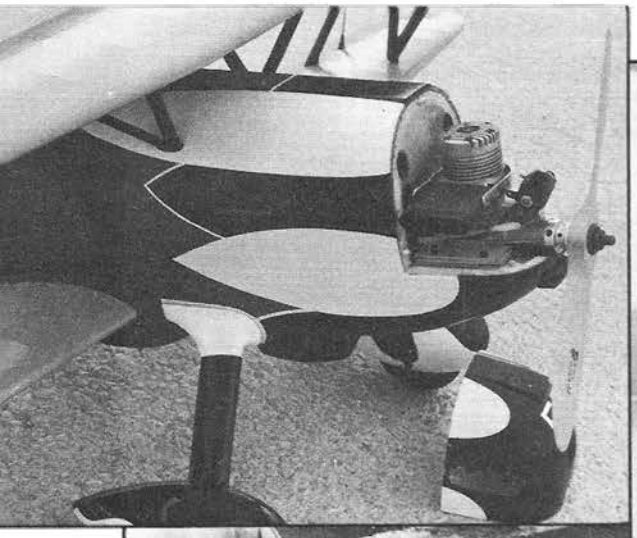
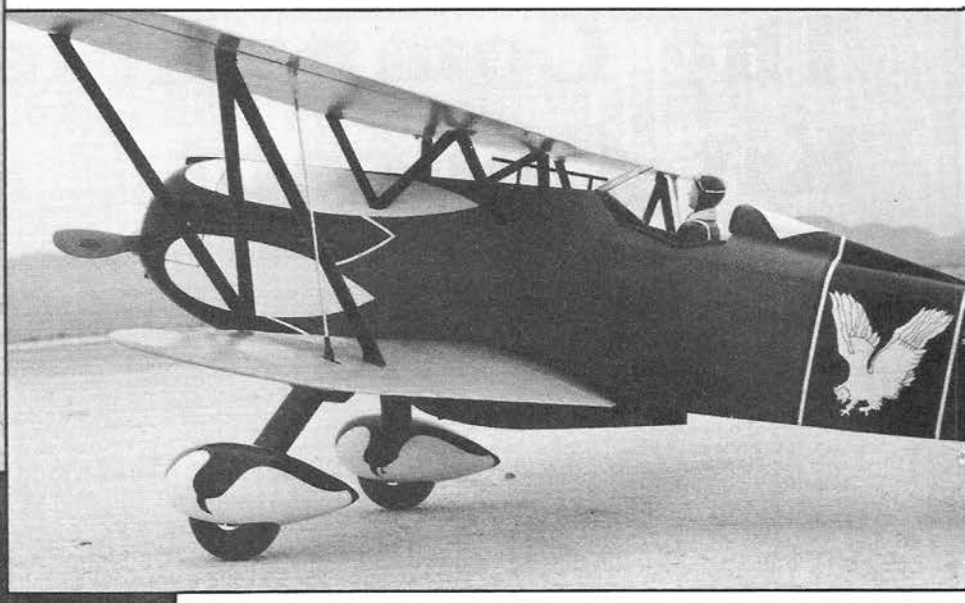
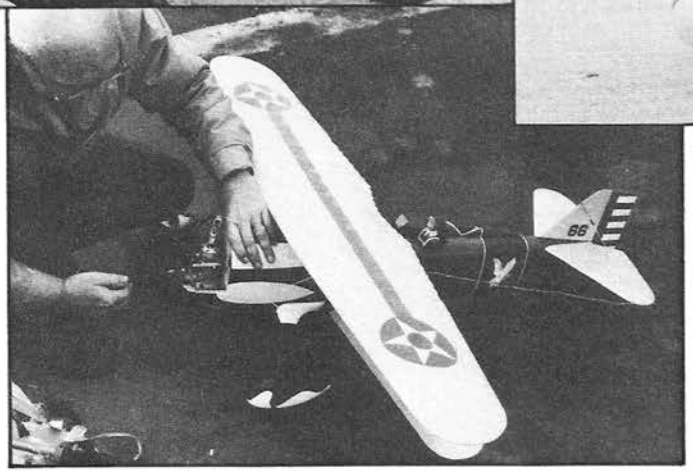






CURTISS P-6E HAWK

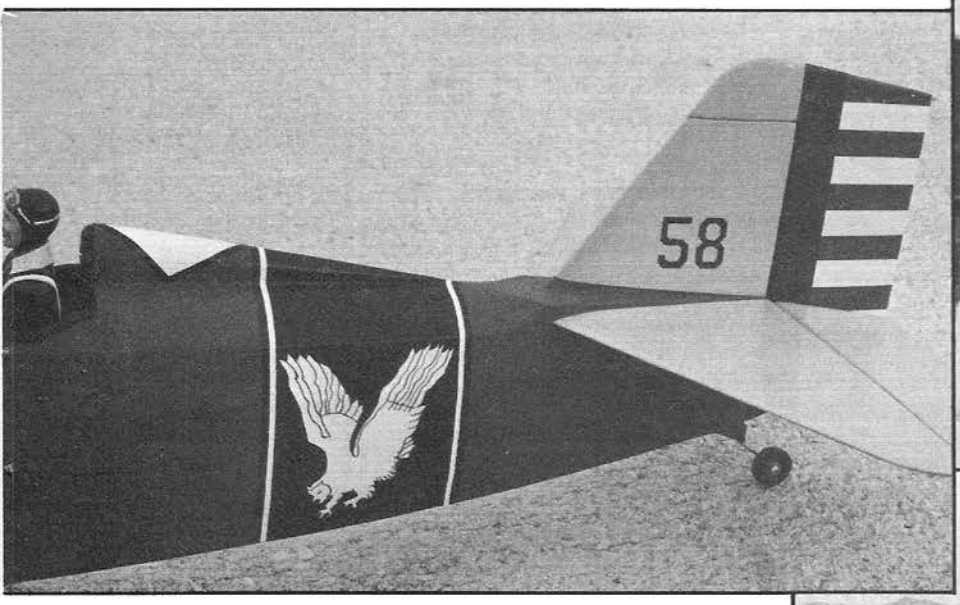
I guess I just have a thing going for P-6E's, but I know I'm not alone. There is a very large group of us who think it epitomizes everything an airplane should be. Two wings, open cockpit, wind whistling through the wires, and all that good stuff. Top that off with a very colorful paint job and what more could you ask for?

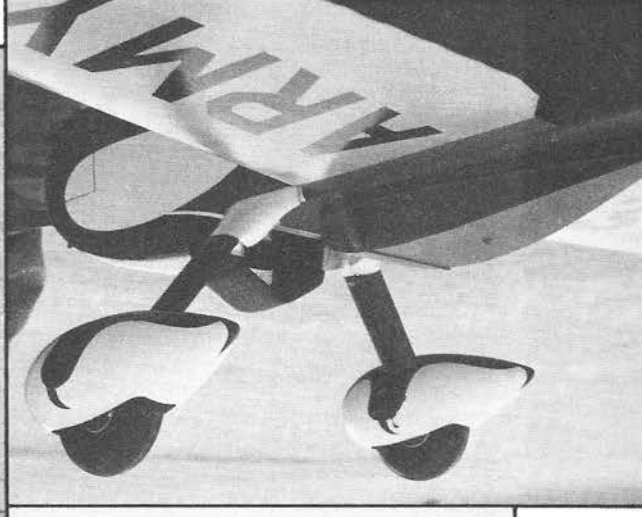
How about a model of that classic that is a very good flyer and is easy to build?

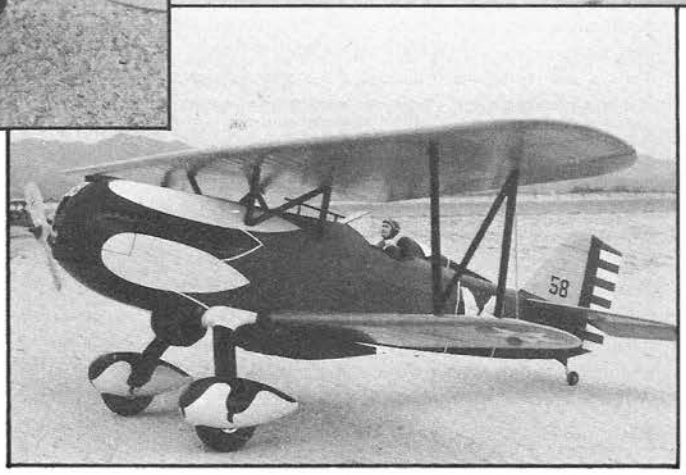
Two models were made from this design, just to check everything out. I would like to say the first one flew right off the drawing board. I would like to, but I can't. There were some changes made to make it better. While the first one flew very well, almost like a trainer at half throttle and very maneuverable at full power, it could be improved upon and it was.

These drawings reflect all of the changes that were made for the second plane to improve ground handling, flying and to get more scale accuracy.

The model is designed for a .40 size engine, but engines from .35 to .45 will work well. A word of caution though, don't over-power







Designed for a "forty," this classic P-6E offers the modeler everything an airplane should be

By Bob Rich

Photos by Bob & Doris Rich

the model. It just doesn't need brute force to fly, even at higher altitudes.

Our small P-6E, RC Modeler August 1976, and currently a Carl Goldberg kit, flew best with a .19 to .30 engine. A .25 is a very good size. It could be a real fun flying machine but, when over-powered is a real handful with the fun removed. This plane could be the same way so keep the power reasonable and enjoy it.

This model is not for the novice, either in construction or flying. But if you have several kits under your belt and can do a fair job of flying you will have no problems. That is if you follow the instructions.

After years of extensive research I have reached the conclusion that the old saying, "If all else fails, read the instructions," is absolutely false.

You can read the instructions all day long, but if you don't follow them they won't do one bit of good.

While the model is an excellent fun and sport flyer, you won't have to take a back seat to anyone in Sport Scale competition. Only a few liberties were taken for ease of construction and flying ability,

and it does look good.

If you are as sold on the plane as I am, let's get down to the nitty gritty and get started.

While the model is quick and easy to build there are several areas in which the construction differs from the general building techniques. The plans are self-explanatory in most areas so these instructions will not be a "glue stick 'A' to stick 'B' procedure."

Areas will be covered in some detail where it will make the construction easier or a special mention is required.

I like to start by making a kit, that is making all of the tracings of the parts and cutting them out before I start. I don't like to slow the building process by stopping every few minutes to cut out a part. I don't like to cut out the parts anyway so it's easier to get it out of the way beforehand, while you are in the mood. Look at the plans and pictures every once in a while to keep up your enthusiasm.

A light model flies better than a heavy one so use some care in selecting the wood.

The model is strong so medium and light balsa can be used. Just plan ahead a little and choose your wood according to its use.

The wing spars should be straight and strong.

Where 3/8" sheet balsa is called for, two layers of 3/16" glued together will work fine. The 3/16" sheet balsa is easier to find, and more reasonable.

Goldberg Super Jet was used throughout on both models and the results were excellent. If you haven't tried Super Jet, you are in for a real surprise. It isn't like any other instant glue, thick or thin. Try it, you'll like it.

Parts all cut out? Okay let's get started.

With Super Jet or a good contact cement, glue the 1/16" plywood doublers to the fuselage sides.

Most instructions emphasize the importance of making a right side and a left side so we won't dwell on that.

After making a right side and a left side, add the 1/4" x 1/8" upright braces. Mark where the formers and motor mounts are located.

Now we are ready to put the sides together, right? **Wrong**!

We do something smart for a change and build the wire cabane struts first. It's a lot easier to do it now.

Make a simple jig for the cabane wires. When everything is square and the measurements are correct, tack the cabane diagonal braces to the uprights with Super Jet. Now it's an easy job to bind the joints with soft wire and solder them.

Now we put the fuselage sides together, but we do it right so everything comes out square.

Using the plans and a couple of good right angles, glue the sides together with the cabane mount blocks and the 1/8" ply lower wing mount (that's the piece at the leading edge of the lower wing). It looks a lot better if the fuselage is nice and square, and the wings fit better too.

Now join the aft end (that's the tail) of the fuselage with the 1/8" square balsa piece. Did you get that square?

Install the cross pieces, formers, tank support, firewall, and motor mounts.

It's beginning to look like something already.

Now we will make another smart move and mark the landing gear wire locations on the inside of the fuselage. Remember they aren't the same on both sides.

Install the cabane struts --- aren't you glad they are already made?

After the cabane struts are securely in place, install the 1/8" x 1" balsa turtledeck top piece.

The turtledeck is now ready for planking with 3/32" sheet balsa, but leave the piece from Former 9 to the tail off until the stab and fin are glued in place.

Drill the holes in the motor mounts for the engine plate bolts and put in the blind nuts. Do it now, you can't do it very well after the chin block is in place. Also fuelproof the area — it's easier now. Super Jet does the fuelproofing fast and easy.

With a good wire bender, the 3/16" steel wire can be bent to the landing gear shape with a little care and effort. It could be done with a vise, but if you have a friend who is good with wire, that's a lot easier.

Don't try to skimp or take the easy way out, the heavy wire is necessary.

And while you're at it, a little toe-in on the wheels helps the ground handling quite a bit.

Drill the 3/16" holes for the landing gear wires in the landing gear mount block and mount the gear with the 1/4" ply landing gear braces.

It's time to put the side formers on the fuselage so draw a line 3/8" down from the top of the fuselage side. That's where the top of the side formers go. When gluing them in place make sure the top of the formers is up. You should have marked them when you traced them, but if you didn't, make sure they are correct before gluing them in place.

The side sheeting is a fairly easy job. On the 1/8" sheet balsa you have selected for the side, draw a line 3/8" down from the top, parallel with the top. Now bevel the balsa from the line to the top edge. A piece of masking tape along the line will help keep your sanding line straight.

When the side sheeting fits at the top, don't glue it. Hold it in place, curved over the formers, and cut it off to fit the bottom of the fuselage.

Mark the bottom of the side sheet and bevel it the same way you did at the top, straight across because it doesn't bevel at the firewall or over the top of the wing. Keep the bevel line straight 3/8" up from the bottom of the sheet.

Now glue the side sheeting in place. Wasn't that easy?

Fit the pieces of 3/8" sheet balsa to the outside of the fuselage side in front of the firewall.

If you are going to add the gun troughs, mark the fuselage for the balsa block insert and cut out the side sheeting. Install the blocks and make the groove.

Add the chin block pieces and tack glue the cowl block in place. Shape the nose area according to the plans.

The cowl can be shaped from block balsa and hollowed or make

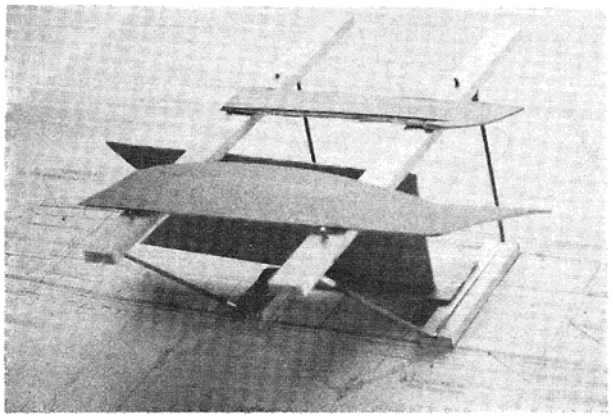
CURTISS P-6E HAWK
Designed By: Bob Rich

TYPE AIRCRAFT
Sport Scale
WINGSPAN
Top 50½ Inches
Bottom 41⅜ Inches
WING CHORD
Top 8 Inches (Avg.)
Bottom 6½ Inches (Avg.)
TOTAL WING AREA
635 Sq. In.
WING LOCATION
Biplane
AIRFOIL
Flat Bottom
WING PLANFORM
Double Taper

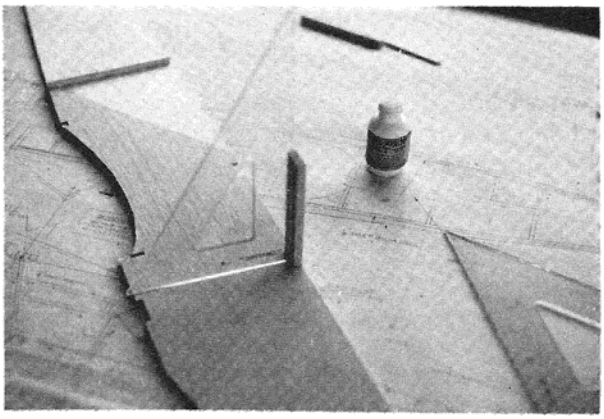
DIHEDRAL EACH TIP
Top — Flat
Bottom — 3/4" Each Tip
O.A. FUSELAGE LENGTH
37½ Inches
RADIO COMPARTMENT AREA
(L)7½" x (W)3⅜" x (H)3½"
STABILIZER SPAN
17-3/16 Inches
STABILIZER CHORD
6 Inches (Avg.)
STABILIZER AREA
100 Sq. In.
STAB. AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
8¼ Inches

VERTICAL FIN WIDTH (incl. rud.)
8¼ Max
REC. ENGINE SIZE
.35-.45 cu. in.
FUEL TANK SIZE
8 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Ail. & Throt.

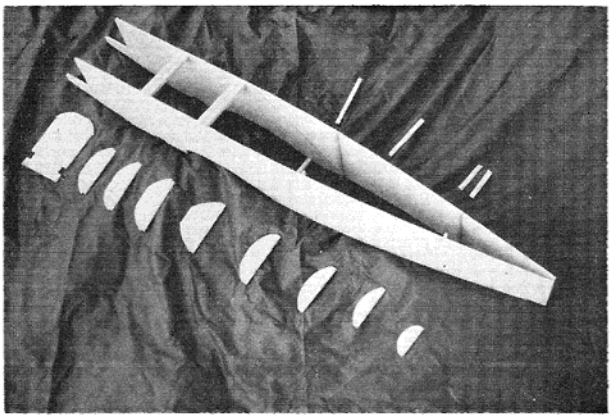
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply
Wing ..... Balsa, Ply
Empennage ..... Balsa
Wt. Ready To Fly ..... 72 Oz.
Wing Loading ..... 16.3 Oz./Sq. Ft.



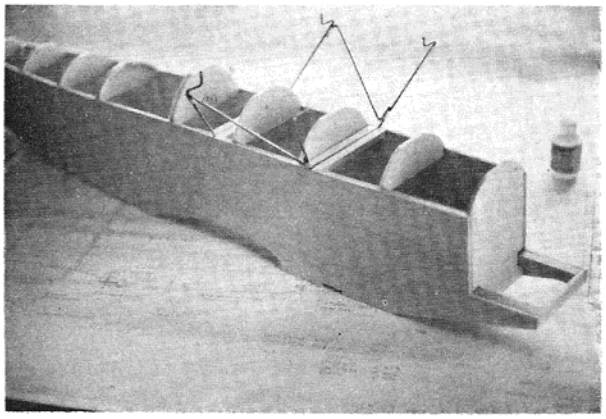
Jig for cabane struts using the cabane mounting blocks and scrap.



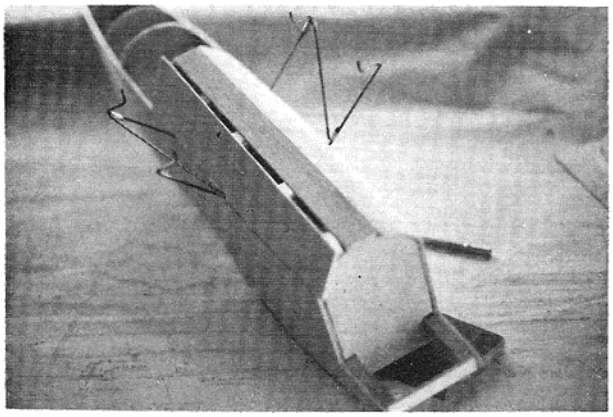
Use right angles to get cabane mount blocks square.



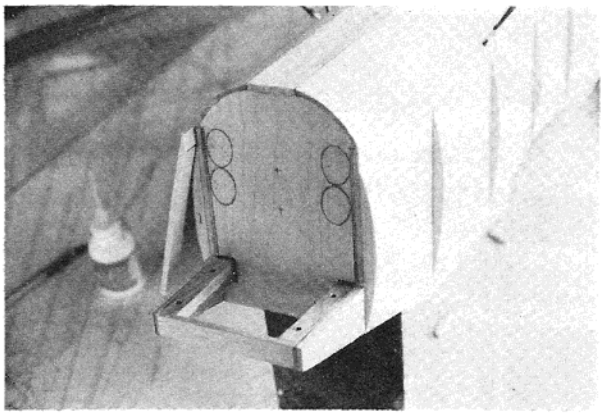
Firewall and formers ready to be glued in place.



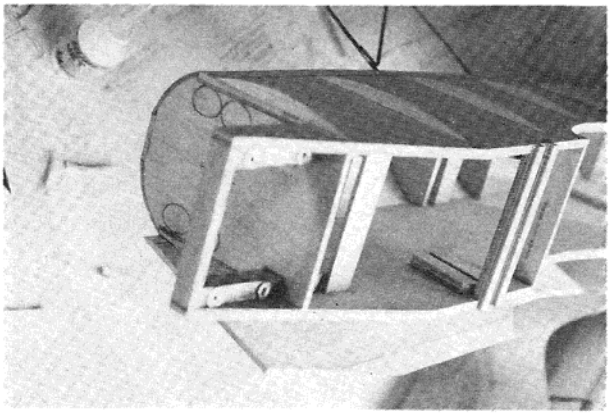
Formers and cabane struts in place.



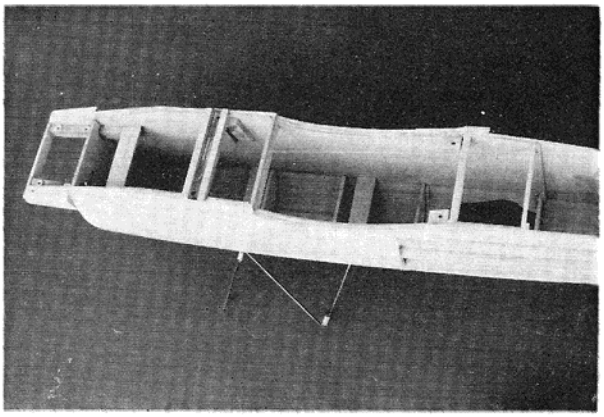
Front turtledeck top piece in place after cabane struts are secured.



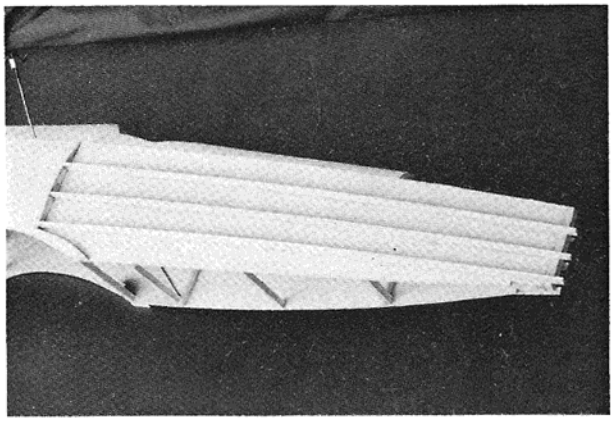
Side formers in place, note line 3/8" from top of fuselage side.



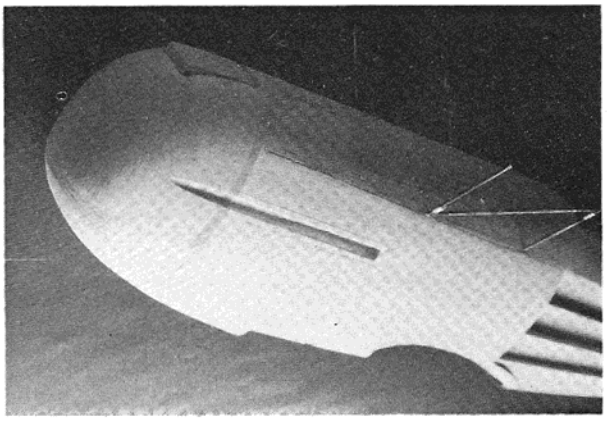
Side sheeting ready for gluing. Note bevel on bottom of side sheeting.



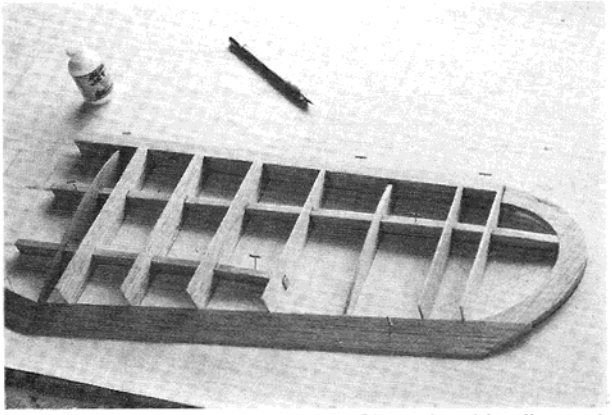
Fuselage without bottom sheeting, lower wing mounting blocks in place.



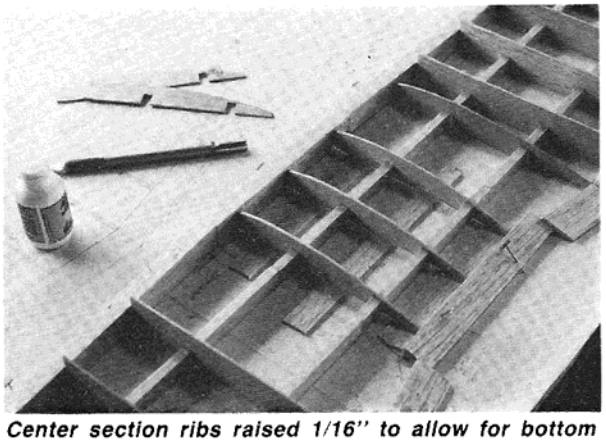
Rear of fuselage with side stringers before shaping.



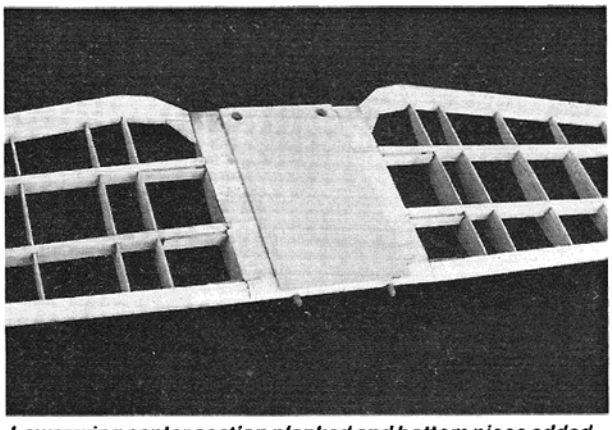
Fuselage nose after shaping, note insert for gun trough.



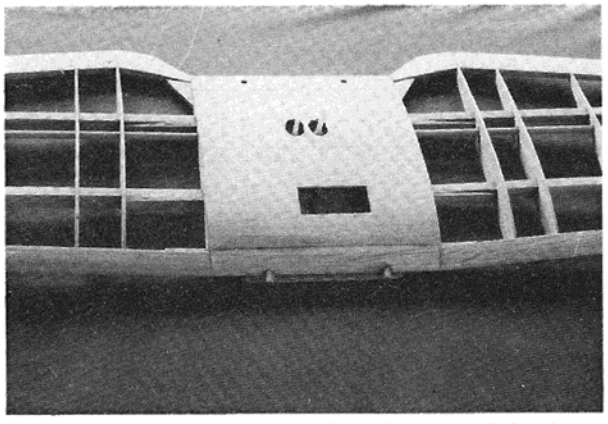
Lower wing panel under const. Shaped guide ribs and oversize rib pieces.



Center section ribs raised 1/16" to allow for bottom planking.



Lower wing center section planked and bottom piece added.



Finished lower wing, control rods and servo hole in place.

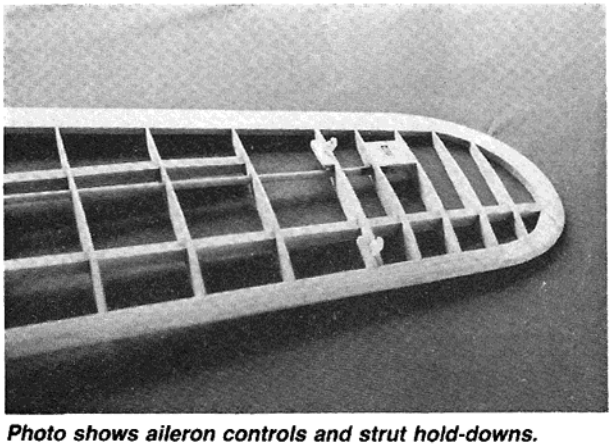
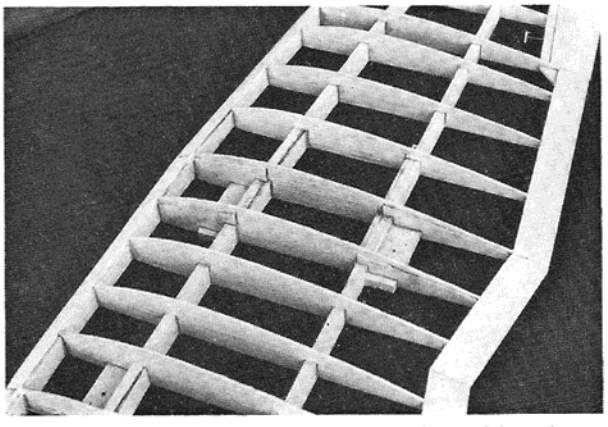
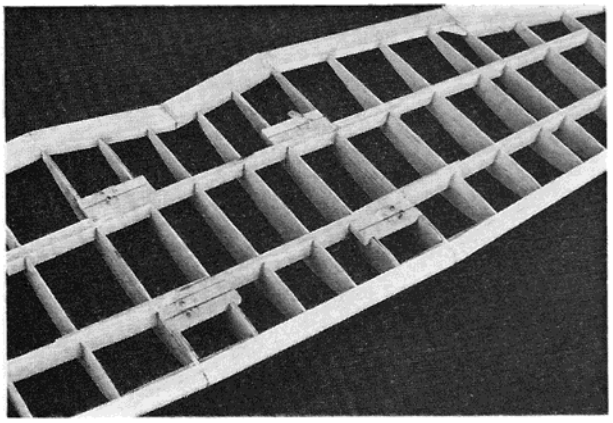


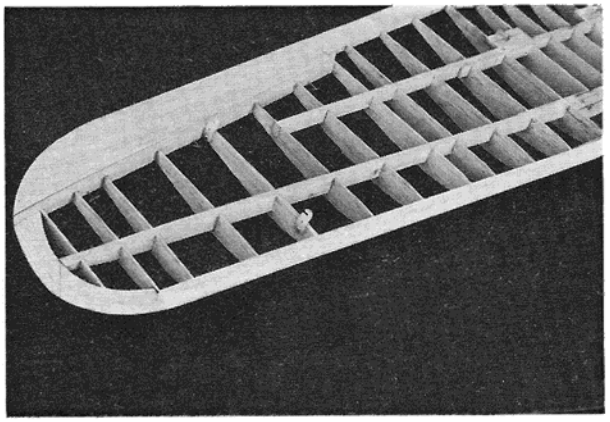
Photo shows aileron controls and strut hold-downs.



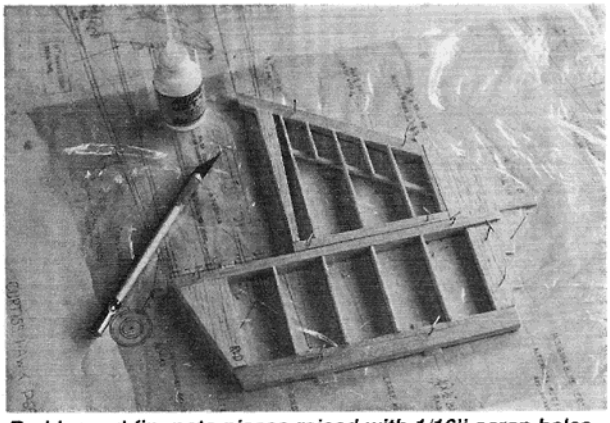
Top view of upper wing center section with cabane mounting blocks and reinforcements.



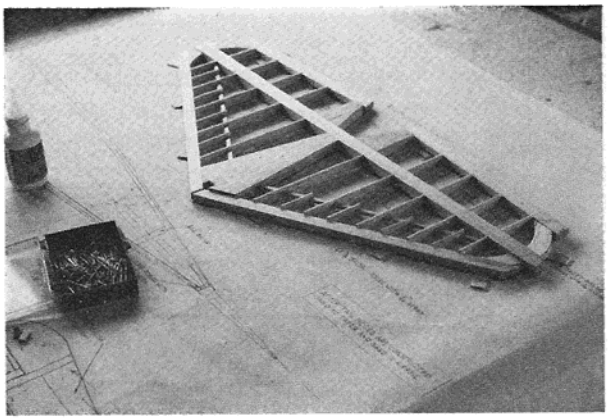
Underneath view of top wing.



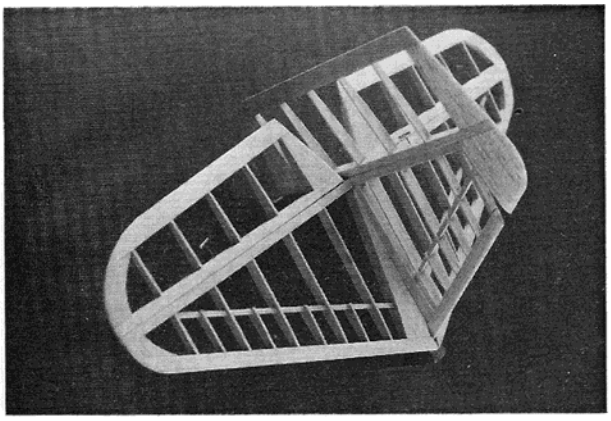
Top wing tip details before covering supports added around hold-downs.



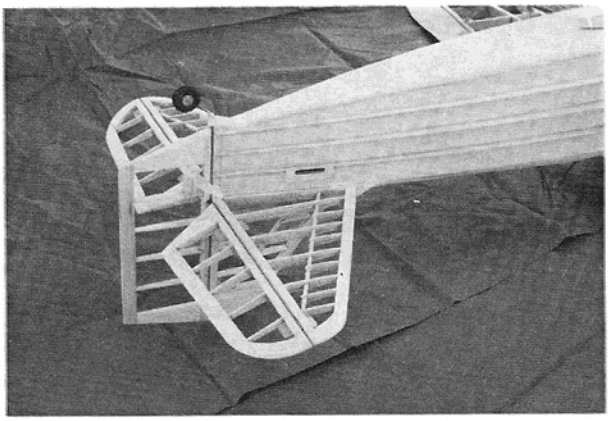
Rudder and fin, note pieces raised with 1/16" scrap balsa.



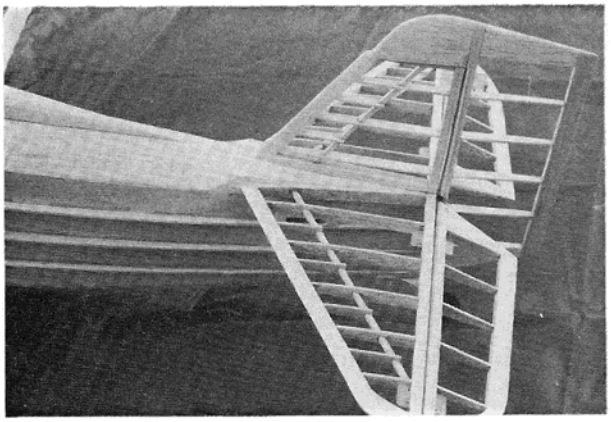
Stab and elevators, note pieces raised with 1/16" scrap balsa.



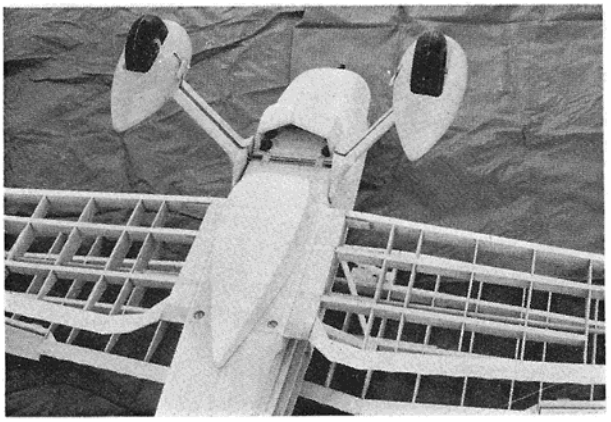
Tail tapered and sanded to airfoil.



Finished tail section viewed from bottom.



Finished tail section viewed from top.



Framed aircraft viewed from bottom showing L.G. detail and aux. fuel tank.

the cowl of fiberglass by using the block to make a female mold. By making the cowl blocks slightly undersize, the Hobbypoxy Easy Does It method will work well.

I prefer having the mold so if I make a goof I haven't lost anything but the fiberglass cowl and I can replace that easily. Besides if a friend is making the model too, you can share the mold or you can sell him a cowl.

Don't add the fuselage bottom sheeting until the lower wing has been fit into place and mounted.

Wings:

The wing construction is not the usual run of the mill method --- it's a lot easier.

I don't like to plot a lot of airfoils and cut all of the ribs so if you follow the same procedure it will be as easy for you as it was for me. Following the instructions here will help.

Now you have a momentous decision to make.

The rib location on the plan are for sport flying and loose sport scale. For more scale appearance the extra ribs can be added at the locations marked for the scallops on the trailing edges and in-between the wide spaced ribs on the upper wing where the ailerons are.

On the second plane the extra ribs were added after the construction photos were taken and it definitely adds to the scale appearance.

Don't get all shook up because your construction doesn't look exactly like some of the photos. Some improvements were made in the drawings after the photos were taken. You know the old saying, "**Plan ahead**."

For the lower wing, trace and cut out the 1/8" balsa ribs and the base ribs. It's better if you use plywood for the base rib pattern as it doesn't sand as easy as balsa.

Lay out the leading edges, trailing edges, and spars on the plans. Don't forget to trim the spar ends as shown on the plans. Do not glue the pieces together at the dihedral break.

Glue the 1/8" balsa ribs in place. Tack glue the base ribs in place if you used plywood, they will be removed later and be replaced with balsa ribs.

Glue the balsa tip pieces together and glue them to the leading edges, trailing edges, and spar. Raise the front of the tip piece 1/8" so it will be in the center of the finished leading edge.

For the outer panels, cut pieces of 1/16" sheet balsa to each rib length, oversize to the rib depth. Notch the rib pieces for the spars and glue in place.

For the lower wing center section, use the rib pattern on the fuselage side view.

Don't forget to raise the center section ribs 1/16" off the plans with scrap. That's to allow for the bottom planking.

Do not put the ribs in at the dihedral break. They go in after the wing sections are joined.

By using the 1/8" balsa rib and the plywood base rib as a guide, carefully sand **the outer panel rib pieces to the proper airfoil. Use a sanding bar or make a long flat sanding block. Don't sand the guide ribs as that would change the airfoil. A piece of Color Stripe striping tape over the guide ribs will make it easier to keep from sanding too far.**

Remove the plywood base ribs and replace them with balsa rib pieces.

Cut the holes in the ribs of the outer panels and the center section and put the aileron torque rods in place before joining the center section and outer panels.

Don't forget the dihedral angle when cutting the torque rod holes in the center section ribs.

Join the outer panels to the center section at the proper dihedral angle and glue the 1/8" ply wing joiners in place.

Install the rib at the dihedral break and plank the top of the center section with 1/16" sheet balsa.

Fit the wing to the fuselage.

Install the wing dowels and hardwood mounting blocks.

Plank the bottom of the wing center section.

Now wasn't that simple?

The top wing is made using the same technique, but with a change in setting the dihedral.

When the center section and the outer panels have been sanded to the proper airfoil, lay the sections upside down on a flat surface.

Glue the sections together and install the plywood joiners.

The top of the upper wing is flat when the wing is right side up.

Install the wing cabane mounting blocks and reinforcements in the center section area.

Carefully bend the Goldberg flat hold-downs as shown on the plans to the strut angle. With Super Jet and screws, install them on the bottom of the top wing and on the top of the bottom wing at the exact locations shown.

All of the hold-down openings are toward the trailing edges.

Add the 1/8" balsa covering supports around the hold-downs.

Tail:

Lay out the leading edges, trailing edges, fin and rudder posts and tip pieces on the plans. Don't forget to raise the leading edges, trailing edges and tips with 1/16" scrap balsa.

Cut the 1/16" x 3/8" rib pieces to length.

The fin ribs have a slot for the 1/8" square balsa which is put in before the ribs are glued in place.

Add the false ribs.

The elevator and stab are made the same way as the fin and rudder.

Join the elevator pieces with the 3/32" wire.

When everything is set up, tack glue or pin the fin to the rudder and the elevators to the stab.

Carefully sand them to the correct taper, then sand the ribs to the airfoil.

Glue the stab and fin to the fuselage.

If you are going to make the tail detail scale, build it up from scrap balsa, filler and sand to shape. See the perspective drawing on the plan for scale detail.

If you aren't going that far into scale, add the balsa pieces to conform to the rear turtledeck shape.

The wheel pants may be made from balsa blocks and hollowed, or laminated sheet balsa.

If you have access to a lathe, or fix up your Moto Tool as a lathe, it's easy to turn them out. The shape of the pants is the same on the top and side views.

Again, I prefer to make a mold and lay them up out of fiberglass.

I made the engine cooling tubes from 1/2" rocket body tubes. You could use aluminum tubing or wrap your own with paper.

The rocket tubes are light, easy to use and reasonably priced so I took the easy way out.

Be sure to fuelproof the inside of the tubes.

Finishing:

Use some care here also, don't go overboard on the paint and finishing and end up with a very heavy airplane. Remember a feather flys better than a brick.

The first model was covered entirely with MonoKote and the results were very good.

The second one was covered with Permagloss Coverite to get the fabric effect on the surfaces. The Coverite is easy to use and gives a good scale appearance but, because it is necessary to paint the model to get the scale colors, I would recommend using Silkspun or Super Coverite instead of Permagloss if you go that way. It would be a weight savings. Top Flite's new FabriKote would also be a good choice. The second model was sprayed with Aerogloss dope to get the desired colors.

This was my first attempt at using Coverite. The only problem I had was overcome when I followed the instructions. Doesn't that sound familiar?

The P-6E's were finished in a variety of color schemes, but I think the Snow Owl trim is the most attractive.

When choosing your colors match your presentation if you are going to enter Sport Scale competition. There are several variations of olive drab by the paint manufacturers so choose the correct one or mix your own.

Also match the Snow Owl to your presentation as there were several different Snow Owls used by the same squadron.

Add the details to your model as you see fit. The inspection panels, shell ejection chutes, gun cover, wires, etc., do add scale points.

The MonoKote covered plane weighs 4½ pounds. With the changes in the second model and the painted finish, your plane

should be just about 5 pounds. If you have used a little care in choosing your wood, building and finishing, anything under 5 lbs. is a plus.

Both planes use a Du-Bro muffler, cut off. On the second plane the muffler was filed so it sloped down to exit the cowl in the gun trough. With the variety of mufflers available, you have a wide choice and it could be completely hidden.

By making the muffler hole in the cowl oversize, you allow more air to exit giving better engine cooling. Every little bit helps.

There is no need to go into detail on the radio installation, you probably have your favorite method anyway. Just use the radio installation to get the balance as marked on the plans.

Putting the switch and charging jack in the cockpit floor keeps them out of the way and they don't spoil the fuselage lines.

Flying:

If your ailerons are controlled by torque rods in the lower wing, the wing struts must be in place when flying. It's a good idea to use them anyway as they add to the strength of the wings.

The model had no bad characteristics at all, it was a real pleasure to fly after the minor changes were made.

But like all tail-draggers it does require a little technique for good take-offs and landings. A recent RCM had a good article on tail-draggers and it is recommended reading if this is your first one.

The ailerons are effective and I would recommend not more than 1/4" up and down at the inboard end of the ailerons on your first flights.

Important: Don't fudge on the balance point and make it tail heavy. It's easy to move the balance point back to suit your flying. If it's too far back to start, you may never get the chance to move it forward without some major repairs.

The Goldberg Precision Balancer is a worthwhile tool to get the balance in the correct position.

When flying with the cowl in place, you will need some wire extensions for the glow plug. A little ingenuity here can make them inconspicuous.

On your first flights leave the cowl off. You don't want to worry about engine overheating while getting it trimmed out.

Keep your first flights fairly high so if any quirks show up you have plenty of altitude to get out of trouble.

Our first flights held no surprises except for how well it flew when trimmed correctly.

A little Scuff Guard judiciously placed on the front of the wheel pants and under the cowl will help just in case it should nose-over accidentally. Most flyers don't do that on purpose.

After it's trimmed out, put the cowl on and check for engine overheating. Enlarge the cooling holes if necessary. Remember you need quite a bit more area for the air to escape than to enter for good cooling.

I hope you get as much pleasure out of building and flying your P-6E as I have mine. □

Editing By Hlsat.
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