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Johnson Bros. Motor Co.

Terre Haute, Indiana

BUILDERS OF THE FIRST SUCCESSFUL AMERICAN MONOPLANE

By: Al Kelch, Editor

The Johnson brothers' airplane, flown successfully just a few years after the Wright brothers' first flight, was apparently one of many built in the U.S.A. about that time. "All the World Aircraft for 1919" states that no less than 2,000 people in the U.S.A. had built flying machines, but that most of them were home made copies of standard designs. Most of them being copies of the Wright brothers' biplane. The percentage that was successful was no doubt very few.

The Johnson brothers' airplane was a great advance in the state of the art, but was never blessed by commercial success. It would be interesting to know how many good designs met the same fate. If Terre Haute, Indiana, which then had a population of 65,000 could have two successful designers in 1911, namely The Johnsons and Gus Riggs airplanes, there must be hundreds of similar stories in the entire country. The tragedy is that people who know about them are rapidly passing from the

scene, and if the stories of these accomplishments aren't recorded, soon they will be lost forever.

While rummaging through Dale Crites' collection of memorabilia, he called my attention to an Argosy Magazine for September 1961, which carried an extensive article on the Johnson brothers' airplane. I read it with complete fascination, and started immediately prospecting for further information to make up the complete story, and research the efforts of the Johnsons. I soon

struck two mother load sources - one through a chance look in Weldon Ropp's scrap book, I found a picture of the Johnson airplane which I published on the back cover of *Vintage Airplane* in June 1976. On asking Weldon where he acquired the picture, he advised that Mr. Johnson was a relative and that his son Harry Ropp had inherited from the Johnson brothers, quite a collection of material on this early effort. Also, through the publication of an article entitled "One Man's Family" in *Vintage Airplane* October 1976 issue, I became acquainted with Deward Peterson who lives in Terre Haute, Indiana. The subject of the Johnsons came up, and he was very familiar with the story, since the Johnsons lived in Terre Haute at the time they built the airplane. He offered to research at the source for me, and has done an excellent job. Credit for this article goes equally to Harry Ropp and Deward Peterson, my contribution being to edit it down from the volumes of material, and separate the fact from fiction. Much of the material is original hand written notes of Louis Johnson, the original manuscript of the *Argosy* article, volumes of newspaper clippings besides a manuscript furnished by Mr. Peterson, researched from microfilm copies of all the Terre Haute papers with some assistance by his son-in-law. My regret is that we couldn't publish the whole package, but it would fill many volumes of our magazine. I will attempt to give you a capsule of the story, and then we will reprint several of the documents from that era, which will help to fill in the fantastic excitement that these brothers caused in Terre Haute.

To start with, the early lethargy of our country was well known in the way that the public reacted, or rather did not react, to the flight of the Wright brothers. It took a trip to Europe and a presentation to the more romantic Frenchmen to cause excitement, which spilled over to this country, and finally got the ball rolling. That was the first time that the French were involved - the second being with Lindbergh's flight to Paris. They were considerably ahead of us in their aeronautical efforts, having so whole heartedly accepted the airplane. In this country, scattered efforts were made in many small towns, and it is hard to tell how many good things were left to wither on the vine and never be accepted by the aviation industry.

The effort of the Johnson brothers is a classic, in that they were at least 10 years ahead of their day in the complete effort, and would have no doubt stolen a great deal of the thunder had their effort come to the public's

notice. Probably the first significant thing is that they had developed an engine as early as 1900, which was far ahead of any engine of its time. The pictures will verify the fineness of this piece of machinery. Its performance was unbelievable for that day. While others were fooling with make shift machinery, the Johnsons developed the four cylinder V type engine, water cooled with a magnificent weight to horsepower ratio, (65 lbs.-65 hp.), and unbelievable reliability. The workmanship and the engineering on the engine is startling even today. The engine was not only a four cylinder V engine, it was a four cylinder two cycle engine with a very successful patented valving arrangement. The engine developed according to their figures 65 hp, but it's probably like the 90 horse OX5. On today's scale it would be considerably better. Many updates on the engine were made and its proving ground was on boats of the day, which it pulled very successfully. The final completion of the aeronautical V type motor to quote Mr. Johnson, was completed in 1909, the same year that they made their first airplane. The straight forward type of thinkers that they were is evident in the following quotation from Mr. Johnson's notes. "In our development we never tinkered with anything. Instead we prepared designs and worked out the problems with many drawings and mathematical calculations in a precision manner. Through our calculations we decided the monoplane would be much more efficient than the biplane that everyone was building, because of the less head resistance than the two planes and all the necessary wires and structures between the planes." Mind you they had already developed a very successful engine, now they were going about it in the same methodical manner to develop an airplane.

To quote the *Argosy* article "if the world had noticed them at the time, the name 'Johnson' would have been emblazoned in aviation history. Lou, Harry and Julius Johnson, of Terre Haute, Indiana, designed their plane in ways that nobody else, not even the Wright brothers or Glenn Curtiss or Bleriot, had ever conceived. Where these immortals had used wood, the Johnsons used aluminum, nickel and steel, and a long slender fuselage that could have been the prototype of the monocoque fuselaged planes that are flying today. Like Bleriot, they saw the basic correctness of the aerodynamics of a monoplane. They worked out a tricycle landing gear at a time when American planes landed on skids. It was very nearly the same sort of landing gear you see today".

(There is much discussion about there being or not

being a steerable nose wheel. I refrain from making the statement that there was, but invite you to take a good look at the pictures showing the hinged front wheel and the steering horns, and make up your own mind.)

Beside the tricycle gear, the rear wheels were on horizontal V struts with verticle spring loaded tubular members very similar to oleos the later airplanes in the 20s and early 30s used. Now add to this the fact that they had a brake to slow it up after landing, a control arrangement that is entirely conventional today consisting of a steering wheel, operating the wing warping which when moved forward and aft operated the elevators, and a rudder bar to activate the rudders, all this at a time when planes had barely come out of the prone pilot stage operating the ailerons with the body and skids for landing gear.

In looking at the pictures, you will note that the main fuselage tubes which are some 2½" in diameter have cooling fins along their length. Again in their inimitable manner, they used the actual fuselage tubes as the radiator in order to cut down frontal area, an idea that was re-enacted in military planes of the early 30s with fuselage side radiators, etc. Now add to this a complete forward section of all welded tube with not a single piece of wood visible, a monocoque tubular boom fuselage extending rearward from the tubular fuselage area to support the tail, this being braced with a minimal number of cables and again at a time when bamboo poles were being used to hold the tail on. If you will notice in the pictures all metal on the tail section is highly polished, all work on the tube is done in a very workmanlike manner that would put today's airplane companies to shame. The method of affixing the wings to the fuselage was to butt them into shallow welded steel pockets held there entirely by the wire bracing structure, a feature that has cropped up many times in later years. This allowed the wings more freedom in warping, which was used for control. The spars themselves did not twist due to not being rigidly connected at the butt ends. By looking at the cover picture of the model, you realize the extensive use of metal throughout the airplane, the outside edge that forms the wings being completely tubular and all of the empennage surfaces being welded aluminum tube. The only evidence of wood in the whole airplane can be found in the propeller and the actual rib sections which have metal caps to strengthen them.

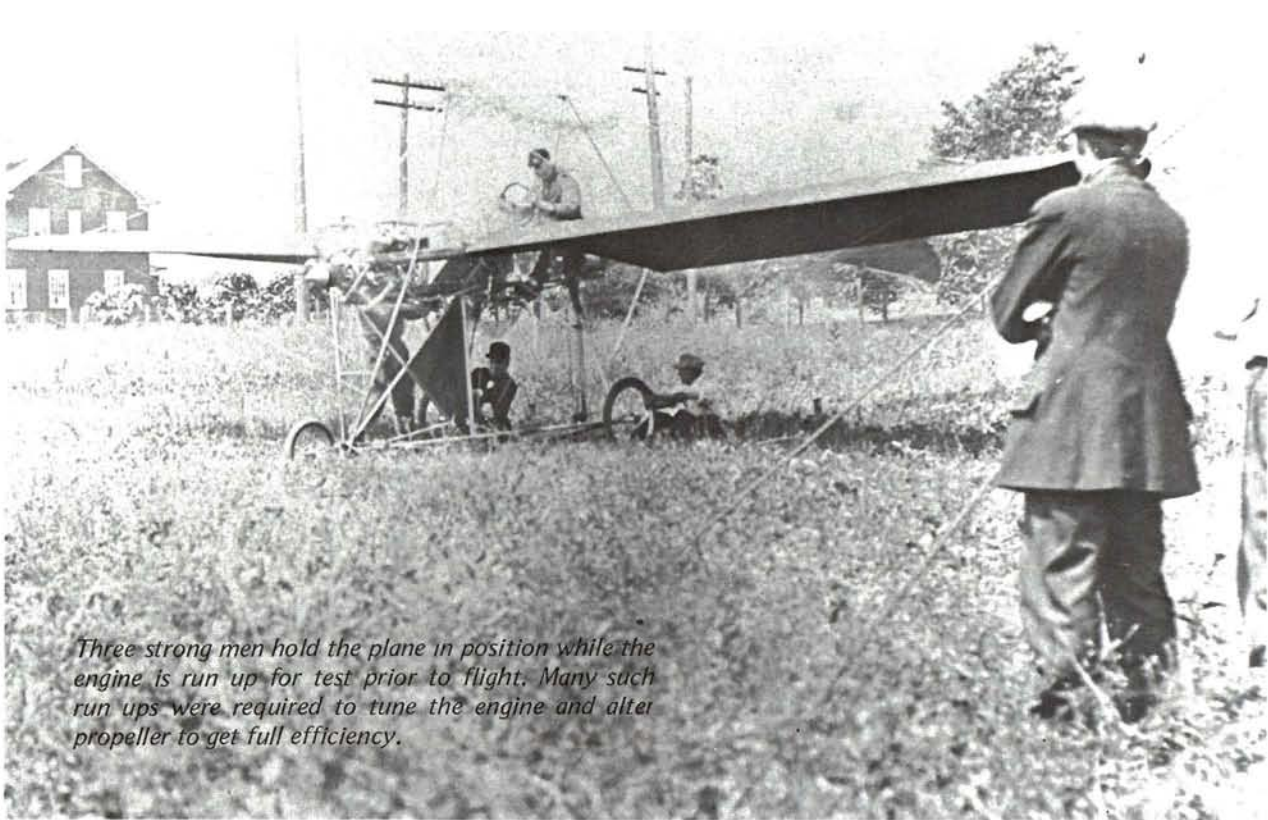
The design features of the airplane are as follows:

Wing spread	36'
All over length	34'
Weight empty	738 lbs.

The fuselage was made of steel, the total tail unit made of aluminum. The fuselage consisted mainly of three large steel tubes, rigidly assembled together by brazing in cross tubes to form a bridge structure and fastenings for all the parts that were attached. Two upper tubes were spaced apart to take the 90° V type engine in a forward tractor position, providing space behind the motor for gasoline tank and pilot's seat, thus being the first plane to use metal tubular construction throughout the fuselage and tail unit. The tail unit of the fuselage was a large tapered aluminum tube with reinforcing structures throughout, including reinforcement at the large end with metal brackets to fit in the ends of the three steel fuselage tubes, forming a rigid attachment (detachable for shipping).

The four cylinder V type motor was a 5" bore and 4" stroke, developing approximately 65 hp. The motor was water cooled, the water being pumped by a water pump through the three large main tubes of the fuselage which had cooling fins attached. The cooling was efficient and afforded very little frontal area as a radiator would on any other airplane.

Quoting Mr. Johnson "learning to fly when the plane was completed, confronted us with the risk of a smash-up. We were very cautious about it and went about it much as you would learn to walk. Stage one, I started ground work on a small field by doing considerable ground running to get well acquainted with the operating of the motor, the controls, etc., keeping all 3 wheels on the ground at all times. Stage 2, I planned to lift the plane off the ground and then right down, but instead of that, the machine jumped up about 50' in the air with the end of the field close, and high wires ahead. I shut the motor off by the switch, made a rough landing bouncing up about 30', and down just in time to avoid a smash-up. There was no damage to the plane which proved its strength. This was an error due to our eagerness to see it fly. We had only a switch down on the control column, but had not yet installed a push button on the wheel. I tried it again with the same results, so we decided to place a push button on the wheel in the hands of the operator (blip switch in later jargon). We then took the plane to a large enough field for longer jumps. Stage 3, on a larger field and the push button



Three strong men hold the plane in position while the engine is run up for test prior to flight. Many such run ups were required to tune the engine and alter propeller to get full efficiency.

installed, I could hold it down close to the ground and make short jumps and finally could make long curves, banking successfully. I soon left the field and returned without a mishap and felt very elated about the whole thing. I made many flights around Terre Haute and contracted many exhibitions away from Terre Haute. Stage 4, I taught a student to fly by the same method I used and he was successful in flying the machine and did very well. Stage 5, I took on a young fellow named Ross L. Smith who learned to fly in a very short time, and was very good. He successfully carried out all our exhibitions and contracts without mishaps. Later he was a civilian flight instructor in the first World War. For three years he flew exhibitions for us."

Mr. Johnson, in some notes written in the late 1950s, states that Tom Beldon for some time urged us to get in touch with the Smithsonian Institution about our early development work on the monoplane, and he finally connected us with his friend Dr. Paul Garber, resulting in

considerable correspondence with Dr. Garber, who was at the time head curator of the Smithsonian. The 3 Johnson brothers decided at their yearly reunion, to take on the task of reconstructing their plans and building a scale model to be placed in the Smithsonian. The original plane having been sent to the scrap yard after approximately four years of existence and the prints having been thrown away, it was a momentous task to reconstruct from pictures and scattered notes the exact dimensions, and reconstruct the airplane. They had to work through much of the original engineering to do this feat. The model is complete down to miniature spark plugs, carburetor and all parts in exact scale. The beautiful model stands as a monument to their supreme skill to the last. At the time of the presentation to the Smithsonian, Harry Johnson and his wife were present at a ceremony at which time Dr. Garber interviewed him, and with much foresight taped the interview. Transcript of that tape follows, giving much insight to their work.

