THE RCM SPORTSTER

BY JOE BRIDI

RCM PHOTOS BY DICK TICHENOR

EKTACHROME BY RITA LORD

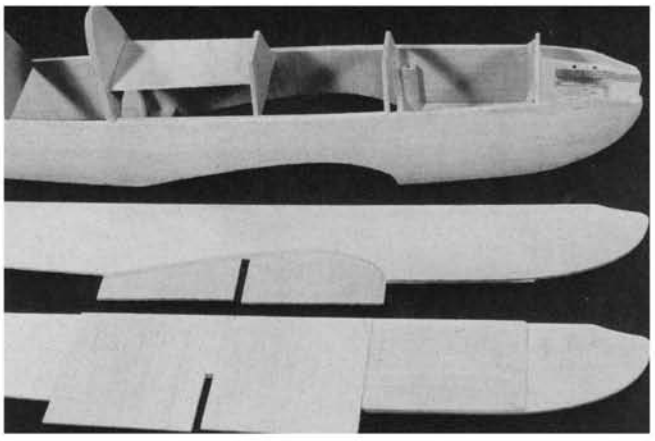
If you've mastered the RCM Basic Trainer, here's a .19 powered low wing sport aircraft that flies as good as it looks. K&B Superpoxy finish, Veco·Lee .19.

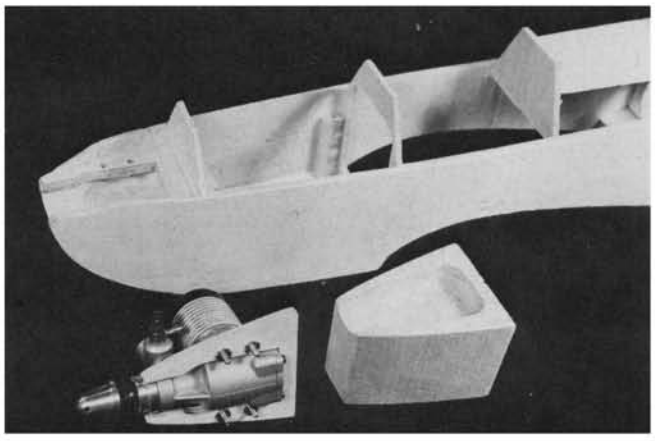
One nice sunny, smogless day in California we were out at the local flying site doing our thing with the RCM Basic Trainer when all of a sudden we said to no one in particular, "If we took the same wing, rear rudder and elevator and put the wing on the bottom we would have a dandy, fun to fly model."

This is how it all began, so we proceeded to make these changes and now we have the RCM Sportster. The wing is the same as the RCM Basic Trainer except the aileron horns come through the top instead of the bottom. The rudder and elevator haven't any changes whatsoever. The motor mounts are the same but the fuselage sides are different. We also added a canopy and turtledeck.

Several months later we finally got the prototype assembled and ready to fly. Once again, we were back at our local flying site testing out our idea. We fueled up, flipped over the prop and we were ready to fly. All controls were checked so we proceeded to taxi out on the runway. Everything was working well so we gave her the gun and off it went.

I was amazed - - - it lifted its tail, and then broke ground just as gentle as you would want it to do. No elevator was needed, but a little rudder was applied. The only trim changes it needed was a couple of turns of down elevator. Other than that it was virtually trimmed out. We had a ball flying the Sportster that day and for quite a few more days since. We also tried some crosswind landings and take-offs with huge success. A little rudder has to be applied to compensate for the wind, but crosswind take-off and landing are possible with little effort. Now we'll get into the construction of the model. We hope we have made the construction easy to follow and the model easy to build.

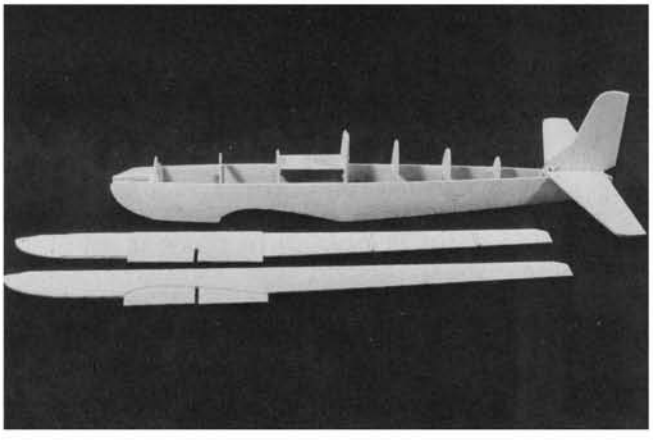




CONSTRUCTION

Start by building the fuselage sides – one left and one right. Draw a line on the inside of each fuselage side from the leading edge of the wing saddle to the top of the fuselage side at right angles to the top of the sides. This is the position of bulkhead No. 2. Cut the 3/32" x 4" x 13" fuselage doublers in four equal pieces, cross grain (see parts list). Next, cut 2 pieces of the wing capstrips to 2-1/8" long, then cut the rear fuselage vertical bracing from 1/8" x 3/16" stock.

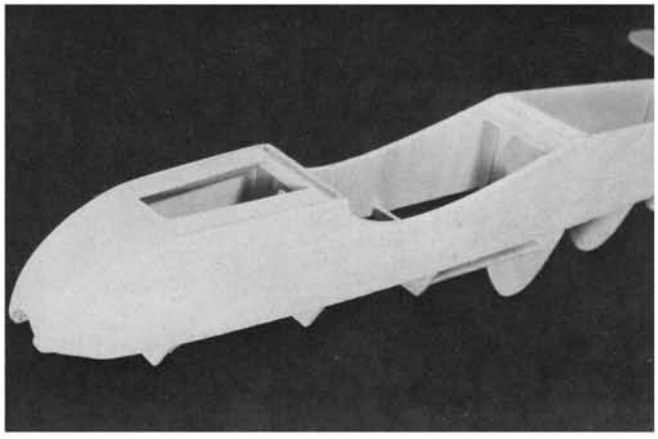
Using epoxy, glue the 1/16" ply fuselage tank doubler to the sides; they go in front of the line drawn from the wing saddle to the top of the sides. Next, glue one piece of the 3/32" fuselage doubler you just cut behind the 1/16" ply doubler, then the 2-1/8" piece of capstrip. Next, add the other 3/32" fuselage doubler. The last pieces to go into place are the vertical fuselage rear braces.



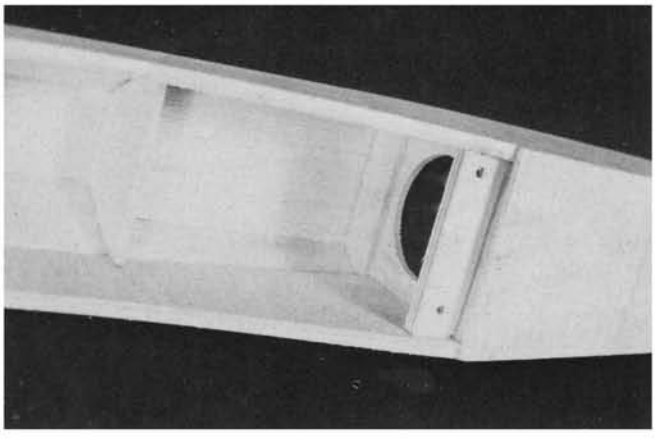
Join the two fuselage sides at the rear and install bulkhead No. 5, making sure the tops of the fuselage sides are parallel. Bulkhead No. 5 goes behind the last 3/32" doubler. Next, install bulkhead No. 2; it goes on the front of the first 3/32" doubler. Do not put bulkhead No. 2 on the 1/16" ply doubler. Now install bulkhead No. 3 and the cockpit floor; this will help keep the fuselage square and rigid. Install the rest of the bulkheads except No. 1 which is the 1/8" ply firewall.

The engine mount must be made to fit your choice of engines and blind nuts installed prior to assembling to nose block and firewall. The fuel and vent line holes in the firewall must match your choice of fuel tanks. Remember to align the landing gear retainer slots properly on bulkhead No. 2 (one slot forward and one aft). Drill a 1/8" diameter hole in each end of bottom landing gear support to accept strut.

Epoxy the engine blind nuts and hollow out the nose blocks to fit your engine. Epoxy the motor mount to the nose blocks. Epoxy the firewall (did you drill all holes?) into the fuselage. Butt the firewall against the 1/16" ply doubler, not on top of it. Now epoxy the nose block, motor mount assembly against the firewall.

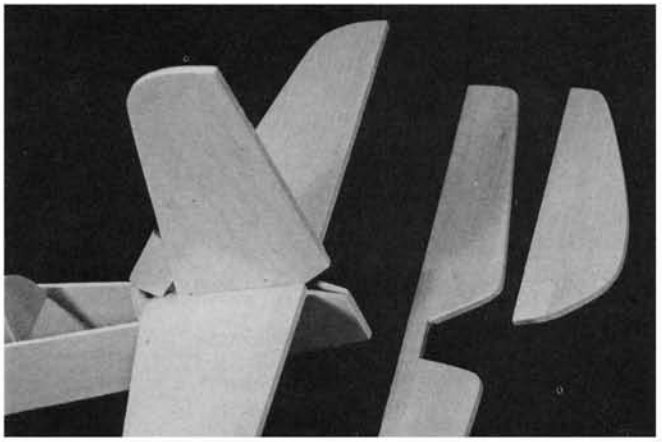


Add the 5/8" triangle stock to the bottom of the tank compartment, then the 1/16" ply tank compartment bottom. It butts up to the landing gear cross bracket, not on top of it.

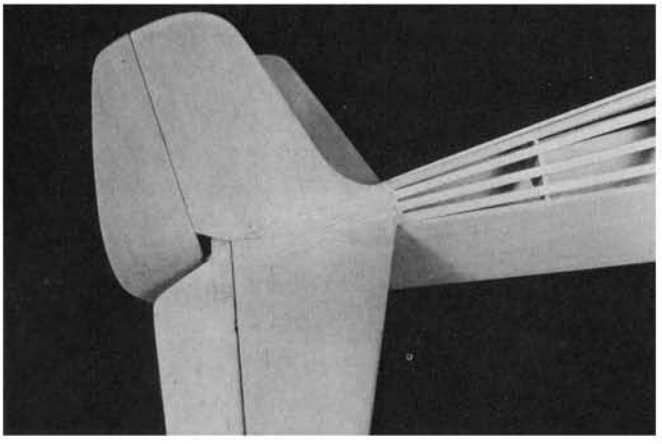


Add the 1/4" ply rear wing hold-down, do not drill until the wing is complete. Add all 1/4" triangle bracing as shown on plans.

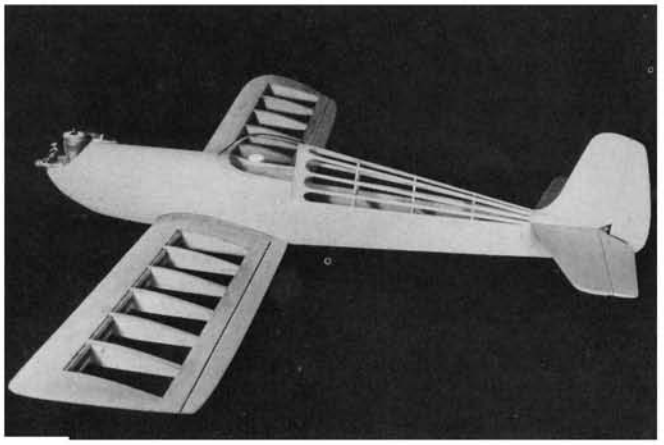
The tail surfaces are 3/16" thick balsa sheet. Pine inserts are cemented in place with epoxy or white glue. The



surfaces are sanded to shape after hinges are installed.

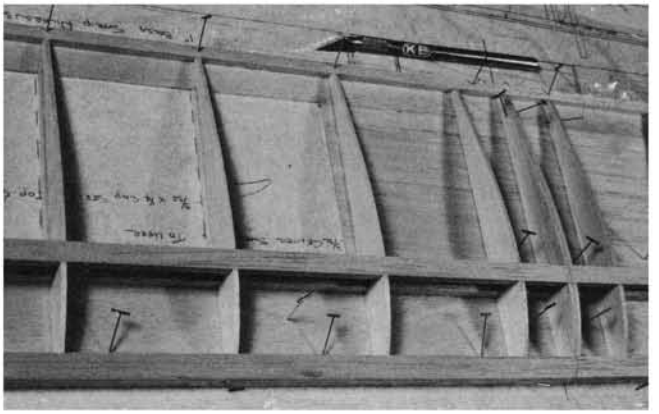


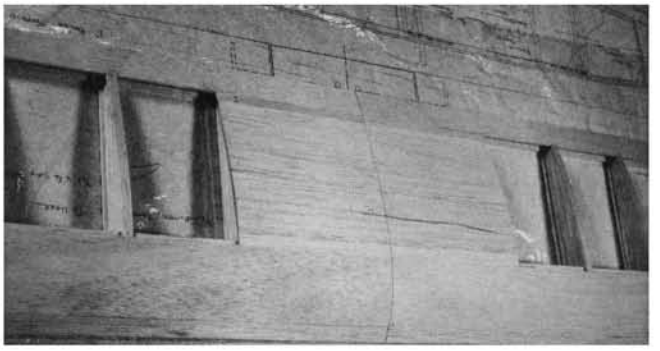
Glue on the rudder and stabilizer, making sure they are at right angles to each other and the stabilizer is at a right angle to the fuselage sides. Then cut a slit in the rear where the two fuselage sides join. Fill the slot with epoxy and insert the tail wheel bracket. Add the small rudder front filler piece but do not shape until the rear stringers are in place.



Cut the fuselage rudder filler block in half. Shape these parts before gluing into position. Add the seven 1/8" x 3/16" stringers to rear deck. The stringers butt against bulkhead No. 4 and rest on bulkhead No. 5.

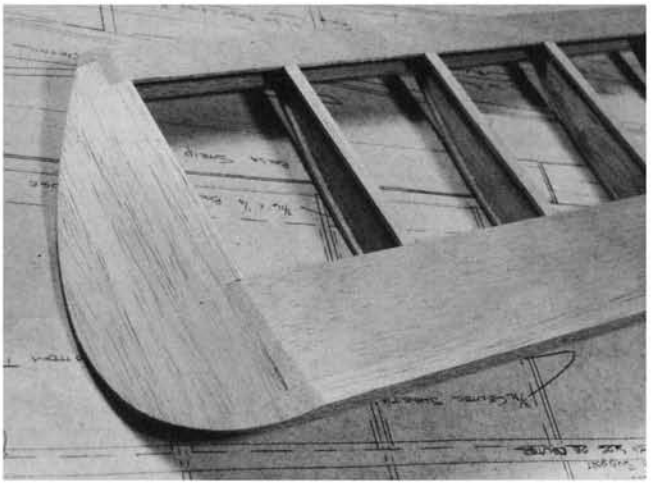
Cut the 1/8" fuselage stringer filler pieces and glue between each stringer as shown. Glue the ¼" fuselage front deck sides in place, and be sure to angle the bottom where it meets the fuselage so a good strong glue joint will be made. Sand the fuselage front deck sides flat on top, then glue on the fuselage front deck ¼" top. Sand the front deck to shape; the front deck is not half round at the cockpit area, it is flat across the front of the canopy and half round at the firewall. A Du-Bro No. 4 canopy can be used.





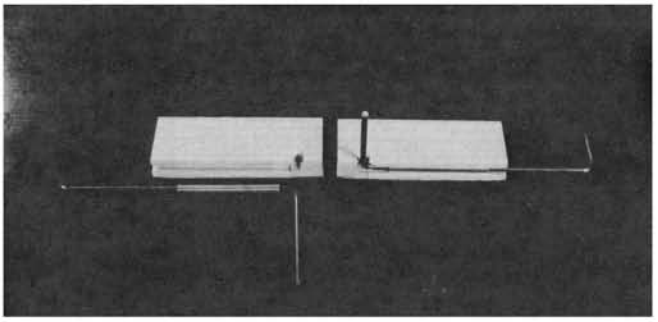
The wing is constructed right on the plans. Note the plastic food wrap to prevent gluing the wood to the plans. The first step is to assemble the bottom leading and trailing edge sheeting, center sheeting, and bottom capstrips. Next, assemble leading edge, trailing edge, bottom spar and ribs. Then install the top spar. A **flat** building surface is required to build a straight wing.

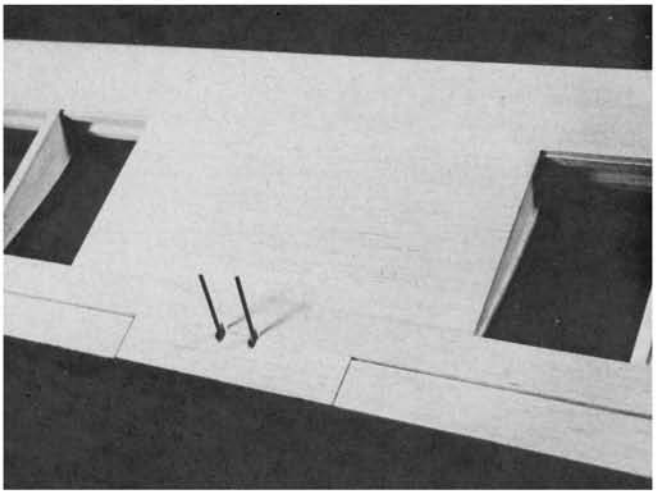
The top sheeting and cap strips are assembled after the bottom assembly is thoroughly dry.



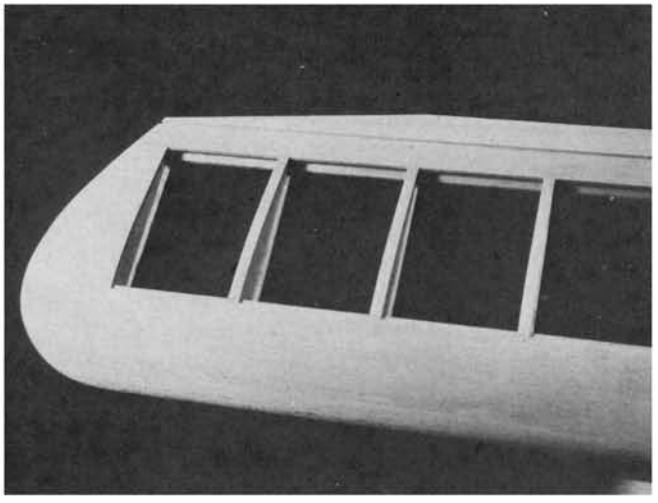
Trim ends of the wing assembly and sand smooth.

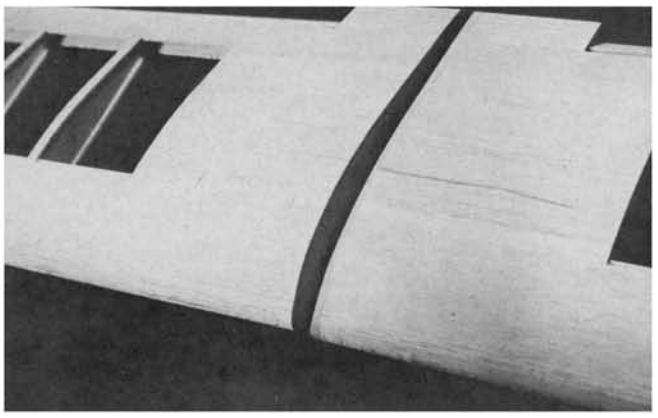
Notches are trimmed in the top side of the center section trailing edge blocks and wing for control arm clearance. The controls are inserted (be sure to assemble a





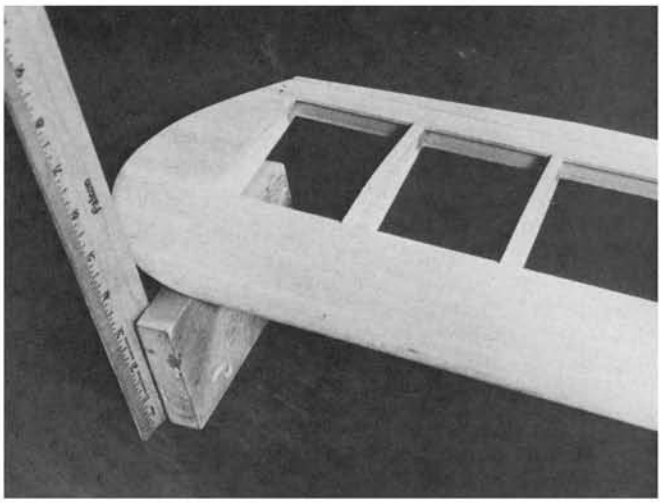
left hand and right hand pair). Cut a groove in the inboard end of the ailerons and drill holes for the control arm. Install the ailerons with hinges.



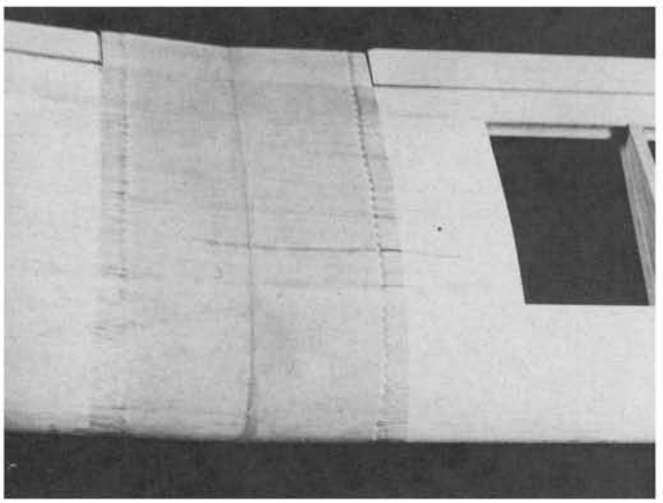


View showing wing tip and aileron tip shape.

The center section wedge shaped rib is glued to one inboard rib.



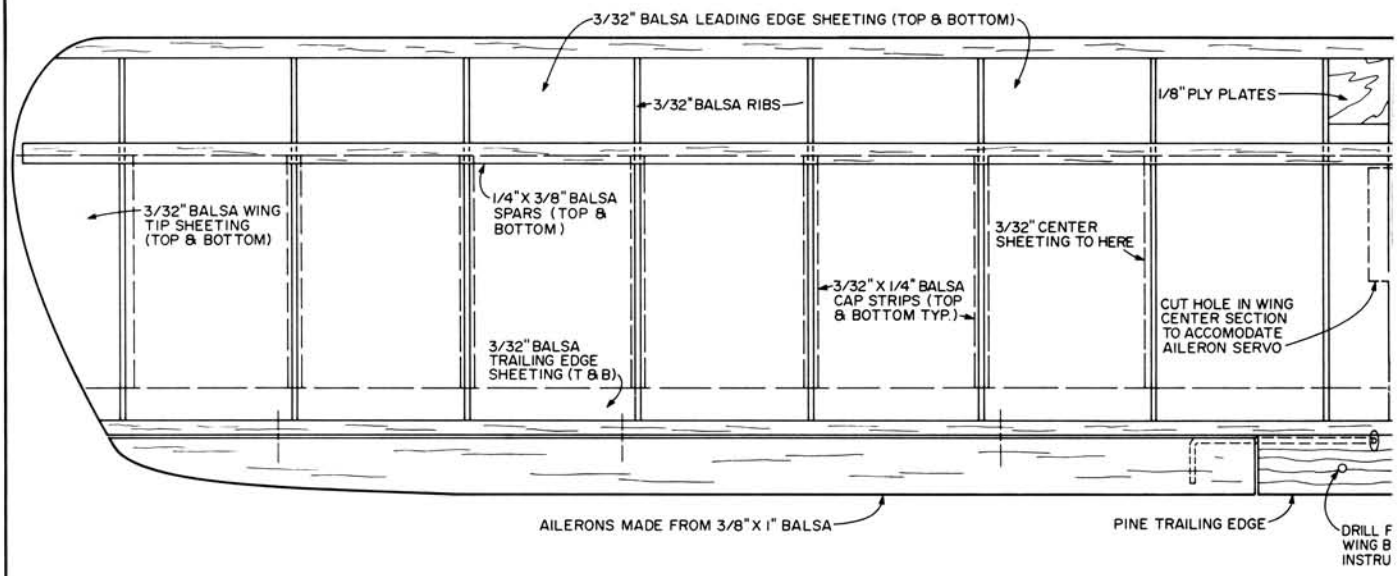
Wing panels are glued together at the center with the wedge shaped rib in place. One panel is held flat and the other panel is blocked up 3 inches to obtain the proper dihedral. Check alignment for a straight wing. A ¼" dowel is inserted and epoxied into the center dihedral rib.

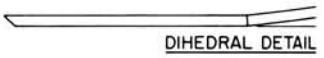


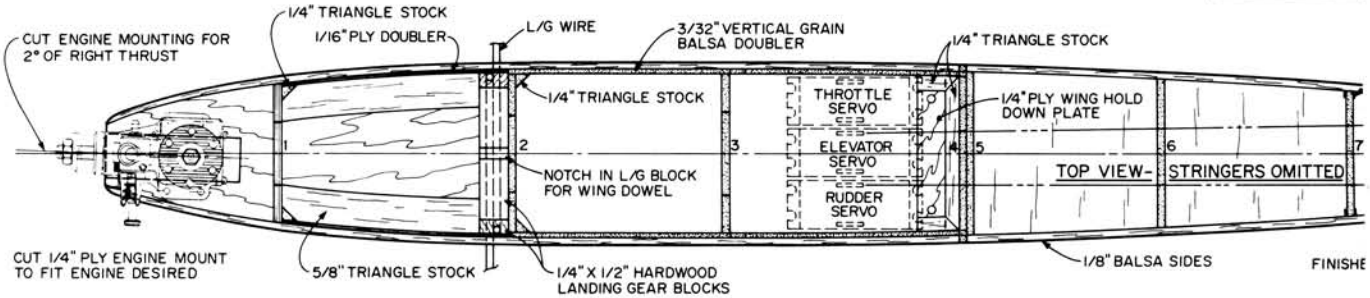
The center section is reinforced with cloth, Celastic, or fiberglass.

With the fuselage upside down, place the wing into position in the saddle. Make sure the wing is square to the fuselage. Then drill the two rear wing hold-down holes through the wing and ¼" ply fuselage wing hold-down brackets at the same time. Epoxy in the two 4-40 blind nuts. Check all alignment – see the RCM Flight Training Course book for alignment suggestion or call Don Dewey on the phone!

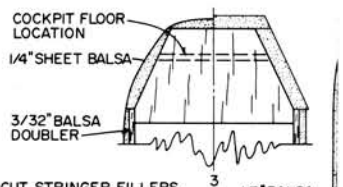
The selection of finishing materials and techniques are left to the option of the builder as there are numerous excellent materials available. Regardless of finish used, keep the weight as light as possible. We have found that the K & B Superpoxy primers and paints give us the desirable combination of a beautiful finish with light weight. Any of the .15 to .30 engines will provide more than ample power for the ship. We have used a Veco .19 with a 9-4 or 8-6 prop. □

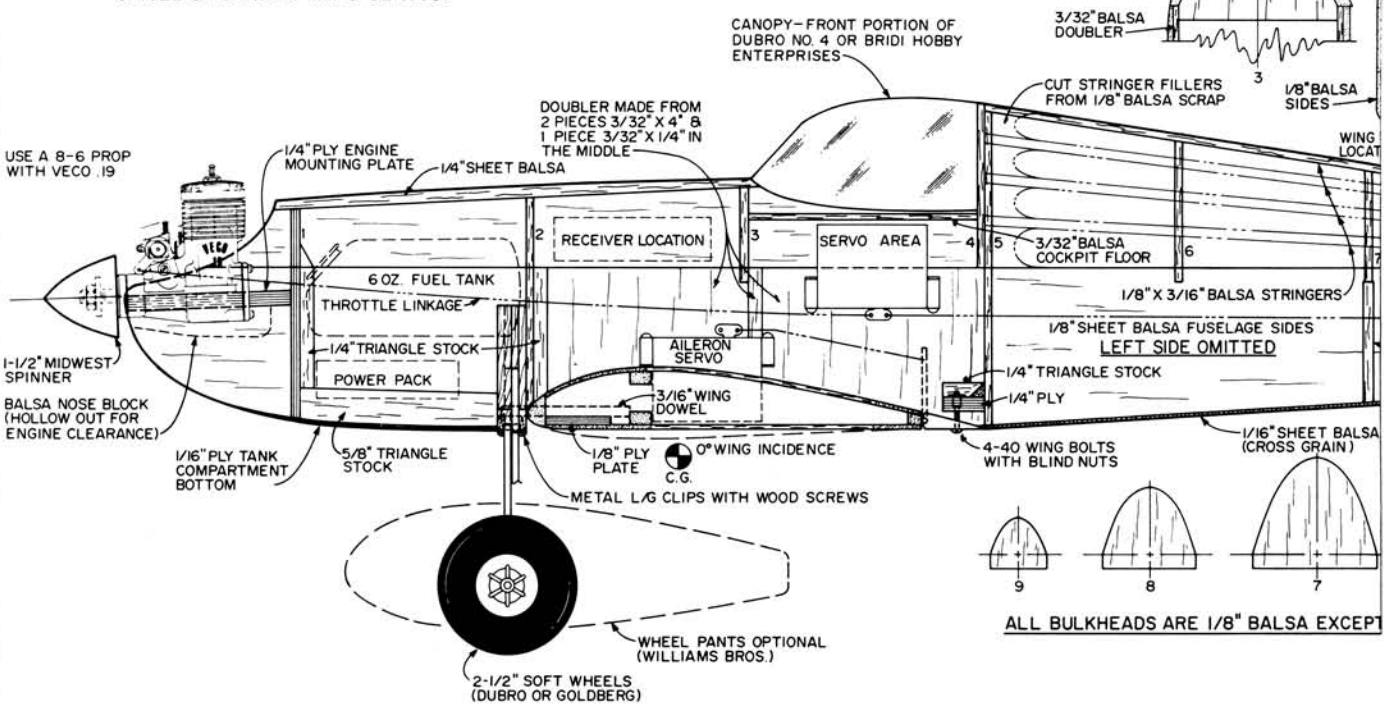




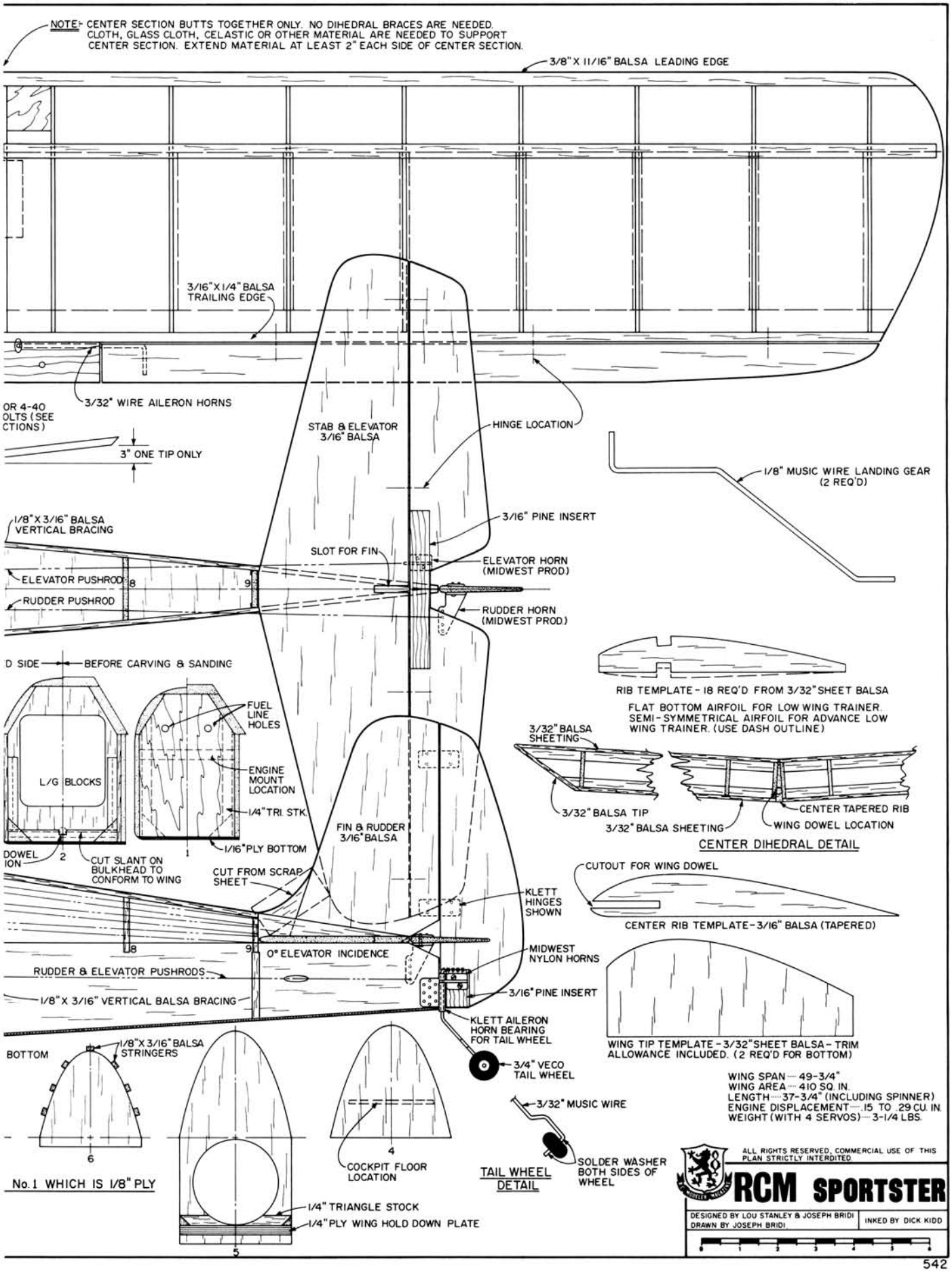


RADIO SYSTEM USED WAS ROYAL CLASSIC SYSTEMS, SINGLE STICK WITH MM-3 SERVOS.





ALL BULKHEADS ARE 1/8" BALSA EXCEPT


NOTE: CENTER SECTION BUTTS TOGETHER ONLY. NO DIHEDRAL BRACES ARE NEEDED. CLOTH, GLASS CLOTH, CELASTIC OR OTHER MATERIAL ARE NEEDED TO SUPPORT CENTER SECTION. EXTEND MATERIAL AT LEAST 2" EACH SIDE OF CENTER SECTION.
3/8"X 11/16" BALSA LEADING EDGE
3/16"X1/4" BALSA TRAILING EDGE
3/32" WIRE AILERON HORNS
OR 4-40 OLTS (SEE CTIONS)
3" ONE TIP ONLY
STAB & ELEVATOR 3/16" BALSA
HINGE LOCATION
1/8" MUSIC WIRE LANDING GEAR (2 REQ'D)
1/8"X 3/16" BALSA VERTICAL BRACING
3/16" PINE INSERT
SLOT FOR FIN
ELEVATOR HORN (MIDWEST PROD)
ELEVATOR PUSHROD
RUDDER PUSHROD
RUDDER HORN (MIDWEST PROD)
D SIDE
BEFORE CARVING & SANDING
L/G BLOCKS
FUEL LINE HOLES
ENGINE MOUNT LOCATION
1/4" TRI STK
1/16" PLY BOTTOM
DOWEL ION
CUT SLANT ON BULKHEAD TO CONFORM TO WING
CUT FROM SCRAP SHEET
FIN & RUDDER 3/16" BALSA
KLETT HINGES SHOWN
0° ELEVATOR INCIDENCE
MIDWEST NYLON HORNS
RUDDER & ELEVATOR PUSHRODS
1/8" X 3/16" VERTICAL BALSA BRACING
3/16" PINE INSERT
KLETT AILERON HORN BEARING FOR TAIL WHEEL
3/4" VECO TAIL WHEEL
BOTTOM
1/8"X 3/16" BALSA STRINGERS
No. 1 WHICH IS 1/8" PLY
COCKPIT FLOOR LOCATION
1/4" TRIANGLE STOCK
1/4" PLY WING HOLD DOWN PLATE
3/32" MUSIC WIRE
SOLDER WASHER BOTH SIDES OF WHEEL
TAIL WHEEL DETAIL
RIB TEMPLATE - 18 REQ'D FROM 3/32" SHEET BALSA
FLAT BOTTOM AIRFOIL FOR LOW WING TRAINER. SEMI-SYMMETRICAL AIRFOIL FOR ADVANCE LOW WING TRAINER. (USE DASH OUTLINE)
3/32" BALSA SHEETING
3/32" BALSA TIP
3/32" BALSA SHEETING
CENTER TAPERED RIB
WING DOWEL LOCATION
CENTER DIHEDRAL DETAIL
CUTOUT FOR WING DOWEL
CENTER RIB TEMPLATE - 3/16" BALSA (TAPERED)
WING TIP TEMPLATE - 3/32" SHEET BALSA - TRIM ALLOWANCE INCLUDED. (2 REQ'D FOR BOTTOM)
WING SPAN ---- 49-3/4"
WING AREA ---- 410 SQ. IN.
LENGTH ---- 37-3/4" (INCLUDING SPINNER)
ENGINE DISPLACEMENT ---- .15 TO .29 CU. IN.
WEIGHT (WITH 4 SERVOS) ---- 3-1/4 LBS.
ALL RIGHTS RESERVED, COMMERCIAL USE OF THIS PLAN STRICTLY INTERDITED
RCM SPORTSTER
DESIGNED BY LOU STANLEY & JOSEPH BRIDI
DRAWN BY JOSEPH BRIDI
INKED BY DICK KIDD
542