YESTERDAY'S WINGS

THE AERO ENGINEERING-PHILLIPS Actoncet

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The sleek Aeroneer of 1936-39 was developed as a civil two-seater soon after the end of the depression opened up a market for new and more advanced designs than had previously been available from the industry. In fact, the Aeroneer, which had the two model numbers of 1-B and X-PT, was so slick that it looked more like a military design than a sportplane. When it failed to win buyers in the civil market, it was offered to the military.

The design originated under rather unusual circumstances. It was not the product of an established manufacturer; rather, it was developed by a small Southern California team of designer-pilots known as the Aero Engineering Co. After successfully test flying their creation late in 1936, the little company went looking for financing and a production facility to build an initial batch of 25 airplanes. Backing was obtained from James A. Phillips, who was based on Metropolitan Airport at Van Nuys, Calif., and the operation was moved there early in 1937. Testing was continued toward eventual certification at Van Nuys. The airplane then received its name of Aeroneer but was still recognized as an Aero Engineering product, not a Phillips.

Construction of the new design was somewhat of an innovation for the sport-trainer field of the day, although it was well established in the military and transport fields. While there were all-metal lightplanes around at the time, including monocoque sheet-metal fuselages, the wings and tails of these contemporaries were still fabriccovered. The Aeroneer brought heavyplane construction to the small twoseater with its metal-skinning of those

View of the early Aeroneer from above shows the relatively short ailerons, sharply pointed nose, and the two halves of the rearward-sliding canopy, which opened on either side independently.



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surfaces. Instead of the traditional twospar wing, or even the single spar with torsion-box leading edge, the Aeroneer used a heavy main spar and auxiliary web-type spars for the outer wing panels. These were butt-joined to the center section through flanges in the manner of the contemporary Northrop military attack planes and the Douglas DC-3. As on those models, considerable dihedral was built in at the wing joint.

Another unusual feature for a lightplane at the time was the flap arrangement, with long-span, split-trailing-edge flaps located in the outer panels between the center section and the very short-span ailerons, plus another split flap across the entire span of the center section. The airfoil section was the NACA 2212.

While tandem seating was preferred for straight trainer types, side-by-side was more sociable and was gaining favor in the lightplane field. The Aeroneer placed the two at dual stick controls and introduced the novelty (for a sportplane) of a designed-in rearwardsliding canopy over both seats. Unlike some hatches that were added to existing open-cockpit designs, the Aeroneer could fly with the canopy fully open. The initial powerplant was an inverted 125-hp Menasco C-4 air-cooled engine.

The tailwheel-type landing gear gave the plane its military look and featured single main gear legs fastened to the center section. Drag was reduced by having the struts centered over the wheels, which were enclosed in streamlined fairings that were then called pants. Intersection drag between the struts and the pants was minimized by the centerline arrangement-a notable contrast to some of today's designs where the fairing is alongside the strut and the resulting pocket adds considerably to the drag instead of reducing it. The landing gear legs were much longer than they needed to be for the required propeller ground clearance but were dimensioned to give a high three-point ground angle for lowest landing speed.

The approval testing went slowly,

Flight view (above) of the Menasco-powered Aeroneer 1-B. The Aero Engineering Aeroneer 1-B became the Phillips X-PT (below) with longer wings. The nose was shortened six inches because of the greater weight of the six-cylinder Ranger engine compared to the four-cylinder model.





and was not completed until June 1938. One problem was a vicious stall, caused to a great extent by the sharp taper of the untwisted wing. Rather than correct it by building in twist, which would mean a complete rebuild of the cantilever wing, the airfoil was modified toward the tips by adding sheet metal bulges that increased the radius of the leading edge curvature, a trick that anticipated some of the present-day STOL conversions by 30 years. Such fixes worked, and the Aeroneer 1-B, still identified as an Aero Engineering product, was awarded Approved Type Certificate A-693 in June. This was made retroactive to October 31, 1937, at which time the firm had been reorganized as the Phillips Aviation Co.

The marketing effort aimed at gen-

eral aviation brought no results whatever in spite of snappy performance, racy lines and a reasonable price tag of \$4,950, plus an offer of engine options. A decision was then made to modify the design and go after light military business, both in the United States and abroad. The U.S. Army had a new primary trainer competition coming up in 1939 and Phillips felt the Aeroneer would have a good chance there.

Two major changes were made. New outer wing panels, which increased the span nearly four feet, were built, and the Menasco engine was replaced by another inverted air-cooled in-line—the 165-hp six-cylinder Ranger. Also, the plane officially became a Phillips, with the new designation of X-PT for Experimental Primary Trainer. The changes invalidated the ATC, so the Aeroneer flew again on a straight experimental license. It went to Wright Field for the fly-off and performed well. Monoplanes finally scored a major breakthrough in the military primary trainer field, with both Ryan and Fairchild, with tandemseat open-cockpit designs, winning significant orders in competition with established biplanes. The Aeroneer was not to share in this, however; the Army was not interested either in side-by-side seating or enclosed cockpits for primary trainers.

The Aeroneer returned home, still without having made a single sale, its only achievements being subsequent appearances in a few movies. It survived well into the post-WW-II years, but nothing is known of its eventual fate.

	Aero Engineering Aeroneer 1-B	Phillips Aeroneer X-PT	
Specifications			
Powerplant	Menasco C-4, 125 hp @ 2,175 rpm	Ranger 6-410B-1, 165 hp @ 2,450 rpm	[
Span	32 ft 6 in	36 ft 2 in	
Length	24 ft	23 ft 6 in	
Wing area	168 sq ft	195 sq ft	-
Wing Loading	12.6 lb/sq ft	12.8 lb/sq ft	-
Power loading	17.2 lb/hp	15.1 lb/np	
Empty weight	1,444 lb	1,690 10	
Gross weight	2,160 lb	2,500 lb	
Performance			
High speed	140 mph	150 mph	
Cruise speed	130 mph	130 mph	
Landing speed	1		
(flaps)	49 mph	46 mph	
Landing speed	1		
(no flaps)	57 mph	53 mph	
Initial climb	750 fpm	1,000 fpm	
Service ceiling	15,000 ft	17,000 ft	
Range (75%)			
power)	600 sm	500 sm	

The original Aeroneer 1-B (above) had a wooden propeller while the X-PT (below) had a ground-adjustable metal propeller. The X-PT had greater wing span, elliptical wingtips and longer, narrower ailerons.

