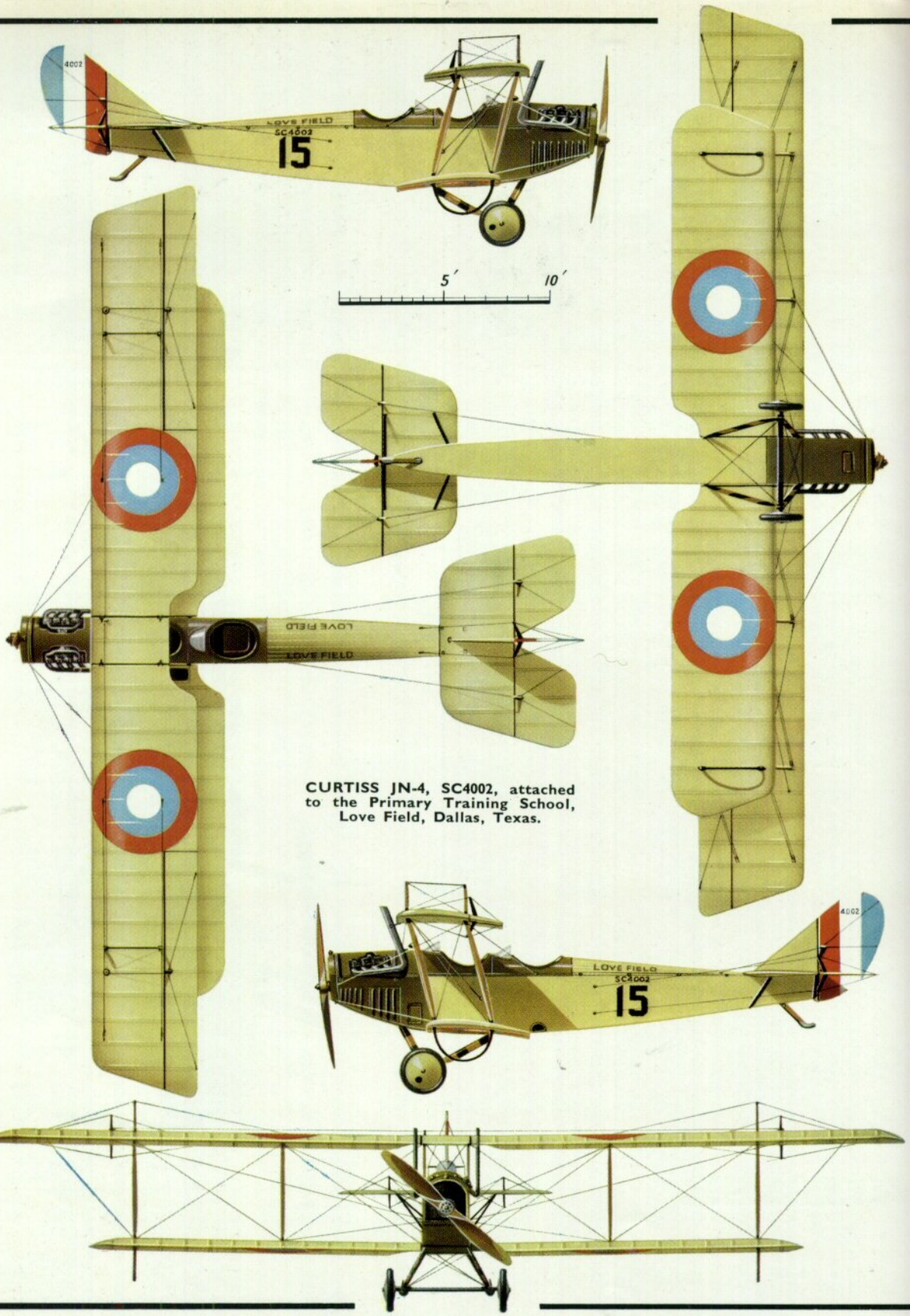
PROFILE PUBLICATIONS

The Curtiss JN-4

NUMBER 37



CURTISS JN-4, SC4002, attached to the Primary Training School, Love Field, Dallas, Texas.

Name of field and combination of small serial and large aircraft number were peculiar to primary training aircraft. National markings and colouring are standard for 1918 period.

The Curtiss JN-4

by Peter M. Bowers

JN-4D with clear-doped surfaces and the star-in-circle wing marking that was adopted in May 1917.

The Curtiss "Jenny", to apply the name to the entire JN-4/JN-6 production series, was one of those ordinary designs that attained immortality through the fortunate coincidences of timing and circumstance. As an aeroplane, it was little better than its contemporaries, and its fame was all out of proportion to its capabilities. Although it was developed and used under wartime conditions, it did not win fame as a combat machine. The major production models were primary trainers and most never left the United States. While the career of a 1914 design should logically have ended at the end of the war in 1918, a whole new career opened up after the Armistice that was destined to add to the fame of the now venerable bird. Thousands of war-surplus JN-4s came on the market and were available to civilian owners at fractions of the price of factory-new machines. Practically every civilian flying school used the Jenny as standard equipment during the early post-war years, and owners by the hundreds took their surplus machines into the countryside on barnstorming tours, flying exhibitions at county fairs, hopping passengers, carrying advertising, etc.

Progress finally caught up with the Jenny. Increasingly stringent regulations pertaining to airworthiness finally drove it from the skies in 1928, but that was not the end of the legend. A few survived on experimental licences to work in motion pictures, and in the years since W.W.II, a surprising number have been unearthed from various hiding places and are now being restored and flown as part of the very active antique airplane boom now taking place in America.

ORIGIN OF THE DESIGN

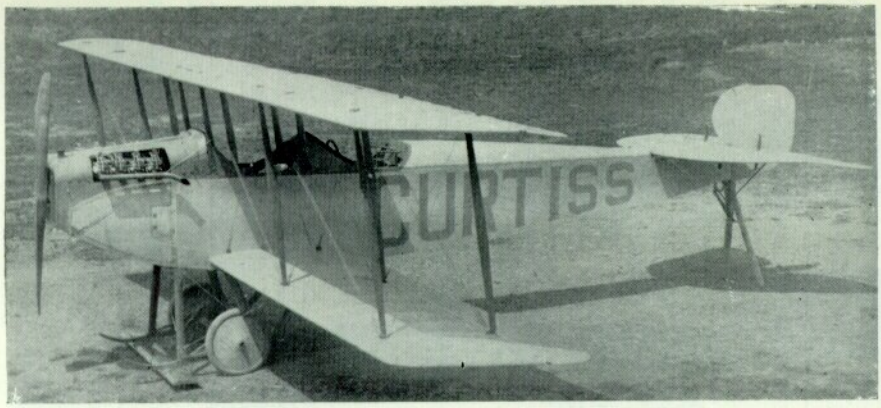
The requirement for a tractor-type training plane for the U.S. Army originated in 1914. Army officials had become greatly concerned over the poor safety record of the service flying schools, notably that at North Island, San Diego. The crashes and fatalities were laid to the inefficiency of the open pusher aircraft designs then in use. With an eye toward contemporary European designs, which were recognised as being more advanced, the Army encouraged American manufacturers to adopt the tractor configuration and the enclosed fuselage.

The Curtiss Aeroplane Company of Hammondsport, New York, was a principal supplier of training machines to the Army. Recognising that the days of the pusher were numbered, the company had set about developing a tractor model on its own before the ban on pushers took effect. The new design, a side-by-side two-seater designated Model G, was not notably successful even though the Army did buy both of the examples that were built. The company was short in tractor design and operating experience, so to save on the necessary development time, Curtiss decided to buy experience rather than develop it. After the decision was made to obtain an experienced designer, Mr. Glenn Curtiss hired B. Douglas Thomas, who had been a designer for Avro in England and was at the time a designer for Sopwith.

Mr. Thomas began the design of the new Curtiss tractor, to be designated the Model "J", while still in England, and completed it at Hammondsport. Powered with the 90-h.p. water-cooled OX engine built by the Curtiss Motor Company, the "J" drew heavily on Thomas's experience with Sopwith tractor designs, even to the shape of the one-piece vertical tail. The airfoil was the proven French Eiffel No. 36. A purely Curtiss feature, however, was the control system. Forward and aft motion of the control column operated the elevators and the wheel worked the rudder. Aileron control was by means of a yoke fitted to the pilot's shoulders, and he leaned in the direction he wanted to bank the machine.

While the "J" was a successful design from the start, it was recognised as being only a beginning, and improved models followed it closely. The "N" was a very similar design, but with ailerons located between the wings as on earlier Curtiss models while the "O" was essentially the "N" modified to side-by-side seating. The best features of the "J" and the "N" were combined into a new model, the "JN". Development of the basic Model "J" ended at this point, but the "JN" and the "N" models continued to be developed separately. A slightly improved JN-1 model brought small orders from both the Army and the Navy, while significant production for the period was achieved

** All the photographs appearing in this profile are part of the Peter M. Bowers' Collection.*



The Curtiss Model "J" in completed form. Its initial flights had been made without fabric covering on the fuselage.

Curtiss Model "N", similar to the "J" except for minor details and between-wings ailerons.

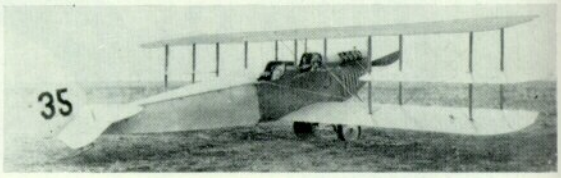
with an order for ten JN-2s placed by the Army in 1915. Outwardly, these resembled the original Model "J" except for having a revised undercarriage, equal-span wings, and ailerons on both upper and lower wings. The second JN-2, however, U.S. Army Serial Number 42, had an overhanging upper wing, as on the JN, with ailerons on the upper wing only. It was this machine that effectively crystallised the "Jenny" configuration with its nose, undercarriage, and wing details.

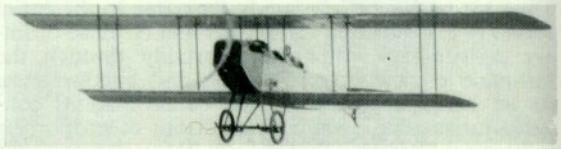
The name "Jenny" was itself another product of coincidence. As with boats, airplanes seemed to develop personalities of their own, and were regarded by their crews as having feminine characteristics. The appearance of the new "JN" model from the marriage of the "J" and the "N" naturally resulted in the corruption of the new model designation into the feminine name "Jenny". Somehow, this particular name was perfectly suited to the personality of the airplane—much more so than some other, such as "Betty" or "Ann". So firmly did the name become associated with the particular airplane that the whole barnstorming era of 1920–26 is generally referred to by latter-day historians as "The Jenny Era" even though there were nearly as many contemporary and similar-looking Standard Model J trainers being used for the same purpose at the same time.

INITIAL JN-4 PRODUCTION

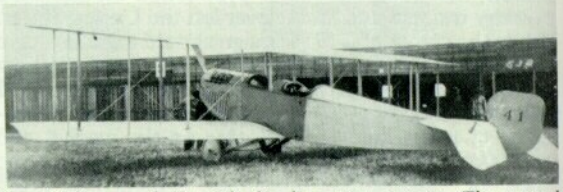
While initial orders from the U.S. military services were slow, the war then raging in Europe provided a large market for the new trainer and for other Curtiss models then in production. An improved JN-3 model, strongly resembling the second JN-2 but fitted with a fixed vertical fin, and the more conventional "Deperdussin" control system, in which the wheel operated the ailerons and a rudder bar operated the rudder, was sold in large numbers to both the Royal Flying Corps and the Royal Naval Air Service. A Canadian subsidiary of the Curtiss Company was established in Toronto, and some of the British production was undertaken in this plant. There were certain features of the JN-3 that the British didn't care for, however, and changes were requested. These were undertaken by a separate firm, Canadian Aeroplanes Ltd., also of Toronto, under the direction of Mr. F. G. Ericson.

The major change was replacement of the Deperdussin control, with the "Stick" type preferred by the R.F.C. In the interest of improved control, ailerons were fitted to both wings and were inter-connected by struts. Wing, fuselage, undercarriage, engine installation, and horizontal tail surface construction remained essentially the same, but the vertical tail construction





The "JN", created by combining the better features of the "J" and "N" models.

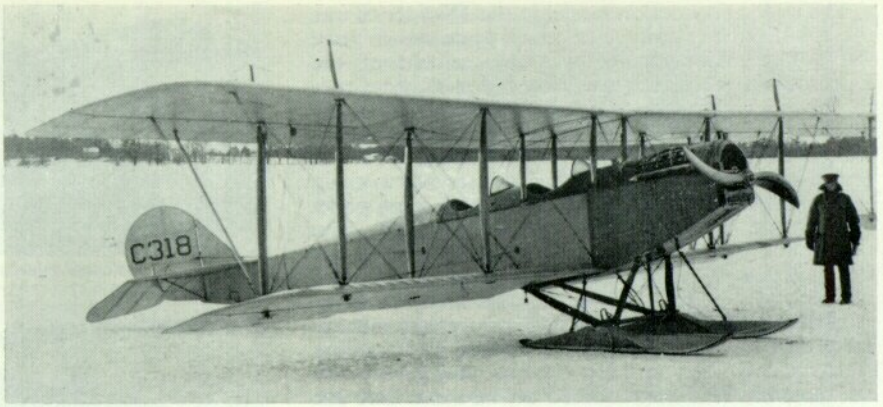


Ten JN-2s were built with this long-wing pattern. The second machine had a shorter lower wing on the pattern of the JN.

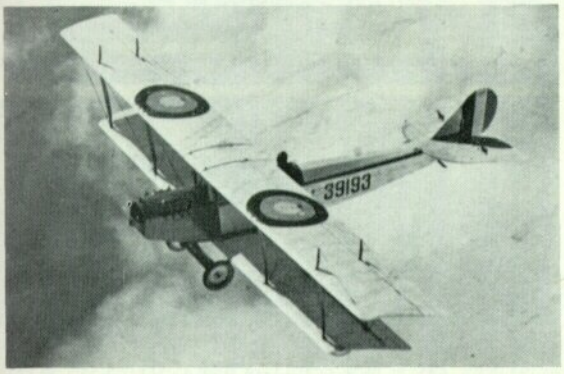
Model JN-3, which was built in quantity for the R.F.C. and the R.N.A.S.

and shape were both revised. Even though the improvements were not developed through Curtiss engineering channels, the new 1917 model was given the designation of JN-4, since it was a direct development of the JN-3. The fact that the American firm had produced a JN-4 model of its own was not considered. When Canadian-built JN-4s were acquired later by the U.S. Army for its expanded training programme, and when Canadian aircraft and crews were sent to U.S. bases in Texas for winter training, distinction between the U.S. and Canadian models became necessary. The official designation given to the Canadian model was JN-4Can, to designate its Canadian manufacture, but it was universally referred to as the "Canuck", a slang term used for Canadians and anything Canadian. The American models, in spite of a number of separate model designations, were still "Jennies". Canadian

The Canadian J-4, introduced early in 1917, was developed from the JN-3 quite independently of the American production series. This was the first aeroplane in Canada to use skiis.



Late production Canadian JN-4 with 1918 U.S. military markings. Compare wingtip and tail surface shapes with JN-4D on page 3.



Prototype American Curtiss JN-4. Tail is virtually identical to JN-3, but was modified on production versions.

Aeroplanes Ltd. also produced a number of American-designed JN-4As along with the "Canucks", but since these had the features of the other late American models, they did not pick up the Canadian nickname.

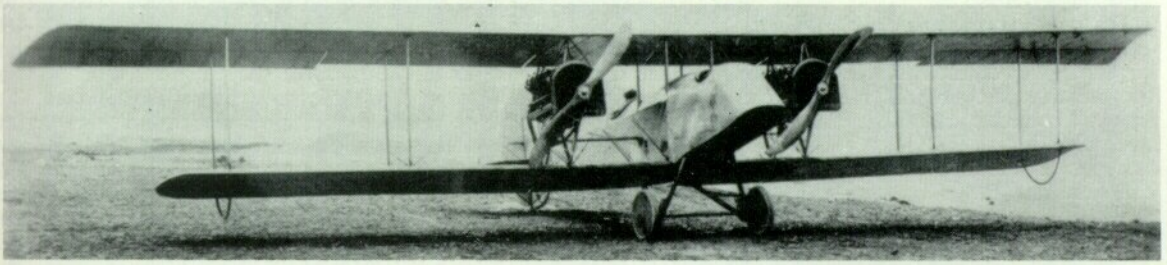
JN-4 DEVELOPMENT

Only the one version of the JN-4 was developed by Canadian Aeroplanes Ltd., but the Curtiss firm, now reorganised as the Curtiss Aeroplane and Motor Company, and re-located in new plants at Buffalo, New York, continued to develop the basic "JN" and "N" designs and assigned different designations to indicate their improved status. The American JN-4 model appeared in July 1916, and was virtually indistinguishable from the JN-3. The "Dep" control was retained, as was the tail skid pivoted to the bottom of the rudder post, which terminated a considerable distance below the fuselage. A new twin-engine design appeared at the same time as the JN-4. It was tentatively designated "JN-5", but the name was never adopted. This design, using JN-4 outer wing panels and engines, was referred to by Curtiss and its military customers alike as "Twin JN".

The JN-4 was followed within four months by the greatly improved JN-4A model, which incorporated several noticeable external changes. The greatest change was in the tail surfaces, both the horizontal and vertical surfaces receiving new and enlarged shapes that were to stay with the design through the rest of its development. The wings, which incorporated only one degree of dihedral on the earlier models, were rigged with four degrees, and ailerons were added to the lower wing, the rear of the wing tip was pointed in duplication of the upper wing shape. Models without lower wing ailerons, from the second JN-2 onward, had nicely rounded lower wing tips. The final distinguishing feature of the JN-4A was the pronounced downthrust of the 90-h.p. Curtiss OX-5 motor. JN-4s were produced both for the U.S. Army and the R.N.A.S. by Curtiss and by Canadian Aeroplanes Ltd.

The JN-4B was very similar to the JN-4A and was distinguishable from it only in the return to low-dihedral wings, ailerons on the upper wing only, and no downthrust for the engine. There was an American-built JN-4C, but only one was built as an experimental variant of the JN-4B, using the R.A.F. 6 airfoil of the "N" series in place of the Eiffel 36 section.

Twin JN used JN-4 wing panels and engines on a modified fuselage. Starboard engine modified to turn opposite to port engine to neutralise propeller torque in flight.



The major production model in the JN-4 series was the JN-4D, the prototype of which appeared in June 1917. The major change was replacement of the Deperdussin wheel control with the stick type previously adopted on the "Canuck". The engine had the downthrust of the JN-4A. The wings of the prototype were identical to those of the JN-4A except for a centre-section cut short at the rear spar and trailing edge cut-outs on the inboard end of each wing panel to improve visibility from the rear cockpit. The production JN-4Ds deleted the lower wing ailerons and reverted to the rounded lower wing tips. A total of 3,354 Ds were built by Curtiss and six other American firms for the American war effort. Manufacture of JN-4Ds is sometimes credited to Canadian Aeroplanes Ltd., but these were actually JN-4Can's and possibly JN-4As procured at the same time the D orders were being placed.

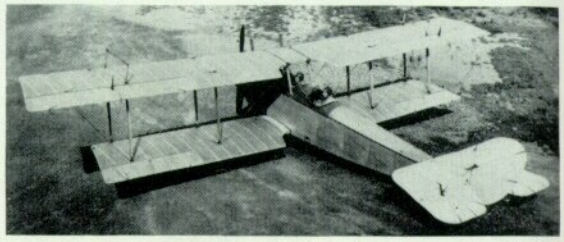
Curtiss built one prototype of an improved model, the JN-4D-2 (Serial No. *34191*) which was outwardly identical to the JN-4D. Production was scheduled for several of the sub-contracting plants, but these were cancelled at the end of the war and only the 100 ordered from the Liberty Iron Works of Sacramento, California, were delivered. The Liberty products differed from the Curtiss prototypes in not having the downthrust for the engine.

Up to the end of 1917, the Curtiss JN-4 models to D were regarded as primary trainers. When aircraft of increased horse-power and performance were needed for advanced training, new designs were sought and developed, notably the Vought VE-7. However, in the interests of economy both in design and tooling time, the government decided to put the larger 150-h.p. Hispano-Suiza engine in the existing Curtiss JN-4D design. This engine, a water-cooled V-8 quite similar in size to the Curtiss OX-5, was of Spanish origin, and produced by the famous motor-car concern located in Paris, France. It appeared late in 1915 and achieved an immediate reputation for performance and reliability after the Spad VII fighter was designated specifically to use it. Even before the United States entered the war in April 1917, manufacturing rights had been obtained by the Simplex Automobile Company, a subsidiary of the Wright-Martin Company. This latter company was itself the result of a 1916 merger of The Wright Company, the original Wright Brothers firm, and the Glenn L. Martin Company, formerly of California. Simplex had been a subsidiary of Wright, and remained a part of the new company. Orders were in hand to manufacture the 150-h.p. Hispano-Suiza engine for the French Government, and the facilities were expanded to permit production for the U.S. services as well. The engine was soon nicknamed "The Hisso", and the modified JN-4 airplane in which it was installed became the JN-4H. The latter did not signify the normal sequence of model evolution, as JN-4, JN-4A, JN-4B, etc., but identified the particular installation with "H-for-Hisso".

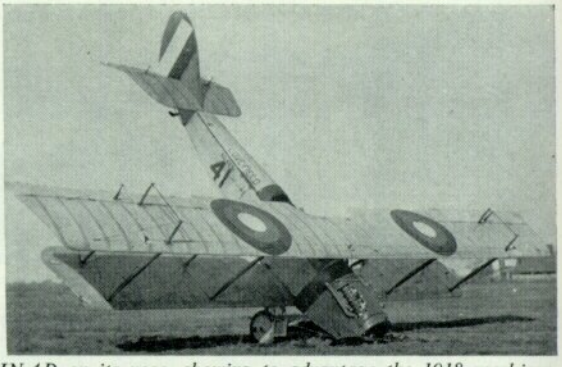
The changes made in the aeroplanes to accommodate the new engine were relatively minor. Since the larger engine required additional cooling surface for the radiator, the original radiator was enlarged by adding a rounded area at the bottom. The downthrust was deleted, and the fuel capacity was increased. At first, it was intended that the JN-4H be used in one configuration for a number of advanced training duties, but all the necessary equipment proved to be a weight and performance handicap. In May 1918, a

JN-4A was distinguished by new vertical tail shape and increased dihedral angle of wings.

JN-4B was produced as a civil model just before U.S. entry into W.W.I, and very few were acquired by the military.



Prototype JN-4D had ailerons on both wings as the JN-4A and introduced the centre-section cutouts that were a feature of all subsequent JN models.



JN-4D on its nose, showing to advantage the 1918 markings, khaki-brown metal cowling, clear-doped fabric, and a comparison of upper and lower wingtip shapes.

decision was reached by the government to divide JN-4H production into specialised aircraft functions, with appropriate designations for the airplanes. Gunnery trainers became JN-4HG-1 and -2 for one- and two-gun machines, the bomber trainers became JN-4HB, observation trainers JN-4HO, and pursuit trainers JN-4HP.

Curtiss did not build a JN-5 as such. Seeking to improve the JN-4H, the Army modified one JN-4H (Serial No. *41358*) by adding minor equipment and the larger tail surfaces of the Curtiss Model R-4, a somewhat similar but more powerful biplane. The prototype retained the upper-wings-only ailerons of the JN-4H, but the production versions had ailerons on both wings. Early production JN-6Hs had the R-4 type tail surfaces, but the majority reverted to the JN-4 type. The same special-purpose designation letters assigned to the JN-4Hs were used on the -6s.

JN-4Ds with special colouring and markings of an Army Ambulance plane. Section behind rear cockpit lifts off to permit insertion of patient on a stretcher.

One of 100 JN-4D-2s built by Liberty Iron Works, identical to Curtiss-built prototype except for elimination of the engine downthrust.

The single JN-4D-2 prototype built by Curtiss had the engine downthrust of the standard JN-4D model. Khaki-brown colouring adopted for trainers late in 1918.

MODEL "N" DEVELOPMENT

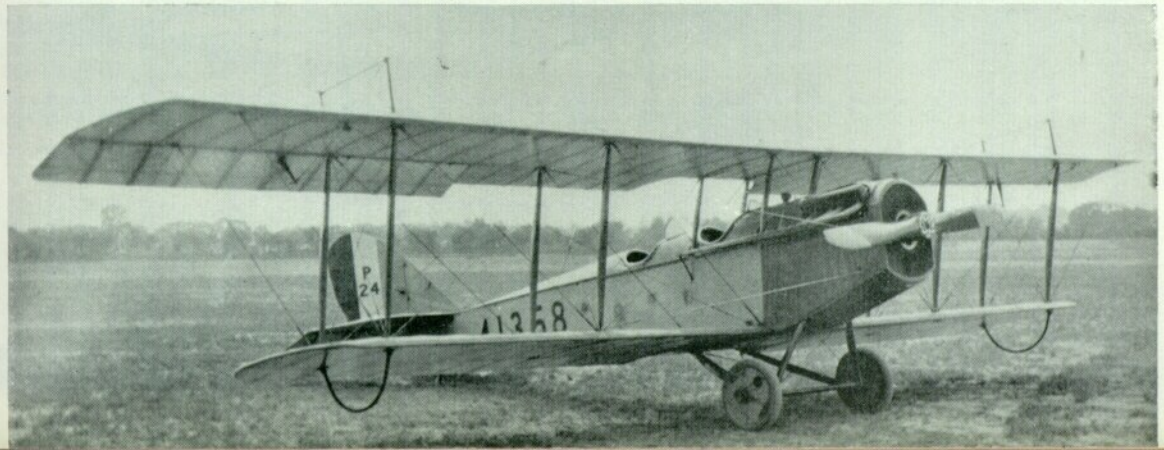
While not true "Jennies", the later "N" models deserve a place in this study. There is no record of any models between the original "N" and the N-8, and it must be assumed that the intervening numbers were assigned to paper studies. The N-8, used on active service by the Army in the Mexican expedition of 1915–16, was virtually identical to the JN-3 except for the old shoulder aileron control and the use of the R.A.F. -6 airfoil in place of the Eiffel. By far the most famous "N", however, was the N-9 developed for the Navy late in 1916. This was essentially a JN-4B fitted with the 100-h.p. Curtiss OX-6 engine and with the wingspan increased by 10 feet in order to carry the additional weight of a large centre pontoon and two wing tip pontoons. The extra span was obtained by using a wider upper centre-section and fitting in extra lower panels inboard of the standard size outer panels. As with the JN-4H, the Hispano-powered version of the N-9 became the N-9H. Five hundred and sixty N-9s were built for the U.S. Navy to war's end, but only 100 were by Curtiss. The remainder were built by the Burgess Co. of Marblehead, Massachusetts, under licence. An additional 50 were created in post-war years by assembling spare parts at the Pensacola Naval Air Station. One N-10 (Serial No. *2573*), was created at Burgess by shortening the wingspan of a standard N-9, but the design was not adopted for production.

POST-WAR MILITARY SERVICE

After the Armistice, most of the JN-4 models to D were declared surplus. Before sales were opened to the public, the Curtiss Company bought hundreds, not only of its own JN-4D model, but of the very similar Standard Model J. These were reworked slightly to suit them to civilian operation and were placed on the market. This phase of Curtiss' business was soon ended, and at a considerable financial loss, when remaining military stocks of the primary trainers were made available directly to the public at practically give-away prices.

Most of the Hisso-powered models, both JN-4H and JN-6H, were retained by the military following the decision that 90 h.p. was inadequate power even for a primary training machine at that period. The JNs, along with their naval equivalent, the N-9 seaplane, remained the principal primary trainers of both the U.S. Army and Navy for the first five post-war years. Because of post-war economy moves, replacements of new design did not begin to appear until about 1923. With both JN-4 and JN-6 models on hand, the Army sought a degree of standardisation, and rebuilt many of the machines on hand as JNS,

JN-4H airframe was identical to the JN-4D except for revised nose contours and radiator shape necessary to accommodate the 150 Wright-Hispano engine.



meaning JN—standardised. This work was carried on as late as 1925. There were some differences in powerplant, and these were reflected in the designation JNS-A and I (not to be confused with the figure 1) for the 150-h.p. Hispano-Suiza "A" and "I" models, and JNS-E for the model with the improved 180-h.p. "E" engine. In spite of the fact that these engines were officially called "Wright", after their American manufacturer, they were still universally referred to as "Hissos" by their users.

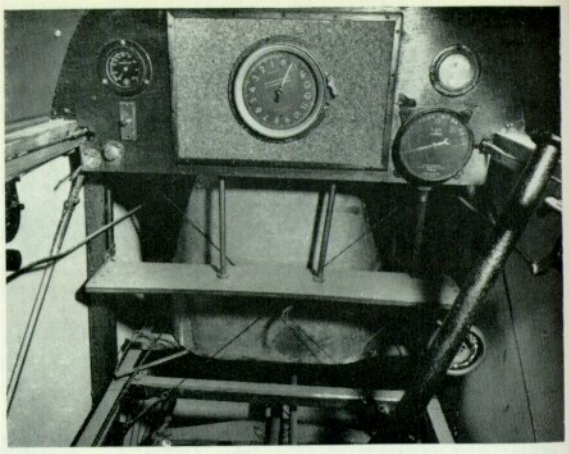
The military life of both the JNs and the N-9s continued until 1927. The last few in the Army, assigned to National Guard and reserve units, were scrapped in September 1927.

BARNSTORMING

The second career of the "Jenny" was unplanned. It just happened because the Jenny was available in quantity at low war-surplus prices at a time when thousands of former military pilots as well as those trained just after the war wanted a plane of their own in which to fly. Before the war, civilian flying had been a rich man's sport and the relatively few machines turned out were virtually custom models. They were neither docile nor reliable. The rapid advances made in aircraft design during the war years brought the machines to the point where they could be handled easily by relatively unskilled pilots. Actually, the State-of-the-Art had moved well past the Jenny by war's end, but the new machines could not be built and put on the market at a price that could begin to compete with the surplus prices of the Jennies, the Standards, and the Canucks. Consequently, it was not until about 1925, when the war-surplus trainers began to wear out, that the new production types were able to assume a significant rôle in U.S. commercial aviation. So thoroughly did the Jenny and its contemporaries dominate the early post-war years that they became known as "The Jenny Era".

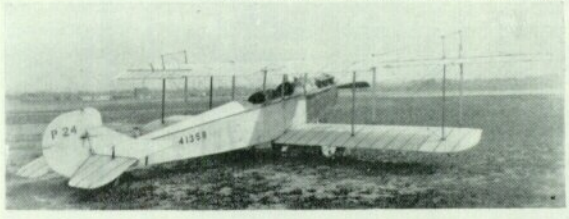
The most famous rôle of the Jenny in this period was that of barnstorming, a term borrowed from travelling theatrical troupes that performed in barns. A pilot with a single airplane and his mechanic-helper would travel from town to town, stopping in suitable pastures from which they would fly passengers for as long as they came forward. For a great many Americans, especially among the rural population, the Jenny was the first airplane they ever saw or took a ride in. Other pilots banded together into "Flying Circuses", performing all manner of now-illegal operations on the county-fair circuit. Some of these shows included such fantastic feats as a car-to-airplane transfer accomplished within the confines of a county fair race track, wing walking, and plane-to-plane changes at altitudes low enough for the grandstand customers to see.

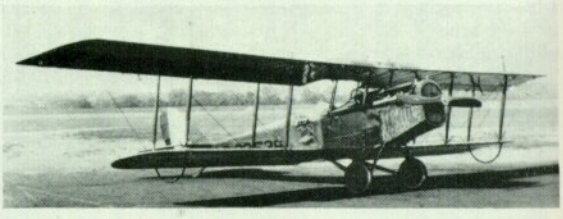
There was no government regulation of aviation in the United States until 1927, consequently, there was no supervision of maintenance, modification, or piloting proficiency. In some of the flying schools, the student that soloed first became the instructor for the others. The standards of maintenance in some of the better schools was quite satisfactory, but on the part of most individual owners and the barnstormers, it



Rear cockpit of the JN-4D. Full complement of instruments includes water temperature gauge, altimeter, oil pressure gauge, and tachometer.

Left: *U.S. Navy JN-4H in postwar colouring with reduced-size wing markings. Note that this machine is being flown without the side engine cowling.* Right: *Early JN-6HB with the larger Curtiss Model "R" vertical tail. Note bomb racks mounted aft of undercarriage.*

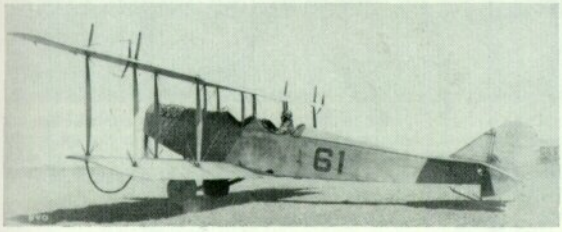




Left: *The single JN-5 was a JN-4H modified by the Army to serve as a prototype for the JN-6.* Right: *JN-4H's and JN-6H's rebuilt after W.W.I in U.S. Army depots were redesignated JNS for "JN Standardised".*

Production version of JN-6H with original JN-4A type vertical tail. Fuel capacity increased by building a tank into the upper wing centre section.

Curtiss N-8 of 1916 was outwardly similar to the JN-3 but retained the shoulder-yoke aileron control of earlier models.



was atrocious. Fence wire seemed to be the essential ingredient in almost any Jenny repair. Individual modifications were a wonder to behold, too. Many different engine installations other than the Curtiss OX-5 and the Wright-Hispano were tried, even rotaries. Since the attrition rate for lower wing panels was quite high in cow pasture operations, spares for these items were sometimes in short supply. It was not uncommon to see a Jenny flying with two sets of upper wing panels on it—a set of upper panels with the strut fittings reversed for the bottom installation and an extra set of outer struts to brace the overhang area in compression.

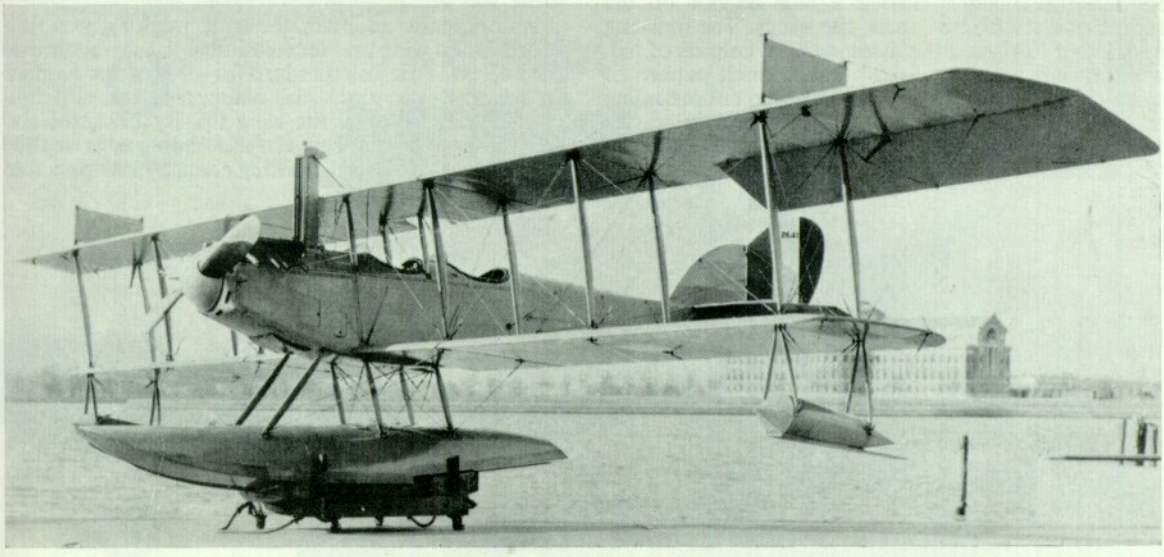
The Jenny, along with the Standard J-1 and the Canuck, was probably the best stage in the world for the wing-walker's art. Not only did it have a handy maze of struts and wires between the wings and a good old-fashioned straight axle between the wheels, but it had king-posts and bracing wire above the wings and stout wing tip skids underneath. These made it possible for the aerialist to climb over and under as well as through the wings. Performances on top of the wings would have been impossible without the presence of the king-posts. This type of performance passed from the American scene with the effective passing of the Jenny in 1927–28. When it was desired to revive the old act for post-W.W.II air shows, it was necessary to find and refurbish a Jenny to allow real wing-walking.

BASIC COLOURING

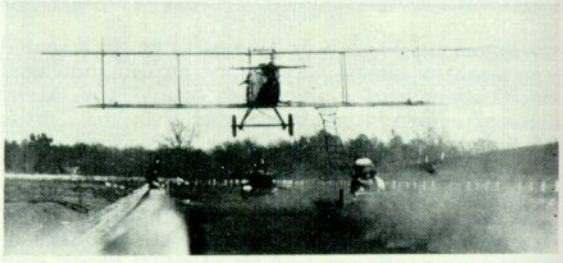
The original colouring of the military JNs—Army and Navy alike—was clear-doped fabric that resulted in an off-white appearance. Sometimes a coat or two of clear varnish was applied over the dope and imparted a burnt umber or amber colour. The JN-3s and -4s supplied to Britain were painted to established specifications, with khaki brown top and side surfaces and clear-doped undersurfaces. By the time of the large U.S. war contracts of 1917, basic colouring was still clear dope, but with the metal engine and cockpit cowling sheet metal painted khaki brown. Late in 1918, trainer planes were given the same overall khaki brown colouring that has recently been adopted for combat types. This remained standard until well into 1927, at which time Army aircraft, in the interest of increased visibility as a safety factor in peacetime years, adopted orange-yellow wing and tail surfaces but retained the khaki brown (now olive drab) fuselage. A few of the military Jennies survived long enough to carry this colouring.

Late in 1917, overall light grey became standard Navy colouring, but most wartime Navy Jennies were clear-doped. By 1921, grey was abandoned in favour of all-silver with orange-yellow on the top surface of the upper wing and the top of the horizontal tail. The

N-9, essentially a JN-4B with longer wings, was the standard U.S. Navy seaplane trainer of 1917–18 and the early post-war years. Note unique vertical radiator design.



Left: *The famous Lt. Ormer Locklear doing a handstand on a war-surplus JN-4D, a feat impossible to accomplish without the aid of the Jenny's upper wing king-posts.* Right: *Typical of the stunts performed in the barnstorming era—a "Canuck" picks up a man from a speeding car on a racetrack. To revive the old wing-walking act for a post-W.W.II air show, it was necessary to restore a suitable aeroplane—the Jenny. Wings and horizontal tail of this JN-4D* (Above) *are original, but a new steel-tube fuselage carries a W.W.II surplus 200-h.p. Ranger engine.*



early Navy N-9s were clear-doped, were re-done in grey, and the post-war survivors carried the silver and yellow until their retirement in 1927.

NATIONAL MARKINGS

Being trainers, the Jennies did not carry the colourful insignia and striping used by the combat squadrons. Other than the standardised national marking, they carried only their military serial number or a training plane number for a particular base on the fuselage.

There was no standardised U.S. National marking prior to 17th May 1917, more than a month after U.S. entry into W.W.I. During the Mexican punitive expedition of 1916, U.S. Army JN-4s and N-8s were marked with a five-pointed red star on fuselage and rudder. Navy planes carried a blue anchor on the rudder and sometimes under the wings. The marking adopted in 1917 used the three national colours of red, white and blue in the British and French pattern of three vertical rudder stripes, with the red at the trailing edge. The wing marking was a white five-pointed star superimposed on a circle of blue with a smaller red circle tangent to the inner projections of the star points. After this wing marking was applied to some U.S. trainers in France, it was pointed out that the white star could be mistaken for a white-bordered German cross in the heat of combat. Consequently, the U.S. was asked to adopt a tricolour circle similar to those used by the other Allies. In January 1918, the former Imperial Russian marking was adopted, consisting of a red outer ring, blue middle ring, and a white centre. At the same time, the order of tail stripes was reversed to put the blue at the trailing edge. This arrangement of stripes and circle remained standard until August 1919, at which time the 1917 arrangement was re-adopted. Meanwhile, not all of the 1917 machines were repainted with 1918 markings, and the use of spare parts with one marking on an airplane with the other was not at all uncommon.

As originally adopted, the wing marking was full-chord of the wing and located immediately inboard of the aileron. This was standard for all wartime Jennies. In the post-war years, the readopted star, still full-chord, was moved to the wing tip. By 1925, the size was reduced to fit in between the leading edge and the aileron spar. One final marking change that applied to

A private owner attempted to improve the performance of this JN-4D by installing a 160-h.p. Gnome rotary engine, clipping the upper wingtip, and adding alance area to the ailerons.

JN-4D Jenny, Trainer finish, 1917. Tail striping adopted May 1917.

▲ JN-4H Jenny, Ambulance conversion, assigned to World War I training bases

JN-4D Jenny, Trainer finish with white, blue, red roundel and reversed tail stripes adopted late 1918.

JN-6H Jenny, Gunnery trainer, 1919. Star in circle marking and 1917 tail stripes. ▶

◀ JN-4H Jenny, Trainer finish adopted by U.S. Navy in early 1920's.

JNS-1 Jenny, Standard U.S.A.A.C. finish, 1927. ▶

JN-4A, Royal Naval Air Service, 1918.

A JN-4D fitted with a monoplane wing built by Sikorsky. Several small firms developed improved wing designs for the war-surplus Jennies and Canucks.

very few military Jennies was the adoption, in November 1926, of a new tail stripe arrangement for U.S. Army planes. This retained the original vertical blue stripe but substituted thirteen alternating red and white horizontal stripes for the verticals, in the manner of the U.S. flag.

PRODUCTION FIGURES

Exact production figures for the JN and N series are unavailable, and existing records are contradictory. The following list has been assembled from compilations made independently by the author, James C. Fahey of "Ships and Aircraft", and Mr. K. M. Molson, curator of the Canadian National Aviation Museum.

SPECIFICATION CURTISS JN-4

	JN-4D	JN-4H
Wing Span	43 ft. 7⅛ in.	43 ft. 7⅛ in.
Length	27 ft. 4 in.	27 ft. 0½ in.
Height	9 ft. 10⅜ in.	9 ft. 10⅜ in.
Wing Area	352.5 sq. ft.	352.5 sq. ft.
Powerplant	Curtiss OX-5	Wright-Hispano "A"
Rating	90-h.p. at 1,400 r.p.m.	150-h.p. at 1,600 r.p.m.
Empty Weight	1,580 lb.	1,595 lb.
Gross Weight	2,130 lb.	2,145 lb.
Maximum Speed	75 m.p.h.	93 m.p.h.
Minimum Speed	45 m.p.h.	41 m.p.h.
Climb	2,000 ft. in 10 min.	6,500 ft. in 10 min.
Service Ceiling	11,000 ft.	18,000 ft.
Endurance at Full Throttle	2 hrs. 18 min.	2 hrs. 30 min.

Manufacturer	MODEL																	
	J	JN	JN-1	JN-2	JN-3	JN-4	JN-4A	JN-4B	JN-4C	JN-4CAN	JN-4D	JN-4D-2	JN-4H	JN-6H	Twin JN	N	N-8	N-9
Curtiss (U.S.A.)	1	1	1+	10+	86+	701	781	5+	1	—	1404	1	929	1035	9	1	4	100
Curtiss (Canada)	—	—	—	—	18	—	—	—	—	—	—	—	—	—	—	—	—	—
Canadian Aeroplanes	—	—	—	—	—	—	—	—	—	1260	—	—	—	—	—	—	—	—
The Burgess Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	460
Howell & Lesser	—	—	—	—	—	—	—	—	—	—	75	—	—	—	—	—	—	—
Liberty Iron Works	—	—	—	—	—	—	—	—	—	—	100	100	—	—	—	—	—	—
Springfield Aircraft Corp.	—	—	—	—	—	—	—	—	—	—	585	—	—	—	—	—	—	—
St. Louis Aircraft Corp.	—	—	—	—	—	—	—	—	—	—	450	—	—	—	—	—	—	—
U.S. Aircraft Corp.	—	—	—	—	—	—	—	—	—	—	50	—	—	—	—	—	—	—
Totals	1	1	1+	10+	104+	701	781	5+	1	1260	2664	101	929	1035	9	1	4	560

PRINTED IN ENGLAND. © Profile Publications Ltd., P.O. Box 26, Leatherhead, Surrey, England,
by George Falkner & Sons Ltd., for McCorquodale City Printing Division, London.