's strenuous efforts it followed its parent Detroit firm into the bankruptcy court.

Court Accepts \$40,000 Bid

It was in that court on that June morning in 1932 that Judge Hollzer studied the single bid before him. It offered to purchase the assets of the bankrupt Lockheed company for \$40,000.

That \$40,000 had been painfully accumulated, largely through the efforts of Gross, for investors had gone into hiding. It represented \$20,000 from Varney, \$10,000 from Chappellet, and \$5000 each from Ryan and Walker.

The judge finished reading the document and paused as Gross rose and approached.

"Do you have the money?" Judge Hollzer asked.

"Yes, it's right here," Gross replied. He displayed a certified check for \$10,000, the required 25 per cent deposit.

The judge looked around. "Does anybody else care to bid?"

Gross, Stearman, and Squier waited anxiously. They knew that among the spectators was Allan Lockheed, who had been trying to raise enough money to buy back the company he had helped organize and then sold.

But there was no other bid.

Judge Hollzer again examined the offer, scrutinized the certified check, peered over his glasses, and rapped his gavel.

"This bid appears to be fair and reasonable," he said. "Since no other persons have come forward in open court to bid for these assets, I hereby approve and confirm the sale."

Then, wryly, he added: "I hope you know what you're doing."

Gross turned to the men beside him. "Now we can go to work," he said with a grin. They shook hands and walked out into an economic picture of the gloomiest kind, their hopes pinned on their own determination to succeed. Out of that determination grew the Lockheed Aircraft Corporation, and from that

modest seed it flowered during the next 25 years into an organization known throughout the world for the accomplishments of its people and its planes.

What They Bought

The buyers realized fully that their \$40,000 had bought primarily only three things—the Lockheed name that even in 1932 was respected wherever the talk was of aircraft; design and manufacturing rights to a series of plywood airplanes; and the experience and service of a few men who were substantial contributors to aviation's development. But the new owners, their minds racing ahead to the future, knew these were intangibles.

From a practical standpoint, the \$40,000 gave them the right to negotiate a lease on an idle factory

LOS ANGELES TIMES
JUNE 7 1932

Los A

LOCKHEED SOLD TO AIR LEADERS

Company in Receivership Goes in New Hands

Name of Famed Concern Will Be Retained

Plans Now Under Way for Factory Activities

Paving the way for production here of superspeed ten-passenger transport monoplanes, a group of nationally known aviation leaders yesterday purchased the assets of the Lockheed Aircraft Corporation at Burbank for \$40,000.

Purchase of the company which has produced the world's latest commercial airplanes and on whose record many historical flights have been written was made with the approval of United States District Judge Hollzer, ending a Federal equity receivership of eight months.

The buying group includes Walter T. Varney, pioneer air transport operator, president of Varney Speed Lines; Lloyd Stearman, aircraft designer and former president of Stearman Aircraft Corporation; Carl B. Squier, general manager of Lockheed Aircraft Corporation, under whose direction the company has developed its high-speed monoplanes; and Robert E. Gross, president of Viking Flying Boat Company and Kittyhawk Aircraft Company of New Haven, Ct.

NAME RETAINED

Reorganization and refitting of the company will start immediately but it will retain the name of Lockheed—known around the world as the company which produced, among many record ships, planes for Col. Charles A. Lindbergh, Wiley Post, Art. Goebel, Amelia Earhart, Putnam, Frank Hawks, Jimmie Doolittle and Harold Gatty.

But with the addition of Varney, Stearman and Gross at the Lockheed plant the present standard line of planes will be built.

bank, California. The experience and integrity of the new organization is assurance that Lockheed ships will maintain their premier position as the fastest commercial airplanes in the world. The new organization is in full operation and in a position to make prompt deliveries. Lockheed Aircraft Corporation, Burbank, California.

Lloyd Stearman, Pres.; Carl B. Squier, Vice Pres.; Robert E. Gross, Treas.; Cyril Chappellet, Sec'y.

LOCKHEED

in Burbank, then a community of 16,000 some 15 miles north of Los Angeles. The \$40,000 also bought for them physical assets that the receiver had valued at \$129,961, including work in process, surplus parts, raw material, small machine tools, office and engineering equipment, and furniture. Among other articles, the inventory itemized an elevator coupling key listed at 7 cents, a pencil sharpener worth half a dollar, and a safe priced at \$171. There was no money in the safe—and very little in the pockets of the men who bought it.

These, however, were details. The men guiding the destinies of the organization had three broad decisions to make. What kind of an airplane were they going to manufacture? Where were they going to sell it? And, just as pressing, where was the necessary operating capital to come from in an era when money was as hard to find as a smile on the face of a broker watching the stock market tumble downhill?

Hibbard Joins Company

While they studied these questions, they added to their payroll in July by bringing in Hall L. Hibbard, who previously had been associated with Gross, Stearman, and Varney in aviation ventures. He hired in as assistant chief engineer under Richard A. Von Hake, who had worked for the earlier Lockheed company and who now was in charge of engineering under Stearman's supervision.

Hibbard, who can design the world's fastest airplanes but never learned to fly, rode to work on a bicycle. He reported for his first day wearing a pair of old gray pants, an open shirt, and a blue sweater

with holes in the sleeves. He spent that day helping Chappellet and Harvey Christen, stockroom clerk and general utility man, take physical inventory of every nut, bolt, and piece of tubing on the premises. Less than a year later Hibbard was elected a vice president and chief engineer, and Von Hake became factory superintendent.

Competition Sharpens

Although they had bought rights to continue making the famous Vegas and Orions, Gross and his associates already had other designs in mind. One was a 10-passenger, metal fuselage, single-engine monoplane developed by Stearman and Hibbard for Stearman-Varney, Inc. Another was a twin-engine transport. The management was fully aware of the sharpening competition in the transport field. Curtiss, Sikorsky, Martin, Boeing, and Douglas introduced multi-engine models that were setting new standards of comfort, safety, speed, and reliability. The smaller, less luxurious Lockheeds, although dependable and often faster, were no match for them.

During the remaining six months of 1932 Lockheed did not complete or sell any planes. Its "sales" amounted to only \$23,000 and consisted entirely of repairs and parts. The company sustained a net loss through December of just under \$10,000. Toward the end of the year, however, airline markets began to revive. Air transport started a growth equaled by few other businesses during the depression period.

Analyzing this strengthening market, the men who had already risked every dime they could raise pondered another hazardous gamble that could make or

FASTEST COMMERCIAL AIRPLANE

LOCKHEED ORION SPECIFICATIONS
7 PLACE CABIN MONOPLANE

Fuel Capacity	132 gals.
Oil Capacity	9 gals.
Gross Weight	5400 pounds
Weight Empty	3325 pounds
Baggage	152 pounds
Pay Load	1172 pounds
Length Overall	27 ft. 10 in.
Span	42 ft. 10 in.
High Speed	220 M.P.H.
Cruising Speed at 1825 R.P.M.	180 M.P.H.
Climb at Sea Level	1350 ft. per min.

LOCKHEED VEGA SPECIFICATIONS
7 PLACE CABIN MONOPLANE

Fuel Capacity	96 gals.
Oil Capacity	10 gals.
Gross Weight	4750 pounds
Weight Empty	2742 pounds
Baggage	290 pounds
Pay Load	1310 pounds
Length Overall	27 ft. 10 1/2 in.
Span	41 ft.
High Speed	180 M.P.H.
Cruising Speed at 1750 R.P.M.	150 M.P.H.
Climb at Sea Level	1250 ft. per min.

LOCKHEED

Lockheed Aircraft Corporation
Burbank, California

LLOYD STEARMAN, Pres. CHAS. E. BOWLER, Vice Pres.
ROBERT S. BARON, Treas. STEVE CHAPPELLET, Sec. Asst.

First sales brochure of new management featured line of wooden airplanes.



THE LOCKHEED World's Fastest Comm

Of low wing construction with proven rot Lockheed Orion cruises at 180 M.P.H., 220 M.P.H. It is the pinnacle of modern a owner and commercial operator. Mile to there faster, with greater comfort and safe in airline operation, the Orion is meeting i Through its appeal to the passenger—thor comfort—and by its lower passenger mile c are using the Orion. Certified, present da airlines using Orion equipment are availa

THE ALTAI

A counterpart of the Orion in a two place sport plane, the Altai is the smartest airplane built. For the private sport owner and for long distance flights it cannot be approached. Performance is identical with that of the Orion.



Early Lockheed customer was American Airways, now American Airlines. Here airline president C. R. Smith takes delivery of shiny new Orion from Lloyd Stearman, who was the first president of our company.

ORION RETRACTABLE LANDING GEAR
—The Orion retractable landing gear is proved and perfect. Note how the wheels drop into the wing and are automatically streamlined when retracted.



Active in engineering were R. A. Von Hake (left), George Prudden.



Busy days, but there was still time for an occasional picnic. From left around table, R. A. Von Hake, Ronald P. King, Hall Hibbard, Mrs. Lloyd Stearman (her husband snapped picture), Mrs. Hibbard, Mrs. Ivan Stearman, the late Ivan Stearman, Courtlandt and Robert Gross, Mrs. King, Mrs. Robert Gross, Mrs. Von Hake, and young Marilyn Stearman, Palmer Gross and William Stearman.



Dining room of former ranch house served as office of Robert Gross.



Famous as an aircraft designer, Stearman supervised engineering.



Company executives in 1934 included (from left) King, assistant treasurer; Carl Squier, vice president, sales; Stearman, president; Robert Gross,

chairman of the board and treasurer; Cyril Chappellet, secretary; Hibbard, vice president and chief engineer, posed here in front of NRA Blue Eagle.

break the new company. Alternatives were two. They could continue the temporarily safer policy of producing single-engine planes — and they manufactured some two dozen before the market ran dry. Or they could enter an entirely new field by building an advanced multi-engine transport.

On a crisp fall day in 1932, Gross parked his well-used Chevrolet coupe in front of the two-story former ranch house that was Lockheed's "front office." He mounted the stairs to the engineering room and stuck his head in the door.

"Boys, let's junk what we're doing — and put two engines on it," he said.

Decision Over a Coffee Cup

That remark demonstrated the ability of the treasurer of the new company to look into the future. It came from an aviation enthusiast with virtually no engineering experience but with an instinctive appreciation of good aerodynamic design and, equally important, of sales appeal.

Gross came up with the decision while breakfasting that morning in the coffee shop at Union Air Termi-

nal, now the Lockheed Air Terminal. He watched idly as passengers boarded airliners on the ramps outside. Poised on the apron were three planes — a Lockheed Orion, a trimotored Ford, and a newcomer, Bill Boeing's Model 247 twin-engine metal transport.

Full Speed Ahead

"If I were going to fly to San Francisco," Gross mused over his coffee, "which plane would I choose?"

To him the answer became obvious. The Boeing was sleek, modern, and attractive, and its two engines provided the necessary margin of safety. One engine wasn't enough — three were too many.

Stearman, Von Hake, Hibbard, and the rest of the engineering staff — including George Prudden, now California Division director of quality control, and James Gerschler, now director of the California Division engineering research laboratory — shoved everything else aside and went to work on a twin-engine all-metal monoplane.

After much deliberation, and hours spent by Gross poring over astronomy books in the Burbank public library, they christened the new project the Electra,



the so-called "lost" star of the Pleiades. In Greek mythology Electra became a comet, forever ranging the heavens. The choice was in keeping with stellar designations given previous Lockheeds.

Everyone was fully aware of the danger in committing Lockheed's slim resources to a model development period of 18 months or longer. Expenditures would be heavy. New capital needed was so large in relation to the company's assets that purchasers of new stock could challenge management control.

Intense Financial Pressure

Development work on the Electra gobbled up money at a fantastic rate. The company's credit standing was so shaky that packages addressed to Lockheed came C.O.D. Chappellet in a reminiscent moment later admitted, "We almost always had the sheriff breathing down our necks."

Gross shouldered most of the burden of keeping the treasury solvent. He placed heavy reliance on two factors. One was his conviction that the course he and his associates set was the right one and would be an entering wedge for broader markets. The other was the help of a small Los Angeles investment firm, G. Brashears & Company.

In less than a year after July 1933 Brashears underwrote nearly 160,000 shares of a new stock issue. By April of the following year 289,741 shares were out-

standing. To sell that much stock in an untried company in the middle of the Great Depression was a big accomplishment.

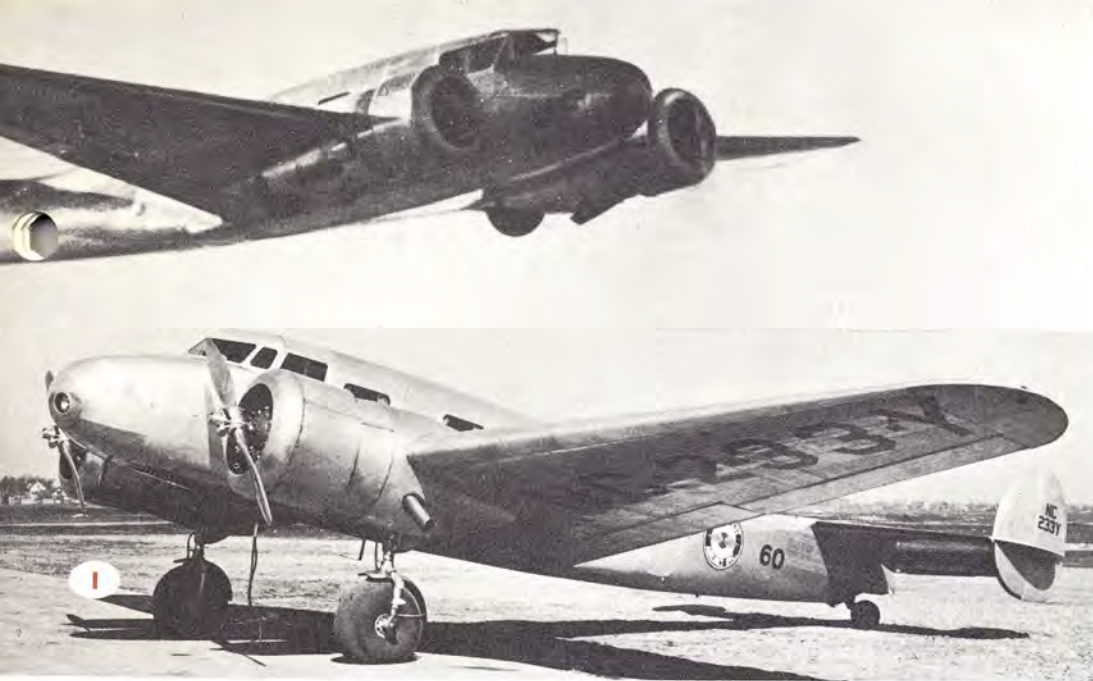
Brashears became a Lockheed director in April 1935. From 1933 to 1937 his company sold some \$1.5 million worth of Lockheed stock, chiefly in the Los Angeles area.

Bankers, Brokers Reluctant

"That \$200 coupe that afforded Gross transportation did its share for the company," Chappellet commented later. "In it he spent every minute he could spare from the office driving around the financial district selling stock."

"During this development period Lockheeds continued to beat Lockheeds in the air, and publicity rolled in—but money didn't. Bankers and brokers were glad to chew the rag with us about Amelia Earhart's flight to Ireland, or Wiley Post and his faithful Vega, the *Winnie Mae*. But when we broached the subject of financing, they often remembered they had another appointment. However, we begged and borrowed—often from our own officers and directors—enough cash to squeak through."

Through such activities Lockheed gradually built up corporate strength. It hired additional workmen. The energetic Squier, armed only with a blueprint of an airplane that still hadn't flown, by the end of



The Electra:

A New Star Is Born

Late in 1932 Lockheed committed its slim resources to development of all-metal Electra. Stages in Model 10's growth:

- A.** Early wind tunnel model shown here with C. L. Johnson had single tail.
- B.** Twin tails featured final design development drawn by Hall Hibbard.
- C.** Triple tail was tested, discarded but used later on Constellation.
- D.** Electra in wooden mockup pointed up clean lines of new transport.
- E.** Like gaffed shark, Model 10 swung high in air to pass station test.
- F.** Mechanics mounted 450 hp Wasps on prototype. Note early windshield.
- G.** Fokker-type windshield was fared over as plane began flight tests.
- H.** Plane made successful first flight on crisp February morning in 1934.
- I.** Northwest Airlines received first Electra with redesigned windshield.
- J.** In August 1934 Electra completed CAA tests, got government ATC.

1933 had advance Electra orders of nearly \$257,000. Through its meager deliveries of Vegas, Orions, and spare parts to airline and private customers, Lockheed that year showed a net profit of \$25,692.

The Lean Years

But these were still lean years. The entire management staff occupied only a handful of rooms in the brick-veneer building at the front entrance to the factory. Gross and other officers frequently carried their lunches to work in paper bags. Payday on Friday often found them facing an embarrassing problem.

"Don't cash these until Monday," Gross found it necessary to advise on many occasions before distributing paychecks. "We'll have the money to cover them by then, I hope."

He believed that the company was "going through growing pains," however, and in a letter to his father early in 1934 he sounded an optimistic note.

"I think we will come out of it with flying colors," he wrote, "but the transitional period is certainly tough."

There was no such thing as specialization. Everybody did everything. Vera Doane, the telephone switchboard girl—later to become Mrs. Harvey Christen—served also as a receptionist, bookkeeper, and extra typist. Christen, now director of quality control at Lockheed's Georgia Division, had an equally

busy schedule. Arriving in the morning, he hurried to the maintenance shack, blew the first whistle, raced to the gate and unlocked it, returned and blew the go-to-work whistle, dashed back to lock the gate, and sprinted through two hangars to the stockroom to await the day's parts requisitions. At noon and again at quitting time he repeated the routine. The U. S. Olympic Games track team lost a potential champion when Christen made aviation his career.

Employment Office Established

In those days job-seekers were hired informally out at the back gate. Recognizing that this was too casual a system, one that might let a good airplane designer or production genius get away, Gross called test pilot Marshall Headle into his office.

"You're not busy flying all the time," he said. "I'd like you to come up here and run the employment office."

Headle, laconic but well liked, had two abiding loves—airplanes and baseball. Since employees sponsored a team of their own, it was not strange that a rivet gun operator with a good pitching arm was fairly certain to land the first available opening.

Lockheed planes continued to write new entries in aviation's ledgers as the Electra took shape. In 1932 Jimmy Mattern and Bennett Griffin flew nonstop from Harbour Grace, Newfoundland, to Berlin in less

Approved Type Certificate

Aircraft

This certifies that LOCKHEED AIRCRAFT CORPORATION is entitled to the benefits granted by law in the production of Aircraft manufactured in quantities of an exact similarity of type, structure, materials, assembly, and workmanship with the authenticated specifications, description, and drawings on file in the office of the Secretary of Commerce, duplicates of which, each bearing the seal of the Department, are attached hereto and made a part hereof.

The type of airplane for which this certificate is issued is known as ELECTRA 10-A

and is approved with the following specifications:

Wing arrangement: Low wing Seating capacity exclusive of crew: 10
Landing gear: Fixed Overall span: 35 ft. 0 in.
Engine: 2 Pratt & Whitney R-1340-17 Overall length: 38 ft. 8 in.

WEIGHTS

Land type	Empty	Useful	Pay	Gross
Water type	5120	3570	Variable	8140
Amphibian				

Dated: August 13, 1934
200 gals. fuel = 1200 lbs.
14 gals. oil = 100 lbs.
Gross wt. = 340 lbs.

E. J. Mitchell
National Secretary of Commerce



than 19 hours. But they cracked up their Vega in Russia, ending their plan for a world flight. Mattern tried a solo hop around the globe in 1933 in another Vega. This time engine failure forced the plane down on the dreary plains of Siberia, and Mattern was missing for three weeks until found by Russian flyers. At about the same time Amelia Earhart, fresh from her triumphant solo flight across the Atlantic, piloted her Vega to a new coast-to-coast record and a world's distance record for feminine flyers.

But it remained for Wiley Post, outstanding in the roster of air pioneers, to become the first man to fly around the world alone as well as the first to fly it twice. In 1931 he and Harold Gatty had blazed the globe-girdling trail by winging the most famous Vega of all, the *Winnie Mae*, on a 15,128-mile world circuit in eight days, 15 hours, and 51 minutes.

Outstanding as was that achievement, Post wanted to do it again—all by himself. After extensive preparations he lifted the *Winnie Mae* off the Floyd Bennett Field runway near New York on July 15, 1933. Seven days, 18 hours, and 49 minutes later, Post brought the plane down at the same airport after covering 15,596 miles in seven stops. The world acclaimed him for "the most remarkable thing that was ever done in aviation." And the flight proved the usefulness of new devices that Post had added, including an automatic pilot, variable-pitch propeller, and radio compass.

Other Record Flights

Then early in 1934 diminutive, tousle-haired Laura Ingalls climbed into her white Air Express and made a solo flight from New York south across the Andes, up the east coast of South America, and back to her starting point. The 17,000-mile journey was the long-

In July 1934, entire engineering department numbered less than 30. Top row from left, Jack Grafman, L. B. Anderson, John Gerber, Milton Stoughton, C. L. Johnson, Hall Hibbard, Waverly Stearman, Al Stockdale, unknown, Dan Fretwell, F. D. Rockold, unknown. Middle row, first four unknown. Then James Gerschler, George Prudden, Russell Barr, Jay Cowling, Jerry Cross. Front row, Carl Beed, unknown, Ted Cummins, Truman Parker, Jack Nichols, and B. W. (Butch) Messer.

est ever made by a feminine pilot. It accounted for several firsts—among them in her words, "the first time a woman ever traveled so far without losing anything." Later that year in a Lockheed Altair, Sir Charles Kingsford-Smith and his co-pilot and navigator, Capt. P. G. Taylor, made the first aerial crossing of the Pacific—7,365 miles from Brisbane, Australia, to Oakland, California, with two fueling stops.

Rudder Redesign

Design progress on the Electra was advancing, and in March 1933 a model went to the wind tunnel at the University of Michigan for testing. From Ann Arbor came a disappointing telephone call—the ship's single rudder didn't provide sufficient control with one engine out. Shortly afterward the young aeronautical engineer who made that report came to work at Lockheed. His name was Clarence L. Johnson, his nickname was "Kelly," and he is now vice president of engineering and research. Johnson designed a twin tail for the transport, loaded a scale model in his car, and drove back to the university wind tunnel at his alma mater. This time it worked.

Finally on February 23, 1934, the long-awaited plane rolled out of the final assembly hangar, and flight tests began. Men in the factory, long experienced in building plywood aircraft, were skeptical

about the new baby, since it was the only plane then in production in the U. S. whose external surfaces were completely metal.

The Electra's First Flight

The Electra was the biggest airplane yet to bear the Lockheed star. It had a 55-foot wing span and carried 10 passengers, two pilots, and a full cargo of mail or express. It boasted the highest ratio of useful load, 3570 pounds, to gross weight, 9750 pounds, and the lowest price — about \$36,000 — of any multi-engine land plane in America. It had two Pratt and Whitney 450 hp engines, and it represented an advance in soundproofing. And most encouraging of all, Squier sold it to Northwest Airlines, Pan American Airways, and other customers before it got off the ground.

From the minute it soared into the crisp winter skies over Burbank, the men who planned and built it knew the Electra was a success. On the day of the first flight, Lockheed took over the Town Pump, a Burbank bistro that served 3.2 beer and other delicacies, and threw a celebration party for the employees who had labored so hard in the face of such obstacles. Music for the occasion was supplied by Gross, who

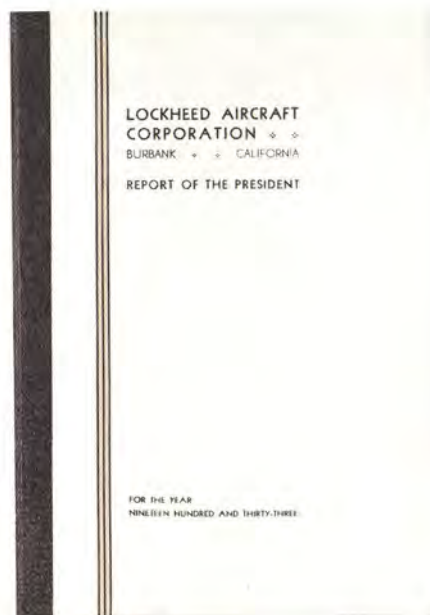
could and still can pound the piano for relaxation and to amuse his friends.

On a late spring afternoon in 1934 test pilot Headle and mechanic Al Zeiner zoomed the prototype Electra off the factory runway and headed out over the Hollywood Hills to Mines Field for the final day of Civil Aeronautics Authority tests. A few hours later Headle placed a jubilant telephone call to Hibbard from Inglewood.

"She made it," he reported. "I'll be seeing you in a few minutes."

All hands turned out to see their transport return in triumph. Headle made a low victory pass over the

At end of 1933, president's report expressed hope Lockheed market would expand, and showed profit of \$25,691.74.



In early days former ranch house (above) was used as front office. G. Brashears, at right, helped build up corporate strength through underwriting stock issues.



Corporation's stock originally had \$1 par value. In two years 289,741 shares were outstanding.

field, then turned and lowered the landing gear. Gross looked up. Only one of its wheels was in place for landing.

Gross dashed back into the plant to report the crisis—but Headle, Zeiner, and the CAA inspector aboard already knew of their plight. The Electra flew in circles while the men struggled with the stuck gear.

"I was ready to turn in my badge," Hibbard admitted later. "One moment we were all set to do business and fill all those orders that Squier obtained. The next moment all we had was a sick prototype aloft, showing all the signs of coming in for a crash landing. Our future and most of the company's capital were tied up in that plane."

A Date With Disaster

His remarks were characteristically conservative. Actually Lockheed was in debt for more than \$139,404 for the development and construction of the Electra—every penny it could raise, including deposits against future deliveries. Hibbard since has described the incident as the most discouraging in Lockheed's early history.

The gear would not go down. In the factory at the time was Major Jimmy Doolittle, whose Lockheed Orion was there for a repair job. He grabbed a piece of chalk and on the black fuselage scribbled a message dictated by Gross: "Try landing at Union—good luck." Union Air Terminal a mile away had a much longer runway than the factory strip and also had fire-fighting equipment. The Orion roared up, Headle got the message, and a crash crew headed for the airport, where a crowd of 2000 or more, including everybody on the Lockheed payroll, also rushed.

Headle Brings Her In

Headle dumped the 52-pound lead ingots used for the CAA's full-weight tests, jettisoned the gasoline, and floated the Electra down the runway. It was almost dusk as he balanced the plane on one wheel for a short distance. The wheel-less wing dropped, and



Test pilot Marshall Headle brought in crippled Electra with minor damage.

the Electra spun away in a half circle. It was a superb job of piloting. No one was hurt, and the only damage was to a wing tip, the landing gear, one propeller, and the blood pressure of the spectators.

But the event was a serious blow. Almost immediately a large portion of the factory's work force was laid off. The Lockheed treasury was at such a critical point that one more day's pay might make the difference between bankruptcy and solvency if the crippled Electra required extensive repairs. For a time the plant payroll, including executives, sweepers, and watchmen, dropped to only 81 persons.

There was a unanimous sigh of relief when Hibbard reported the physical damage was slight and the cause of the trouble was a sheared landing gear shaft. It was a simple, relatively inexpensive operation to double the size of the shaft, and the Electra became what Hibbard called "a first class airplane."

When it received its final CAA approval, new orders and more financing appeared, and the workers were rehired to a man. Their spirit during those troubled times was one of the keystones in the company's ultimate success. They were skilled craftsmen, and many of them could have gone on to other jobs, but

A Note of Thanks...

Many members of the Lockheed family—past and present—had a helpful hand in this history. They sat down with us to recall memorable events and achievements. And they dug into scrapbooks to furnish old photographs, newspaper clippings, and other treasured souvenirs.

The collaborators included Robert and Courtlandt Gross, Cyril Chappellet, Carl B. Squier, Lloyd C. Stearman, Allan H. Lockheed, Walter T. Varney, Hall L. Hibbard, John K. Northrop, W. Kenneth Jay, James Gerschler, Harvey Christen, Roscoe Behan, Firman Gray, George Prudden,

C. L. Johnson, Jay Cowling, and others whose memories are part of the Lockheed saga.

We made use also of a previous history of the company prepared by James V. Griffin in 1943, and a group of articles about Lockheed airplanes written by Wayne Pryor for the Lockheed Star.

Putting together and writing this new series was the work of Philip L. Juergens of the corporate public relations staff who has had long experience in newspaper and magazine writing.

they chose to stay on the home ground, gambling that Lockheed would find a way out of its difficulties.

The original Northwest and Pan American orders were opening up the domestic market for the Electra, and Lockheed was sure it could also be sold in quantity in the foreign field.

Delivered to Northwest in June 1934, the first Electra quickly proved itself. It flew 1500 hours in

Not long afterward, in marked contrast, he enjoyed one of his most encouraging moments. One evening in February 1935 Gross attended a business function at a downtown Los Angeles hotel. Between dinner courses he got to a telephone and called Ronald King, the company's assistant treasurer, who was working on the January books.

"How does it look?" Gross asked King.



Famous pilot of Lockheed planes was Major Jimmy Doolittle who scooted skyward in this Orion and helped avert Electra crash.

five months on the Chicago-St. Paul run, carrying capacity loads on two daily round trips. After thousands of hours it was written off the books, sold to another airline, used extensively in continued commercial service, and sold again—this time to the Canadian Ministry of Defense.

On Its Way to Fame

Northwest officials were so satisfied that they ordered nine more. By July Lockheed had signed contracts for 22, and it delivered 10 by the end of the year. Sales by the end of 1934 totaled more than \$562,000, orders on hand climbed to better than \$1 million, factory floor space doubled, and the payroll grew from its low of 81 to 350.

But the company reported a net loss of \$190,000 on the year's operations. This was due partly to the high development costs and partly to the fact that the original price tag on the Electra was too low. Renegotiation of contracts with Northwest and Pan American helped the pricing problem, but Gross regards that year's loss as one of his most disheartening experiences.

"Fine," King replied. "We made \$8000 last month."

Years later, recalling the incident, Gross declared: "That, I felt, was the turning of the tide."

The Electra was on its way to national and international fame. On its twin tails it carried Lockheed's Winged Star, and into it was poured a cargo of hope and heartbreak. Gross once called it "the most honest airplane that has ever been flown." He might have added that, to the group of men who purchased Lockheed out of bankruptcy only 18 months before, it was a triumph of vision, a symbol of achievement in the face of tremendous obstacles, and an omen of the future.

Coming next month...

Chapter II of *Of Men and Stars* goes back to aviation's earliest days. Titled "The First Lockheed," it relates the adventurous exploits of Allan Lockheed, self-taught pilot and airplane designer, and his brother Malcolm, who together built the Model G. It first flew in 1913 and carried the Lockheed name to fame across the skies.



A



B



C



D

Wings of wood and fabric, of aluminum and steel have lifted the Winged Star to the farthest ends of the earth, across the widest oceans, above the highest mountains, over both poles, and high into the heavens to rival the brightest stars.

Many of these flights that added luster to our Winged Stars came during the early 1930s as Lockheed struggled to gain a share of expanding airline market opportunities. Some of the many fliers who brought fame to themselves and their planes appear on this page.

A. Sir Charles Kingsford-Smith, first aerial crossing of the vast Pacific from Australia to California in his Lockheed Altair, 1934.

B. Jimmy Mattern, later Lockheed test pilot, forced down in Siberia in his Vega, lived for three weeks with natives, 1933.

C. Laura Ingalls, soloed 17,000 miles around South America in her Air Express, 1934.

D. Amelia Earhart, new coast-to-coast and world distance records for feminine flyers in her Vega, 1933.

E. Wiley Post, ex-Lockheed pilot, achieved immortality for himself and his Vega Winnie Mae by flying around the globe twice, 1931 and 1933.

F. Thousands stayed up all night at Floyd Bennett Field in New York to greet Post after historic solo flight around the world, July 1933.



F



E