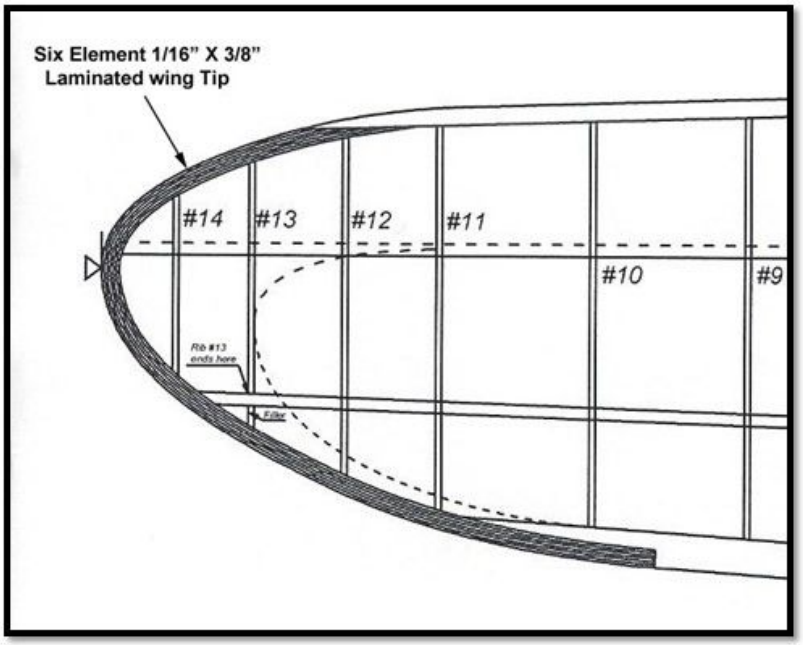
From: "Tandy Walker" <rdb435021@icloud.com>
To: "Tandy Walker"
Date: 12/21/2017 11:46:13 AM
Subject: 20 Lancer 850 - Making Wing Tips (Part 1)

New Cyclone Lancer 850

December 21, 2017

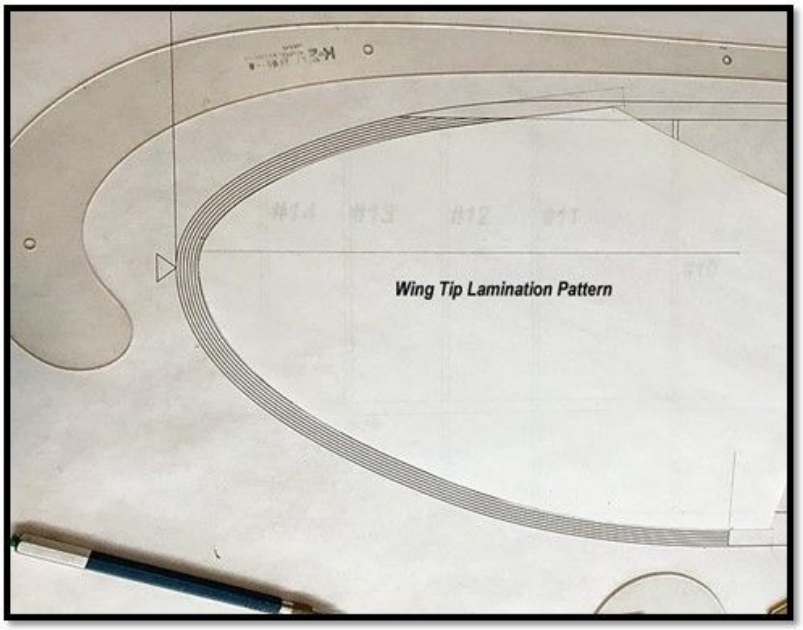
Now that the wing ribs are all finished, considerations for framing up the two wing panels are in order. First however, the wing tips must be made. A candidate design for the Lancer 850's wing tips is six 1/16" X 3/8" balsa strips glued together to form a 3/8" square laminated spline as shown below.



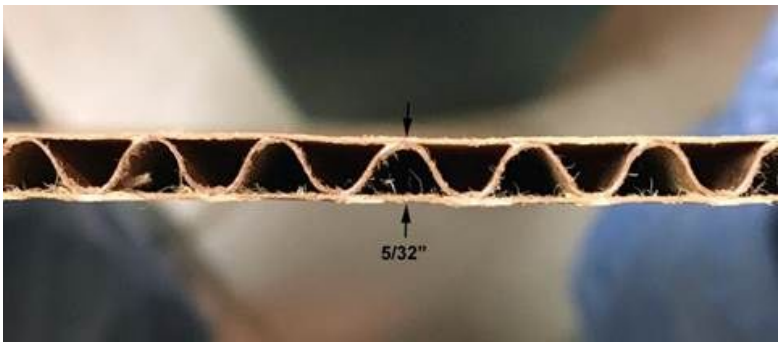
Over the years, I made any number of wing tip laminations. Most wing tip shapes have a liberal radius which made it relative easy to bend around the form. However, there is a question, in my mind at least, whether or not the six 1/16" strips can be successfully bent around the Lancer's much sharper curvature without breaking the strips.

After expressing my concern to Alfredo, he told me his procedure for making the strips even more pliable was to keep them submerged in boiling water for about two minutes. So I decided to use Alfredo's approach to try and soften the strips enough with boiling water to see I could successfully bent them around such a sharp curvature without breaking them.

The first thing I needed was to make was a form. So a paper pattern was made by tracing around the inside edge of the wing tip and cutting it out. The pattern was then proofed by laying it on the left wing half plan as shown below.



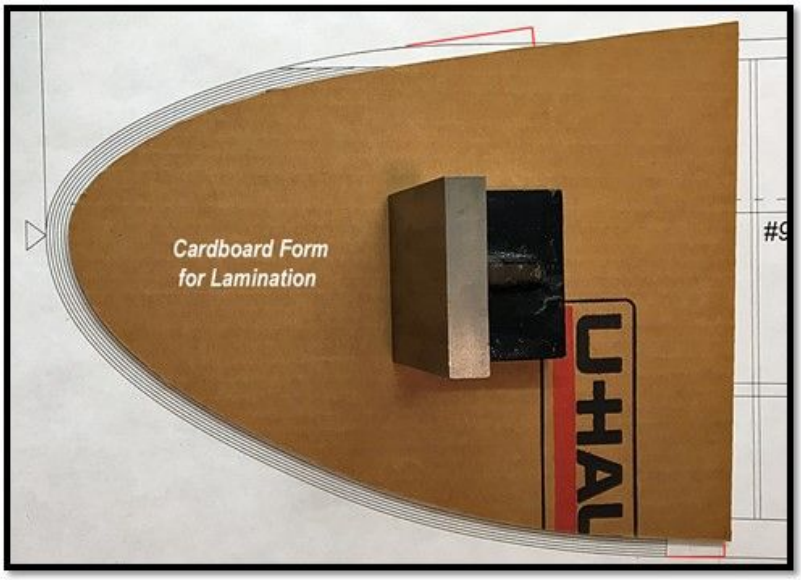
Next a sheet of corrugated cardboard was cut out of the side of a *U-HAUL* cardboard packing box. This is a close up of the edge shows the 5/32" thickness of the cardboard corrugation



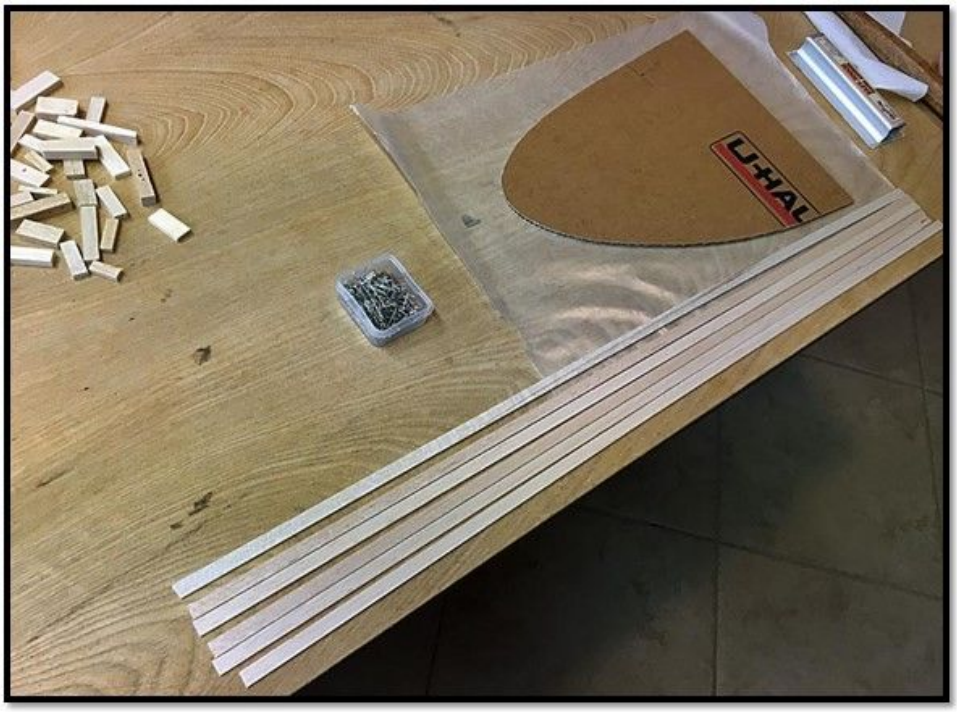
The paper pattern was pinned to the cardboard and the pattern was traced onto the cardboard. It is important to note that the cardboard's corrugations run spanwise because the lamination's largest compression force will occur right out around the end of the wing tip.

Then the traced pattern on the cardboard was cut out and the edges sanded down smooth to produce the cardboard form that will be used to bend the lamination around. The cardboard form was then proofed by laying it on the left wing half plan as shown below. Notice the red line extension on the plan at each end of the lamination. These extensions, which will be

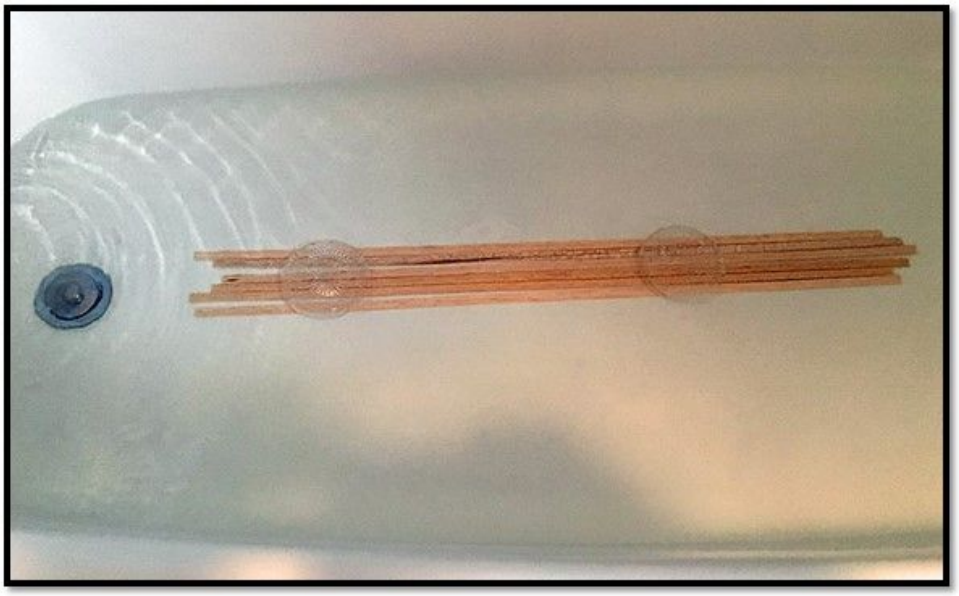
cut off later during assembly, are necessary to get a good lamination match to the plan.



The outer edge of a cardboard form was rubbed with bar soap to prevent glue from sticking to it. Wax paper was laid down on the work table and the cardboard form pinned to it. The six 1/16" X 3/8" X 36" were cut to a 29" in length. Notice the group of scrap balsa pieces on the table that will be used to hold the spline in place.

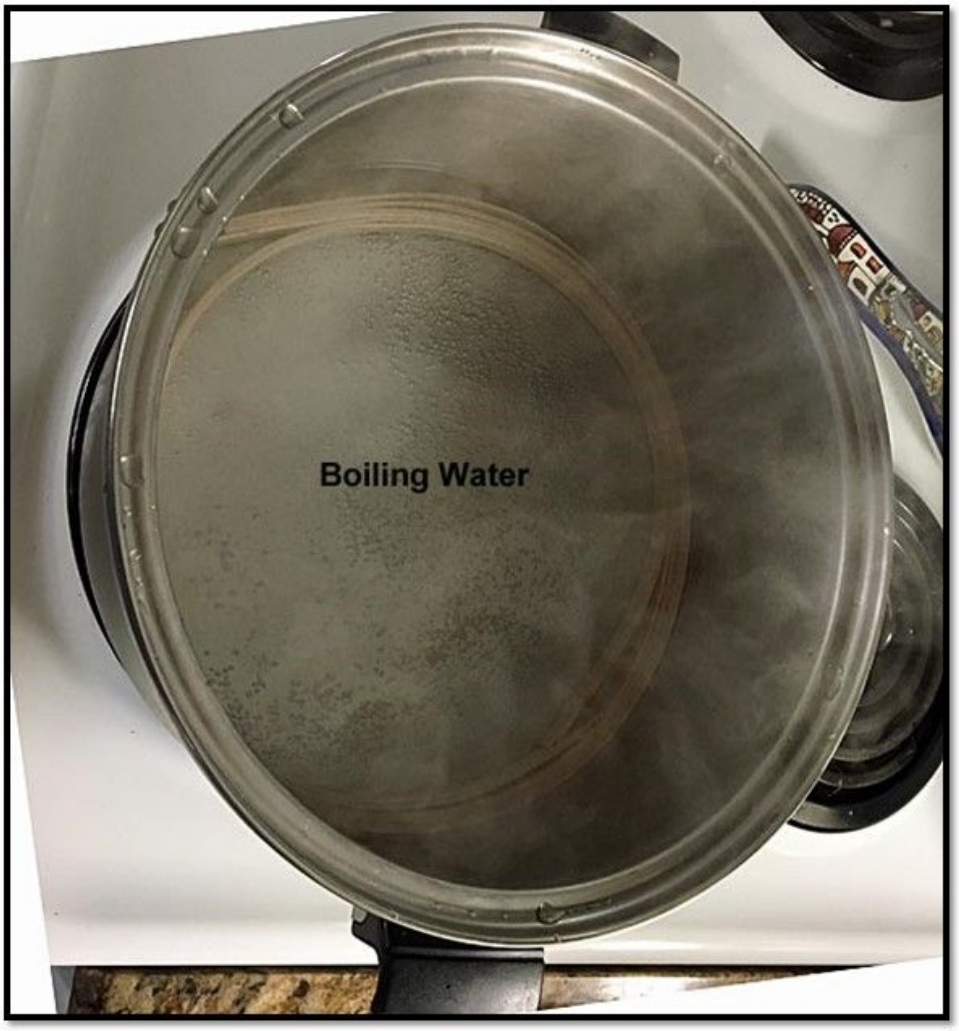


The balsa strips had to first be soaked under hot tap water in the bath tub as shown below.



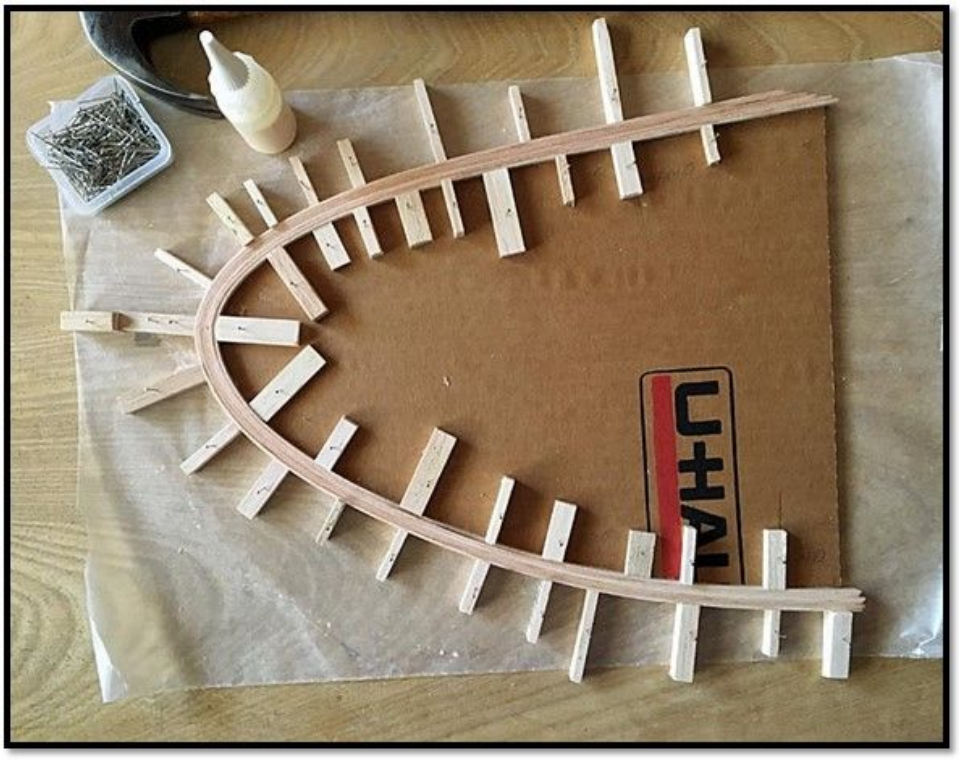
The strips were removed from the water and carefully bent around and placed on the bottom of Sue's Dutch Oven pot as you can see below.

The pot was placed on the stove and the strips were covered with about 2" of water. After the water was brought to boil, the strips were left in the boiling water for two minutes as per Alfredo's suggestion. Then the hot water in the pot was poured out and the pot was cooled down with cold water.



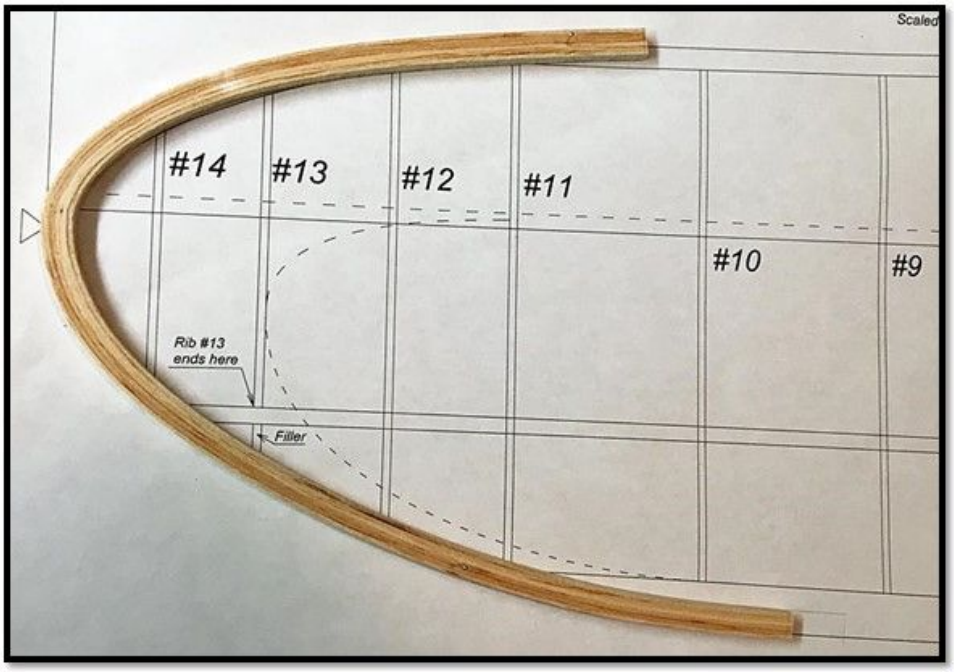
The 6 strips were dried off and placed on the table next to the form as you see below.

After putting aliphatic glue between the strips, the 3/8" square wet flexible spline was carefully bent around the cardboard form and held in place with 40 balsa pieces pinned against both the inside and outside faces of the spline as shown in the picture below.



This close up of the sharp bend at the tip shows the spline did crack with 2 of the 6 strips forming small voids.

After drying overnight, the laminated spline was removed from the cardboard form and the ends trimmed. The spline matched the tip drawing very closely as you can see in the picture below.



However, the fact that the spline cracked at the tip makes this a failed approach. Therefore, my fallback position will be to use the more conventional method using pieces cut from sheet balsa and glued together……Tandy