



*RCM's version of the author's Basic Biplane. Yellow and silver Solarfilm, DJ's trim tape.*

# RCM BASIC BIPE

FOR .19 TO .30 ENGINES AND FOUR CHANNELS,  
THIS EASY-TO BUILD AIRCRAFT CAN BE YOUR INTRODUCTION  
TO THE WORLD OF BIPLANES

BY JOHN CHAPIS

● I had the pleasure of flying the RCM Basic Trainer which belongs to my neighbor and photographer, "Chick" Allen. The flight characteristics are very impressive. While flying, we began a discussion about the modifications used to change the basic trainer into the RCM Sportster.

Well, at this point I got a bright idea. Why not take things one step further — high-wing, low-wing, and now the biplane. The first attempt used the "Sportster" as the basis, but the outcome looked too much like the "Pulsar Biplane". I wasn't looking for something like a hot pattern ship. I wanted a biplane that would bring back the thoughts of barnstorming — like the Stearman and Great Lakes. Thus, the RCM Basic Biplane was born. Using the plans from the basic trainer the following modifications were made:

1. Omit the nose block.
2. Extend the top of the fuselage to intersect with the firewall, thus enlarging the tank compartment and omitting the windshield.

3. Shorten the tail moment approximately 6".
4. Enlarge the tail surfaces to compensate for the increased wing area.
5. All other modifications were made to ease construction or improve looks.

After assembling the prototype, everything was checked out and the moment of truth came. The feeling that comes over you when all your dreams and expectations turn to reality is hard to put into words. But this is the way I felt as I made the initial flight tests. The only trim added was just a slight tap of down to keep the nose down in a 10 mph wind.

All flight characteristics are the same as the trainer with one big plus — the stall is very soft. But the proof is very evident on landing. Pull back the power on final, don't touch the elevator, and just keep the wings level. About 4 feet off the ground, start feeding up elevator very slowly. This will set you up in a slightly nose high attitude and kill any excess speed. Then, just before touch down, pull in full up and, very gently, the ship will plant all three wheels very nicely

on the ground. This is the most impressive characteristic of the RCM Basic Biplane. Enough talk, let's get to work and make all this literary imagery a reality for you.

As with all biplanes, the work involved to build an extra wing can discourage the builder more quickly than anything else. So let's get the hard part done first. The wing should be constructed on a flat surface. I find that building over the plans doesn't allow you to use them for reference during construction and leaves the plans in poor shape after construction. To construct a wing in this manner, transfer the rib location to the bottom planking of the wing. This is an easy process with the Basic Biplane which uses standard 36" stock for the upper wing and 34" of 36" stock for the lower wing. Both wings can be constructed at the same time, if room in your workshop permits.

After laying out the bottom planking and cap strips, glue the bottom 1/4" x 1/2" spar on both wings and the 1/4" square rear spar on the lower wing.

**Color photo of the author and his RCM  
Basic Bipe at a local flying area near  
John's home in Delaware.**

Now, glue the ribs in place and install the top 1/4" x 1/2" spar. Only after this portion has dried, install the 3/8" square leading edge, and the 1/4" ply bolt blocks in the top wing.

The top sheeting and cap strips are added after the bottom assembly is thoroughly dry. Remove the wings from the work surface then shape and install the tips. Now trim the wing assemblies and sand smooth. Install the aileron control arms and fit the ailerons on the bottom wing.

At this point, cut out for the aileron servo in the lower wing. After you are satisfied you have enough room, use a hand saw to cut through the bottom wing just to a point shy of the bottom planking. Now elevate each tip 1/2" and epoxy the center section back together and add the 1/8" ply brace. When dry, drill and insert 1/4" dowel. The center section is reinforced with cloth, celastic or fiberglass.

Okay, you've completed the hard part, so don't give up now. Cut out the fuselage sides. After piecing the sides together, clamp and sand them to assure they are identical. Lay the two sides with the tops together, then glue in place the doubler, wing saddle (1/8" x 1"), 1/8" x 1" diagonal, 1/4" square stringer, and 1/8" stringers. Once dry, remove them from the building surface.

Using a square, install formers F-1, F-2, F-3 and 1/4" x 1/2" tail post on the right fuselage side. Glue the left side in place. Now you're ready to join the sides together at the tail post and install the 1/4" sheet under the cockpit.

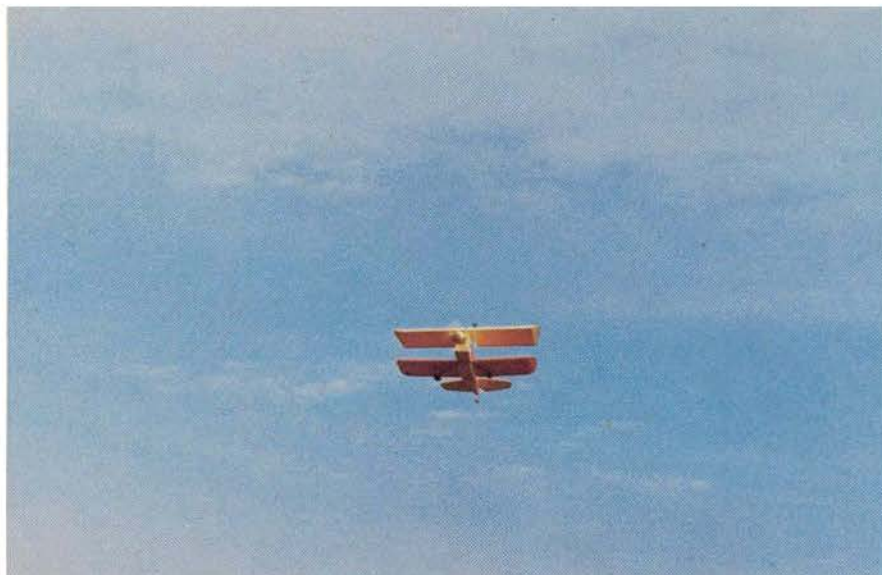
While allowing this to dry, cut out the 1/8" x 3" ply wing rest, 1/4" ply pylon and 1/16" ply gussets. Carefully epoxy this unit together, making sure the wing rest sets squarely on the pylon. Use two #6 sheet metal screws to keep the wing rest from pulling away from the pylon. Now epoxy the pylon to the fuselage formers checking alignment carefully.

Before planking the top and bottom, install the maple block for the hatch, ply landing gear blocks, and the maple bolt block for the lower wing. The 1/4" sheet tail surfaces may now be set in place.

Hang in there gang, you're coming down the home stretch. It's time to set the wings in place and check all alignments.

Now, just a few minor details such as hatch cover, 1/4" sheet for the bottom of the bottom wing and the headrest.

Hey, don't just sit there dreaming, bend the landing gear and tail wheel. By the time you finish that you'll be able to





**Don Dewey's version of the RCM Basic Biplane by John Chapis. Veco-Lee .19, Mathes Electronics radio. All-up weight, four pounds. If you like biplanes, but are not overly fond of cabane struts, the center crutch pylon used in the Basic Biplane solves the construction problems.**

do the final sanding and cover this little bird.

Finishing the model is the option of the builder. But keep in mind the weight should be no more than 4½ pounds less fuel. My RCM Basic Biplane has Solarfilm on the wings with Coverite used on the

fuselage and tail surfaces, then doped.

With a .19 and 3 channel equipment, the Basic Biplane will make an ideal trainer, especially with the gentle stall characteristics. But with a .25 or .30 and 4 channels, you've got a fantastic sport performer. With Evel Knievel or G.I. Joe

as a wing walker, you can have a real air show crowd pleaser on your hands. No matter what route you take, I know you'll enjoy your Basic Biplane more than any biplane lover on the block, unless he has a Basic Biplane too.

Happy landings. □

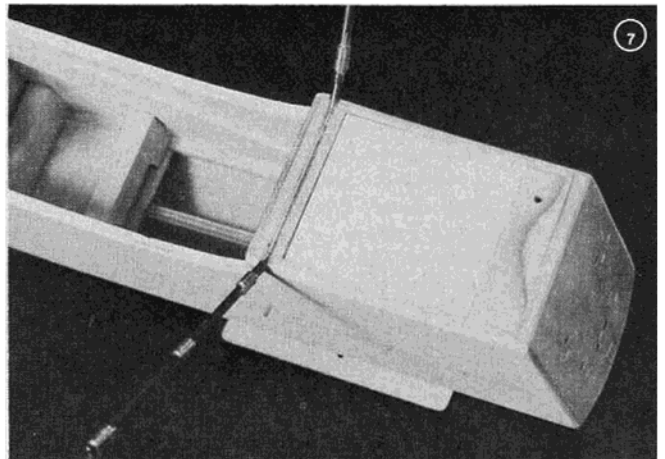
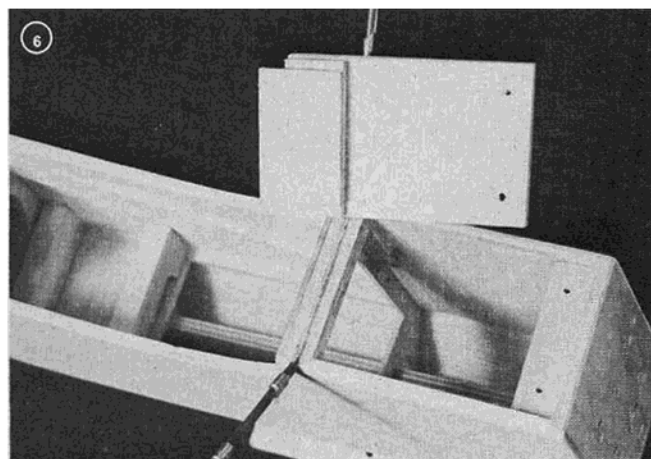
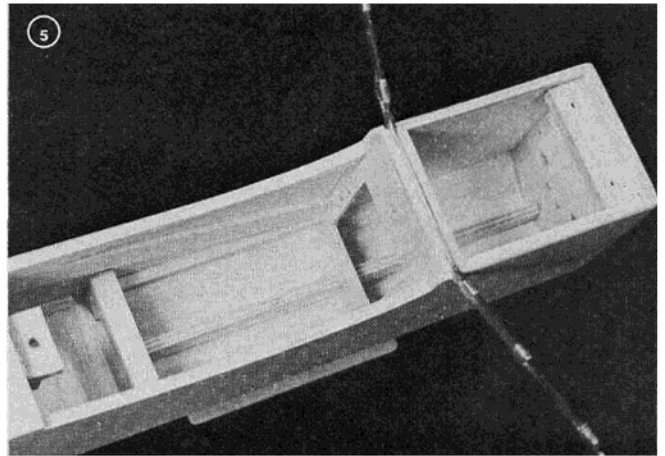
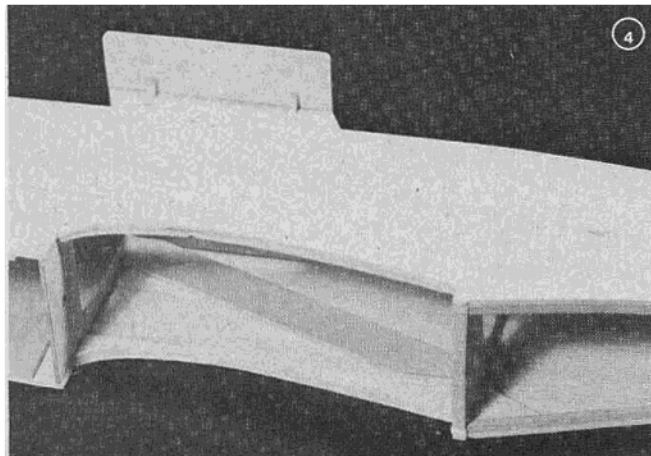
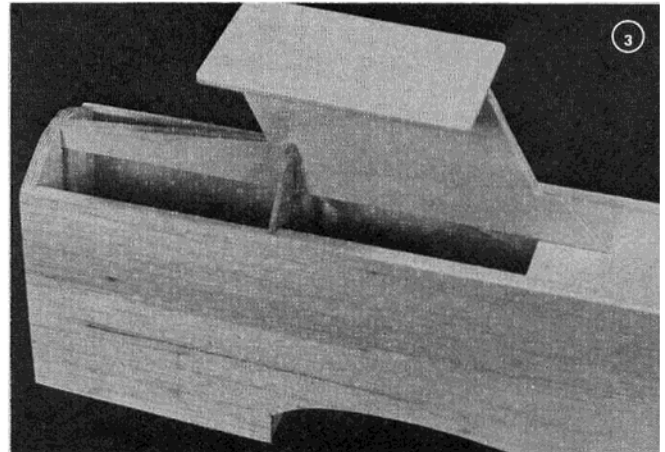
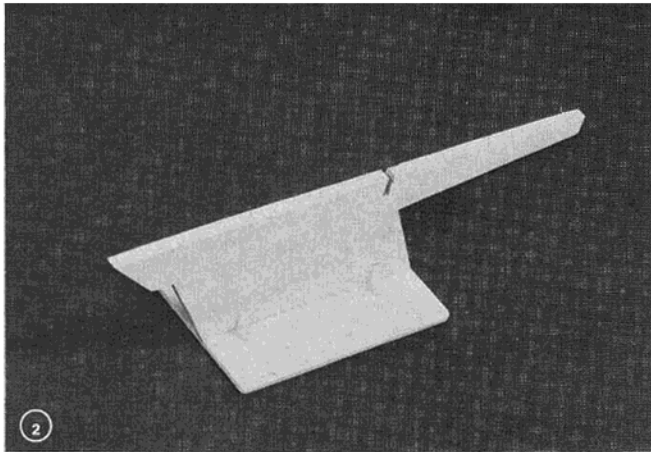
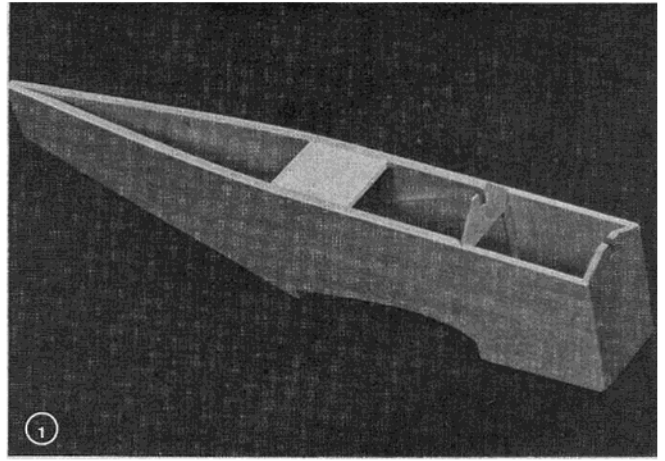
**RCM BASIC BIPLANE**  
Designed By: John Chapis

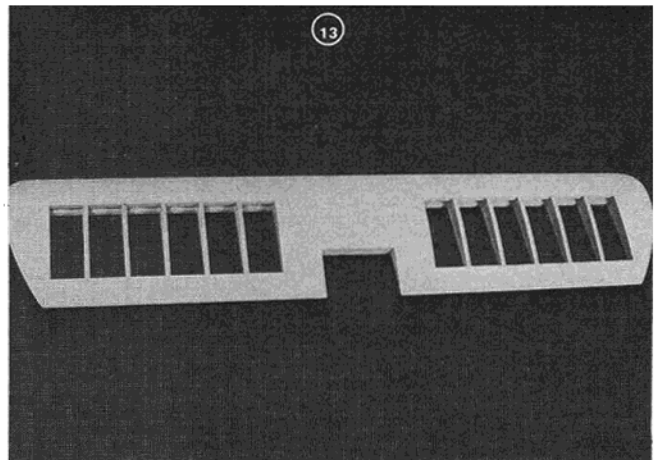
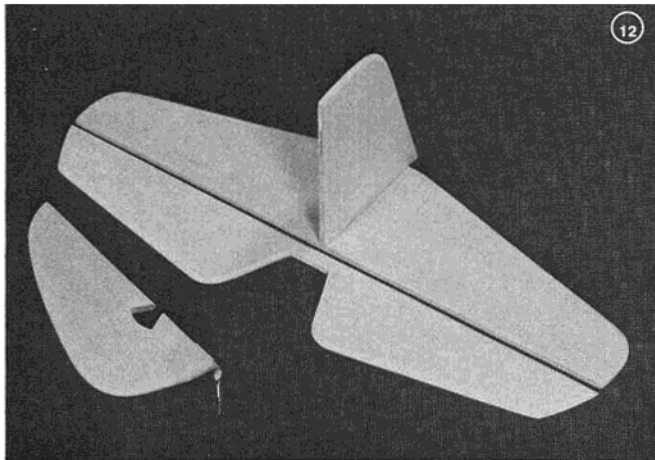
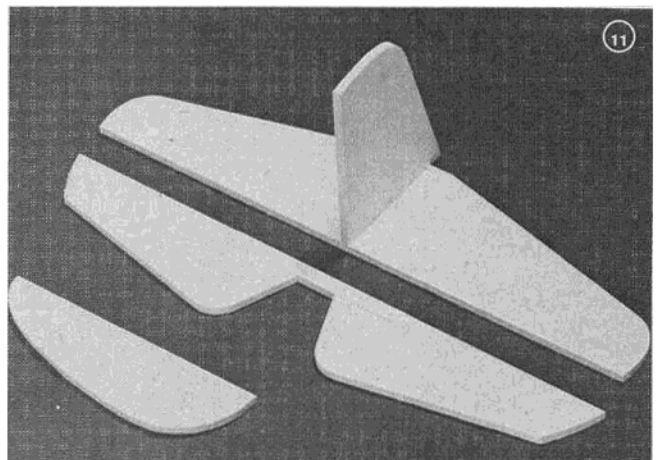
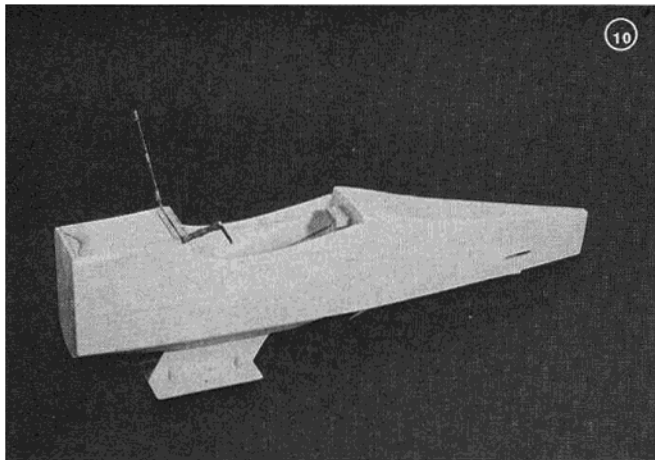
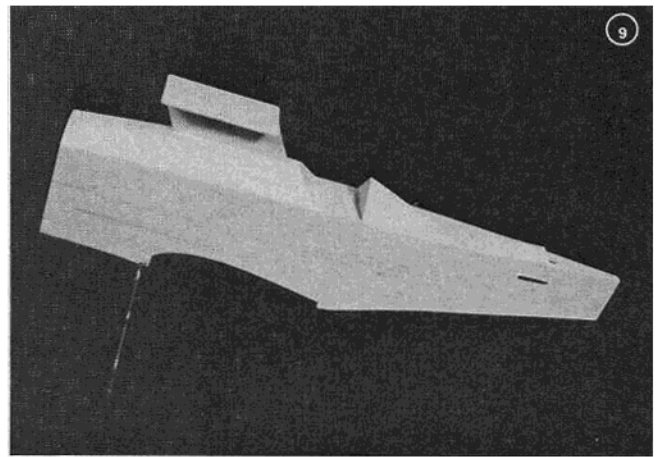
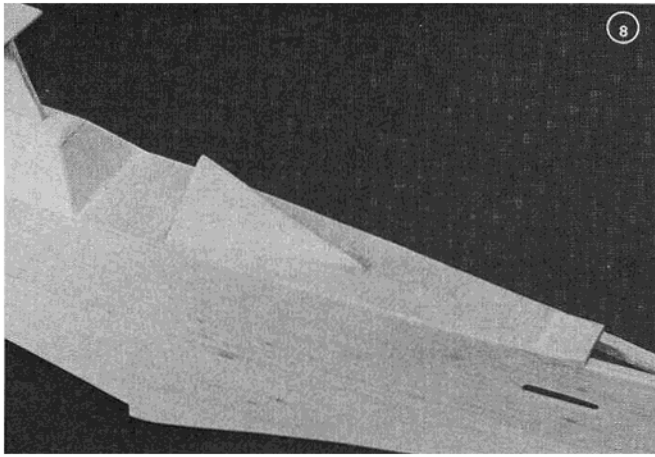
**TYPE AIRCRAFT**  
Sport Biplane  
**WINGSPAN**  
36" Top — 34" Bottom  
**WING CHORD**  
8 Inches  
**TOTAL WING AREA**  
521 Square Inches  
**WING LOCATION**  
Biplane  
**AIRFOIL**  
Flat Bottom  
**WING PLANFORM**  
Constant Chord

**DIHEDRAL, EACH TIP**  
1/2" (bottom only)  
**O.A. FUSELAGE LENGTH**  
28 7/8" (minus engine)  
**RADIO COMPARTMENT AREA**  
(L) 7 3/4" X (W) 3" X (H) 3 1/2"  
**STABILIZER SPAN**  
18 Inches  
**STABILIZER CHORD (incl. elev.)**  
5 1/2" (Avg.)  
**STABILIZER AREA**  
95 Square Inches  
**STAB AIRFOIL SECTION**  
Flat  
**STABILIZER LOCATION**  
Top of Fuselage  
**VERTICAL FIN HEIGHT**  
5 1/2 Inches

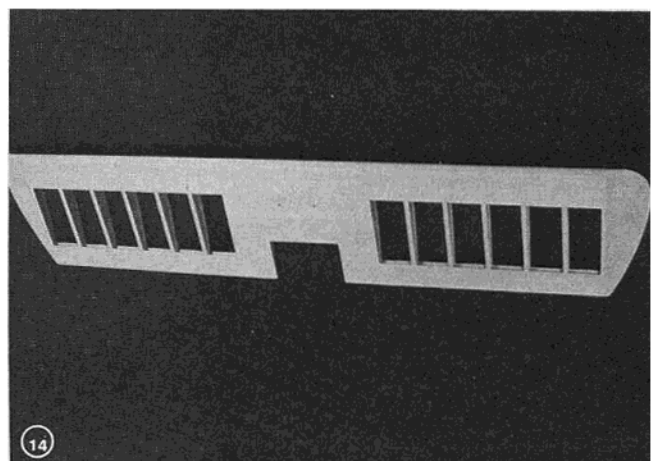
**VERTICAL FIN WIDTH (incl. rudder)**  
6" (Avg.)  
**REC. ENGINE SIZE**  
.19 — .30 Cu. In.  
**FUEL TANK SIZE**  
4 oz. .19 — 6 oz. for larger  
**LANDING GEAR**  
Conventional  
**REC. NO. OF CHANNELS**  
3 — 4  
**CONTROL FUNCTIONS**  
Rudder, Elevator & Throttle  
**BASIC MATERIALS USED IN CONSTRUCTION**  
Fuselage ..... Balsa, Ply & Maple  
Wing ..... Balsa & Ply  
Empennage ..... Balsa & Ply  
**Weight Ready-To-Fly** ..... 72 Oz.  
**Wing Loading** ..... 20 Oz/Sq. Ft.

Figure 1: The basic fuselage sides with doublers, firewall, crutch former and cockpit floor in place. Sides glued together at tail. Figure 2: The plywood cabane crutch assembled and ready for gluing to fuselage. Figure 3: The cabane crutch glued in place. Figure 4: View of internal diagonal brace, wing locating dowel hole in forward bulkhead. Figure 5: Rear wing bolt block in place. Note double strut main landing gear. Figure 6: View of hatch cover and method of attachment. Figure 7: Front hatch in place.





**Figure 8: Close-up of cockpit area and stabilizer front fairing. Figure 9: The completed fuselage with cabane, wing mount, headrest, stab fairing, and landing gear in place. Figure 10: Bottom view of fuselage. Figure 11: Basic empennage parts. Vertical fin notched into stabilizer. Note pine elevator joiners. Figure 12: Sanded tail feathers. Note stab clearance notch in rudder, tail wheel gear installed. Figure 13: Top view of completed upper wing. Figure 14: Bottom view of top wing.**



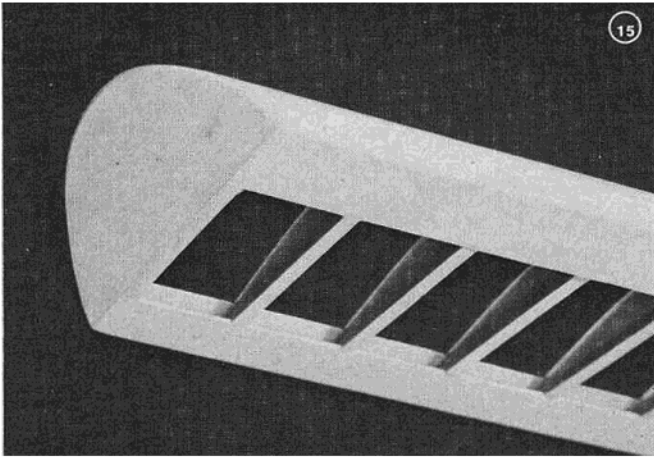
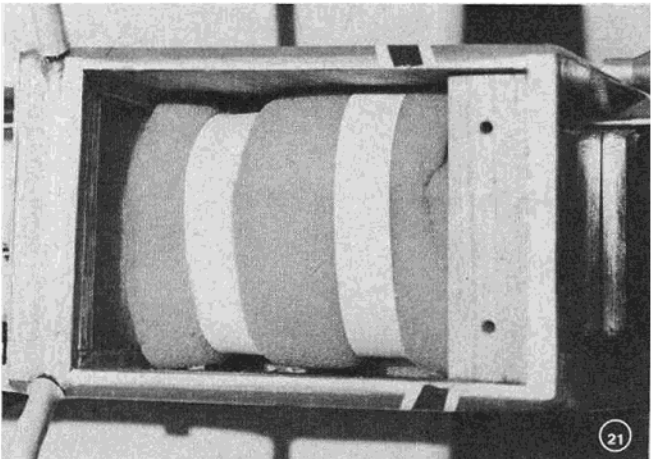
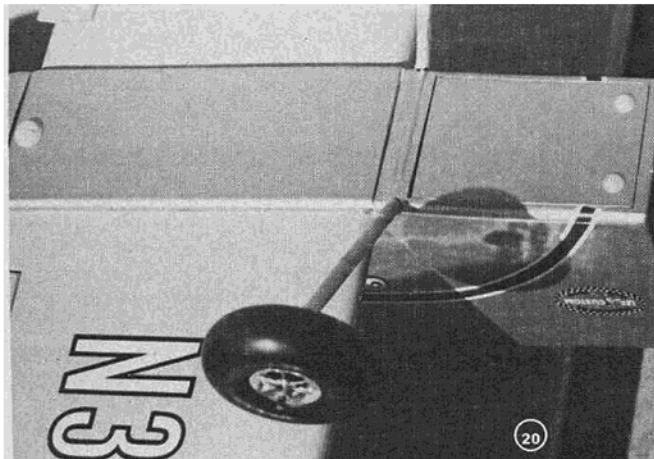
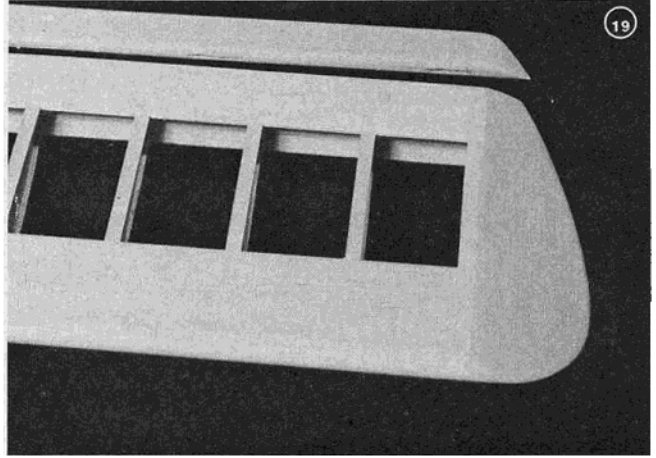
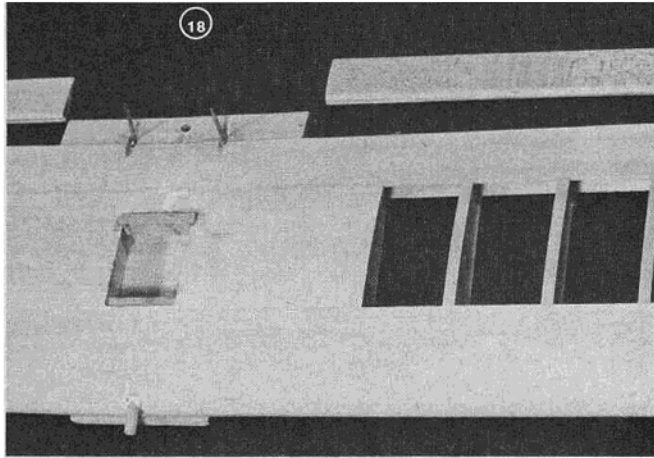
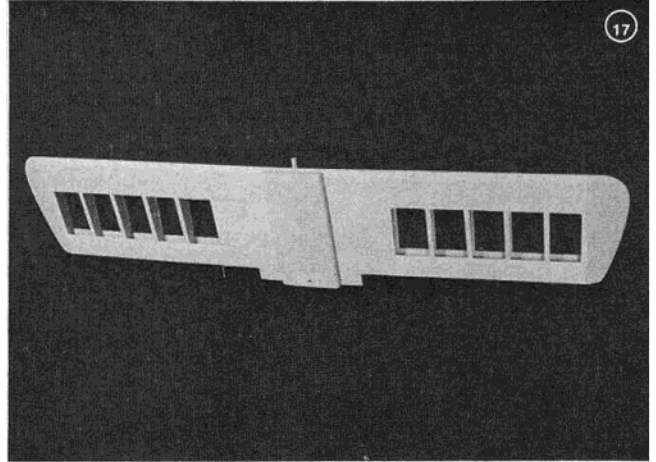
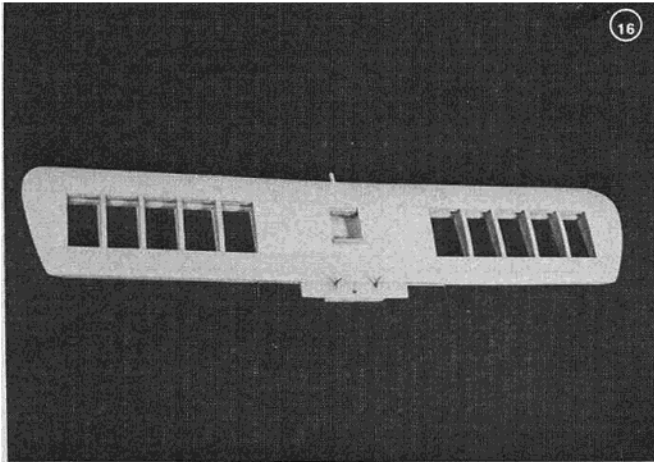


Figure 15: View of angled wingtip sheeting. Figure 16: Bottom wing with aileron rods installed. Note slight dihedral. Top wing is flat. Note wing dowel and hole for rear hold-down bolt. Figure 17: Bottom view of lower wing. Quarter inch sheet center section fairs wing to bottom of fuselage. Figure 18: Close-up of lower wing center section details. Figure 19: Lower wing tip detail. Sand end of ailerons to fair into tip angle. Figure 20: Yellow heat shrink tubing installed on landing gear after covering is completed. Figure 21: Lower hatch removed to show wrapped battery pack.



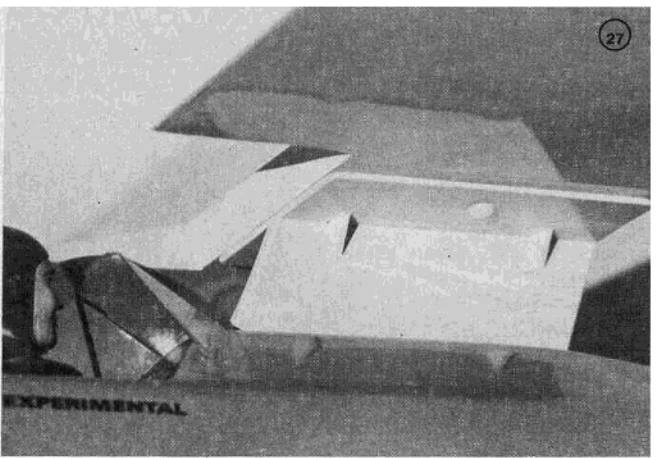
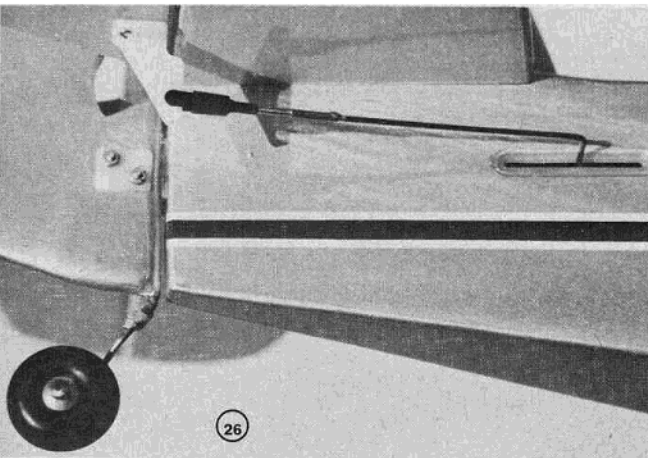
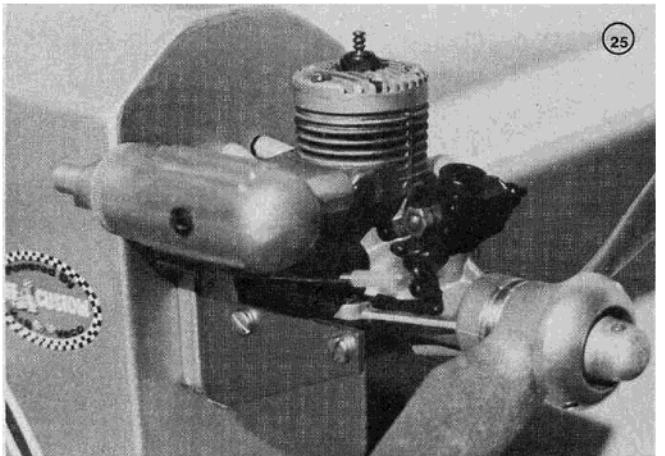
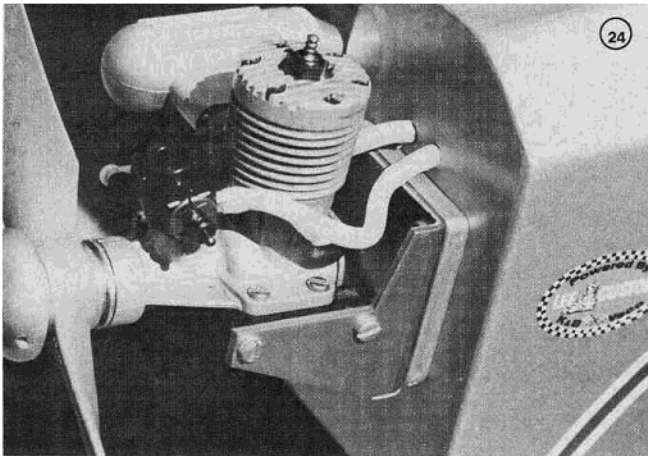
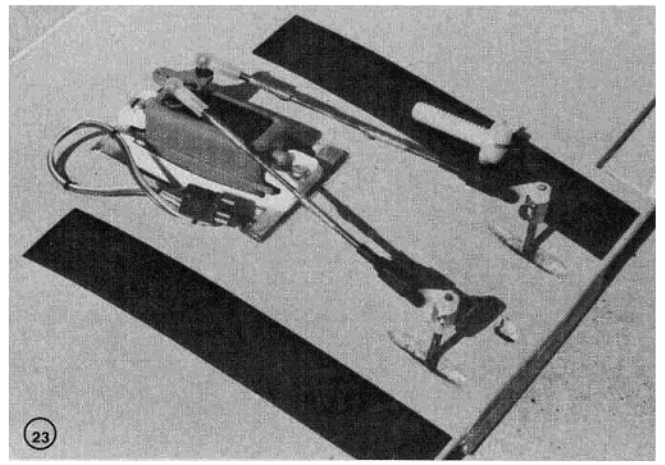
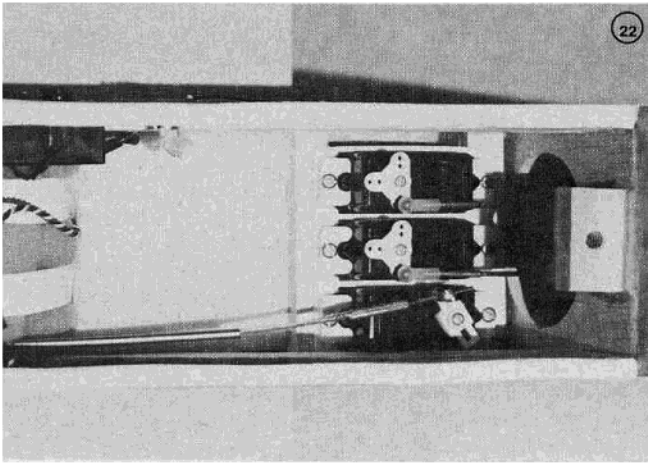


Figure 22: View of Mathes Electronics radio system installed. Note use of Du-Bro connectors. More than adequate room for any system. Figure 23: Aileron servo installation. Again Du-Bro connectors used for no-bind movement. Figure 24: Veco-Lee custom .19 installed on Midwest mount. Quarter inch backing plate provides necessary muffler clearance. Figure 25: View of throttle linkage and muffler installation. .19 is minimum size engine recommended. Figure 26: Tail wheel installed. Note pushrod exit guides installed after covering. Figure 27: Nylon wing hold-down bolts installed under cabane platform. Figure 28: Williams Bros. pilot, windshield, and instruments add to overall appearance.