The Student Prince Biplane

An Oregon original, built by the class of '30.

BY PETER M. BOWERS

These days, most new airplane designs that reach the civil market are the products of well-established firms that have formal design and engineering staffs. The firms survey the market and develop a new model or alter an old one to meet a recognized need; then they follow up with a sales campaign.

The same generally was true back in the late 1920s and early 1930s, but a few designs got onto the market through much less orthodox channels.

One of these was a little two-seat, biplane trainer called the Student Prince, which appeared early in 1930 and has had an identity problem ever since. The prototype of this airplane was not the product of an established manufacturer—or actually any manufacturer at all. It was the second full-scale airplane built by the students of the Adcox Aviation Trade School in Portland, Oregon, and was designed to meet the personal requirements of Jerry Wildman, a Portland-area pilot who financed the project.

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In view of all the requirements that existed even then for "commercial" airplanes, it is surprising that an individual could contract for a one-only design to be used for private-owner purposes. Actually, there was a little-known loophole at the time.

Aircraft certification and licensing was (and is) a federal function. But acceptance of the federal air regulations, which became effective in 1927, was up to each individual state. Most went along with the new regulations right away, but Oregon was an important holdout. Right up to World War II, airplanes could fly there without federal licenses, and they did not have to conform to federal standards. Some people actually moved to Oregon to take advantage of the situation. These unlicensed airplanes did have to carry federal registration numbers; in addition they carried Oregon state licenses in the form of a car-like metal license plate attached to the side of the fuselage.

The Student Prince was a conventional two-seat biplane, designed by Basil B. Smith, an aeronautical engineer formerly associated with aircraft designer Alexander Klemin. He was assisted by his brother Dexter, a structural engineer noted for his work on the St. John Bridge in Portland.

The fuselage and the tail surfaces of the Student Prince were welded steel tubing, and the wings used wooden spars and wood-truss ribs. The airfoil was the popular Clark Y, and a 20-gallon fuel tank was fitted in the center section of the three-piece upper wing. As a trainer, both cockpits had dual controls and the essential instruments. Entrance to the front cockpit was a minor acrobatic feat, because of the relatively low position of the upper wing and the absence of a small door in the upper portion of the fuselage, as was common on many biplanes.

The powerplant was the 85-hp Cirrus III, the American production version of the popular British Cirrus engine, an air-cooled, upright, in-line four. It dated back to the early 1920s, when it had been developed by the Aircraft Disposal Company (ADC) to

Though the Depression was putting many aircraft manufacturers out of business in 1930, the excellent flight characteristics and easy producibility of the Student Prince airframe prompted some notable Oregonions to form Aircraft Builders. Six airplanes were begun immediately; but despite extensive flight testing and inspection, the Student Prince never met full federal standards.

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continued

use surplus parts from World War I engines.

The design was started in the fall of 1929, and the completed Student Prince was delivered to Wildman in the spring of 1930. Flight characteristics were excellent, just right for a trainer. Because of these, and the easy producibility of the airframe, serious thought was given to putting the airplane into production.

This was done with the backing of some notable Oregonians, including flying school operator Tex Rankin. The new firm, Aircraft Builders, was established in a plant at St. John, about six miles east of Portland. It was a really audacious move for the time, considering what the Depression was doing to the aircraft market. The first batch of six airplanes was started, using much more suitable tooling than the school had provided. The initial shop work force totaled five.

The only significant structural change from the Adcox-built airplane was to use pressed sheet aluminum for the wing ribs, which were manufactured in Cleveland, instead of wooden trusses. Increased fuel capacity and minor structural changes brought the gross weight up to 1,500 pounds, 90 more than the prototype.

The Aircraft Builders aircraft, designated Student Prince X, was in a different legal situation than the custom-built Adcox product had been. Since the production models had potential for commercial sales outside the state, they had to be eligible for regular federal licenses. This meant a higher degree of engineering analysis, production inspection and flight testing. In spite of extra effort in these areas, the design still did not meet the complete requirements for a full approved type certificate (ATC).

It did, however, qualify for a somewhat lesser Category 2, or Memo, approval, 2-

Before and after: The 1954 photo above shows early modifications that include a Kinner engine; it was not till 1963 that this Student Prince received the 220-hp Continental. At the same time the rudder was enlarged, as was the center cutout for easier access to the cockpit.

Each Student Prince was subject to individual airworthiness inspection, and only three of the six produced received certification. Two of those are still flying in Oregon today.

ADCOX STUDENT PRINCE

Specifications

Powerplant	American Cirrus III 85 hp @ 1,900 rpm
Wingspan	30 ft 3 in
Length	23 ft 5 in
Wing area	240 sq ft
Wing loading	5.88 lb/sq ft
Power loading	16.59 lb/hp
Empty weight	825 lb
Gross weight	1,410 lb

Performance*

High speed	110 mph
Cruising speed	80 mph
Landing speed	37 mph
Initial climb	1,200 fpm
Service ceiling	15,000 ft
Range	500 sm

**Published performance figures are engineers estimates for the prototype. Most are believable, even a 37-mph landing speed; but an initial climb of 1,200 fpm is not, nor is a range of 500 miles on 20 gallons of fuel for a 301-cubic-inch engine.*

258, which was issued on August 14, 1930. This still permitted commercial revenue operation on a standard (NC) federal license, but reflected a difference in production status. Each airplane had to be inspected individually for workmanship, materials and so forth. Only three of the six were certificated; those that were not were limited to operation in Oregon.

The customers were well pleased with their Student Princes. The only serious drawback was the undependable Cirrus engine. It soon was replaced by the 100-hp Kinner K-5 in four aircraft, a 110-hp Warner Scarab in one and a 150-hp Comet in another. These air-cooled radials significantly altered the appearance of the airplane. All of the engine changes were accomplished as individually approved modifications or simply were done without approval, for no new powerplant, weight or performance figures were issued under the Memo approval.

Other individual modifications were accomplished from time to time, notably changes in rudder shape, reinforcement of the landing gear, a switch to low-pressure tires and the adoption of tailwheels, as more and more airports outlawed tail skids.

At least two of the production Student Princes are flying today. One, more extensively modified than the other, is in a unique situation for a factory-built airplane—it is licensed as Amateur-built.

After Oregon came into the federal fold, the old freedom for uncertificated types no longer applied. Airplanes ineligible for standard or other special-purpose licenses had to operate on highly restrictive, straight Experimental certificates. Since this airplane was to be used for recreational purposes only, never had been licensed and was rebuilt extensively and modified from the original configuration, the Federal Aviation Administration was convinced that it was less than 50 percent original and therefore qualified for licensing in the new (since 1947) Amateur-built category. □

Originally, the Student Princes were equipped with Cirrus engines, but this picture shows N10686 with a more powerful Kinner engine and a war-surplus Ryan PT-22 propeller spinner.