

# THE 1909 JOHNSON MONOPLANE – YEARS AHEAD OF ITS TIME



*1/10<sup>th</sup> scale model of the monoplane built by the Johnson brothers and residing in the Smithsonian.*

Lou, Harry and Julius Johnson are best known as the brothers who produced the famous range of Johnson outboard marine engines. What is not so well known is their foray into the world of aviation, one which should have made them even more famous, except for a series of unfortunate incidents.

The following article covers some of the detail of these men and their design, and the world's only 100% accurate reproduction of that unique aircraft which has just been donated to TAVAS. Excerpts are taken from Jory Graham and from WW1 Aero magazine issue 206. Pictures courtesy of Herbert Seiser.

The Johnson Brothers of Terre Haute, Indiana, designed their 1909 plane in ways that nobody else, not the Wrights, nor Curtiss, nor Martin nor Bleriot had ever conceived. Where those had used wood, the Johnsons used aluminum and nickel steel in a long, slender fuselage that could have been a prototype of the planes that are flying today.

Like Bleriot, they saw the basic correctness of the aerodynamics of a monoplane; they never tinkered with a biplane but went ahead and only built 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. And they invented a brake which slowed their plane after landing – something no one else had done.

Their engine design was unique and streamlined. They were clearly decades ahead of their time, so how did it all come about and more importantly, how did it go all so wrong for these bright brothers?

Lou Johnson was the oldest of seven children. He was a natural leader and an innovator. Like Ole Evinrude, Lou Johnson conceived of the idea for a motor one hot day in 1903 when he had to row his 18-foot boat, ten miles upstream to harvest walnuts.

Lou's first engine was a single-cylinder, two-cycle, 3-hp monster, weighing in at 150 pounds. By 1905, the Johnson brothers, Lou, Harry and Clarence, had perfected their creation to a single-cylinder, 3-hp engine weighing only 65 pounds. With an interest in speed, the brothers expanded to both two and four-cylinder inline models and tested them in the Black Demon, a 26-foot displacement boat, going 18 mph.

From this, the boys created a going business - the Johnson Brothers Company. They built small gasoline marine engines for the pleasure craft and working boats that plied between the towns along the Wabash River.

But Lou Johnson had this crazy notion he wanted to build a plane, and he'd gotten Harry and Julius so excited about it, they all kept snatching time from the business to build the thing. Put all their profits into it, too.

So the Johnson brothers developed an aircraft motor. The lightweight V-4, two-cycle motor which produced 60-hp.



*The 4 cylinder, 2 stroke, water-cooled "V" type engine with a 5" bore & 4" stroke and revolutionary cooling system - the radiator is incorporated into the fuselage and engine mounts, eliminating the need for large drag-inducing honeycomb radiators.*

Since the Johnsons had no aircraft on which to test their motor, they decided to build one. No small feat considering they had never actually seen an aircraft – they had only read about them in Flight magazine!

So in 1909 they designed their first aircraft to be powered with their unique aero engine, in which the radiators lay along the fuselage, not sticking out in the airflow creating unwanted drag.

The engine build was time-consuming but relatively easy since they'd had plenty of experience with their marine engines. Then they realized they even had to make their own spark plugs because everyday sparks kept shorting out from the heat of the two cylinder engine and no other kind was available.

After two years of work and just seven years after the flight of Orville and Wilbur Wright, the Johnson brothers built the first American monoplane to actually take flight. The plane weighed 750 pounds, (340 kg) had a 36-foot (11 m) wingspan & measured 34 feet (10.36 m) from propeller to tail.

After all the work was done and the plane had been moved to a field for a test flight, they realized it was tail-heavy. Harry, who'd done almost all of the designing, and Julius, who'd done most all of the mechanical work, were terribly discouraged. Yet they knew that if Lou managed to get the monster airborne, tail drag would pull him back down into a certain crash.

They looked at the results of their two years of work in dismay. But Lou, undaunted, got them to start all over again, using the wooden empennage as a prototype for an aluminum and nickel steel one.



*The hollow aluminum & nickel steel empennage.*

In early August of 1911, the brothers rolled the plane from the shed and hauled it to a cut wheat field out beyond the edge of town. They had already calculated that the engine would give the plane 250 pounds of thrust.



The engine had no throttle and only a single speed. It was completely exposed and when running full blast, it made a fantastic racket. Lou waved to his brothers and then, suddenly, he was rolling across the cut wheat field, feeling his way, feeling the way

of the plane, teaching himself as he went along.

When Lou made the end of the field, he twisted the steering wheel and felt the plane turn neatly under his command. The engine was roaring at him to turn the plane loose. So he pulled the wheel toward his body and shot into the sky.

He bolted up at a wild forty five degree angle and bounced at least thirty feet into the air. It was so abrupt that he lost his breath and felt out of control, so he cut the engine out and glided to the ground.

Back on the cut wheat field, Lou started all over again. Feeling much more confident, he got the plane up smoothly and stayed up for almost ten minutes, teaching himself to turn in the air on this second flight.



*The fully controllable monoplane airborne in 1911*

When he made his next landing, Harry and Julius and the news reporters were screaming their heads off. He had already achieved more than some of the famous aviators of Europe had (longer duration, fully controlled flight and landing at the same field from which he had taken off).

The monoplane quickly gave the brothers celebrity status, drawing invitations to attend county fairs and carnivals throughout the state. If there wasn't an event to tie into, they'd rent a farmer's field at the edge of a town, advertise their flights, and the townsfolk would stream out.

Visitors paid 25 cents to take a look at the machine. At a big fair, the brothers would make as much as \$600 over the weekend. In addition, Lou piloted the plane in contests; once winning \$1,000. However the cost of exhibiting gobbled the best part of the profits

But in spite of the number of people who saw this unique machine fly over many years and the way the people felt, nobody of real importance took notice. The shrewdest Indiana business men admired it, but shrugged when the Johnsons asked them to invest in a factory to build similar planes. As far as they were concerned, the plane had no commercial value. "Good luck, boys" - and they walked away.

The United States Government wasn't interested, even when it saw the Johnson's four cylinder engine outperform all competing engines in a ten hour test at Mineola, Long Island.

Several Russian engineers watched the Johnson motor run the ten grueling hours without missing a stroke. They talked at length with the brothers and persuaded them to try, without an experimental contract, the development of a twelve cylinder engine.

Try they did. They invested every cent they had in producing first, a six, then an eight and finally a mighty twelve-cylinder engine. If they couldn't sell their plane, they'd sell engines.

However, a series of swift disasters ripped success from their grasp. As WW1 progressed, Germany, their only source of reliable magnetos (crucial to their ignition system) was shut off.

Meanwhile, gambling on getting a Russian contract, they'd gone into debt, building a factory on the Wabash River to produce the heavy twelve cylinder motor. Ingeniously, they figured out a way to build their own magnetos, but just as they set up production of these, a tornado flattened every brick in the little plant. Next day, the flooded Wabash river swallowed anything left under those bricks.

In twenty four hours, seven years of dreams and money and time vanished in the winds and waters. During those years, the brothers had all married and started families, and the families had to be fed. So they abandoned the plane in a farmer's field near Terre Haute and turned their backs on the dream and never talked about it again. The plane rotted away in the farmer's field, and as the years passed, its glory diminished in their minds.

In 1957, Paul Garber, The Head Curator of the Smithsonian Institution's Aviation Museum, heard about the plane. He didn't know much because no history of early aviation ever recorded it. Still, he felt it might be worth adding to the line-up of early planes and models he was assembling.

He tracked down Lou, who was retired, and wrote asking if it would be possible to get a model for the museums new air wing. Thus, Garber not only released the Johnsons from their tight-lipped silence, but gave America a rare example of its own special brand of genius.

The brothers got together and after much effort and research produced this 1/10th scale model which is still on exhibit at the Smithsonian today.



*Close up detail of the 1/10<sup>th</sup> scale model on display*

### **The Johnson Monoplane reproduction for TAVAS**

Herbert and Sylvia Seiser live in South Africa. When they first read of the Johnsons monoplane they became fascinated by what these pioneers had achieved and wanted to learn more.

In 1998, they visited the Smithsonian Archives. In Herbs words, "Their Johnson file consists of a few pages which they very helpfully copied for us. I spent the better part of a week parked in front of the 1/10 model at NASM, sketching, and turning into a part-time exhibit myself. The model was built by the Johnson brothers after a lifelong occupation with activities unrelated to aircraft.

When translating drawings, archive information, photos and model sketches into a full size reproduction, the inevitable discrepancies became apparent. And exactly this is what makes building a reproduction of an old aeroplane so fascinating.

For me, building to detailed drawings takes the challenge out of the equation and leaves the builder with the deployment of his skills only. I make 90% of the parts myself from scratch. This requires imagination, patience, perseverance and skills - plenty of them.

The most challenging part of the build was the tail. It is 5.70 meters long (the Johnson is a big aeroplane) and consists of 6 conical aluminum sections. I used hand rollers to get the aluminum into shape. When each cone fit flush with the previous one, the two were riveted together. This took some 1,200 rivets and we still regret that we did not film the work in progress. As the whole aeroplane is a one man job, this was pure masochism.

The three tubular longerons of the aeroplane double as the radiator. This is a most ingenious idea: copper fins are braced onto the tubes (this was a hell of a job) to facilitate heat exchange and reduce the frontal area significantly. Just look at the ugly installations of the Wright and Curtiss pushers and all the other contemporary aircraft to savor the engineering genius of the Johnsons.

An interesting detail is the sealing of the covering fabric. Dope was not known then, but there was plenty of shellac which was used as a sealer for the wooden foundry patterns, and which gives that maroon colour to the fabric surfaces. A few drops of castor oil per litre of shellac, keeps the shellac pliable and prevents it from cracking.

It is interesting to observe peoples reaction when confronted with the Johnson in our workshop. The development of flight from this skeletal butterfly to a B747 or the A380 Airbus goes beyond average understanding. We have spent a great many hours explaining the importance of men like the Johnson brothers.

The great irony is that the influence of the Johnsons in aviation history is minimal. Their aircraft was technically too advanced (three years exhibition flying with no crash!) and too far away from the mainstream to be noticed.

The Johnsons were not the acerbic Wrights or the attention seeking Fokker; but I think America should be more than proud of what three boys produced in the Indiana back sticks. Their pioneering spirit is an ongoing inspiration. After the commercial flop of their monoplane, they shifted venue and produced the world famous Johnson Outboard Motors."

#### **Donating the Johnson monoplane to TAVAS.**

What Herb and Sylvia have accomplished in building this reproduction, is one hell of an achievement. The fact that they now choose to donate it to TAVAS is incredibly generous.

However, we need to pay the cost of getting it out here and an aircraft this size isn't cheap to ship.

**We need your help and we have very limited time.**

**Please click on the following link and make some contribution to assist,**

<http://www.indiegogo.com/projects/package-and-post-a-vintage-aircraft>

or contact me directly through [info@tavas.com.au](mailto:info@tavas.com.au)



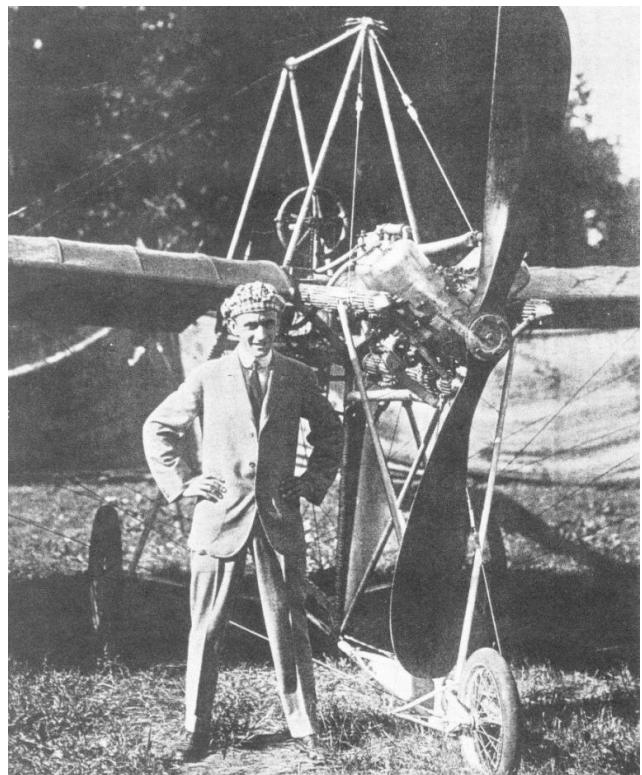
*The completed fuse. Note hook break near LH wheel*



*The impressive and time consuming woodwork wings*



*The finished product on display & awaiting covering*



*The man who started it all – Lou Johnson standing next to his rather large, impressive monoplane 1911*