ACROSPORT WING RIB

OBJECTIVE

For students to construct a wooden wing rib of an Acrosport biplane.

Average completion time: 1 hour

SUPPLIES

Plastic rib jigs.
¼" precut nose block.
¼" x 36" Basswood sticks.
1/16" x ¾" plywood strips.
Wood glue.

TOOLS

Staple gun and staples.
Sanding blocks.
Tack hammers.
Staple pullers or side clippers.
Pencils.
Shop scissors.
Cutting blocks.
Razor saws.

STAFFING

- Minimum staff requirement: 1 staff per 8 students.
- Staff should have a standardized knowledge of how to construct the wing rib.
- Construction should be performed by the student—staff should only serve as a knowledgeable assistant.

SETUP

- Each rib station gets the following: 1 rib jig.
  2 ¼" x 18" sticks.
  1 1/16" x 3/4" plywood strip.
  1 Staple gun.
  1 Staple puller.
  1 Bottle wood glue.
  1 Tack hammer.
  1 Scissors.
  1 Pencil.

*** Glue bottles, staple guns, tack hammers, and staple pullers may be shared between stations.

GUIDELINES

- This project requires the use of sharp tools that can seriously injure someone if used improperly. Make sure the student is fully aware of the dangers of the tools that they are using.
- Because this project may become frustrating to some students, be sure to give them positive encouragement to keep their motivation going.

PROCEDURE

INITIAL

- The chief instructor should give a brief lesson on the concept of the wing rib and it's function.
- Construction should be divided into four stages: nose block and longerons, vertical and diagonal trusses, front gussets, and back gussets.
- Breaks should be taken at the approximate time between each stage for an announcement and basic direction.

CONSTRUCTION

Stage 1 -- the Shape

- Before any construction begins, have student write their name on both sides of the nose block.
- Place nose block in jig, then fit top and bottom longeron, fitting the top one first. Be sure to mark cut points with a pencil and do all cutting off the jig on the designated cutting block.

Stage 2 -- the Frame

- Measure and cut the vertical spar braces.
- Measure and cut the diagonal braces, with angled cuts on the ends for best fit.
- All braces should have a snug, seamless fit with the adjacent wood.

Stage 3 –- the Strength

- With the thin plywood strips, use the scissors to cut rectangular shaped gusset blocks for each of the brace joints, including the trailing edge and nose block joints.
- Wood glue should initially be applied to the rib framework and *NOT* the gusset material.
- As each gusset is glued down, staple the gusset to the rib by putting one staple in each separate brace that the gusset is glued to.

Stage 4 –- the Reinforcement

- Have instructor remove assembled rib from jig with special rib extractor or staple puller.
- Attach gussets to reverse side of the rib using the same techniques in Stage 3.
- Clean off any excess glue with a paper towel allow rib to dry.

OPTIONAL STEPS

- After glue on rib has dried use staple puller to remove staples from the rib.
- Sand down outer edges to remove any gusset overhang or sharp corners.
- Spray rib with a protective coat to guarantee a long-lasting souvenir.