

# The Electric P-51 Mustang



**Speed 400 Powered P-51A  
(and A-36), P-51B & P-51D**

*Designed and Drawn By Gus Morfis*

*Built and Flown By John Hix*



The story of the P-51 Mustang has been told a good many times already and this article could add nothing new. Suffice it to say that this was the Allied fighter which was finally able to successfully escort and defend our bombers against the German interceptors, on the long road to their targets and back.

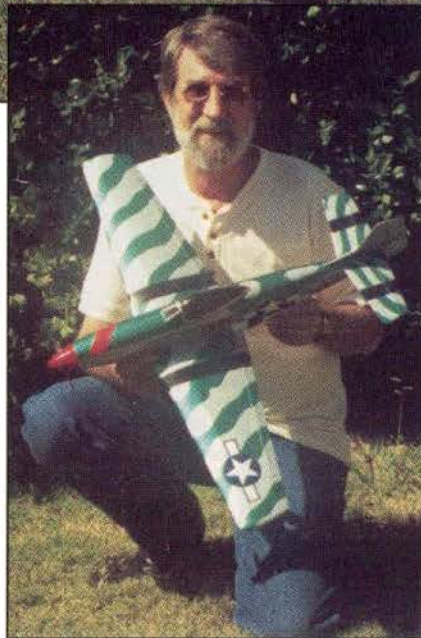
The name "Apache" was given to the earliest airplanes, but this quickly gave way to the now famous "Mustang."

The earliest model was the A-36 and it was to be a ground attack airplane. The P-51A was really the same airplane, except that it was optimized for the fighter role, and the most prominent differences were the change in armament and the deletion of the wing mounted dive brakes.

In service, it quickly became apparent that its Allison engine was rated for medium altitude performance and that Allison-engined airplanes could not operate effectively at much over 16,000 ft. altitude. The same thing happened to the Bell P-39 Airacobra. But the Lockheed P-38 Lightning escaped this problem because its Allison engines were turbo supercharged. The rules of war had changed and altitude capability in the 25,000 ft. range was now required.

The Allison engine could not be adapted for this new altitude environment, but the British Rolls-Royce Merlin engine could. And it was agreed that these engines would be built in the U.S. by the Packard motor car company. These airplanes were identified as P-51Bs. This change altered its thrust line and its nose contours. In addition, the belly radiator also had to be enlarged and revised to match the requirements of the Merlin engine.

These changes improved the P-51B's altitude performance and now its range was unmatched as an escort fighter. The P-51B was now a significant player in the war.



Jack Hix and his P-51 model. The unique color scheme is what "Man O War" of the 334th Squadron, 4th Fighter Group, 8th USAAF, operating out of Debden, Essex, carried in late 1944. The pilot was Lt. Col. C.H. Kinnard.

The next change was to develop the Mustang to its final, classic shape. A bubble canopy was fitted in order to improve its all around vision, and the designation was now P-51D.

The plan gives the details required to make any of these versions. My partner in this project is Jack Hix, who also did the photography. Our model used a direct drive Speed 400 motor and seven KR600AE batteries.

After doing a lot of flight testing and having a lot of fun with his Mustang, Jack then tried the more powerful Astro Flight 020 motor, but this proved to be just too much power for this model.

Jack first used aileron and elevator control only, and he was very pleased with the Mustang's handling. But then he added the rudder and the model was even more fun to fly. So, you choose the set-up that you prefer to use.

#### CONSTRUCTION

This is a small model, so be weight alert, and select quality wood for your

#### ELECTRIC P-51 MUSTANG

Designed & Built By:  
Gus Morris & Jack Hix

#### TYPE AIRCRAFT

Electric Sport Scale P-51

#### WINGSPAN

30-3/4 Inches

#### WING CHORD

5-3/8 Inches (Avg.)

#### TOTAL WING AREA

165 Sq. In.

#### WING LOCATION

Low Wing

#### AIRFOIL

Flat Bottom

#### WING PLANFORM

Double Tapered

#### DIHEDRAL, EACH TIP

1-1/2 Inches

#### OVERALL FUSELAGE LENGTH

25-3/4 Inches

#### RADIO COMPARTMENT SIZE

(L) 6-1/2" (W) 1-3/4" (H) 1-5/8"

#### STABILIZER SPAN

11 Inches

#### STABILIZER CHORD (inc. elev.)

2-1/2 Inches (Avg.)

#### STABILIZER AREA

27-1/2 Sq. In.

#### STAB AIRFOIL SECTION

Flat

#### STABILIZER LOCATION

Top Of Fuselage

#### VERTICAL FIN HEIGHT

3-3/4 Inches

#### VERTICAL FIN WIDTH (inc. rud.)

3-1/4 Inches (Avg.)

#### REC. MOTOR SIZE

Speed 400 — 6 Volt

#### BATTERY SIZE

7 Cell/500mA

#### LANDING GEAR

Optional

#### REC. NO. OF CHANNELS

3 or 4

#### CONTROL FUNCTIONS

Elev., Throt., Ail., Rud. (Optional)

#### C.G. (from L.E.)

1-3/8 Inches

#### ELEVATOR THROWS

1/8" Up — 1/8" Down

#### AILERON THROWS

3/16" Up — 3/16" Down

#### RUDDER THROWS

1/2" Left — 1/2" Right

#### SIDETHRUST

2° Rt

#### DOWTHRUST/UPTHRUST

1-1/2° Downthrust

#### BASIC MATERIALS USED IN CONSTRUCTION

Fuselage ..... Balsa & Ply

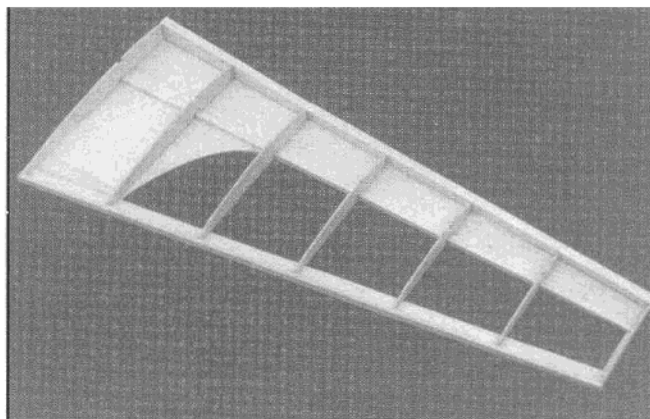
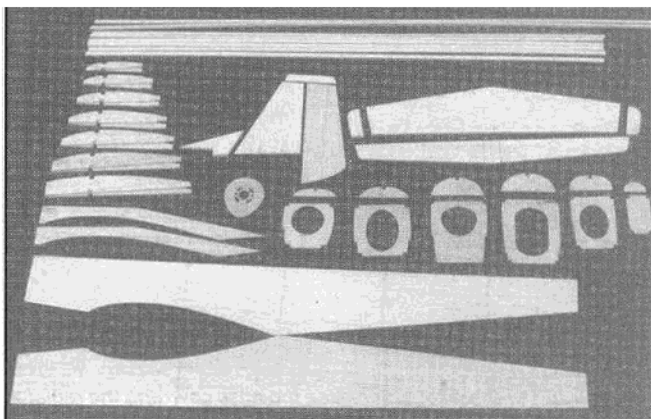
Wing ..... Balsa

Empennage ..... Balsa

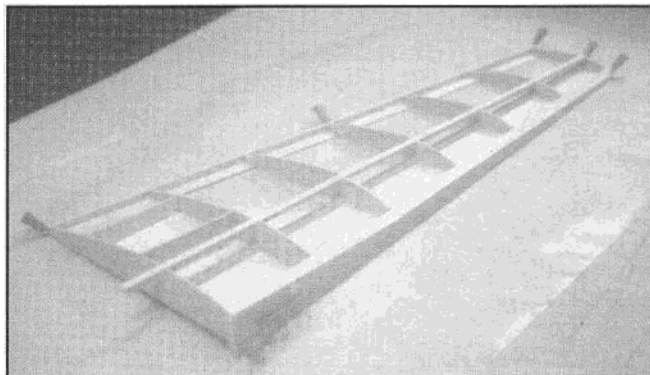
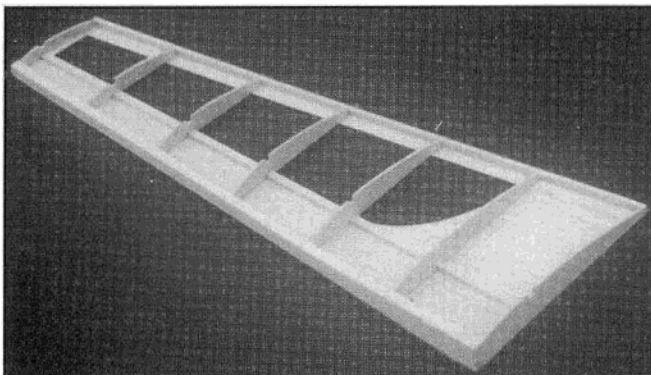
Wt. Ready To Fly ..... 17-1/4 Oz.

(1 Lb. 1-1/4 Oz.)

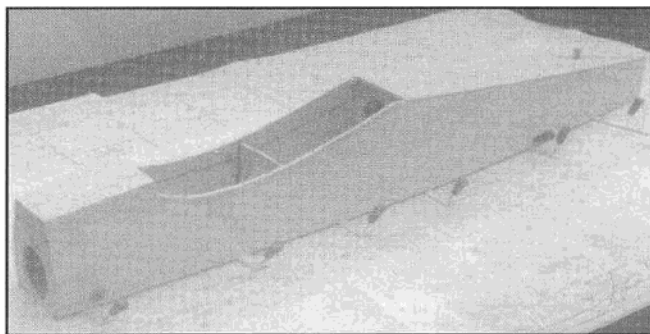
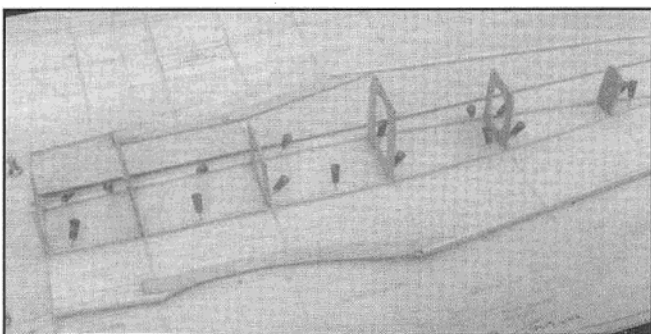
Wing Loading ..... 15.0 Oz./Sq. Ft.



**LEFT:** First cut a kit of parts, ready for assembly. **RIGHT:** Wing construction doesn't get much simpler than this.



**LEFT:** A wing panel ready for the wash-out to be put in. **RIGHT:** The wash-out is installed by pinning the wingtip and T.E. in place, then shimming under the L.E. at the root rib.



**LEFT:** Starting to frame the fuselage. **RIGHT:** The fuselage is built upside-down, like a box, on your building board.

construction. Also, prior to beginning construction, cover the plans with waxed paper or plastic wrap to prevent the glue sticking the parts to the plans.

**Wing:**

Note that all four versions of this airplane have the same basic wing, but only the A-36 Apache's wing has the four 20mm cannon armament.

Locate lower sheeting, lower spar cap, lower 1/32" x 1/2" trailing edge strip, the lower 1/32" x 1/4" capstrips, and glue in place.

Taper, chamfer and glue in place the leading edge and the trailing edge doubler as required.

Locate the wing ribs as shown on the plans and angle rib #1 per the dihedral template, then glue in place.

Pin the top 1/32" x 1/2" trailing edge strip down to your building board along

its aft corner and pin rib #7 down to your board too.

To add the correct amount of wash-out to the wing, shim ribs #1 and #4 as shown. Note: it is very important that the wash-out be exactly the same for both the wing panels.

Locate and glue all of the remaining wing parts into position. The 1/32" shear webs grain should run vertically.

The 1/4" x 3/4" trailing edge (aileron) may be fit and installed at this time. Be sure to allow for the aileron torque rods in the center section.

Glue the 1/2" sq. x 4" leading edge extensions in place at this time.

Sand the leading edge to fair-in smoothly with the wing surface.

Using epoxy, glue both of the wing panels together. Next, wrap the joint with a piece of scrap lightweight

fiberglass and epoxy in place in order to reinforce the joint.

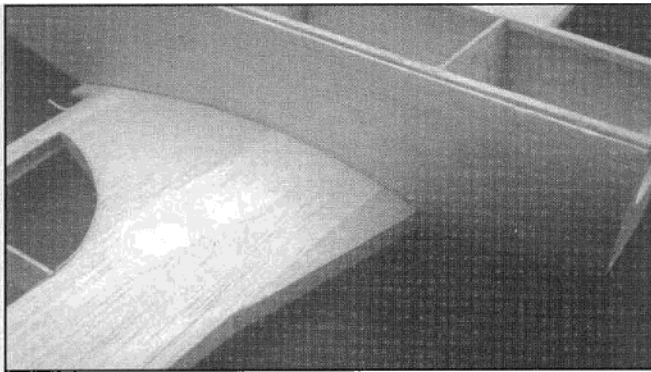
**Fuselage:**

The fuselage of the P-51A and the A-36 are the same, but the P-51B has a different nose shape and thrust line. In addition, the belly radiator is deeper and has a different shape.

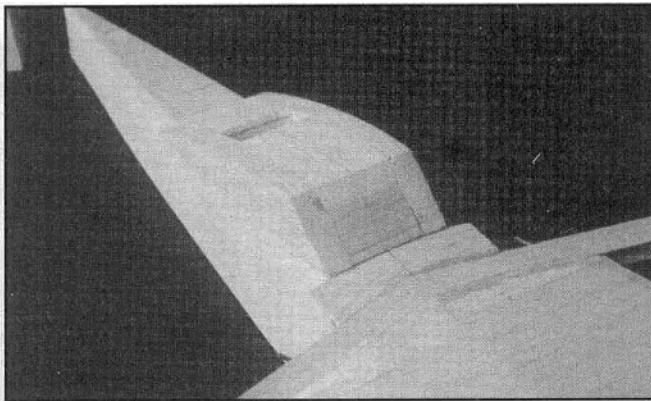
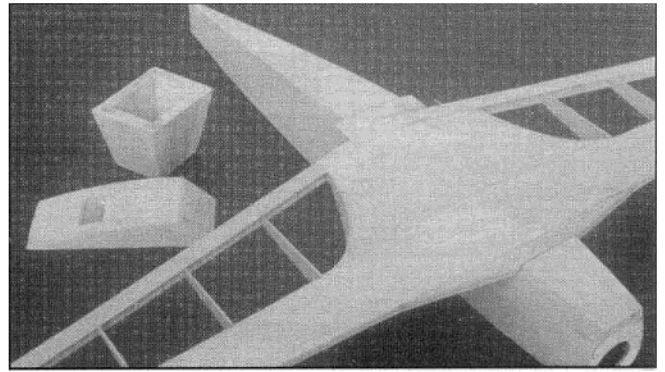
The P-51B and P-51D are the same except for the canopy and the aft upper deck. Note that there was also a P-51C. It was the same as the P-51B, but was built in Dallas, with some internal equipment differences.

The following instructions refer to the more famous P-51D version. Study the plan carefully in order to understand which parts are used for the version that you are interested in.

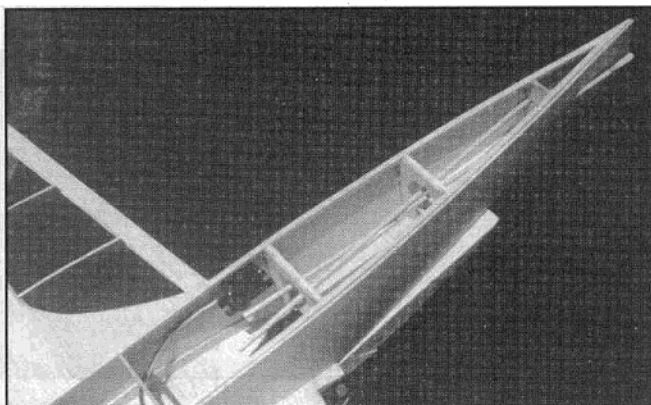
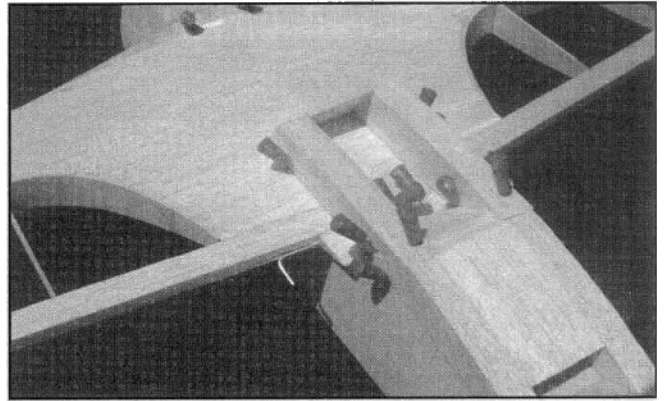
The fuselage is built upside-down on a building board. Former #1 can be installed



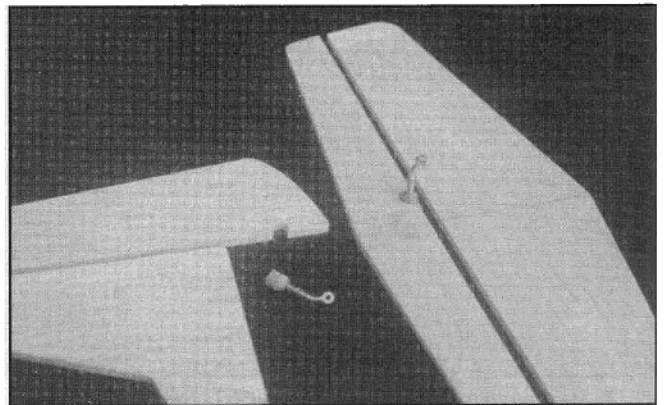
**LEFT:** Make sure that the fuselage fits the wing neatly. **RIGHT:** The parts are starting to come together. Note the nose cowl and the radiator.



**LEFT:** The wing being fit to the fuselage. **RIGHT:** The radiator being installed. Notice the radiator vent at bottom.



**LEFT:** A good time to start installing the control rods. **RIGHT:** The empennage and the control horns. (Hobby Lobby "Low Drag" control horns used on original.)



with 2° right and 1-1/2° down thrust, or the motor can be shimmed to have some side and down thrust if you prefer.

Former #1 (or #8) is cut from 1/16" ply. The cutouts shown match and accommodate the common speed 400 motor. Laser cut ply blanks which have these cutouts neatly laser cut in them can be ordered from: Tim McDonough, 127 S. Oaklane Rd., Springfield, IL 62707.

Pin the bottom portion of formers #2 to #7 on the building board in their proper locations.

Position and glue the 1/8" sq. crutch in place at each former.

Glue the 1/8" sq. stock between formers #2 and #3. Glue the 1/8" sq. stock between formers #5 and the aft portion of the fuselage.

Fit and glue the 1/4" x 1/2" x 2" ply piece to former #5.

Locate and glue in place the 1/16" sheet wing saddle doubler. Note: this piece will be trimmed to fit the wing later.

While your fuselage structure is still relatively open, it is a good time to plan where to locate your radio gear, the elevator pushrod, and the other equipment.

Cover the aft portion of the fuselage bottom (aft of former #5) with 1/16" sheet, fitted cross-grain.

Add the 1/16" balsa fuselage sides. Install the 3/8" block between formers #2 and #3. Note: Do not trim the wing saddle at this time.

Remove the fuselage from the building board, install the upper portions

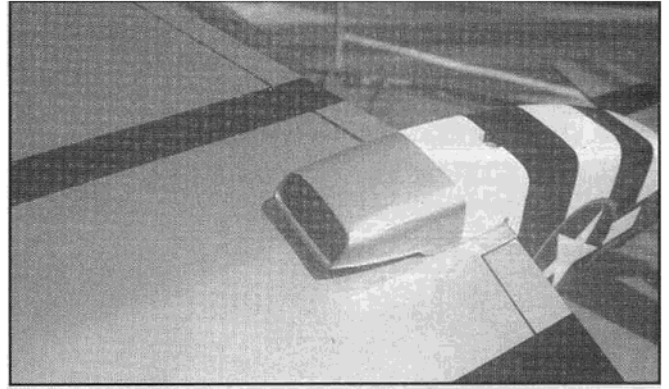
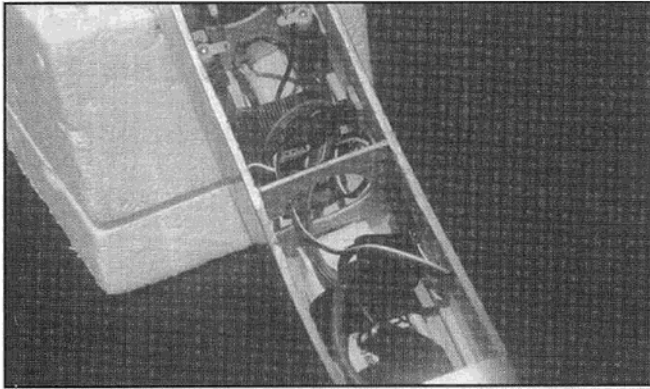
of the formers and sheet with 1/16" balsa, using the widest pieces that you can.

Finish the nose by fitting the 3/8" and 1/2" blocks and install the spinner ring (#1) as shown. Note: maintain the thrust line as shown.

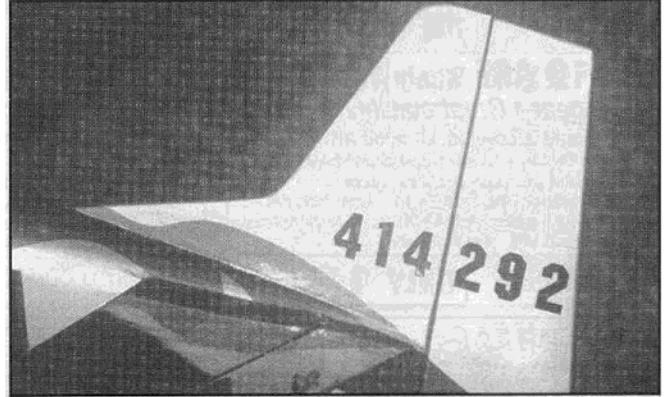
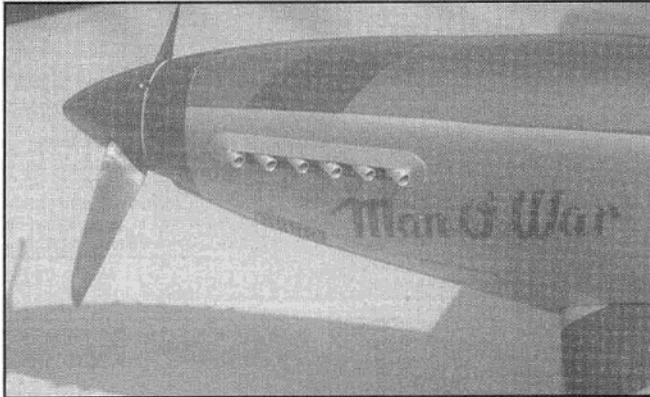
Sand the fuselage smooth using fresh sandpaper with a very light pressure on the structure while sanding.

You can now fit the fuselage to the wing, trimming and sanding the joint as required. Locate and install the wing mounting dowel at this time.

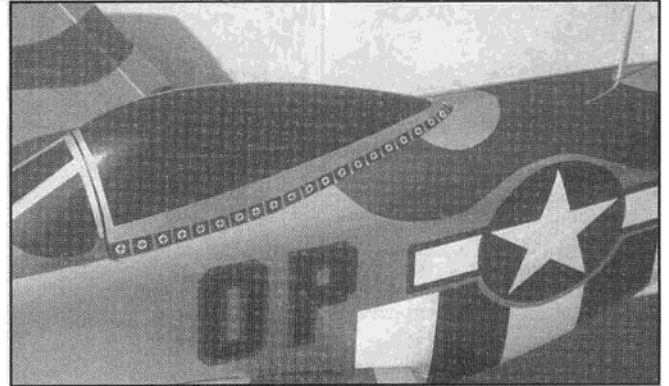
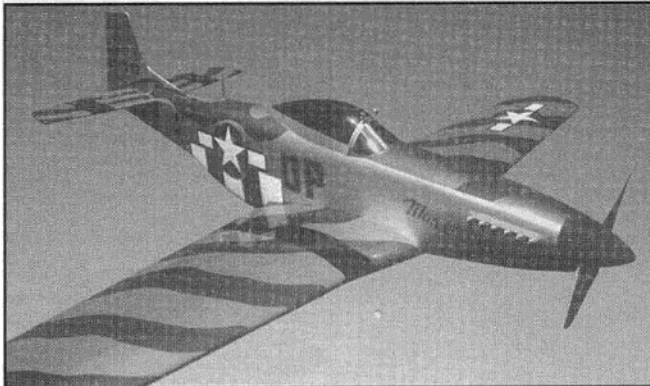
Shape the radiator block to the fuselage; fit, hollow, and sand as required. Cut the separation line for the belly hatch and glue the pieces as required. After shaping, drill the vent hole where shown. Remember that the P-51A



**LEFT:** For a small model, there is still room for more gear. **RIGHT:** The radiator is made up from scrap blocks which are hollowed out to reduce weight.



**LEFT:** Exhaust details are made up from scrap wood and aluminum tube. **RIGHT:** A working rudder was added to the original.



**LEFT:** Note the rear view mirrors and antenna details added to model. **RIGHT:** Jack made the little swastika "kill marking" from scrap decal.

and the A-36 radiator shape is shallower with a different profile than that which is used on the P-51B and P-51D.

Jack Hix can supply a canopy for your model. For information, contact him at: 1021 Birmingham Dr., Cardiff, CA 92007, e-mail:

**Graphix1@home.com**

And tell him which canopy version you are interested in. He is also going to be cutting foam core wings for anyone who is interested.

**Empennage:**

The empennage is cut from 1/8" sheet balsa, with cross-grain tips in order to resist warping. All versions have the same basic empennage.

Some later P-51B models had a small dorsal fin added and the earliest P-51Ds

did not have the prominent dorsal fin which later distinguished this model.

Our model originally did not have an active rudder and it flew great, using ailerons and elevator controls only. After the initial flight testing was satisfactorily concluded, Jack revised his model to include a rudder, and it now flies even better than before.

**Finish:**

Use lightweight film to cover your wing. Cover the rest of your model as you prefer, remembering to watch the weight, since paint is heavy.

**Flying:**

For your first flights, balance your model about 3/16" forward of where shown on the plans. Then, after setting the trims and the control throws to your

satisfaction, **gradually** shift the C.G. aft, until you are comfortable with your model's handling.

For your first flights, you can set your control surface deflections as follows: Ailerons 3/16" up and down, Elevator 1/8" up and down, Rudder (if used) 1/2" left and right. These are good numbers to start with, but of course, your model and your flight technique will probably require something different.

Be sure to remember me with a snapshot or two of your completed model when you get them. Maybe, if we get lucky, the Editor will share them with us in some future issue of this magazine. So, go out there and enjoy!

