

Yesterday's Wings

The Monoprep 218

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This early Mono Aircraft Monoprep was fitted with 1928-style Monocoupe landing gear and a curved center windshield panel. Compare fin and rudder shapes with later models in other photos.

The little Monoprep trainer of 1929 is an early example of a special-purpose spin-off of an established production airplane model. In 1927, the Central States Aero Co. of Davenport, Iowa, introduced a real innovation in general aviation airplanes—the two-seat, side-by-side cabin monoplane known as the Monocoupe. This was a big break with traditional design in several ways—first in being a low-powered (50- to 65-hp) two-seater at a time when most contemporaries were big, three-seat, open-cockpit biplanes with at least 90-hp engines; and, further, the side-by-side seating was a distinct novelty.

The lightweight Monocoupe caught on in the flying boom that followed Lindbergh's flight, and was a best seller in a weight class that it had pretty much to itself for a while. Prosperity brought a corporate name change to Mono Aircraft Co. and relocation of the factory to Moline, Ill. While the contemporary biplanes were mostly "all-purpose" types that could be used for training, sport and various commercial operations, the Monocoupe was in a middle area and was neither a trainer nor a workhorse even though

some flying schools did use it.

Recognizing the need for a specific primary trainer equivalent of the Monocoupe, designer Don Luscombe utilized some major Monocoupe components to come up with a bare-minimum trainer that he named the Monoprep. This utilized the high, one-piece, wood-frame wing of the Monocoupe with the same V-strut bracing. The steel-tube tail surfaces and the landing gear were also existing Monocoupe components.

The major change was in the fuselage. Instead of being laid out to accommodate a full cabin, the steel-tube structure was considerably shallower, with the wing supported on superstructure above an open cockpit to create a parasol monoplane. Seating was still side-by-side at dual-stick controls.

A certain amount of tradition was involved in the change to an open cockpit for a trainer—cabins were still new and training was preferably done out in the open for what was then considered the necessary "feel" of the wind. The seating was a definite break with tradition, however. Since World War I days, the military had preferred

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separate tandem cockpits in spite of the fact that side-by-side trainers had been tested from time to time and greatly improved communication successfully demonstrated.

One major disadvantage to side-by-side seating was the need for a wider fuselage, which often blanked out a significant portion of the propeller arc and reduced the effectiveness of the tail surfaces. The objections largely vanished in the early postwar years when three-seat commercial models appeared with passengers alongside each other in the front cockpit and the pilot alone behind. When controls were installed in the front cockpits of such designs for training, they were on the centerline and the instructor and his student still operated in tandem.

Luscombe had very good reasons for going side-by-side with the Monoprep. For one, the airplane was a relatively minor adaptation of the existing Monocoupe, which cut down on the design time and tooling requirements. Second, the lightweight Monocoupe had already come up with the simplest solution to the serious longitudinal balance problem. In the big military trainers, it did not make too much difference whether one or both cockpits were occupied. In small designs, the crew weight makes up a much higher percentage of the total weight and variations have a much greater effect on balance. With both bodies right on the center of gravity, as in the Monocoupe and Monoprep, trim is not affected by changes in individual weight or by the presence or absence of a second person. The principal disadvantage, as the airplane gets smaller, is the proportionally wider fuselage.

Don Luscombe was a great believer in the benefits of side-by-side seating and, when he left the successor company to Mono, he designed the same feature into the famous Luscombe line, which in turn influenced Cessna, among others.

The engine used in the Monoprep was the same 55-hp Velie M-5 used in the 1927-28 Monocoupe and was itself a notable pioneer with a rather unusual background. It was a five-cylinder, air-cooled radial and the first true American-produced lightplane engine to achieve significant use. It was designed in 1925 by Glenn D. Angle as the Detroit Air Cat at the request of Eddie Rickenbacker, who felt that what American aviation needed was a good light airplane engine to replace the heavy 90-hp, war-surplus Curtiss OX-5, which required a big airplane to carry it.

After a few prototypes were built by the Detroit Aircraft Engine Works,



A later Monoprep had a revised tail shape and different landing gear but retained the original curved windshield. A full-depth, hinge-forward door on each side of the cockpit has a step below it.

This mud-spattered late Monoprep has a flat-panel windshield and a small steerable tailwheel added to the spring-leaf skid. Elbow room was a bit better than in the Monocoupe because an arm could be rested partially out of the cabin, on top of the door.



the engine was ready for production but was not built by Detroit; the design was sold to the Le Blond Aircraft Engine Corp., a newly formed subsidiary of the well-established Le Blond Tool Co. Angle then designed another engine, which was placed in production as the Velie M-5 by Velie Motors, a supplier of engines to the auto industry. Unfortunately, this was so similar to the Air Cat Le Blond had bought that Velie was sued for patent infringement.

In spite of this, the M-5 was quite successful and was used by other builders beside Mono. Although selling well by the aviation standards of the time, there were not automotive quan-

ties; Velie sold the design to Lambert Aircraft Engine Corp., controlled mostly by Mono management, in May 1929, and the plant was located in Moline. Power was soon increased to 90 hp; this engine remained the principal powerplant for the Monocoupe and remained in production until 1941. Only one Lambert 90 was tried in a Monoprep; the others stayed with the Lambert-built Velie.

The first few Monopreps were certificated under Memo Approval 2-90 in August 1929. After a few minor refinements were made to the design, the Monoprep received full Approved Type Certificate A-218 on August 30, 1929, with some variants licensed

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under Memo 2-128 issued in September. Note the ATC number—it coincides with the sales model number of the airplane. Mono had this unique way of identifying its production models at that time—numbering them according to the corresponding ATC number. The procedure was soon changed, however, to reflect the horse-

MONOPREP 218

Specifications

Powerplant	Velie M-5 55 hp @ 1,850 rpm
Span	32 ft
Length	21 ft 10 in
Wing area	143 sq ft
Wing loading	9 lb/sq ft
Power loading	23 lb/hp
Empty weight	783 lb
Gross weight	1,288 lb
Fuel capacity	15 gal

Performance

High speed	92 mph
Cruising speed	80 mph
Landing speed	37 mph
Initial climb	680 fpm
Ceiling	9,000 ft
Range	290 mi

power, such as Monocoupe 90, 110 and 145, but this was after the Monoprep was out of production.

Monoprep production continued into early 1930, with minor refinements being added in parallel with their appearance on the Monocoupe, which had by then taken on a number of powerplant options and developed another spin-off called the Monosport. Through all these, the Monoprep stayed with its original engine and the concept of spartan simplicity.

The initial price was \$2,675, soon increased to \$2,835 for the fully certificated model. This was slashed to \$2,575 in 1930 as the firm sought to sell airplanes in that disastrous year.

The innovative Monoprep successfully held its own against a generation of 60- to 90-hp, open-cockpit trainers that followed it, but was done in—as were the others—by the depression. Of Mono's products, only the Monocoupe survived, and then only through a corporate takeover by another firm. The concept of the ultra-light and bare-minimum, open trainer was carried on by other manufacturers who struggled to survive in the depression, and it is interesting to note that these initially open models gradually evolved back to fully enclosed cabin types to end the design cycle started by the original spin-off of the open-cockpit Monoprep from the closed-cabin Monocoupe. □