

# The Harlow PJC-2

*Believe it or not, the PJC stands for Pasadena Junior College.*

BY PETER M. BOWERS

The Harlow PJC-2 is a unique airplane on several counts. For one, it is a 44-year-old design that needs only a tricycle landing gear and possibly a flat engine to look as modern as any current high-performance single on the flight line. For another, although a type-certificated production article, it was not designed entirely by professional engineers at an established aircraft plant. The letters PJC give the background.

Max B. Harlow was a graduate aeronautical engineer. He had gained a broad base of experience working at a number of West Coast aircraft firms that produced various types of models ranging from slow, all-wood trimotor airliners, through slick, all-metal military and airline models,

*Peter Bowers, AOPA 54408, is an aviation photo collector and historian of world renown and a Pilot contributing editor.*

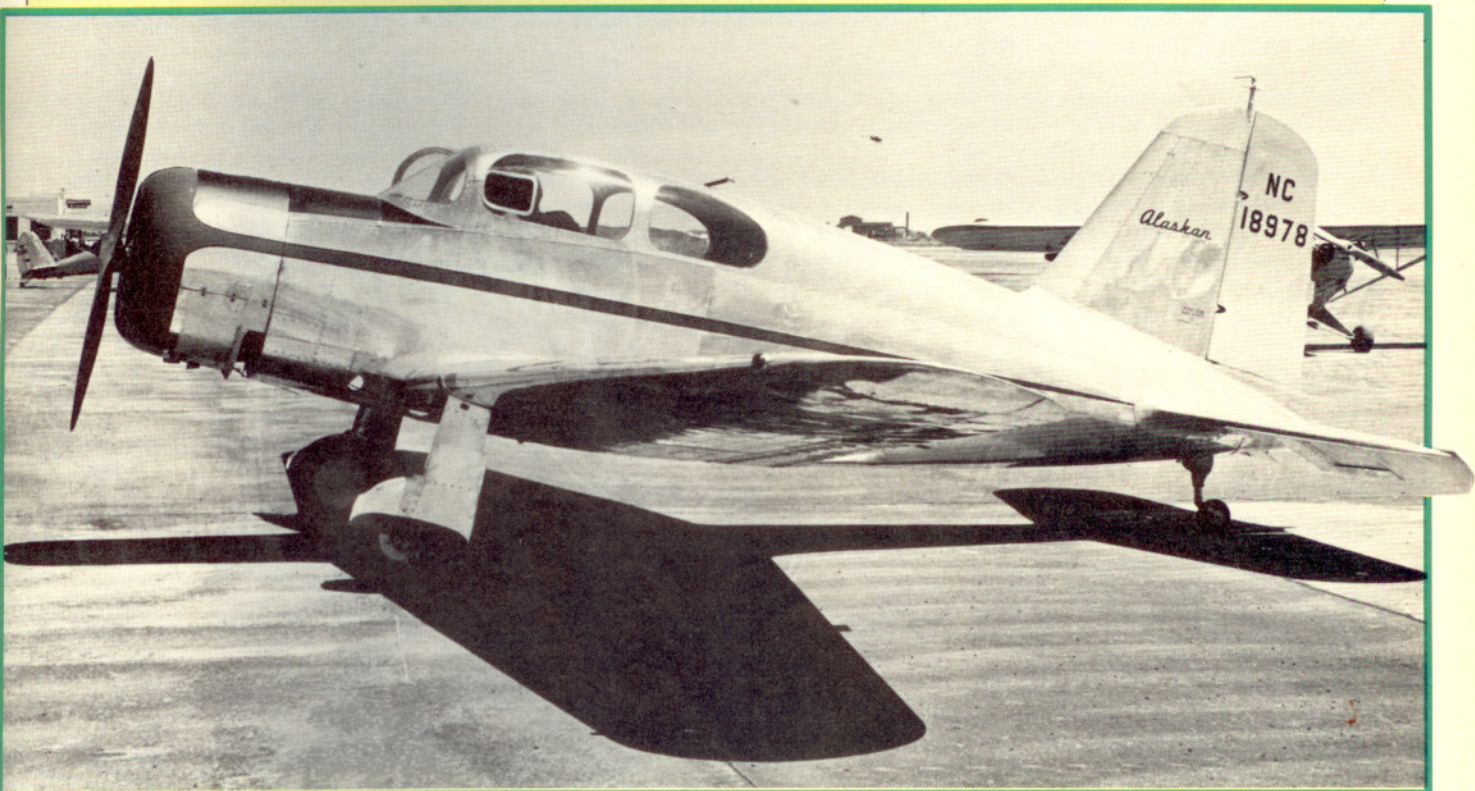
to Howard Hughes's racer and low-powered light-planes.

With this background, he obtained a position teaching aeronautical engineering at Pasadena Junior College—PJC—in California. He soon convinced the directors that the best way to teach the subject was to have the students not only design but also build a modern airplane. All students in such courses designed an airplane, either individually or as a group project; but few schools ever carried the paper projects on into the hardware stage, much less to the points of certification and production. Local industrial supporters of the school underwrote the cost of both the materials and equipment.

Construction of the initial design, identified as PJC-1, was started in November 1936, and it was ready for its test flight in September 1937. The design was thoroughly up-to-date in all aspects of the

aerodynamic and structural state-of-the-art. It was an all-metal, two-to-four place, low-wing monoplane with cantilever wings, electrically operated retractable landing gear and split trailing-edge flaps. The airfoil was the NACA 23012 used by the new Douglas DC-3. Only the control surfaces were fabric covered.

Entry to the cabin was by a single, large door on the right side of the cabin, and dual wheel controls were provided. The cabin was roomy enough to seat four with space in the rear for a little baggage, but Harlow took a realistic approach. He knew that four seats did not necessarily mean that the airplane was a *good* four-seater—the two rear seats were options. Without them, the PJC-1 used the space for a very generous baggage allowance of 113 pounds plus the full 34-gallon fuel load. With three seats, the baggage weight was reduced to 25 pounds with a full fuel



*The first production PJC-2, pictured here, rolled out in April 1940. Six of the nine units that were built before the plant turned to war production were purchased by the Civil Aeronautics Authority. The Army also bought a few to meet its need for light transport airplanes.*

## YESTERDAYS • WINGS

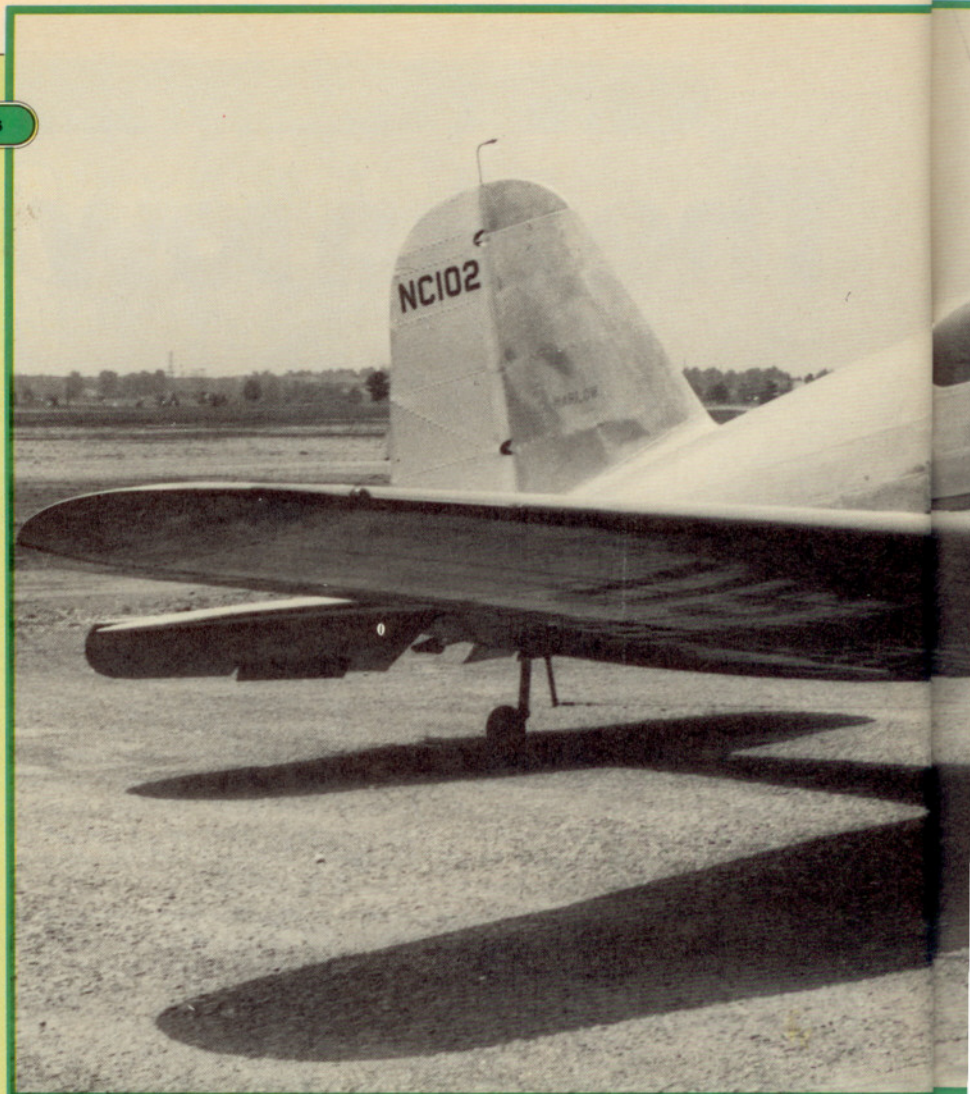
load or 130 pounds with only 26 gallons.

Power was provided by a 145-hp Warner "Super Scarab" air-cooled radial engine under an NACA-type cowling. The original propeller was wood, but fixed-pitch Curtiss-Reed and later controllable models became available by the production of the PJC-2. The fuel tank was built into the center section of the wing beneath the cabin—a hazardous location in case of a wheels-up landing.

The PJC-1 was almost through its certification program when it crashed during a spin test with 400 pounds of ballast aboard. The pilot escaped by parachute, and the mishap did not put a stop to the program. Minor design changes, notably increased vertical tail area, were made to a second article designated PJC-2, which received Approved Type Certificate (ATC) A-659 on August 26, 1938. Although of the same dimensions and power as the PJC-1, the PJC-2 had a little less performance all around as the result of a 306-pound increase in gross weight and an increased empty weight.

Since the PJC-2 turned out to be a very good airplane, it was logical to consider putting it into production. The school obviously could not do this, so a new company was formed for the purpose. Harlow Aircraft Company was incorporated early in 1939, and a small plant, financed in part by Howard Hughes, was set up on Alhambra Airport. Actually, it was sort of a moonlighting operation on Harlow's part; he was vice president and general manager but also held on to his teaching job. Full-time employees held the other key managerial positions.

The first production PJC-2 rolled out in April 1940. Six of the nine units that were built before the plant converted to sub-contract war work were taken by the Civil

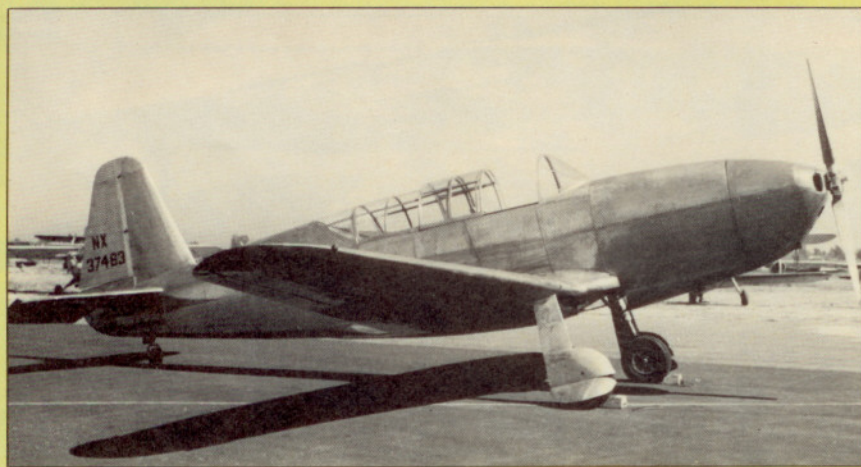


Aeronautics Authority (CAA, predecessor of today's FAA) for the use of its traveling agents. Basic price was \$6,985.

Meanwhile, other models were designed back at the school. A tandem two-seater using the wings and horizontal tail of the PJC-2 was developed for the U.S. Army's big trainer-design competition of 1939, but

did not win. The rights to that design, the PJC-4, were sold to another firm.

The PJC-4 was followed by another PJC-2 derivative, the PC-5 (apparently the junior college had become a regular four-year college and dropped the J). A somewhat narrower, two-place tandem-seat fuselage was fitted to the PJC-2 wing



The PJC-4 was designed for a 1939 design competition. The tandem two-seater, which used the wings and horizontal tail of the PJC-2, did not win the contract and was sold to another firm.

## HARLOW PJC-2

## Specifications

Powerplant	Warner Super Scarab 145 hp @ 2,050 rpm
Wingspan	35 ft 10 in
Length	23 ft 4 in
Wing area	185 sq ft
Wing loading	14.05 lb/sq ft
Power loading	17.93 lb/hp
Empty weight	1,661 lb
Gross weight	2,600 lb

## Performance

High speed	160 mph
Cruising speed	140 mph
Landing speed (with flaps)	52 mph
Initial climb	750 fpm
Service ceiling	15,500 ft
Range	490 sm



The PJC-1 cabin had enough room to seat four and its original propeller was wood. But, by the time the PJC-2 was being produced, fixed-pitch Curtiss-Reed and controllable propeller models were available.

for the usual test program for new models, which routinely involved photo coverage, and they were just more C-type airplanes at the air bases.

The small company was reorganized late in 1940 and airplane production ended. Harlow left and returned to full-time teaching, but the company retained his name. It survived as a subcontractor to the end of the war, at which time it acquired the assets of Interstate Aircraft Company of El Segundo, California, builder of the prewar S-1A Cadet lightplane and some wartime radio-controlled flying bombs. However, no further manufacture of complete airplanes was undertaken. In the late 1940s, Harlow was taken over by Call Aircraft of Afton, Wyoming. The Cadet was put back into production there, but nothing was done with the Harlow designs.

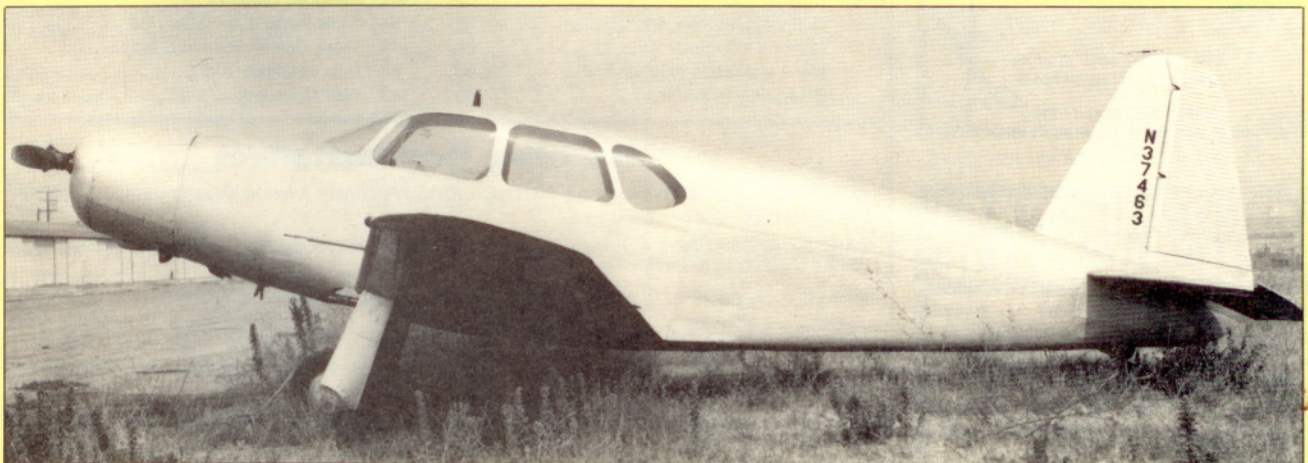
Meanwhile, the single PJC-4 that had been sold reappeared in 1945 under a new name. Now a re-engined, four-place, cabin model, it was called the Rheem (or Rheam), but quickly became the Atlas H-10. The -10 in the name was a derivation of PJC-10, a designation assigned to the cabin variant that existed only on paper before the war. The H, of course, was for Harlow. In spite of the new firm ownership, the PJC-4/H-10 was destined to remain a one-only.

There were seven PJC-2s on the civil register in 1947, but some must have been in storage for all nine were on the books in 1948. There were still six in 1969, and four are active today. This includes the first PJC-2, which is quite a different airplane now by virtue of extensive modification by the present owner, including a rare 200-hp Warner engine. □

and tail and a more powerful Warner engine. The PC-5 was tested to the extent of receiving ATC-735, but only the prototype was built.

Although Harlow lost out on his bid for military business, some PJC-2s ended up in the Army. To meet its rapidly expanding need for light transport and utility air-

planes in 1941 and 1942, the Army bought quite a few small airplanes from private owners. The four PJC-2s thus acquired received the Army designation UC-80. Unfortunately for historians, these were never photographed in military markings. As fully certificated civil models, there was no need to send them to Wright Field



WILLIAM T. LARKINS

The only PJC-4 went through several name changes when it reappeared in 1945. The re-engined, four-place, cabin model came back as the Rheem then became the Atlas H-10. The H was for Harlow and the -10 was for the PJC-10 cabin variant that existed only on paper before the war.