

A.T.C. #177
(7-29)
CUNNINGHAM-HALL PT-6



Fig. 247. A Cunningham-Hall PT-6 with a 300 h.p. Wright J6 engine; shown is the prototype.

The James Cunningham & Sons, Co. founded in 1838, was long famous for high quality horse-drawn carriages and coaches, and also famous for fine custom-made automobiles. Upon study of the trend, they decided it was perfectly logical and quite reasonable for them to branch out into the manufacture of the latest mode of transportation, the airplane. Formed as a subsidiary unit, with operating space in the factory building of the James Cunningham & Sons, Co., the Cunningham-Hall Aircraft Corp. launched an enthusiastic program to manufacture the Cunningham-Hall PT-6. The PT-6 (also CHPT-6) designed as a personal transport, was a fairly large and rather buxom cabin biplane of handsome and generous proportions, with comfortable seating for six; though labelled as an "all-metal airplane", it was not in the true sense. The PT-6 was of all-metal framework but fabric covering was used for most of the airframe; construction data at the end of this chapter will explain this in more detail. Powered with the new 9 cyl. Wright "Whirlwind" J6 series engine of 300 h.p., this craft had a sprightly performance with an efficient utility that offered payload, comfort, and spaciousness. The passenger's compartment in the main cabin section seated four, and was quite large to avoid cramped quar-

ters; entrance and exit was gained through a large door at the rear. The pilot's compartment up forward, was separate from the main cabin section but access was possible through a bulkhead door; this forward compartment, raised slightly above the main cabin section, seated the pilot and one passenger with separate entry or exit possible by a side-panel door on each side. Visibility in the main cabin was quite good and the pilot also, in his elevated position, had exceptional visibility in most all directions.

The Cunningham-Hall PT-6 (CHPT-6) was designed and developed by Randolph F. Hall, who had been active as an aircraft designer, engineer, and stress analyst with various aircraft companies since 1915; his broad experience and practical good sense was well reflected in the handsome lines of the PT-6. The first PT-6, as shown here, was introduced in the early part of 1929; it was X-461E with serial # 2961. The type certificate number for the Cunningham-Hall PT-6 as powered with the Wright J6-9-300 was issued in July of 1929 as a dual-controlled airplane, and re-issued in September of 1929 with single controls. The PT-6 (Personal Transport-6place) was manufactured by the Cunningham-Hall Aircraft Corp. at Rochester, New York and about 6 of this type were

CUNNINGHAM-HALL PT-6

built in all. F. E. Cunningham was the president; Randolph F. Hall was V.P. and chief engineer; Paul D. Wilson was chief pilot, and Wm. T. Thomas, one of the pioneers in American aviation, was consulting engineer.

Though very well designed with a bag full of attractive features, the PT-6 got off to a rather bad start: a second airplane (NC-692 W, serial # 2962) was not built until 1930. The Guggenheim Safe Airplane Contest of 1929, prompted entry in the tests with the special-built Cunningham-Hall model X which was an unusual "inverted sesqui-plane" with the largest wing on the bottom. This 2 place craft was powered with a Walter (Czechoslovakian) engine and though performance was excellent, it did not survive the preliminary judging. A model PT-6F was built as a freighter in the latter "thirties", and though only 6 of this type were built in all, there is still at least one that has been serving usefully as a hard-working "bush-plane" in our northwest country.

Listed below are specifications and performance data for the Wright J6 powered Cunningham-Hall model PT-6; length overall 29'8"; hite overall 9'7"; span upper 41'8"; span lower 33'8"; chord upper 78"; chord lower 54"; wing area upper 239 sq.ft.; wing area lower 131 sq.ft.; total wing area 370 sq.ft.; airfoil "Clark Y"; wt. empty 2670; useful load 1680; payload 910; gross wt. 4350 lbs.; max. speed 136; cruising speed 115; landing speed 45; climb 900 ft. first min. at sea level; service ceiling 17,500 ft.; gas cap. 90 gal.; oil cap. 6 gal.; normal range at 15 gal. per hour

was 6 hours or 690 miles; price at the factory was \$13,900. The fuselage framework was built up of welded chrome-moly steel tubing, and quite unusual is the fact that the longeron tubes were squared at all of the joint intersections to eliminate the curved bevel ends that would be necessary with the joining of round tubes; the structure was then faired to shape and the cabin portion was covered with corrugated "dural" sheet. The balance of the fuselage aft, was fabric covered. The cabin walls were sound-proofed and insulated against temperature changes, noise, and vibration, with thick blankets of Balsam-wool; a large baggage compartment was located to the rear of the main cabin section. The upper wing framework was built up of two spar-beams that were fabricated of chrome-moly steel tubing in girder form, bolted together; the spars in the lower wing panels were single, large diameter, chrome-moly steel tubes. The wing ribs for both panels were built up of riveted duralumin tubes in truss-type form and the leading edges of all panels were covered with dural sheet to preserve airfoil form; all completed panels were then fabric covered. Two fuel tanks of 45 gallon capacity each, were placed in the root end of each upper wing panel. Ailerons of construction similiar to the wings, were of the Freise offset hinge type and were in the upper wing panels only. The fabric covered tail-group was built up of welded steel tubing frame members, with sheet steel formers and ribs; the fin was ground adjustable and the horizontal stabilizer was adjustable in flight. The rudder was aerodyna-



Fig. 248. The PT-6 had a rugged metal structure; its large capacity was ideal for air freight service.



Fig. 249. The PT-6F was designed to haul freight in the bush country.

mically balanced, but it was somewhat unusual in that it used the offset-hinge type that was similar to that used on the ailerons; this type of control surface balance was used quite frequently, later on, but was still quite rare at this time. The split-axle landing gear was of the outrigger type and was fastened at one point to the spar of the lower wing; shock absorbers were "Aerol" struts, wheels were 32x6, and Bendix brakes were standard equipment. A normal type, shock-cord sprung tail-skid was used, but a tail-wheel was available as optional equipment. A metal propeller, inertia-type engine starter, exhaust collector-ring, and wings wired for lights were also standard equipment.

The last version of this model, also built under this A.T.C. number, was the PT-6F of the latter "thirties", that was powered with a 9 cylinder Wright engine of 330-365 h.p.; this version was specially arranged for hauling air-freight but the cabin could be easily

arranged to carry four passengers. The configuration and construction of the model PT-6F were typical except for the low-drag cowling that was mounted over the engine; large low-pressure tires were used on the main gear and a swiveling tail-wheel was used in place of the tail-skid. Cabin interior of 156 cubic foot capacity was lined with corrugated aluminum alloy sheets, and had a large opening in the ceiling for lowering freight into the cabin compartment. A large 56 inch door in the side of the fuselage, allowed entry for bulky articles, Listed below are the changes in weights and performance of the PT-6F (Freighter) to compare with the earlier PT-6; dimensions were more or less the same. Weight empty 2875; useful load 1675; payload 915; gross weight 4550 lbs.; max. speed 150; cruising speed 130; landing speed 55; climb 1100 ft. first min. at sea level; usable ceiling 20,000 feet.