

F.O. RICK



OF MEN AND STARS

June 1957

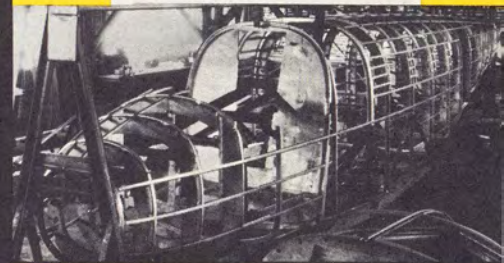
A History of Lockheed Aircraft Corporation

Chapter IV * * *

LOCKHEED
ELECTRA-FIES
THE AIRLINES

Today, after a quarter century, it's easy to underestimate what Lockheed's new managers accomplished during their first two or three years in Burbank.

The Great Depression era of 1930-35 still remains vivid to millions of Americans as the abyss of their despair and hardship. Farmers dumped milk trucks to stop them from reaching market. Veterans marched on Washington. Thousands raked leaves and joined conservation camps. Or they gratefully accepted surplus food or outright "relief" payments. Other thousands turned their ears to all sorts of political schemes and panaceas, even to those who would organize American Nazi or Communist movements.



The Electra... Her Fame Spreads

By year-end 1935 Lockheed had delivered 46 Electras, successfully invaded U.S. market, sold first transport abroad to Polish airline (right) to open foreign field. Gross in 1935 report said orders were sufficient for "carefully planned production" at plant in Burbank (below).

The depression introduced in the United States a new concept of reliance upon government to protect the personal well-being of its citizens. Yet in the hearts and heads of the men who took over the assets, goodwill—and the three remaining employees—of the bankrupt Lockheed airplane factory in 1932, the drive for individual enterprise and achievement remained fervent.

In just two years the new managers had taken on a series of risks that fortunately paid off. They continued selling the sturdy, record-setting wooden planes that had earned a solid reputation for the earlier Lockheed company. But they had staked their own cash and every penny they could raise on the Electra, a new all-metal transport to gain a share of the airline market that was just beginning to boom—one of the few industries to show real growth in those stagnant years. Had this venture failed, the Lockheed firm might well have failed too—or had its efforts diverted into personal airplanes or some other field.

Electra—a Buy at \$50,000

The Electra quickly demonstrated speed, comfort, and performance that advanced air transport standards of the day. It was a worthy successor to the Vega, Air Expresses, and Orions that had carried the Winged Star to earlier fame. Its superior range, size, twin-engine dependability, and metal construction made it a remarkable buy—particularly since the \$50,000 price tag was lowest of any plane in its class.

Carl B. Squier, vice president and sales manager, and his hard-hitting staff secured an encouraging flow of Electra orders to give the small plant in Burbank the shot in the arm it needed. The ship successfully penetrated the domestic market. Airlines such as Northwest, Mid-Continent, Pan American, Braniff, and Delta were among purchasers of the rugged Model 10. Orders on hand by early spring of 1935 called for delivery of three planes a month through September, and the payroll jumped from 350 to nearly 500.

But Squier and other members of the management



were not satisfied. They gazed longingly at the foreign field, and tapped it in 1934—on a modest scale—through an export arrangement with Okura & Company, a Japanese trading firm. It wasn't until mid-summer 1935, however, that a transatlantic telephone call from Burbank to Warsaw, Poland, paved the way for Lockheed's extensive overseas trade throughout Europe from Danzig to the Balkans.

Word filtered along the aviation grapevine that Polskie Linje Lotnicze LOT, the Polish national airline, was ready to buy a medium-sized 200 mph transport for its sprawling network that connected most important population centers in pre-Hitler Europe. But quick action was necessary—both foreign and American aviation firms also knew of LOT's requirements, and competition was brutally tough.

The Electra Goes to Poland

Robert E. Gross suddenly recalled an old friend living in Warsaw. He was Norman (Nick) Ebin, a former investment banker, who had worked for him at the Viking Flying Boat plant in New Haven. Promptly Gross put in a call to Warsaw 7-0277.

"Nick," he said, "let's sell the Electra to the Poles."

Ebin did. He was a shrewd bargainer, familiar with entanglements and pitfalls of middle European political intrigue. He emerged in September with an order for four Model 10s, and the first was delivered just three months later.

The sale drew international attention to Lockheed, and its twin-tailed transport became standard airline equipment in Romania, Yugoslavia, Greece, Hungary, Czechoslovakia, France, Holland, Venezuela, Chile, and Argentina. U.S. military services bought Electras for staff work. And there were numerous private customers, among them intrepid Amelia Earhart, who early in 1932, piloting a Vega, was the first woman to fly across the Atlantic alone.

After two record-shattering flights in her Vega in 1935—she made the first eastern crossing by a feminine pilot from Honolulu to California, then hopped from Mexico City to Newark—Miss Earhart became associated with Purdue University to guide coeds in aviation studies. During this period she acquired an Electra so thoroughly instrumented that she dubbed it her “flying laboratory.”

In June 1937 she began an air voyage around the world with Fred Noonan as navigator and co-pilot. From Miami, Florida, they sped to French West Africa, then to India, Siam, and New Guinea. On July 1 they left Port Darwin, bound for Howland

Island, 2556 miles away and the most difficult hop of the lady flyer's career.

The next day, Navy and Coast Guard listeners heard weak messages. The Electra was over the Pacific—out of sight of land—with only a half-hour's supply of fuel.

“Position doubtful,” Miss Earhart radioed.

The World Mourns Amelia Earhart

That was the last word. A few days later listeners picked up garbled messages, never established as hers. And the world mourned a gallant woman who had promoted strong interest in flying.

Her death was the second tragedy to involve the Lockheed name since the company's organization in 1932. In 1935 Wiley Post, one-eyed “flyer's flyer,” first to wing his way around the globe alone and first to circle it twice by air, built up a “halfbreed” airplane using an Orion fuselage and Sirius wings. He came back to Lockheed, where he had once been a test pilot, and asked the factory to fit floats to the ship and install a larger engine for a projected trip around

Earhart: Air Immortal

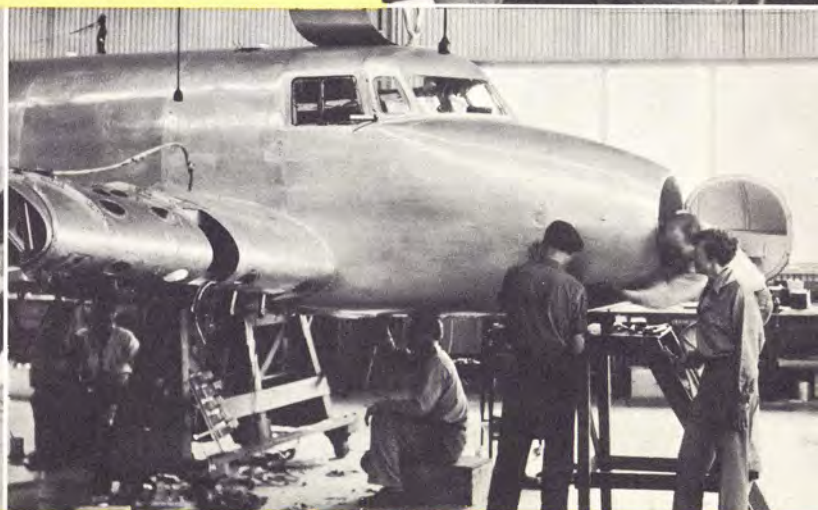
Amelia Earhart, most famous woman pilot of the era, began flying Lockheeds in 1929, set many major marks in her Vega Record Breaker and later in Electra “flying laboratory.”



Miss Earhart made first Hawaii-California hop by woman in 1935 in Vega. Right, she and Engineer C. L. Johnson discuss Electra.



Aviatrix (center) grins amid well-wishers at 1936 National Air Races. At the time she was assisting coed flyers at Purdue.



Preparing for initial around-world flight at equator, Miss Earhart checks her ship. She disappeared in western Pacific ocean.

the world with the beloved Will Rogers, a flying enthusiast and international goodwill ambassador. Lockheed engineers studied Post's request, manipulated their slide rules, and turned him down.

"Floats will make the plane dangerously nose-heavy," said Jimmy Gerschler, then assistant chief engineer. "You'll be in trouble if there's just a slight power loss on takeoff."

But Post was insistent. He had another company install the floats, and he and Rogers set out on their journey. They got as far as Point Barrow, Alaska, and there—in August 1935—the engine stuttered on takeoff. The ship nosed in and crashed, and two of the most famous men of their generation died.

Post's Stratosphere Experiments

His death cut short a series of experimental stratospheric flights that Post had launched earlier that year. After two round-the-world hops he predicted the future of high speed air travel lay in the stratosphere because of the greatly-lessened atmospheric pressure and resistance. To get data on conditions above 20,000 feet he built an auxiliary supercharger

Man from Mars

Wiley Post carried out several experiments in stratospheric flying in 1935, designed a "man from Mars" pressurized rubber suit, aluminum helmet. He demonstrated that high speed travel was feasible above 20,000 feet. In same year he ignored Lockheed advice, installed floats on "half-breed" Sirius-Orion for global flight with Will Rogers. Plane crashed at Pt. Barrow.



Engineering department in 1935 (above) totaled 42 employees. Five years later it included 783.

for the Wasp engine that powered his faithful Vega, the *Winnie Mae*.

Post also designed a "man from Mars" pressurized rubber flying suit with an aluminum helmet. The headpiece had glass apertures for the eyes, and some wags insisted he should install windshield wipers on them. But Post stoutly maintained they wouldn't get frosted over up in the stratosphere.

"They can't," he confided. "I'll be too scared to breathe."

To gain the last possible measure of speed from the *Winnie Mae*, Post installed a droppable landing gear that left only a small skid after takeoff. That meant he had to bring the craft in on her belly with a dead engine and with the propeller cranked to horizontal position. But Post's skill was such that these proved only minor difficulties.

He tried four times to lower transcontinental speed records, each time balked by mechanical failure. On his first attempt the Vega climbed above 30,000 feet and scooted from Los Angeles to Cleveland—where engine trouble forced it down—at an average of 253 mph. This performance convinced Post the stratosphere was his baby.

Shiffin' in the Rain

While Squier hit the airways for more Electra orders, Gross, chairman of the board and treasurer, and Cyril Chappellet, corporation secretary and administrative handyman, battled with day-to-day problems of raising money to keep assembly lines moving. Lloyd C. Stearman, the company's first president, divided his time between management duties and engineering, working with Hall L. Hibbard on design developments.

"All of us handled as many problems as came through the door," Chappellet recalled. "We had to get the business off dead center and started on its way."

Working conditions were somewhat less than ideal. Men in the shop baked in the summer and numbed their hands in the winter. During the rainy season they constantly shifted their work benches to get out from under leaks in the roof, and engineers kept waste baskets on their drawing boards to catch the dripping water.

"During a heavy rain there would be as much as a foot of water in the machine shop," said Chappellet. "I had to raise Cain with the landlords."

Even in the early days, when every dime was funneled into the Electra and meeting the payroll was a frequent major headache, company officers laid the cornerstone for progressive management-employee relationships. During the first year or so there was an easy informality between the front office and shop personnel. Everyone knew everyone else by his first name. Any employee with a real or fancied grievance walked up front to the red brick building that housed the top brass and got it off his chest.

Four-Man "Squawk" Committee

But with the employment boom came a new family of personnel problems. To handle them fairly Gross, Chappellet, R. A. Von Hake, factory superintendent, and Marshall Headle, test pilot who doubled as employment manager, sat down in July 1934 and drafted a clear declaration of company aims and policies in its relationship with employees.

feeling of honesty, friendliness, and cooperation that has motivated Lockheed's relationship with its people ever since.

News Publication Launched

Even then, however, important events happened too fast to keep everyone alerted by word of mouth. And the management then, as now, believed Lockheed's strength depended upon an informed people who had pride in the products they manufactured. To meet this need R. Randall Irwin—a one-man industrial relations, public relations, and publicity staff—proposed a regular newsletter. Called the *Lockheed Star*, it first appeared July 9, 1934.

To provide recreational opportunities and solutions to minor welfare problems, employees aided by Chappellet organized the Lockheed Recreation Club in April 1935. Its first officers were Carl Roth, president; Charles Sweet, vice president; Ernest Starr, treasurer; and Bob Mills, secretary. Of them, Sweet, Starr, and Mills are still with the company.

The club established the monthly *Lockheed Air-*

A News Star Is Born

Aircraftman magazine made its appearance in late 1935, continued until 1944 for Recreation Club. *Lockheed Star's* first issue told of 10 Vegas entered in London-Melbourne air race, backlog of 22 Electras, Northwest Airlines' service with initial transport.



"Lockheed may have a good airplane, it may have a good plant, it may have some orders," they said, "but it has nothing unless it has mutual trust and confidence between the front office and the shop... We do not want anything to disturb or upset the healthy peace of mind of our employees, and, above all, we want to provide them with the means of coming to the management freely, openly, and without fear of prejudice, on all questions affecting their welfare."

Accordingly the four men made themselves available at stated times "to discuss and attempt to settle any possible differences." Their action evidenced a

craftsman magazine in November. The *Aircraftman* continued until May 1944, when an enlarged *Lockheed Star* took over reporting activities of the Lockheed Employees' Recreation Club.

Late in 1934 Stearman resigned as president. His first love was designing airplanes, and he poured into them knowledge accumulated ever since his barnstorming days after World War I. Desk work, administrative duties, and ins and outs of the financial world—although vital to the growth of any organization—just weren't his favorite cup of tea.

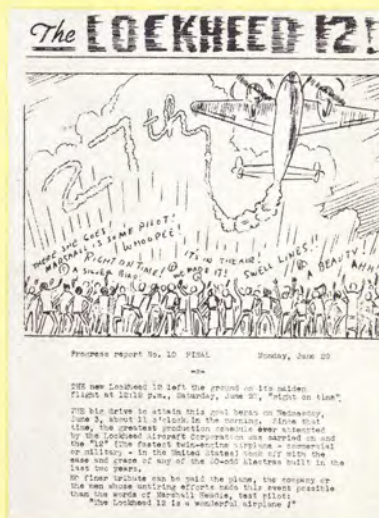
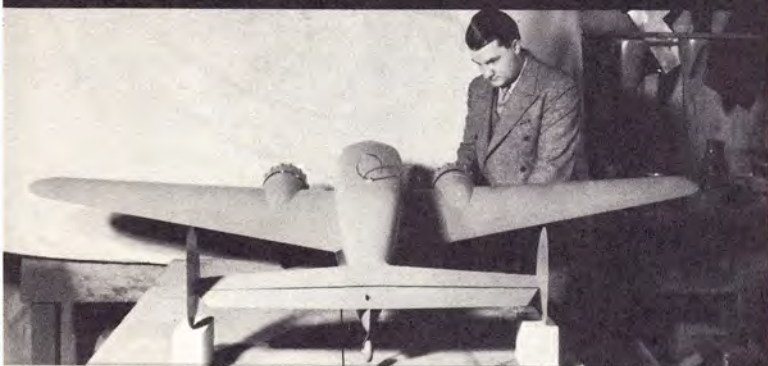
There was no question about his successor. One man clearly possessed the experience and enthusiasm

Another Winged Star: The Model 12

Compact Model 12 invaded new market in 1936. Directly below, C. L. Johnson studies wind tunnel model. At bottom, Hall Hibbard, Cyril Chappellet, Pilot Marshall Headle discuss performance.



Smaller version of Electra, the Model 12, cruised at 200 mph, carried six passengers plus crew. At top is first model of series shown in 1939 with, from left, Jimmy Gerschler, late Vern Dorrell, C. L. Johnson, Hall Hibbard, Carl Squier. Original buyer, Phillips Petroleum, still uses airplane today (upper left).



Final issue of pep sheet in 1937 tells how employees met June deadline to get Model 12 off line and into the skies.

necessary to energize Lockheed's operations during these critical years. That was Gross, driving force in welding together the group that organized the company in 1932. On December 15, 1934 the board of directors accepted Stearman's resignation and chose Gross to succeed him, his title being changed to president-treasurer and chairman of the board. Squier was elected a director to fill Stearman's vacancy.

Stearman returned to design and in 1935 formed the Stearman-Hammond Company in San Francisco in partnership with another designer, Dean Hammond. With Carl Haddon—now chief engineer of Lockheed's California Division—as their chief engineer, they built and marketed the Stearman-Hammond pusher, a two-place monoplane, first production airplane with a tricycle landing gear.

"It was a bit ahead of its time," Stearman commented later, "and the so-called 'recession' of 1937 and 1938 slowed down the sale of personal aircraft

of all kinds. So after we built 25 of them we had to close down."

Other Personnel Realignments

For a time Stearman worked with Thomas Fortune Ryan III's Mid-Continent Air Lines in Kansas City, analyzing equipment requirements. As a result of his recommendations the Ryan line in 1940 bought the first three of a group of Lockheed's Model 18 Lodestar transports.

During the war Stearman was in charge of the aviation division of the Harvey Machine Company in Long Beach, California. Later near Fresno he converted Stearman trainers—the famous Boeing-built PT-17 Kaydets—into crop dusters. Stearman returned to Lockheed in June 1955 as a production design engineer.

About the time of Stearman's departure from Lockheed in 1934 there were other realignments of

factory and front office personnel. Hibbard was elected vice president and chief engineer. Von Hake—a rare combination of pilot, engineer, and mechanic—became factory superintendent. And L. M. (Mort) Bach, who in the lush days of 1928 designed and built an all-metal transport bearing his name, hired in as foreman of the assembly division.

Louis W. Wulfekuhler, now president of Lockheed Air Terminal, joined the company in February as a sheet metal stock clerk. He was appointed transfer officer in July to issue and countersign stock certificates. By October, Lockheed stock, already on the Los Angeles and San Francisco exchanges, was listed on the New York curb exchange. Wulfekuhler found plenty to do, with 152,423 shares issued and sold in 1934.

Courtlandt S. Gross, younger brother of Robert and liaison executive for Lockheed since 1933, became assistant secretary in September 1935. He continued to head the company's New York office and to represent the organization in the east and Europe.

Opus 12: *Theme and Variations*

Model 12 had long life, was adapted to many uses. Navy ordered version (below) with fixed tricycle landing gear. Government had Lockheed try engine exhaust heating for deicing purposes in hot wing model (right).



Gross—who kept a day book of the orders and requests he made to others—in 1934 set a policy for what has since grown into a multi-million dollar spare parts business. One of his early entries was an order to Von Hake to build “one Orion fuselage untrimmed, one Orion wing unpainted, one Vega fuselage untrimmed, and one set of spars for Vega,” and to “keep these materials always on hand, at least one ahead of all definite sold business.” That directive

led to formation in September 1937 of a customer service department under Joseph R. (“Uncle Joe”) Hargrove.

Within a year the department grew to 36 people and \$2,400,000 annual business. Probably it was the first department in the aviation industry to take such special recognition of customers, absorb complaints, and handle emergency overhaul and repair jobs of all kinds. “Repair sales,” as such work was recorded, played an important role in keeping the company going during the struggling 1930s.

An RFC Agreement

Another factor that helped keep the treasury solvent—in addition to the unflagging stock-selling efforts of Gross and the investment house of G. Brashears & Co.—was the government's Reconstruction Finance Corporation. In September 1934 Lockheed applied for an RFC loan “not to exceed \$200,000,” and the agency made a revolving fund available. Under the agreement Lockheed “warehoused under bond” each new plane from the time its fuselage was assembled until the completed ship went out the back door for delivery and payment.

In 1935 Lockheed first began tentative explorations of the military field. Courtlandt wired his brother from New York in September that the Secretary of War had granted authority to negotiate for a multi-engine fighter. “I can hardly tell you how delighted I was to get it,” the Lockheed president wrote in acknowledgment of the information.



Not until more than a year later, however, did he pass word on to Courtlandt that engineers in Burbank were “drawing some pictures of a two-engine fighter for the Air Corps competition.” That possibly was the first reference to what became the famous World War II multipurpose workhorse, the P-38.

“This is in advance of the specifications, which are not out yet,” Gross explained. “We’re just fishing

around on our part for types and layouts.”

The company could develop a “splendid military airplane,” he declared in a message to employees at Christmas 1935, predicting that “we ultimately will do so.” But even though Lockheed did decide to spend time and talent on military designs, he reaffirmed the management’s conviction that it should “steadfastly remain in the private and commercial field, because of all the branches of aviation the one that has had the brilliant record, and has made the really great strides, has been the branch of commercial transport.” The airline, he added, “has kept aviation’s flag flying, and passenger travel has made everybody feel there was some business in the country after all.”

Time for a New Design

The Electra did its share to help keep that flag flying. Lockheed built 148 of them from 1934 through July 1941 and delivered 40 by the end of 1935. It reported a net profit of nearly \$218,000 that year on net sales of \$2 million. The capital surplus stood at \$226,787. It was the best showing by far in the company’s still brief history.

But the men who guided Lockheed’s destinies regarded it as poor policy to keep all their design eggs in one basket. Late in 1935 they probed the world markets and discovered a likely opening in a Department of Commerce design competition.

“Let’s build an airplane as good as the Electra, but not so big,” Squier suggested. “We can sell a six-passenger ship priced at around \$40,000. But if we’re going to do it, we’d better do it fast. There’s plenty of competition, and the first one in the air is the one they’re going to buy.”

The Model 12 Is Born

Squier was right. For the first time since the financial crash of 1929 business prospects brightened enough so that airplane builders began to wax hopeful about introducing and selling new models. The 10-passenger Electra was an excellent buy even at its increased price of \$55,000, but many feeder airlines, sportsmen pilots, and corporation executives would welcome a smaller craft if it retained the Model 10’s high performance characteristics. Gross made a careful survey that “indicated clearly” the advisability of continuing to concentrate on airplanes of the feeder type rather than to attempt bigger ones that would compete with larger manufacturers “whose financial facilities are adequate for the purpose.”

But as Squier pointed out Lockheed wasn’t the only company aware of the sales possibilities of such a plane. Aircraft gossip traveled fast, and to be marketable the new model had to be ready to fly exactly on schedule. Hibbard and his engineering staff, con-

Lockheed: *Still a Leader in Speed*

RECORD FLIGHTS 1933 THROUGH 1936

1933

- JULY** Wiley Post in Vega becomes first man to fly around world alone, 15,596 mi. in 7 days, 18 hrs., 49.5 min.
- JULY** Col. and Mrs. Charles A. Lindbergh in a Sirius make 29,000-mile aerial survey of Europe, Africa, South America, pioneering transoceanic air routes.
- DEC.**

1934

- FEB.** Laura Ingalls in Air Express flies solo New York to South America and return, 16,897 mi.
- APRIL**
- OCT.** Sir Charles Kingsford-Smith, Capt. P. G. Taylor in Altair make first west-east flight across Pacific, Brisbane, Australia, to Oakland, Calif., 7,365 mi. in 54 hrs., 49 min. flying time.
- NOV.**

1935

- JAN.** Amelia Earhart in Vega is first woman to fly from Honolulu to Oakland, Calif., 2,408 mi. in 18 hrs., 16 min.
- APRIL** Amelia Earhart in Vega flies from Burbank, Calif., to Mexico City, 13 hrs., 32 min. elapsed time.
- MAY** Amelia Earhart in Vega makes first non-stop flight, Mexico City to Newark, N.J., 14 hrs., 19 min.
- JULY** Amelia Earhart in Vega sets new transcontinental speed record for women, Los Angeles to Newark, N.J., in 17 hrs., 17 min., 30 sec.
- SEPT.** Laura Ingalls in Orion sets non-stop transcontinental speed record for women, Burbank, Calif., to Newark, N.J., in 13 hrs., 34 min., 5 sec.

1936

- APRIL** Major James H. Doolittle in Electra with full load sets commercial transport speed record, Chicago to New Orleans, 5 hrs., 55 min.
- NOV.** Max Aitken, Marshall Headle, Brian Allen, and Ray Buckminster in Model 12 fly from Las Vegas, Nev., to Burbank, Calif., 264 mi. in 1 hr., 2 min., average speed 256 mph.

fronted with a target date of June 27, 1936, quickly came up with blueprints for the Model 12—also known as Electra Jr.—to carry six passengers, cruise at well over 200 mph, and sell for about \$40,000. By spring of 1936 work was well along on the project.

Time ran close, but Project Engineer Gerschler vowed the flight date would be kept. Everyone in the plant from president to newest worker caught the “June 27 or Bust” spirit. Engineers worked nights and Saturdays—and Sundays too, until Hibbard rode over to the factory on his bicycle one Sunday morning and chased them away from their drawing boards. Long hours meant nothing to the men in the shop. They gambled their own time and skill to put together an airplane that, if successful, would help to insure their jobs. And they knew the management was gambling as much or more by pouring the company’s limited capital into the venture.

Von Hake, plant superintendent, Harvey Christen, who headed the production office, and Gerschler practically slept on the premises. At night, while the day force put in extra hours, front office people served coffee and sandwiches, and when needed they picked up bucking bars and helped out.

Model 12 Meets Date

The June 27 date was met. With Headle at the controls, the Model 12 slipped into the air shortly after noon and quickly proved itself an even livelier performer than the Electra. Gross commented in a letter written a few days later that it “so far has proven to be a fine airplane—it seems to handle a little better than the Electra and is quite a bit faster.” The first flight was so successful that work was abandoned for the rest of the day. Beer and pretzels were served in the final assembly hangar and in the shade of the old apple tree on the lawn outside of the ranch house office building.

Electra Jr. was the second rung on the ladder Lockheed was forging in its climb toward the forefront of the aviation industry. The sleek little ship won first and second awards in the Department of Commerce design competition in 1936. It gained fame rapidly, found purchasers among airlines, industrial firms, and private flyers—including such exotic customers as the maharajahs of Jodhpur and Kashmir—and set speed and performance records. The plane’s development cost was about \$117,000 and Lockheed built 114 through 1942, halting production only because of pressure of war business. Some Model 12s still fly today.

Coincident with construction of the first Model 12, a “mystery” ship shaped up in a walled-off section of the factory. Men who worked on this project wore special badges, and to inquiries from curious fellow employees they replied:



XC-35 Electra was first pressurized plane. It won 1937 Collier Trophy for stratosphere hops.

“Government job.”

It was somewhat more than that, although they were under orders not to say so.

The Air Corps began dabbling seriously with high altitude flight in the mid-'30s when coincidentally Post made his series of substratospheric hops in the *Winnie Mae*. In June 1936 the Air Corps asked Lockheed to build a modified Electra capable of holding pressure in the cabin.

The plane, riveted together as the XC-35, represented one of aviation’s basic advances. It was the world’s first successful pressurized substratosphere airplane, built to hold a 10 pound per square inch differential between inside and outside pressure.

This differential meant nearly three quarters of a ton of bursting force would be exerted on each square foot of cabin area. To keep the fuselage from splitting, Lockheed built the XC-35 strong—it weighed nearly 1500 pounds more than the standard Electra. Workmen used a new neoprene sealing tape and installed extra heavy plexiglas in the cabin windows. The fuselage completed, they applied maximum pressure—but nothing popped.

XC-35 Wins Collier Trophy

Dubbed “the Boiler,” the XC-35 first flew May 7, 1937, and was formally delivered to the Air Corps in August. It proved successful in high altitude flight—on one trip from Chicago to Washington, D.C., it averaged more than 350 mph at above 20,000 feet. And it won for the Air Corps the Collier Trophy for having made the most valuable contribution to aircraft development in 1937—paving the way for high altitude bomber and fighter construction and later pressurized passenger airliners.

By the end of 1936 employment doubled to nearly 1200. Since its formation in June 1932 the company had delivered 112 airplanes, 107 new, the rest rebuilt, worth \$4,597,000—37 of them in 1936—and had increased plant area to about 108,000 square feet.

But Lockheed was still in the minor leagues. The years of spectacular growth and dazzling achievement lay immediately ahead.

The Men Behind the Stars...

Seven men founded the Lockheed company in 1932. No one knew better than they the difficulties that lay ahead. Yet to them the depression was a challenge—not a catastrophe.

Their names were Robert E. Gross, Carl B. Squier, Cyril Chappellet, Lloyd C. Stearman, Walter T. Varney, R. C. Walker, and Thomas Fortune Ryan, III.

They possessed in common two unswerving beliefs. They had an unquenchable faith in the inherent strength of America and an equally strong conviction that the aviation industry would grow with the nation. In the middle of the

most severe economic setback the country had yet experienced, it was their aim to build a master business out of an investment that, even from the most optimistic viewpoint, was shaky. They had the courage to seize an opportunity, and they had the vision, initiative, and common sense to convert that opportunity into success.

How did these men meet?

Perhaps that question can best be answered by retracing the paths they followed before the day in 1932 when a federal receiver accepted their \$40,000 bid to buy the bankrupt Lockheed company.



Hockey captain R. E. Gross (center) at Harvard, 1919.



Carl Squier (left) served three years in France with Allies.



Walter Varney (left) trained aviators for World War I.



Famous Swallow biplane was first Lloyd Stearman design.



Cyril Chappellet, at left, was 1930 National Guard pilot.



Gross, sports car fan, had Hispano-Suiza in late '20s.

Gross was born in Boston in 1897, son of Robert Haven Gross, who for a quarter century was active in developing coal and copper industries, and Mabel Bowman Gross. After his graduation from Harvard in 1919, he entered the employ of Lee, Higginson & Company, an investment banking firm. George C. Lee, two years before had become impressed with the young man's fighting spirit as a third baseman on the college varsity. As he learned finer points of stocks, bonds, and investment banking, Gross gained wider latitude and responsibilities. And at an age when most young graduates still look forward to the next homecoming rally he was traveling in the U.S. and abroad, representing the firm in major business transactions.

Lindbergh's flight across the Atlantic in May 1927 sent interest in aviation zooming, and Lee, Higginson seriously considered the flying business as an investment possibility. In 1928 it sent Gross to Wichita, Kansas, to investigate the Stearman Aircraft Company, organized a couple of years before. Gross knew of Lloyd Stearman's growing reputation as a designer. As far back as 1923 Stearman, who started his aviation career on the flat Kansas plains, turned out the sturdy Swallow biplane, an advanced craft for its day. In 1924 he and Walter Beech constructed the first Travel Air, famous for years as a utility ship. Stearman left Travel Air in 1926, formed his own company in Venice, California, and transferred it back

to his home ground, Wichita, the following year.

The Stearman biplane was one of the most practical and rugged all-purpose aircraft yet developed, and it found a ready market. By 1929 one customer, Varney Air Lines—organized in Seattle in 1926 by Walter T. Varney—operated 11 of them.

"Gross walked in one day, wondering if we could use additional capital," Stearman said. "It took all my will power to keep from jumping across the desk and locking the door so he couldn't get away."

Another event occurred in 1928 that was to have far-reaching influence on the future Lockheed company. Hall L. Hibbard, 25-year-old engineering graduate of the Massachusetts Institute of Technology, came to work for Stearman at \$80 a month as draftsman and engineer. The industry was not yet sophisticated enough to employ both. The man later to be responsible for an imposing list of aviation achievements, and now a Lockheed senior vice president, spent his first day at the Stearman plant cutting a large roll of drafting paper into standard sizes and storing them in a file. In three years he was a project engineer.

Short Joins Stearman Firm

Another Stearman employee was Mac V. F. Short, a Kansan like Hibbard who also attended M.I.T., where he obtained a master's degree in aeronautical engineering. He, too, was to become a valued contributor to Lockheed's growth.

Impressed with Stearman's operations and prospects, Gross hurried back to Boston and unsuccessfully urged Lee, Higginson to invest in the enterprise. He was so enthusiastic that he resigned from the banking house, invested \$20,000 of his own in the Stearman firm, and bought one of its airplanes. In that plane, with Stearman and Short at the controls, Gross went aloft for the first time. But he never learned to fly.

Gross assisted with administrative and production problems at the Stearman factory. And early in 1929 he made another sally into the airplane business with

his younger brother, Courtlandt, by starting the Viking Flying Boat Company at New Haven, Connecticut.

The Stearman venture paid off. By mid-1929 big holding companies were gathering promising aircraft manufacturing and corollary organizations into sprawling networks. In August the United Aircraft and Transport Corporation added the Stearman company to its family. Gross helped to negotiate the merger, and he, Lloyd Stearman, and other shareholders realized a substantial profit—at least on paper.

Stock Drops in Value

United bought the Stearman unit by exchanging stock valued attractively at \$2 million at the time of the merger. The stock dropped drastically in value by the time the men who sold the Stearman company received their shares, and they didn't realize a great deal in the way of ready cash. In fact, they had little left except their jobs. Stearman and Short remained on the United Aircraft payroll at the factory in Wichita and also became directors of the Viking organization.

In August, Viking secured exclusive American licensing rights to manufacture flying boats based on designs of the French Schreck firm. Viking's officers included Gross as president and treasurer, Reginald D. Thomas as vice president and general manager, and Robert Proctor as secretary. A few weeks later Viking took over the New Haven Air Terminals Company and in October merged with the Bourdon Aircraft Corporation of Providence, Rhode Island. Manufacturing activities of the \$500,000 corporation that resulted centered under the Viking name in New Haven.

By merging with Bourdon, Viking inherited the Kitty Hawk, a three-place open biplane, and an advertising slogan, "Flies like a hawk, lands like a kitten." After building about 30 of them, Gross changed the slogan to "Flies like a kitten, lands like a Welsh rarebit," and closed the plant.

Problems beset the flying boat, too. Gross advised



Robert, Courtlandt Gross began Viking Flying Boat Company just before stock market crash.



Viking flying boat used French Schreck design. Firm built 25, but market faded in depression.

Electra's Competitors

Leading transports serving the airlines when Lockheed began design of Electra in 1932 included Ford trimotor and Lockheed Orion (below). Orions regularly beat Fords on Los Angeles-San Francisco schedule by half hour or more for Varney Speed Lanes.



Stearman and Short that all wasn't well. The French drawings were in bad shape, and the plane needed redesign and stress analysis.

"We could use an engineering jack of all trades," Gross told his associates in Wichita, "somebody who can set up an efficient engineering drawing system and tell us what to do to make this thing fly."

Short had a suggestion. "We'll lend you Hall Hibbard. If he wants to go back to New Haven, you can have him for three months or so."

Gross knew Hibbard only slightly, but he was agreeable to the idea.

"That's fine," he said. "I'll take your word for what he can do."

In their brand new Model A Ford, Hibbard and his wife Irene drove back to Connecticut, where the young engineer spent four months successfully trouble-shooting the Viking problem and getting the drawings in shape.

"I was impressed with Gross the minute I met him," Hibbard said. "He was as dynamic a leader then as in later years—and he had more hair."

The Viking flying boat got off the ground—or, more accurately, the water—but the timing was unfortunate. Gross still believes the craft "would have had

a place" in the airplane market had it not been for the economic collapse of 1929. He thought first of potential sales among wealthy sportsmen pilots who frequented the New England coastline and north-eastern waterways. Next he interested Uncle Sam, and it was not long before Viking proudly advertised itself as "Contractors to the U.S. Navy and the U.S. Coast Guard."

But the Viking had a flat-bottomed wooden hull and was not good in a rough sea. Government orders weren't extensive. Further, the early days of the depression found the ranks of wealthy sportsmen considerably thinned.

The first Viking was launched in October, but after that, according to Gross, "People didn't want boats. They wanted collateral!" So after selling about 25 flying boats Viking closed its doors in 1931. Courtlandt remained in New Haven. Bob, mindful of Horace Greeley's advice, headed west.

His decision followed receipt of a telegram from Walter T. Varney, whose Varney Speed Lanes were now flying in California, boasting the fastest passenger, mail, and express service between San Francisco and Los Angeles. Earlier in 1931 Stearman had resigned as vice president and chief engineer of United Aircraft's factory in Wichita to join Varney in Alameda, California.

Varney's Motto: Speed

Varney's single-engine Lockheed Orions regularly beat competitive Fokker and Ford tri-motors by 30 minutes to an hour. The line was potentially profitable, but Varney—with a penchant for custom-built automobiles and other luxuries—spent money with a free hand. He did not like to concern himself with financial details.

"I met Varney in Alameda and looked over his operation," Gross said. "Then I sat around the airport with no obligations and no title, making an occasional suggestion as to how the airline could be pulled out of the red."

By watching the pennies and putting Varney on a budget, Gross pulled the business out of the hole. Within a short time the Speed Lanes began to show a profit—sometimes as high as \$10,000 a month. Gross received no pay for his services.

Bigger Plane Needed

Varney was a booster for Lockheed Orions, but he, Gross, and Stearman felt the Speed Lanes could increase its patronage and profits with a larger plane, carrying more passengers and cargo.

Times were far from promising in the fall of 1931. But that did not deter Varney, who was thoroughly familiar with intricacies of the air transport business, Gross, whose two previous ventures into aviation

convinced him it was the field he most wanted to pursue, and Stearman, who had an almost intuitive grasp of aerodynamic theory and practice.

Together in September 1931 they formed Stearman-Varney, Inc. Gross didn't have much ready cash, but he put a little money into the venture, which he says was "not much more than a drawing board." Stearman was president and chief engineer. Immediately they began kicking around ideas for a new airplane, similar to the 225 mph Orion but larger.

The new firm promptly enlarged its payroll by hiring Hibbard—still with United in Wichita—as assistant engineer. There were four-way debates about the general form the plane might take. Should construction be of conventional wood and fabric? Or should it be all metal, then a comparatively new technique? A monoplane, certainly, but where to locate the wing—high, low, or in the middle? And what about power? Was a single engine enough, or should they consider two? Finally, with some misgivings, Stearman-Varney decided on a single-engine, 10-place, all-metal, low-wing monoplane. But it never got beyond the design stage.

In the meantime, Varney Speed Lanes had a more immediate problem—its source of supply for more Lockheed Orions and spare parts. That source was threatened when, in October 1931, the Lockheed Aircraft Company in Burbank went into receivership.

Lockheed Goes on Block

Working with Varney, Gross saw that speed was important, and when Lockheed folded up he wondered "how it would be to pick up the bricks." While he was musing over this thought, the Title Insurance & Trust Company as receiver offered Lockheed for sale on April 15, 1932.

The factory's general manager was Carl B. Squier. A native of Michigan, he saw his first airplane—a Burgess—while racing motorcycles at county fairs. He turned grease monkey in return for free rides and determined then and there to make flying his career. Enlisting in the U.S. Army Air Service in 1917, Squier won his wings at North Island, near San Diego, and was a member of the 1st Pursuit Group Squadron at Selfridge Field.

Squier Arrives in Burbank

He served in France for nearly three years, attached to the 90th U.S. Aero Squadron, attained the rank of captain, formed a lifelong friendship with Eddie Rickenbacker—America's ace of aces in World War I—and participated in several dogfights with the Germans. He emerged unharmed and with the Croix de Guerre. After the Armistice Squier completed his college education, interrupted by the war, and became a barnstormer and test pilot. He assisted in the formation of the Stinson Aircraft Company and was an engineering test flyer for Glenn L. Martin. When Detroit Aircraft bought Lockheed in 1929 it sent Squier to Burbank as general manager.

In that capacity he was convinced of the company's value. Fearing it might be liquidated, he began beating the bushes for a possible purchaser. Among the prospects on his list was Varney—one of the few men in aviation who Squier knew had some available cash and who was already sold on the stamina and performance of planes Lockheed built.

Gross, Stearman, and Varney talked over the idea, and late in April Gross flew south to Los Angeles. "I thought the Lockheed factory had a better outlook than the Varney line," Gross explained. At the Grand Central Air Terminal in Glendale he looked up Roscoe J. Behan, then Varney's Los Angeles manager and later a member of Lockheed's sales staff. Behan



Notice of sale was formal record that Lockheed assets were sold for \$40,000.



Sale took place in federal courthouse.



Gross in front of office in red brick ranch house.



Mac Short, at left above in picture with Carl Squier. Mort Bach at right became vice president for Lockheed.



introduced Gross to Squier, and the two inspected the Lockheed plant.

It was not a cheerful sight. Only three persons were on the payroll—Squier himself drew no salary during the receivership. Except for an overhaul job on a Boeing trainer owned by Howard Hughes, the factory's 33,000 square feet of floor space was completely shut down. To Gross the idle equipment and facilities were a challenge.

Gross and Squier Talk It Over

After their survey of the tools and equipment, the rented buildings, and the small landing strip, Gross and Squier strolled over to the drying shed that served as a garage for Squier's car. They sat down on the running board to talk things over.

"I'm interested," Gross said. "What do you think would be a reasonable bid?"

"The inventory shows assets of around \$130,000," Squier told him. "You might be able to swing the deal for \$40,000."

Gross rose to leave. "I don't know if we can raise that kind of money," he said, "but I think we might. We're certainly going to try."

In Alameda Varney, interested because he wanted to see Lockheed continue to supply his airline, agreed to underwrite \$10,000 of the bid.

Chappellet Enters Picture

Among Gross's acquaintances was Lawrence Ames, a San Francisco broker. Ames mentioned the Gross proposal to another broker, R. C. Walker of Sutro & Company, who was married to Jacqueline S. Walker, a cousin of Cyril Chappellet.

Chappellet, graduate of Stanford University and

subsequently of Air Corps Advanced Flying School at Kelly Field and one-time transport pilot for Western Air Express, had launched the Airlines Consolidated ticket agency in Los Angeles in 1931. It wasn't exactly a flourishing business. Profits, dependent upon a 5 per cent commission for securing plane accommodations, were less than meager. Chappellet, determinedly aviation-minded, began forming plans to organize a west coast "milk run" airline linking Santa Barbara, San Luis Obispo, and other small California communities.

Walker, who occasionally bought plane tickets through the San Francisco office of Chappellet's agency, thought Chappellet might be interested in joining Gross and Varney in the bid to buy Lockheed. So he placed a long-distance call to Los Angeles and



From left, Stearman greets Lyndal Young and C. R. Smith of American Airlines, and Mr. and Mrs. Elliott Roosevelt at airport.

explained the situation that had developed.

A couple of days later in the Sutro offices on Montgomery Street Chappellet and Gross met for the first time. Gross told his hopes, ambitions, and plans, and Chappellet immediately found himself intrigued by the man and the idea.

"I could see how enthusiastic he was," Chappellet said later. "And he had a good sense of money values, a factor that was unusual in aviation in those days. Few of the people in it had banking experience, and Gross brought to the business a point of view and knowledge that not many others could equal. He was a happy combination."

More important, Chappellet had some cash, since both he and his wife, Sybil, had inherited some money from their parents. The Chappellets agreed to invest \$5000 each. Gross obtained another \$5000 from Thomas Fortune Ryan III, a personal friend and grandson of Thomas Fortune Ryan, New York Central Railroad executive.

Through Chappellet's efforts, Walker invested



Early picture shows Squier, Robert Gross, Ronald P. King, assistant treasurer, in front of rose arbor at Burbank offices.

\$5000 in the name of his wife, Jacqueline. All told, the kitty now stood at \$30,000—and that wasn't enough. Gross went from one bank to another and found them all ready to listen, but not to loan. This was the low point of the depression. Bankers who weren't risking money even on the most stable of business ventures shuddered at the mere thought of underwriting an airplane company on the brink of liquidation. Finally Gross turned again to Varney, who added another \$10,000.

The group was far from confident that the \$40,000 would be enough. After the receiver offered Lockheed for sale, Squier compiled a list of several prospective buyers in addition to the Gross-Varney-Stearman group. Among them was Allan Lockheed himself, who tried desperately to get together enough money to buy back the company he had founded. Others on Squier's list were Erle Halliburton, a wealthy oil man; T. Claude Ryan and Walter Beech, veteran airplane builders; Roscoe Turner, swashbuckling speedster of the skies; Whitley C. Collins, Lockheed's secretary-treasurer before Detroit Aircraft purchased the firm; and E. L. Cord, one of the era's financial giants, active in American Airlines and Aviation Corporation.

Present Company Organized

They all displayed interest. But when the chips were down the adage that money talks proved itself. Only one bid was entered.

A few days after the sale the new Lockheed Aircraft Corporation was organized in offices of a San Francisco law firm. Varney, as trustee for the purchasers of the bankrupt predecessor company, met with Gross, Squier, Chappellet, Stearman, Ryan, and Walker, and they drew up the necessary papers.

They debated briefly about what to call it. Gross

avored giving Stearman top billing because of his well-publicized name as designer and manufacturer. The single name Lockheed prevailed to take advantage of the reputation and goodwill the predecessor company had built. But Stearman—best known of the group in aircraft circles—was elected president and general manager. Squier was named vice president and sales manager. Gross, an investment banker by training, became treasurer. Chappellet took on the duties of corporate secretary. Stearman, Gross, Varney, Walker, and Chappellet comprised the board of directors.

Varney Becomes First Customer

At a later meeting the new corporation secured its first prospective customer when Varney contracted to purchase from Lockheed for a two-year period all the airplanes required for his Varney Speed Lanes. Lockheed agreed not to sell its aircraft to persons competing with Varney.

Organized under California laws, Lockheed had an authorized capitalization of 50,000 shares of no-par stock. The company immediately issued 4800 shares to those who contributed to the \$40,000. At a stated value of \$10 a share, 2000 shares went to Varney, 1000 to Chappellet, and 500 each to Ryan and Jacqueline S. Walker. To Gross went 800 shares



Now president of Lockheed Air Terminal, L. W. Wulfekuhler joined factory as stock clerk in early 1934.



George Prudden, now California Division quality control director, helped design first U.S. all-metal plane, built in 1920.



Five company founders gather at 1956 reunion: Squier, Gross, Chappellet, Stearman, Varney.

in exchange for plans and designs developed by Stearman-Varney, Inc., including blueprints for its single-engine 10-passenger all-metal monoplane design. Shortly afterward, at \$10 a share, Ryan bought another 500 shares, and William L. Graves acquired 700. Graves worked for the company in the purchasing department for several years.

Stock Issue Authorized

Salaries voted the new officers were far from lavish. Stearman and Squier were on the payroll for \$400 a month, Gross for \$300, and Chappellet for \$200.

Early in 1933, to attract more capital, directors

authorized an issue of 500,000 shares of Lockheed stock at a par value of \$1 a share. The 6000 outstanding shares of the original no-par stock previously had been transferred to a holding company organized as Lockheed Aircraft Corporation of Delaware but known later as the Southern California Aviation Corporation. These 6000 shares now were exchanged for 90,000 shares of the new \$1 stock, and 34,600 shares were issued to the Delaware unit to cancel an indebtedness. Southern California Aviation had provided operating funds after Lockheed shareholders transferred their issued and outstanding shares to it. The non-operating company dissolved in 1935 after its usefulness ended, and the Lockheed stock it held was distributed to shareholders.

Management Changes

A couple of changes in the management lineup occurred in 1933.

In March, Ronald P. King, who had started as a bookkeeper with the old Lockheed company, became assistant treasurer.

In May, Varney, who had found it necessary to dispose of his Lockheed stock to finance his airline operations, resigned from the board of directors. His Varney Speed Lanes suspended operations in that year, and he was ill for a time. Later he launched another airline—Lineas Aeros Occidentales of Mexico—but it was not successful. In 1939 he returned to the Lockheed fold, later becoming a co-pilot on the B-17 bombers that spewed during World War II from production lines of the company he helped found.

Coming Next Month...

One American industry that grew and prospered throughout the many years of the depression was the fast-spreading network of airlines. Revenue passenger miles flown, only 127 million in 1932, had nearly trebled by the end of 1935. In that year U.S. airlines carried 678,500 passengers. Lockheed's all-metal Electras were timed just right to provide carriers with the additional seats and reliable operation they needed.

But the company had to diversify its products to assure its position in the fast-changing aviation field. The Model 12, described in this chapter, broadened our line to two types.

But, President Robert E. Gross reported to his stockholders at the end of 1935, Lockheed had "the technical ability and plant facilities to develop planes suitable for military and naval use." He pledged "serious attempts" to

exploit the military as well as the commercial market.

Chapter V, next month, tells of Lockheed's product diversification activities through the later 1930s. It describes the third Electra development, another small cabin plane, a trainer, a target drone, a tail-first canard transport idea, and the series of designs that finally emerged as the Constellation.

Even more important, Chapter V describes the gathering war storm over Europe and how inevitably the United States and Lockheed were vacuumed into it. This is the period of the Hudson bomber and the P-38 Lightning, the planes that changed the entire character of our organization.

Look for Chapter V in your gate boxes next month. It will also have holes punched for easy filing in a three-ring binder. If you have missed earlier chapters, call your public relations office.