

Interview (1967) with Don Hall, Ryan Aeronautical Chief Engineer

Re design of Spirit of St. Louis

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Don Hall: I retired in September 1963 from Navy. My main interest is home and garden plus one important project that I have which AIAA might be interested in – a very large technical data developed over many, many years since 1919. I'm going over it and want to donate it to a suitable organization. Smithsonian has asked for some of it. I'm putting it in shape and discarding the junk.

Q. When did you last see Lindbergh?

Over in Paris four years ago, just before retirement. I haven't corresponded with Lindbergh recently as I was sick. I'll have to initiate it again to let him know how things are. He lives in Darien (Scotts Cove), CT.

Q. How did you come to be at Ryan?

Ryan Airlines was founded in 1922. Claude Ryan sold out and started the present company. I came to Ryan three weeks before Lindbergh. I was the first engineer working full-time; Jack Northrop was a consultant on weekends.

I was from Brooklyn, NY and started out with Curtiss on Long Island. I joined Douglas Aircraft in 1923. In 1927 I had been on leave from Douglas to go to Air Corps flying school in San Antonio, Texas. That's now called Randolph Field; then Brooks Field. I washed out and got back to Douglas. Things were slow – very dull -- and they said Ryan needed an engineer. Northrop and another man (Mackey?) were working at Douglas and found it too hard coming down weekends and they wanted to quit.

I joined Ryan on January 31, 1927. A telegram four days after I'd arrived came from Lindbergh's backers asking if we could build an airplane to fly from New York to Paris nonstop. It didn't say anything more than that. I studied it and it looked questionable for the short time they wanted it, for spring, but we said yes anyway. And the first I knew of it again, he'd arrived February 21, walked in the door. Never heard of him before. No one else had either and his name wasn't even used in the telegrams.

Q. Quite a bit to chew off there wasn't it, only being in company four days?

In meantime I'd been hired to get Government Approval from Bureau of Air Commerce, now the FAA Certificate, for the M1 mail airplane. Really M2, as M1 had been flying for couple of years. Claude Ryan and Mahoney had the company, and Ryan sold out just before I got there.

While working on that, another party wanted a passenger job so I switched to that one temporarily. With wide tread landing gear and bigger span and so on and that gave me little lead on the Spirit. I had to increase wing span some more and increase length also. What it amounts to, enlarged the airplane, kept same wing chord.

Q. When did the Spirit activity get started?

The contract was signed Friday, February 25. I had done some preliminary design a few days before, after he arrived, like you always do, preliminary design. He was satisfied and we were satisfied with him and that way we were...

We really started about the 28th, then test flew two months later 28 April. No one else tested it. That was one of his requirements. He was the only flier all the time. After the (Atlantic?) flight one friend of his flew it as far as I know.

I had a ride in it. Sat on the right hand arm of the wicker chair. Vision was pretty good after all; straight ahead was blind but it had big windows each side. Fishtail landing. I took controls with my left hand probably.

Q. About the design.

It wasn't a very stable airplane. It was purposely make unstable. Lindbergh wanted it unstable so he'd stay awake. Stable in some parts of cg location but unstable in others. Notice ailerons are very small. I did that purposely. I was worried that, with a full load, sudden gusts and reacting control, it might have structural failure of the wing, cut the load factor down (?) I was very well satisfied when through. No major mods were made, just little things we did to finish up, streamlining as we'd planned to do. The main job was to get good flight data in the limited time we had.

We had more than usual instrumentation. We had an earth inductor compass, and a magnetic compass in New York. The earth inductor wasn't working too well and failed in flight.

Q. First reaction to Lindbergh planning to fly across alone.

It surprised us but right away we saw the merit of it. In the first place with two people you have to have a much larger airplane. Of course one advantage is that one person could sleep while other was flying. He felt confident he could do it and I wasn't worried a bit.

Q. When first heard about the flight?

We were at office just after we got to work in the morning. Not many radios around. The San Diego Union kept us informed all the way up until past St. Johns, then the newspaper phoned our office.

Q. Quite a celebration?

Sure was -- being a little company like that and a small city in those days. We all left work, 40-45 people employed then.

Q. What help did you have?

I was all alone during the design of the plane except for two evenings when a purchasing agent helped me with weight analysis. We had to hurry and get things done. We kept the office doors locked so nobody could walk in. A few aeronautical people were always interested in anything and they'd walk around; we didn't keep anything from them. I don't think we talked about it either but gradually it leaked out. When test flights started the people heard about it in San Diego.

Q. What about flight tests?

We flew from Dutch Flats just opposite from Marine Corps Recruit Depot. (The strip) ran northwest through a hill which was taken down during the war. Dutch Flats was a tidal flat at one time. I think they built up a dike so the water wouldn't flow in. Not paved, natural tidal ground, sand, muck, and when it rained heavily you might have 2-3 feet of water there.

Just before Lindbergh came here we had heavy rains and floods and you couldn't leave San Diego except by way of El Centro. The storms lasted two weeks. Lindbergh came in by train about a week later.

Q. Lindbergh's first thoughts?

The water had disappeared when he arrived. And we had no rain at all during test phase. We started flights 28 April. We only had about twelve days for flight test. He flew every day he could except when we made little changes here and there, e.g., streamlining, we had to put the fairing on. No major problems at all and the engine was excellent.

M1 had a Wright engine, though a few were made with J4 engine, for mail purposes, flying from San Diego up to Seattle. The only thing we used from the M2 was the wing ribs and the tail surfaces; everything else was different. I'm not sure if the M2 was built or not. I think one was built with an OX5 90 hp engine. In the Spirit was a J5C 200 hp Wright Aeronautical engine.

Lindbergh was not a bit nervous about the flight. He was the most composed man I ever ran across. Physically he was very good, had excellent vision, maybe better than normal which helps a lot in flying. He was an excellent cross-country navigator by means of dead reckoning, just by following the maps. Never had any problems with long ranges, you know. This time he studied dead reckoning and had all his own maps from New York to Paris – cut the maps, plot your own course on the maps.

Q. Lindbergh's part of the actual design.

He wasn't actually a designer but had his own ideas, some of which I accepted and some I disagreed with. and we'd come to agreement. Claude Ryan, was, I think, was acting (manager?) out in field. I only saw him once or twice, outside of our office hours only, during design. Mahoney said to leave us alone, Lindbergh and I, and not to bother us, that we could handle it without any interference.

Then when we got to construction we had to work with the shop. We had no inspection system. We had to work continually. We laid a lot of stuff down full size -- landing gear, axles -- full size on plywood and then worked from that.

All work was done in the same building. First we started with a front office in a little ten-foot square room. There were four of us in there, I think; then we moved to another room upstairs.

Q. What about the publicity and beyond?

You can do much better without publicity. Ryan Airline had changed name to Ryan-Mahoney and moved to St. Louis in November 1927. After all the publicity I started running my own company, Hall Aeronautical Development Company. It was too hard all through the depression and I finally gave it up when Consolidated moved to San Diego.

I was with Consolidated 1936-1949; they hired me as an aeronautical engineer. I was consultant to Mac Laddon for a few months (he was chief engineer and works manager). Then I went into pre-design several years. Then I was with the Navy from 1949 to retirement at North Island as an engineer, head of helicopter branch and then structures branch.

Q. Your involvement with the IAS - Institute of Aeronautical Sciences (later merged to form AIAA).

For years I was the only member in San Diego area. It was the IAeS in those days. We had a big dinner with 450 people before we even had the section organized. Engineers from Vultee in Los Angeles came down with an analysis of a downed German twin engine airplane.

Q. Looking back.

I don't like to stress the work on the Spirit. Other work has been extremely important over the years. And also I did another airplane in 1928 with Ryan-Mahoney more important to me than the Spirit. I never could get it promoted far enough along. Called the X-1 same as the other X-1. Had a low wing semi-tandem wings, low forward wing monoplane, aft wing a little higher. All moveable wing main span thirty feet, aft wing fifteen feet. Ryan-Mahoney bought the idea all right, but they went back to St. Louis and we parted company. I promoted it myself, but then the depression hit.

Q. Your family?

My wife Elizabeth was bom in San Diego. I met her several years after the Lindbergh flight. (More about his son.)

End of tape