



Professional model, Gina Kelley Thompson, gives us an interesting perspective as to the size of her dad's 9' span "Yardstick."

YARDSTICK

By George Thompson

Photos By Sean Kreck

Introduction

Have you wanted to build a "biggy" but have been turned off by excessive kit prices of \$80 to \$150, knowing you still had to buy the covering, wheels, landing gear and motor mounts.

Here is a 9 foot span model you can build for \$50 complete (not including motor and radio). The trick is making your own kit, stack cut the ribs, splice spars, build up the leading and trailing edge, fabricate the fuselage formers and substitute other material for balsa.

Use free yardsticks for the entire fuselage, wing spars and odds and ends. Use the plain, unvarnished kind; the printing is okay. Yardsticks can be obtained at hardware stores, paint stores, fabric houses, dress shops and sewing centers. Get your wife, girlfriend, mother, etc., to help. You will need approximately 20 yardsticks. Use scrap pieces for gussets, etc. Yardsticks are excellent wood to work with, easy to cut, saw, and sand. They are not prone to splitting, cracking, or breaking.

Use standard building practices throughout, keeping the weight down.

Do not add to the plans, the plane is plenty strong enough as drawn. I cannot emphasize the weight factor too much. Use white glue throughout except the high stress areas where the newer 5-minute epoxies are used.

CONSTRUCTION

General construction notes are as follows:

Fuselage:

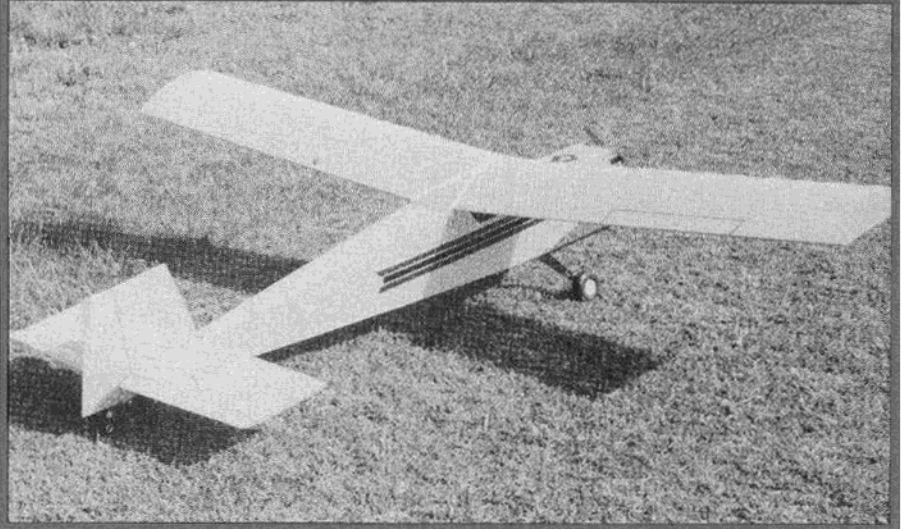
Lay out and glue two sides as shown. Add splice plates, making sure you have a left and a right hand side. Make formers F3 through F5. Construct the fuselage upside down using a



Check out this 9' span model you can build for \$50.00, less engine and radio. A .40 to .61 engine will put it in the air.

straightedge and a right triangle to assure alignment. Double glue the motor area including the firewall and gussets. Install the plywood floor and the landing gear mount. Drill for the blind nuts for mounting the landing gear; drill and tap 1/4-20 two places for the functional struts. Glue in the plywood plate for the tail skid; drill for the wire skid; glue in the balsa plate top rear as a platform stabilizer.

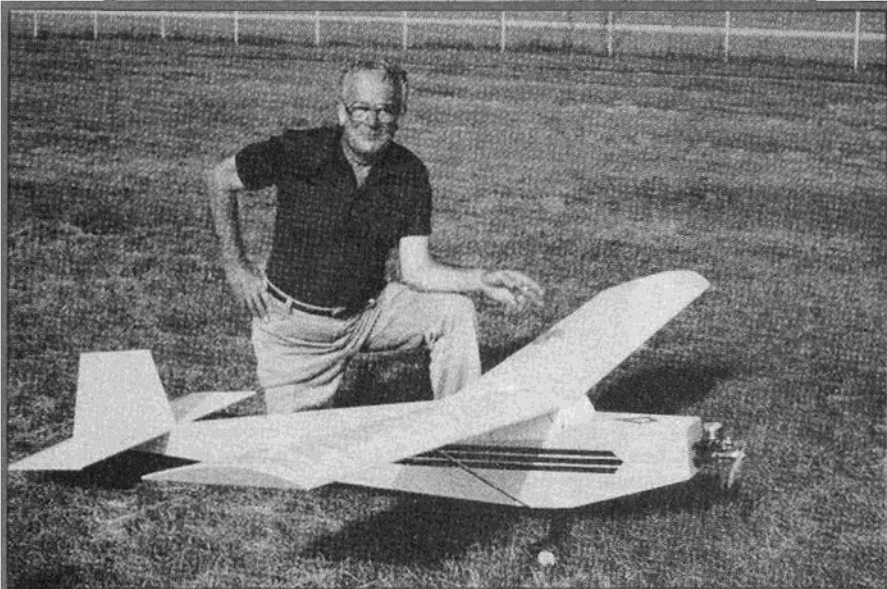
The formers from F5 back are not shown on the drawing. They are installed after the rear tail post is pulled together and glued. The height and the width of these formers is undetermined. Using a long flat sanding block, sand the entire

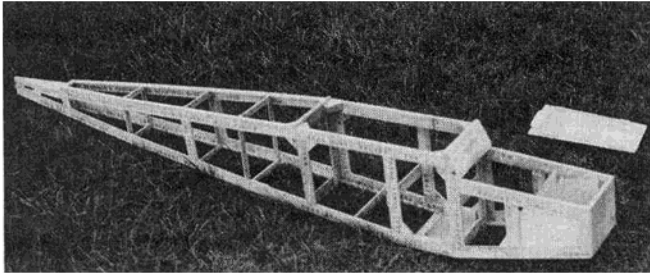


fuselage to remove burrs, ridges and glue overspill. Do not attempt to remove the printing from the yardsticks.

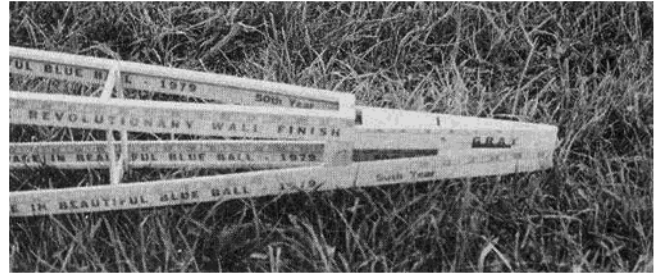
Wing:

Make a cardboard pattern of the wing rib W-1 without the spar slots. Trace around the pattern with a fine point ballpoint pen on 1/8" x 3" x 36" balsa sheets (you get five ribs per sheet). Cut out the ribs, stack them together and pin and sand to finished shape. Cut the spar slots (four hacksaw blades taped together make the correct width cut). Splice the spars using epoxy glue. Lay on the full size plan. Using white glue and pins, add the ribs. Build up the leading edge, butt splicing 36" balsa strips, staggering the splices. Do the same with the trailing edge. Please note the 1/4" sq. balsa strip used as rib spacer and gussets front and rear. Add wing tip plate and gussets TB-1 and TB-2. The wing half is now finished; do the same for the other half except put the tip plate on the opposite end to make a left and a right half. After sanding and shaping, cut out the center ribs for the DB-1 ply joiner. Block up the tips for 5° dihedral angle each tip (that is .017 per inch per degree or 4.5" per tip). Add the DB-1 plywood joiners using lots of epoxy. Clamp in place. Add 1/4" sq. pieces of balsa to prevent wing hold-down rubbers from crushing covering. Go back and double glue the





Completed fuselage should be covered in clear film to be able to read the names.



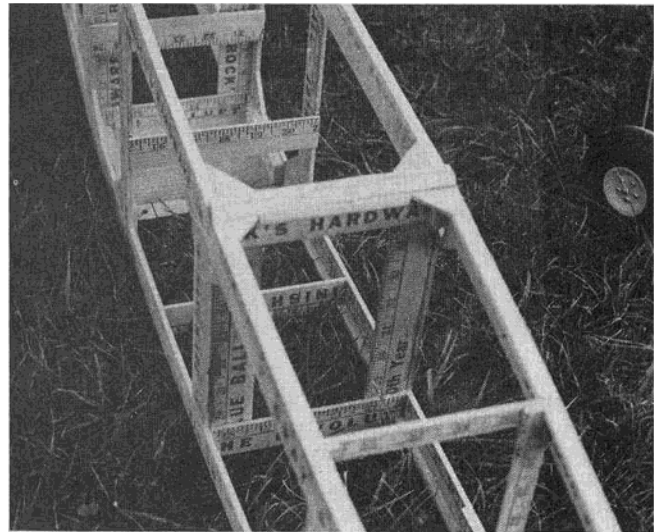
Aft end of fuselage showing stabilizer platform.

entire structure. Let dry overnight.

Tail Surfaces:

Cut the 3/8" sheets into required strips. On the full size drawing lay out and glue the strips to form the elevator and the rudder. When dry, remove from plan and sand to remove burrs and excess glue. Round the leading edge and the hinged edges and taper the trailing edges. Go back and double glue all joints.

Before covering, check fit the wing and stab. Insert the 1/4" dowels in holes; do not glue; strap on the wing; lay on the stab; sight from front and rear to align stab. At this time make the two functional struts. Flatten one end of a tube for about 1" of its length. Bend to proper angle by trial and error. Drill 5/16" oversize hole in the center of the flattened area. Using 1/4-20 nylon bolts, fasten flattened end to tapped hole in wing. Mark strut tubing where it touches the bottom of the fuselage. Remove and flatten at mark. Cut off excess, leaving 1" of the flattened area to bend. Drill the



Fuselage at wing trailing edge showing gussets and cross pieces for radio tray.

Bill of Materials

Fuselage:

- Approximately 16 yardsticks
- 3/8" plywood for firewall, 4" x 6"
- 1/4" or 3/8" plywood for floor, 6" x 6"
- 1/8" plywood for windshield, 3" x 7"
- 1/4" dowel for hold-down, 16" long
- 1/4" balsa scrap
- 1/4" plywood scrap

Wing:

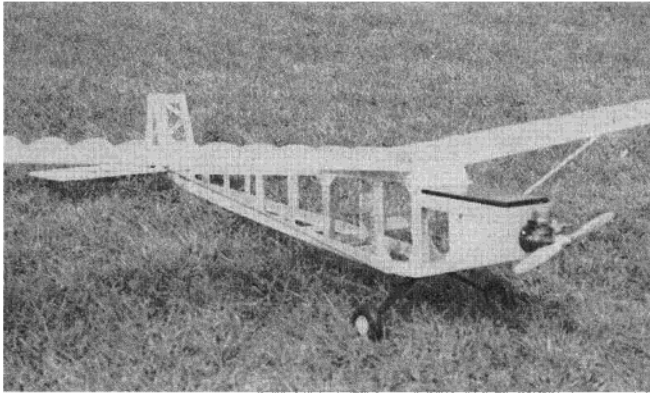
- (8) 1/8" x 3" x 36" balsa for ribs & tip plates
- (6) 1/4" sq. x 36" balsa for leading edge
- (9) 1/4" x 1/2" x 36" for leading & trailing edge
- (6) Yardsticks for spars

Rudder & Elevator:

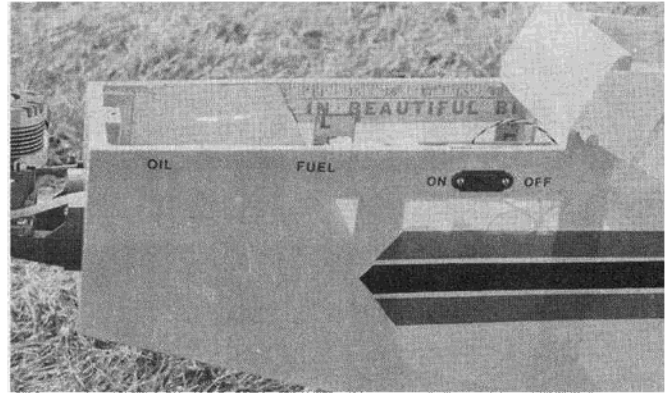
- (4) 3/8" x 3" x 36" balsa (cut to strip size)

Miscellaneous:

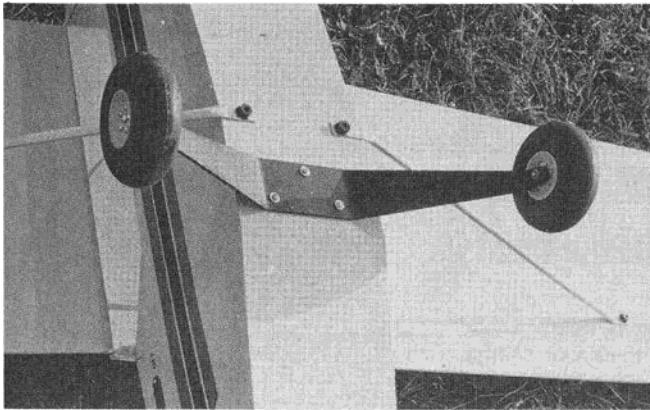
- 5 — rolls of MonoKote
- 8 — oz. white glue
- 1 — oz. epoxy glue
- 2 — 4 1/2 in. diameter wheels
- 1 — aluminum landing gear
- 2 — 3 ft. lengths of 1/2" aluminum tube



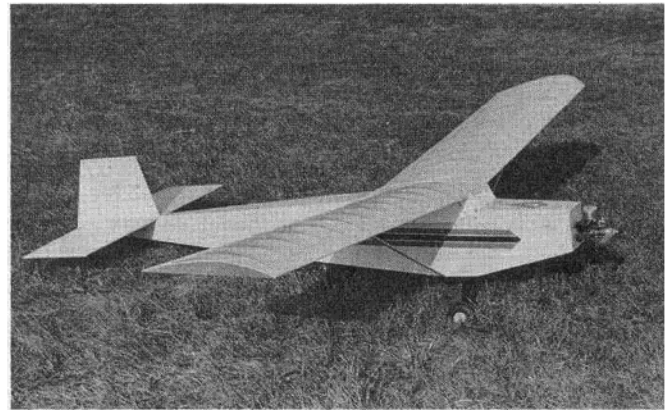
Completed airframe — very strong and sturdy, yet lightweight.



Tank compartment with room for most anything you want to put in there.



View of strut attachment and landing gear.



Completed Yardstick eager to get into the air.

second 5/16" oversize hole in the center of the flattened area; check for fit and repeat for other strut.

Covering:

Cover with anything you feel most comfortable using — silk, silkspan, bamboo paper, nylon dress backing, or iron-on film. I used silkspan on the first Yardstick and Super MonoKote on the second. It all costs about the same. By the time you have bought silkspan, clear dope, colored dope and trim dope you might as well buy five rolls of Super MonoKote and save a lot of labor. I use different colored vinyl tape for trim, fixing the edges with clear polyurethane spray.

Engine and Radio Installation:

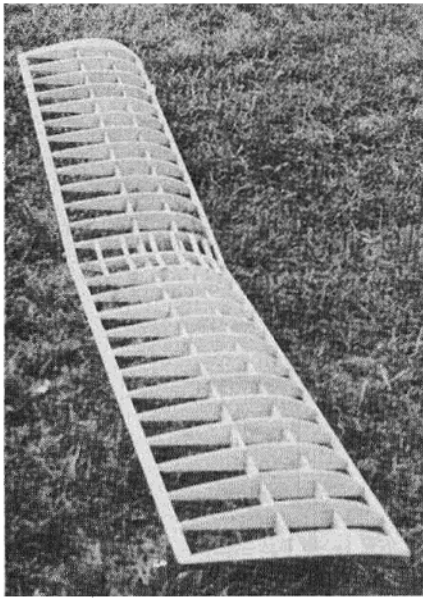
You can power the Yardstick with a sick, tired, old .60 or a good .40. Use any make beam mount that fastens radially to the plywood firewall. Use at least a 10 oz. fuel tank and do not forget to pressurize the tank from the muffler. Any good three channel radio may be used. In my last yardstick model I made a tray using the yardstick scraps. The tray was 1" deep, 3" wide and 11" long. I mounted a standard 3 servo tray, the receiver and the battery back in the noted tray. I installed two transverse pieces of yardstick across the fuselage at F3 and F4 and mounted radio tray on

them. I slid the tray back and forth to find the Center of Gravity. I used 3/8" dowels as pushrods for the elevator and rudder, and nyrod for the throttle control.

Flying:

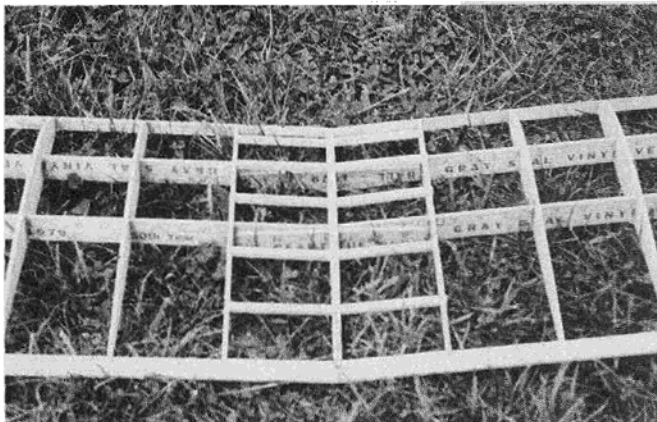
I won't insult you by presuming to

**From
RCModeler
Apr. 1984**

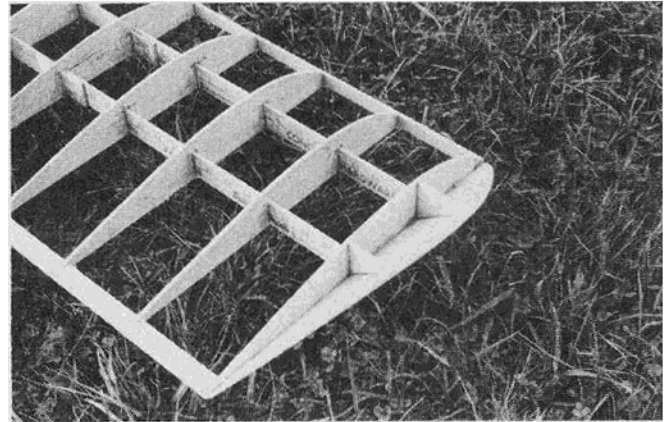


Completed wing ready to cover.

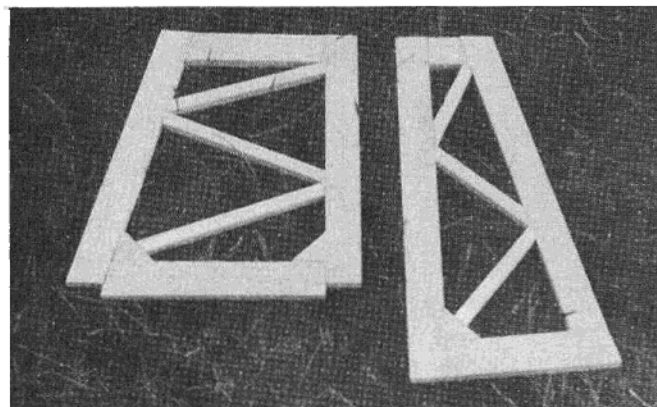
YARDSTICK		STABILIZER AREA
Designed By.		385 Sq. In.
George Thompson		STAB. AIRFOIL SECTION
TYPE AIRCRAFT		Flat
Large Sport		STABILIZER LOCATION
WINGSPAN		Top of Fuselage
108 Inches		VERTICAL FIN HEIGHT
WING CHORD		10 Inches
15 Inches		VERTICAL FIN WIDTH (incl. rud.)
TOTAL WING AREA		11½" (Avg.)
1620 Sq. In.		REC. ENGINE SIZE
WING LOCATION		.40-.61 cu. in.
High Wing		FUEL TANK SIZE
AIRFOIL		12 Oz.
Flat Bottom		LANDING GEAR
WING PLANFORM		Conventional
Constant Chord		REC. NO. OF CHANNELS
DIHEDRAL EACH TIP		3
4½"		CONTROL FUNCTIONS
O.A. FUSELAGE LENGTH		Rud., Elev., Throt.
81"		
RADIO COMPARTMENT SIZE		BASIC MATERIALS USED IN CONSTRUCTION
Ample		Fuselage Balsa, Ply, Yardsticks
STABILIZER SPAN		Wing Balsa, Ply, Yardsticks
36 Inches		Empennage Balsa
STABILIZER CHORD (incl. elev.)		Wt. Ready To Fly 120 Oz.
10½" (Avg.)		Wing Loading 10.7 Oz./Sq. Ft.



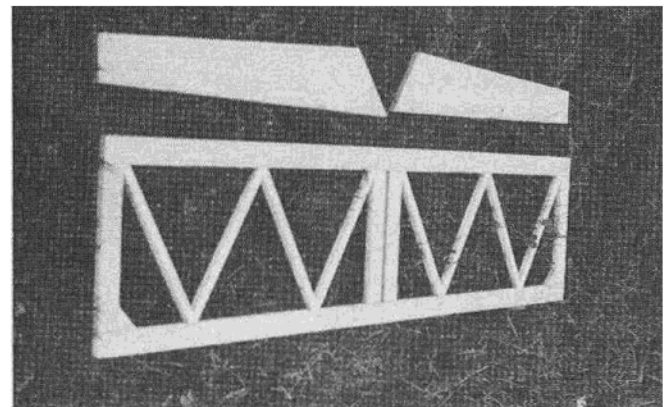
Wing center section dihedral gussets.



Wing tip detail — very simple.



Rudder and fin built from 3/8" balsa.



Elevator and stab built from 3/8" balsa.

tell you how to fly. I'll just tell you about the first flight of the Yardstick. Power was an old Enya .60. The pilot was Mr. Fran Crane of the "Hurricane Hawks" show team of Hamilton, Ohio. After the usual preflight checks, Fran taxied to the head of the runway and

took off. That's all I can say, he took off. He said later that at 1/2 throttle he literally leaped into the air in 10 feet. With the .60 for power the model cruises at 1/3 throttle. Loops are really a joy. Fly through them just as you would in a full scale aircraft, chopping

the throttle at the top and feeding it back in as you level off. Landings are made with throttle just as you would any real aircraft with a full flare-out just before the wheels touch down. That is really all I can say about it --- try it, fly it and enjoy it yourself. □