Differences Between the Thomas-Morse S-4B and S-4C: Lessons and Questions From an Ongoing Restoration (Part 2)

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Ithaca Aviation Heritage Foundation’s Thomas-Morse Scout is assembled by volunteers in the parking lot of the Morse-Chain factory where it was originally built. The machine has S-4C wings and elevators but it is really a modified S-4B.

Photo: Unknown

Old Aeroplane, New Wings

Our Tommy came to us in 2010 as a generous donation from Dr. William N. Thibault of Newport Beach, California. At that point, our group, the Ithaca Aviation Heritage Foundation (IAHF), was deep into the construction of a new set of scratch-built wings. This turned out to be a fortunate occurrence, because when we examined the donated machine we discovered that the lower wings showed signs of hasty construction and were also in poor condition (we have reason to believe they came from the prototype), so our replacements would be needed in order to make the aircraft airworthy. In addition, the upper wings were from an S-4C, and clearly were not original to the machine’s S-4B fuselage.

IAHF member Don Funke cuts spruce with a 100 year-old band saw at the Morse-Chain woodworking shop with the assistance of volunteers Pete DeGraff and Bucky Dew. Both the saw and the shop were in use when the Thomas-Morse Scouts were built.

Photo: Authors
Above Left: Volunteers Bucky Dew and Roger Pellerin work on the new wing panels in the Morse-Chain woodworking shop in June 2009. Above Right: The Morse-Chain shop closed and we moved to the shop of Albert Heidt in Dryden, NY. Our wings are shown there in October, 2011, along with the original fuselage that will receive them.

Varnishing our new upper wings in the warmth of Mr. Heidt's garage in December, 2011. Mr. Heidt is pictured in the foreground, followed by Steve Umscheid, Jim Rundle and Roger Pellerin.
Engine / Fuel Tanks

Although our Tommy came with a Le Rhône rotary engine, it was originally equipped with a 100 hp Gnome, a type which was used on all S-4B Scouts as well the first 50 S-4C Scouts. The Gnome, unlike the Le Rhône, required a pressurized fuel system. Because of this, S-4B fuel tanks had a streamlined tube sticking straight up in front of the pilot - the “snorkel” as we call it. The device was hollow and contiguous with the tank; apparently providing a chamber of pressurized air when the tank was full.

Although present on S-4B Scouts, the “snorkel” appears to have been absent on the Gnome-powered S-4Cs, as we discovered while examining the original Gnome-powered S-4C based at Fantasy of Flight in Polk City, Florida. We speculate that with the gas cap in the back of the tank, the tank always had head space because it couldn’t have been completely filled that way with the plane resting at an angle on its skid.

Another difference between the S-4B and S-4C tanks related to the method of aileron control. The S-4C used aileron pushrods similar to those used on Nieuport Scouts, and their tanks featured cutouts which allowed the pushrods to pass from the cockpit to the wings. These were not needed on B Scouts due to the use of cables.

Discovering Our Tommy’s Identity

We know that Dr. Thibault bought his Tommy from the Wings and Wheels Museum in Orlando, Florida, in 1981 - but what was its origin and history? The aircraft had no factory placard in the cockpit, but it did have an intriguing number on the side: A-4358. Was this the Signal Corps serial number of our aeroplane?

The National Museum of the Marine Corps in Virginia informed us that the number 4358 was assigned to a Marine base in Miami, where 10 S-4B Scouts were based. By this time we knew our Scout was a B model, so it was a promising start. Then we found a story in WWI Aero#121 about a Marine pilot overshooting a landing and winding up in the canal adjoining the base. The story said his plane was number 4358. One day an internet search on the U.S. Marine Corps web site turned up a picture of a Thomas-Morse S-4B in a canal being fished out by a bunch of Marines, and the number on the rudder was also 4358! Now we wanted very badly to believe that this was our aeroplane.

Despite these findings, nagging questions remained. A publication titled Report of Director of Air Service (a letter from the Acting Secretary of War transmitting a report compiled in the Office of the Director of the Air Service in compliance with House Resolution 190, Document HC465, dated 4-Dec-1919) is an accounting of all World War I surplus equipment and materials at the end of the war. This report identifies 48 surplus Thomas-Morse S-4Bs at the Aviation General Supply Depot in Houston, Texas. Among these, 4358 is not listed. This suggested that 4358 was disposed of prior to the end of the war - however, it was not definitive. Houston had the bulk of the S-4B Scouts, but there were also some at other bases, so there was still hope.

We questioned the number because there shouldn’t have been an “A” in front of 4358. The “A” was used when
the Navy and Marines re-numbered the planes, so it
would have had a different number. We wondered if the
person who last painted the plane had any knowledge of
what its original number was, or if someone saw the
same story in *WW1 Aero* and decided to use the number.

What really troubled us was that nothing on the
aeroplane provided identification. The S-4C Scouts had
numbers stamped on various metal parts, but we never
found such numbers on ours, and we began to suspect
they were not stamped on the B Scouts...Then something
turned up.

Painted on a metal panel behind the cockpit we found the
number 191. What did it mean? We know that Thomas-
Morse started its production numbers with 101 - would
this therefore be the 91st machine produced at the
factory? It was possible, because the first 100 machines
were S-4B Scouts numbered 101 to 200. Were those
numbers only used in the books, or were they used on
the shop floor? A photo inside the factory shows a line-
up of Scouts with numbers hanging from the cowlings;
the numbers 129 and 130 are visible in the line-up. They
are all B Scouts, so those numbers are within the
correct range. This convinced us that the production
numbers 101 to 200 were used on the shop floor.
Furthermore, a metal placard inside the cockpit also used
those numbers, as can be seen in a photo of the placard
in the Rhinebeck Scout where the number “153” appears
(see page 41).
Above: As work progressed, the number 191 was found once again, this time painted on the underside of the cowl that covered the fuel and oil tanks. This gave us great confidence that our aircraft is indeed the 91st production machine. Here we see the top view of the aluminum forward deck before we removed it. Note the “snorkel” protruding from the fuel tank and the cutouts for pushrods which were needed to fit S-4C wings to the S-4B fuselage.

4306. The 91st production machine would have had 4366 painted on its side, not 4358, and would not have been preceded by an “A”.

Unlike the previously mentioned 4358, serial number 4366 is listed in Report of Director of Air Service as surplus at Houston, Texas at the end of the war. The machine was noted as being in fair condition with unknown hours of operation. This, we believe, is our Tommy.

The Old Rhinebeck Aerodrome Scout And The IAHF Scout: Were They Built Side By Side?

According to Frank Strnad’s Profile Publication on the Tommy (Number 68) the Signal Corps serial numbers assigned to these first 100 production Scouts were 4276 to 4375. Note that the photo of the lineup in the shop on the previous page shows part of a number beginning with 43. In the lineup that aircraft would have been production number 131, so its number would have been

Our S-4B has the “snorkel” on the fuel tank, but since it was converted to have S-4C wings there were pushrods passing through the tank. How did that happen? The holes were made later, as a modification, and a rather crude one at that. They don’t line up with the pushrods well enough to have been functional - we therefore believe our Tommy was never flown with the C wings.

When the Old Rhinebeck Aerodrome kindly gave us an opportunity to examine their S-4B, we checked the
inside metal panel behind the cockpit and found the number “192” painted in exactly the same position - the port side just behind the coaming. This was a surprise, because the Rhinebeck Scout, unlike ours, has a factory placard in the cockpit stamped with production number 153. This would correspond to a Signal Corps serial number of 4328, which is what is painted on the side. Of course, the paint is not original, so the number on the side does not necessarily corroborate the number on the placard. So, because of the number we found behind the cockpit, we now think that the Rhinebeck Scout might actually be Signal Corps number 4367.

Of course, the number 153 in the cockpit of the Rhinebeck Scout leaves the matter in doubt. Could the placard be from another aircraft? Cockpit placards, held on by four nails, might be more likely to have fallen off, or been taken off, and replaced than the metal decking. We were not able to inspect the forward panel of the Rhinebeck Scout to see if it also had the number painted in the way that ours did - but it might not be there.

The fuel tank on the Rhinebeck Scout has been replaced with an S-4C tank; it has holes for pushrods even though it is fitted with aileron cables, so the panel above the tank may have been replaced too, in which case the additional evidence would be lost. We think it was replaced because the original would have had hole for the “snorkel”, and there doesn’t appear to be a hole or a patch in our photos. We know from the Report of Director of Air Service that both 4328 and 4367 were sold as surplus at Houston, so either number is possible.

The number we found behind the cockpit is consecutive with ours, so if it really is the true identity of the aeroplane, then the Rhinebeck Scout and the IAHF Scout would have been built side-by-side, just as consecutive airframes appear side-by-side in the old photo inside the plant.

The Post-War History of Our Tommy

The hunt for our Tommy’s post-war story began with a different number, 474, that appeared on the appraisal letter written by Frank Strnad in 1970 when the plane we now own was donated to the Aeroflex Museum by Capt. Lloyd B. Milner. NC474 is listed in the Civil Aircraft Register of the Civil Aeronautics Authority (CAA). We are indebted to the Federal Aviation Administration (FAA) for searching their archives, handed down from the old CAA, for information on number 474 and for passing their records along to us. They proved to be a gold mine of information about the history of our Tommy.

In the middle of the night, sometime in the early 1920s, Roy Larson, of Larsen, Wisconsin, got a phone call from the railroad station in Neenah. His Thomas-Morse S-4B Scout had just arrived. He’d paid more for the rail delivery than he had for the aeroplane, which he had bought at auction from the Aviation General Supply Depot in Houston, Texas. He hitched a team of horses to a hay wagon, rode a dirt road 15 miles to Neenah in the night, and returned home in the morning with his Tommy. He wouldn’t have noticed or cared at the time, but underneath the deck panels the plane carried the number 191 in two places, as we discovered 90 years later.

The plane Roy bought was eventually designated 474 by the CAA, which recorded his ownership. At the time
Our Tommy in 1923 at the Larson Brothers Airport, Larsen, Wisconsin (Left). At that time they also had a Curtiss Canuck (Center), and a Standard J-1 (Right).

Roy bought it the CAA did not exist, and the aircraft likely bore its U.S. Signal Corps number 4366 on its sides. Mr. Larson’s daughter, Theda, still remembers him telling the story of the day he got the Tommy, and she shared it with Don Funke in 2012 when he visited her in Larsen, where she still lives.

In 1922 Roy, with his three brothers, cleared a sod strip and founded the first airport in Wisconsin. They built a hangar there two years later, now listed on the National Register of Historic Places. They gave rides and trained pilots using a Curtiss JN-4 “Canuck” and a Standard J-1. Roy must have picked up the Thomas-Morse for exhibition flying since it was a single-seater and was never modified to take a passenger.

On November 3, 1928, William H. Palmer of Neenah, bought the plane from Larson. The CAA record has the aircraft located at Whiting Airport in nearby Appleton, which was known as a barnstorming field during the 1920s. A list of licensed and identified Thomas-Morse Scouts published in “Tommies: Part II” by Frank Strnad, (American Airman, July, 1960, pp. 8-14) shows that by January 1929, number 474 had been re-engined from the original 100 hp Gnome to the more reliable 80 hp Le Rhône. We don’t know when this was done, only that it had been done as of that date. This is the engine that is on the plane today.

Because of the short time Palmer would have had the machine at that time, we assume the conversion was done by Larson.

On May 13, 1931, Palmer sold 474 to Dalma Kamm in Oshkosh - the location was listed as Larson Airport. The “Reassignment Application” states that the fuselage was re-covered in 1928. We believe this work was done by Larson and that he likely painted the machine red. This claim is substantiated by red paint found in several locations on the Tommy’s airframe.
Was our Tommy painted red? At least part of it was. This is the tail section where the stabilizer is mounted. We believe the red paint was applied in 1928 when Roy Larson re-covered it.

On August 25, 1931, Steve Shabreck, of Rhinelander, Wisconsin, bought the plane and moved it to Rhinelander Airport. The Tommy was reported as being “in flying condition” in February 1934 and “A-1 condition” in 1935. Shabreck sold it to Don Oscar Voge of Robinsdale, Minnesota on July 19, 1937. The “Identification Mark Assignment” in Mr. Voge’s name dated June 1, 1939 is stamped “EXPIRED”. In addition, a CAA response to a query about Mr. Voge’s aircraft in May of 1940 stated that 474 was inactive. We therefore believe the plane’s last flight was during the period 1937 to 1939. The engine mount was broken when we received the plane; that may have ended its flying career. That is, until we finish the restoration!

Oscar Voge photographed with our Tommy in Wisconsin, circa 1937. At this point, the machine still had the original “B” wings, and no aileron pushrods. The number 474 appears on the rudder, and the engine is clearly a Le Rhône, which is consistent with the records. Is the plane red? We wish we could tell.
After World War II

Voge retired the aeroplane in about 1939, and records show that it was inactive throughout the war. In 1946 the Tommy was purchased by Lloyd B. Milner, a retired Northwest Airline pilot from Minneapolis, Minnesota. Milner also bought another Scout, N66Y, which was the prototype. A letter from the CAA in 1946 responding to an inquiry shows that both aircraft were in storage. The October 1946 issue of Flying carried an ad placed by Jack Walton for a Thomas-Morse Scout. Walton was the owner of N66Y, so that is probably what he was selling, and it appears the sale went to Milner, probably in 1946, at the same time as 474. In any case, Strnad’s previously mentioned list identifies Milner as the owner of an S-4C (actually an S-4B) and another aeroplane “that will be used for parts”, which was probably N66Y, the prototype. This means that Milner likely owned both planes beginning in 1946.

Years later, in 1970, Milner donated both 474 and N66Y to the Aeroflex Museum in Newton, New Jersey, which we know from appraisals written for each aircraft by Frank Strnad. Therefore, the prototype, N66Y, and our Tommy, 474, were stable mates for much of the time they were owned by Milner (some evidence suggests they may have also been in storage together prior to that). As we noted in Part 1, we believe the cowl on our Tommy came from the prototype, and that the hasty construction of the lower wings suggests that they too were from the prototype. We know that the prototype had been converted to carry S-4C wings with ailerons driven by pushrods and torque tubes, so it is also possible that our Tommy has those upper wings as well. Given that both planes were stored for a long period of time together, and that the prototype appears to have been identified as being “used for parts”, we assume that the planes had been disassembled at some point and reassembled with parts mixed up.

Aeroflex loaned 474 to Wings and Wheels in Florida in 1975, and there it stayed until 1981, when Dr. Thibault bought the plane and took it to California. He donated it to us in 2010, and it was shipped by tractor trailer back to Ithaca, New York, where it had been built in 1918, bringing our story back full circle.

Summary

The IAHF Thomas-Morse Scout that we are restoring was the 91st production model S-4B in the first order of 100 Scouts purchased by the U.S. Army Signal Corps, identified by production number 191 found in two locations inside the plane. It therefore must have been Signal Corps number 4366.

It was sold at auction by the Aviation General Supply Depot, Houston, Texas not long after World War I and shipped by rail to Roy Larson, Larsen, Wisconsin. During much of the 1920s Larson flew it as an exhibition plane from his field in Wisconsin, now listed as the Larson Brothers Airport on the National Register of Historic Places.

The CAA gave it number 474, and from CAA records we know that it changed hands several times from the late 1920s through the 1930s, continuing to be used for barnstorming in Wisconsin and Minnesota. In the late 1920s it was re-engined with a Le Rhône rotary, the same one it has today, but we know from a photo taken in about 1937 that it retained its original S-4B wings and aileron cables and was not converted to the S-4C configuration during that time.

Our Tommy was in storage during World War II, and acquired by Lloyd Milner after the war, who also bought the prototype Scout. There is evidence that some of the prototype parts were switched to our aircraft, and at some point, probably after 1946, the aircraft was modified to take S-4C wings, re-covered and displayed with the number A-4358. As noted, the correct number was actually 4366. We believe we now have the best-documented Thomas-Morse Scout in the world. We are restoring it as closely as possible to its original condition and plan to fly it by the 100th anniversary of the date it left the factory.

Can You Help Us Complete This Project?

Please visit our web site at www.tommycomehome.org to learn more about this project. Please note that some of the items we are looking for are located under the "Wanted" tab. Any help locating these parts would be greatly appreciated. In addition, we are seeking monetary or parts donations. The Ithaca Aviation Heritage Foundation, Inc. is a not-for-profit corporation which has 501(c)(3) status. Your donation to IAHF will be tax deductible in accordance with the IRS Code. Donations can be mailed to IAHF, c/o Randy Marcus, 119 East Seneca Street, Ithaca, NY 14850, or can be made online at IAHFs website.
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