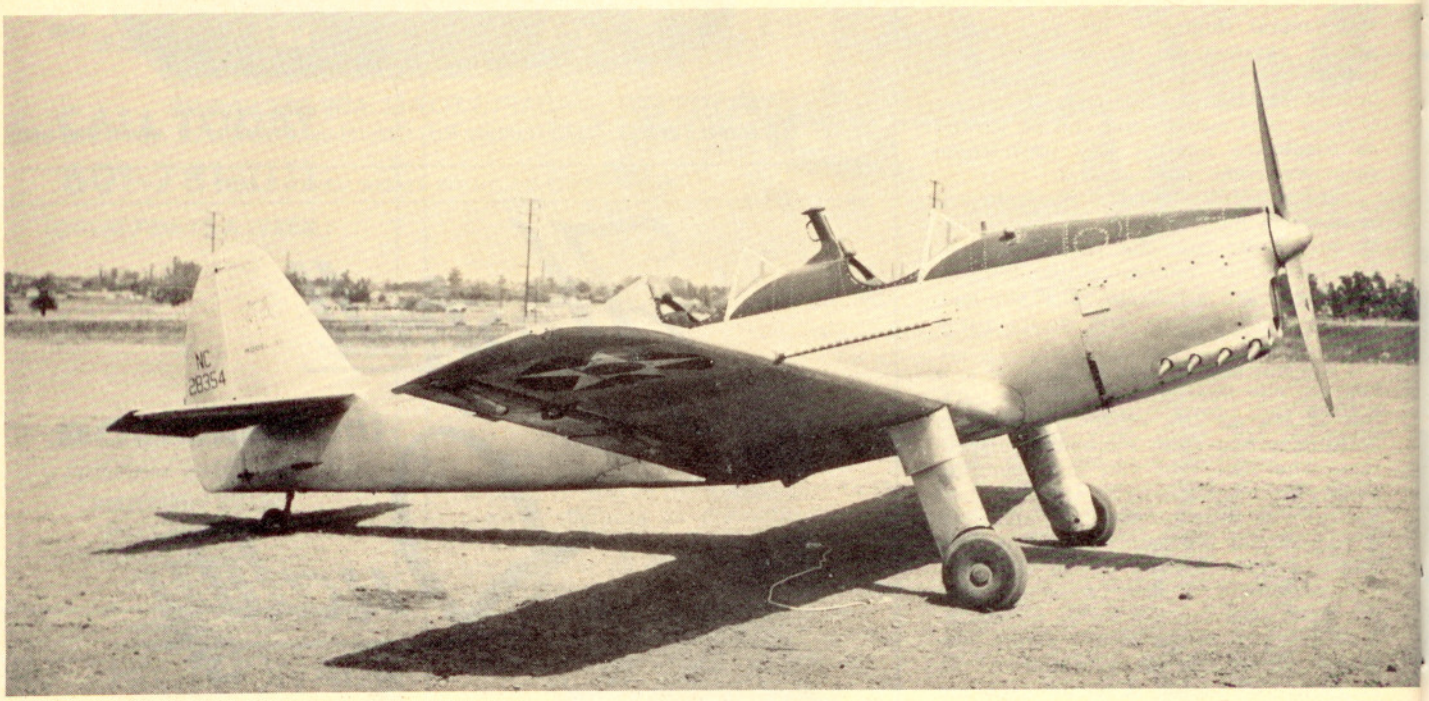
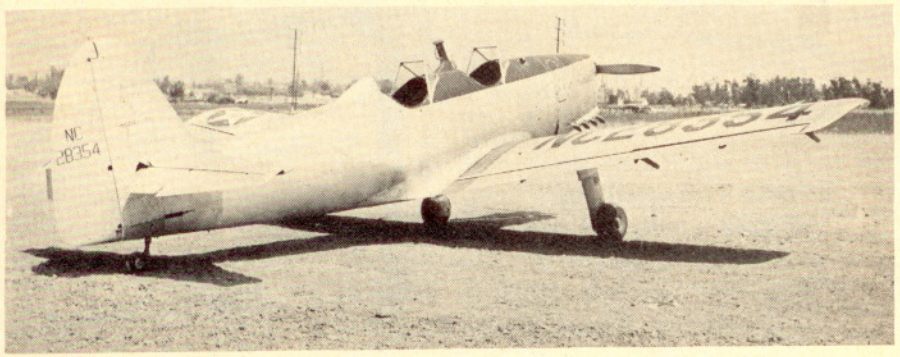


The clean lines of the Vega-built Model 35 that was originated by North American are evident. Note the pylon between the cockpits, installed to provide clearance between the fuselage and the ground in case the airplane should flip onto its back following a landing accident. Photo by Boardman C. Reed.



The appearance of military insignia does not mean that the Model 35 saw military service. Many civilian airplanes on the West Coast carried the star on the upper left and lower right wings after Pearl Harbor. Photo by Boardman C. Reed.

Yesterday's Wings

Although this surviving Vega Model 35-67 was used in the Civil Air Patrol, the CAP marking shown in this 1955 photo appears to be nonstandard. The distinctive tail marking, patterned after the pre-WW-II Army tail striping, has no significance. Photo by Chalmers Johnson.

The North American/Vega Model 35

by PETER M. BOWERS / AOPA 54408

■■ The efficiency of a new airplane design, or the lack of it, isn't always reflected in subsequent production figures. Many excellent airplanes never get beyond the prototype stage for reasons entirely unrelated to their own characteristics, while some pretty mediocre types get into large-scale production because of fortunate circumstances of timing or other reasons.

The little Model 35 is a good example of the first kind, a good design that didn't make it in the market for a couple of reasons. First, it entered a market that was already saturated and then it found itself neglected by both of its parent companies because they had more important things to do than build sport trainers. The Model 35 can be considered a war casualty that never encountered an actual enemy.

The backgrounds of the two companies that produced the Model 35 are both rather unique by normal company development standards. The first, North American Aviation, originated in 1928 as a holding company for other builders of airplanes and equipment. By 1934 its holdings included manufacturers that had been merged to form General Aviation Corp., plus large shares in both Eastern Airlines and TWA. The Air Mail Act of 1934 ended this through legislation that prohibited a single organization from working both the manufacturing and operating sides of aviation.

North American then sold off its airline shares and concentrated on manufacturing. Just prior to this, it had developed a new basic trainer (BT) model that interested the U.S. Army, and moved its manufacturing facility from Dundalk, Md., to Inglewood, Calif., where it set up a new factory and got into large-scale production of military trainers and observation planes.

The second company, that was to get involved with the Model 35 later, was The Vega Airplane Co. of Burbank, Calif. It was an affiliate of Lockheed that was formed in 1937 to carry out the development of light airplanes using a unique mated-engine arrangement that had been developed at Lockheed a few years before. This "Unitwin" feature placed two inverted in-line Menasco engines side by side driving one propeller to give twin-engine reliability to a single-propeller design. In 1941, Lockheed took Vega over as a wholly owned subsidiary and renamed it Vega Aircraft Corp.

With World War II imminent in 1938, the U.S. Army Air Corps began an expansion program that called for thousands of new primary training planes and announced a design contest for new trainer models. Already well established with its BT-9 model and even more advanced designs, North American decided to try a primary design, and the Model 35 was the result.

The Model 35 was a thoroughly conventional low-wing monoplane with open cockpits in tandem. The structure reflected the trend toward all-metal construction, with monocoque sheet aluminum fuselage and a monocoque wing that replaced the more traditional spars with multiple stringers. A wide-track, single-leg landing gear was mounted on the wings. Initial powerplant was the 150-hp, inverted, air-cooled Menasco C4S-2 driving a fixed-pitch wooden propeller. Starting was by means of a hand-crank.

Aerodynamically, the design was very slick except, of course, for the drag of the open cockpits. Cockpit canopies were then a feature of higher-performance trainers but were several years in the future for primaries. For the military, the problem of communicating between the widely spaced cockpits was taken care of by the standard speaking tubes. With clean lines and a 12.4 lb/sq ft.

VEGA 35-67

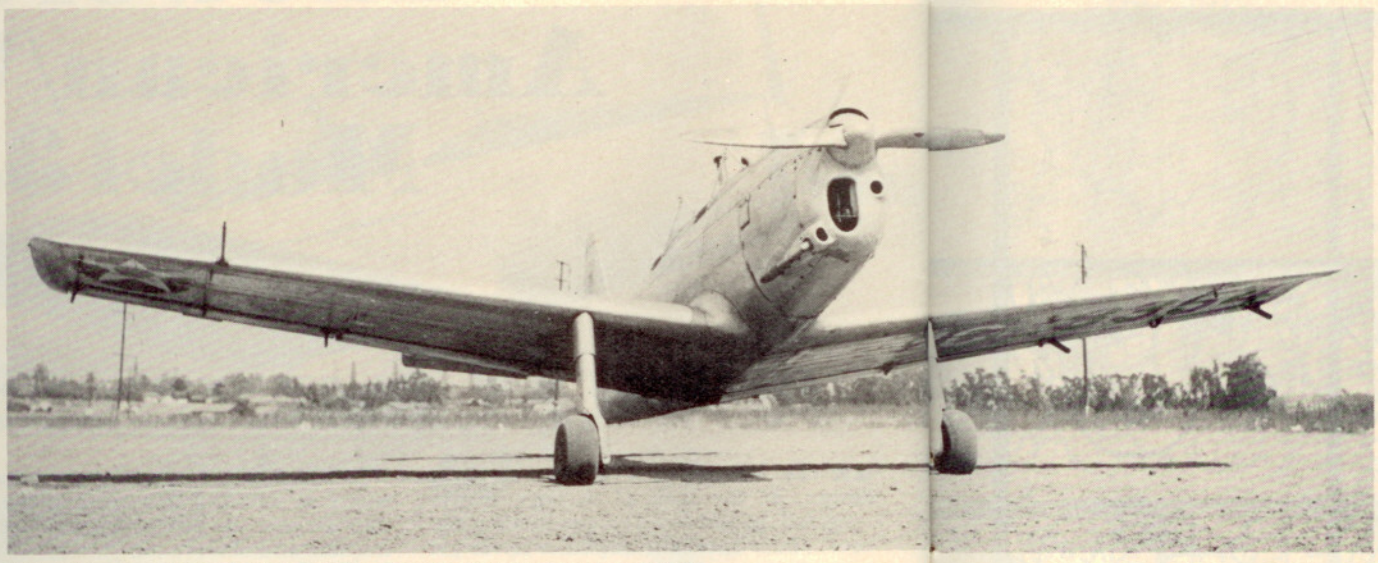
Specifications

Powerplant	Menasco D-4 125 hp @ 2,175 rpm
Span	29 ft 8⅞ in
Length	25 ft 5¾ in
Wing area	147.2 sq ft
Empty weight	1,278 lb *
Gross weight	1,827 lb *

Performance

High speed	124 mph
Cruise speed	12 mph
Landing speed (flaps)	48 mph
Initial climb	725 fpm
Service ceiling	12,500 ft
Range	312 sm, 25 gal, 75% power

* Vega made minor structural changes in adapting the Model 35 to production that added 60 and 67 pounds to the empty and gross weights, respectively, over the North American prototype.



This photo shows the high dihedral angle, the wide track landing gear, and the centerline wing splice of the Vega-built Model 35-67. Photo by Boardman C. Reed.

wing loading, landing speed was reduced by slotted trailing edge flaps. The airfoil was the NACA 4416-R at the root tapering to the NACA 6509-R at the tip.

In the 1939 fly-off trainer competition, the Model 35 lost out to the Ryan ST-A that used the same engine. While the Model 35 was the better airplane aerodynamically, a slight performance edge was not the determining factor in the final choice. The Ryan was strictly an "off-the-shelf" airplane that had been in production since 1934 and was high on the learning curve from a production and tooling standpoint.

The Model 35 was handicapped by the fact that it was a single, hand-built prototype; tooling and a production line would have to be set up before useful quantities could be turned out. Also, the Model 35 had a disadvantage that was not so outwardly apparent. It was developed by a design team that worked downward to the lightplane level from extensive experience with heavier designs. The Ryan, on the other hand, started as a lightplane and was better off from the maintenance and repair standpoint. Even so, stock lightplanes proved to have certain inadequacies for military use as compared to commercial operations, and extensive changes were made to later Ryans to adapt them to the pure military training role.

Since the Model 35 didn't win a military order, North American decided that it had plenty of heavier airplane business to keep it busy and sold the Model 35 design to Vega in nearby Burbank. Vega was still involved with relatively light civil designs and saw a market for a design like the 35 that could be exploited without the time delay of designing and testing a prototype.

With the military market obviously closed, Vega sought a wider civil market by offering a lower-powered model using the 125-hp Menasco D-4 engine. This version was type certificated as the Vega Model 35-67 while the 150-hp version became the 35-70. Other engine options such as the 175-hp inverted, inline Ranger 6-440 and the 160-hp Kinner R-5 and 145-hp Warner Scarab radials were offered, but no installations of these engines are known to have been made.

While it looked at first like the Model 35 had a future at Vega, such was not to be. With World War II now under way, Britain was buying military airplanes in the United States. Lockheed had developed a patrol bomber from the established Lodestar airliner and Britain ordered $30 million worth. This work was turned over to Vega, and a huge new plant was built to produce it. The British named their new bomber the Ventura, and the versions taken into the U.S. Army became the B-34 and B-37. Late in 1941, Vega also became involved in a three-party manufacturing pool that built the B-17 under license from Boeing.

Under these circumstances, the little Model 35 again found itself overwhelmed by bigger programs and only four examples were built by Vega. One of these had a war record of sorts—it was used in the Civil Air Patrol. In private hands, this one survived into the middle 1950s.

In view of today's interest in homebuilt airplanes, antiques, and a revival of open-cockpit flying, the Model 35 would seem to be a good candidate for some minor redesign directed toward simplified structure and a modern flat-four engine in the 125- to 180-hp range. Such a fine little design should not be forgotten when it could be adapted for the amateur builders. □