The Lockheed Wasp-Vega 5

by George Meyer

Electric powered, pendulum trimmed. Flies well with scale dihedral. A Winnie Mae Free-Flight; VL-Hytork 48 motor.

Being a logical development of the earliest Whirlwind-Vega, the Wasp-Vega 5 was also a five place high wing cabin monoplane of typical Lockheed configuration and construction. That is, it had an all-wood monococque fuselage and an all-wood full cantilever wing; the Vega 5 now mounted the more powerful 9 cylinder Pratt & Whitney Wasp engine of 400-425 horsepower. In the quest for still higher performance, the Wasp engine was installed in the standard Vega; the performance derived from this added power was a combination that was nearly sensational. It was only natural then for these Wasp powered Vegas to go right out and start breaking records right and left.

Wiley Post's first Winnie Mae, a sistership to the later and more famous Winnie Mae that set a round the world record or two, was also a Vega 5 of this type and was built late in 1928; it was about the 4th Wasp-Vega to come off the line.

Listed below are specifications and performance date for the Wasp powered Lockheed Vega 5; wingspan 41′, chord at root 102″, chord at tip 63″, M.A.C. 80″, wing area 275 sq. ft., airfoil at root Clark Y-18, airfoil at tip Clark Y-9.5, length 27′8″, height 8′6″, empty weight 2361, useful load 1672 lbs., payload 1012, gross weight 4033 lbs., maximum speed 170 mph, cruise 140 mph, land 54 mph, climb 1300, ceiling 20,000 feet, gas capacity 96 gal., oil 10 gal., range 725 miles. Price at the factory in July of 1928 was listed at $18,500.

PHOTOGRAPHY: TOM MEYER

The Model Structure

The Lockheed Vega, Winnie Mae gave me the chance to try a different type of construction for a Free-Flight model. After some experimenting with polyurethane foam, coating it with nitrate dope, acetone, model airplane glue, etc., no deterioration developed. The Lockheed Vega monocoque fuselage was a perfect subject on which to try this type construction, using a VL-Hytork 48 motor and it turned out to be one of the prettiest models I have built so far.

After some thought on the spiral problems of electric models during the cruise portion of the flight, I decided to install a pendulum control for both rudder and elevators. This keeps the model out of the deadly spiral dive and also allows the model to be built with scale dihedral in the wings.

When constructing the model, cut two blocks of polyurethane foam (I found some of this type foam at a local insulation company) on a band saw to the side view of the fuselage. A hand saw may be used. Cut four 1/32″ balsa keel pieces, two upper and two lower and glue them to the foam blocks with model cement or Titebond Glue. After the glue is dry, tack glue the matching keel pieces together, then cut the foam to match the top view of the fuselage. Cut cardboard templates to the outside contours as shown on the plans. Carefully carve and sand the fuselage to match the templates. Cover the fuselage with Jap tissue and give it a couple of coats of nitrate dope. Split the fuselage in half at the tack glue joint of the keel pieces and hollow the fuselage halves to approximately 3/32″ thick. Slice out the bulkheads in halves then locate the bulkhead positions on the keel pieces, making sure both sides match so that when the fuselage halves are glued together, the bulkheads will be lined up. After this glue the bulkheads in their correct positions on the two fuselage halves. When the glue is dry, join the two fuselage halves. Use Hot Stuff here because it is easier to keep things lined up while you tack glue the two sides together. Lightly sand the glue joints and cover with two layers of Jap tissue.

Bend the landing gear wires of .045″ dia. hard music wire as shown on the plans. Be sure to include the coils as shown as it is absolutely necessary that the gear be shock absorbing since the model has a heavy electric motor and batteries and the landing gear takes quite a beating. Carefully cut out the foam of the fuselage shell with a razor blade large enough to bind and glue the landing gear wires to the bulkheads.

The landing gear wires will have to be squeezed together and inserted from the inside of the fuselage. Bind and epoxy the wires to the bulkheads. Be sure that the coils are not glued so the gear can flex freely. Reinstall and glue the foam pieces at the landing exit point, then sand and patch with Jap tissue. Bind and solder the landing gear wire together at the lower ends. (I glued the wires together with Hot Stuff to hold them in position, then wound them with fine iron wire and soldered them. The Hot Stuff melts off and does not interfere with the solder). Make the landing gear fairings of balsa sheet. Sand to streamline shape, then groove and install on landing gear wires with Hot Stuff.

Carve the wheelpants from balsa blocks split down the middle. Hollow to approximately 1/16″ thick. Slip the inner portions of the wheelpants over the axle, then the wheels, making sure everything is lined up and glue the pants to the landing gear fairings. Install the outside half of the wheelpants and glue the two halves together. Cut off the axle flush with the outside of the wheelpants. Make a fairing at the juncture of the wheelpants and the landing gear fairings of celastic. This will beef up the joint to take landing shocks.

Build up a tube of 1/64″ plywood for the battery box and drill 1/8″ dia. holes 1/4″ spacing the total length of the tube and make two 1/8″ dia. dowels 1/2″ longer than the diameter of the tube. When the batteries are installed this will allow you to shift the batteries back and forth to get the model to balance properly. Glue the tube in the bulkheads as shown on the drawing.

Cut a hole the exact size of the square section of the switch and charging plug on the left side of the fuselage just aft of the front landing gear struts and centered between them. Cut a doubler of 1/64″ plywood approximately 1 1/2″ square with a cut-out to fit the switch and glue inside the fuselage shell. Install switch per hardware supplied with motor.

Make the pendulum control as shown on the drawings. Be sure to install the movement limiter on the fore and aft swing so the elevator will not have more than 2° travel up and down. Fit in fuselage, but do not glue in place until tail surfaces have been installed so the torque rod and pushrod can be slid out the back of the fuselage and can be bent to match elevator and rudder positions.

Install the 1/64″ plywood plate on tip of the fuselage at the wing and fuselage juncture. Make sure it has the correct curve to match the bottom of the wing and square with the fuselage vertical centerline.

Build up the pilot's compartment and windshield as shown on plans. Cut the windows out of the fuselage shell with a sharp knife. Do not install windshield or windows until pendulum and motor wiring has been finally installed.

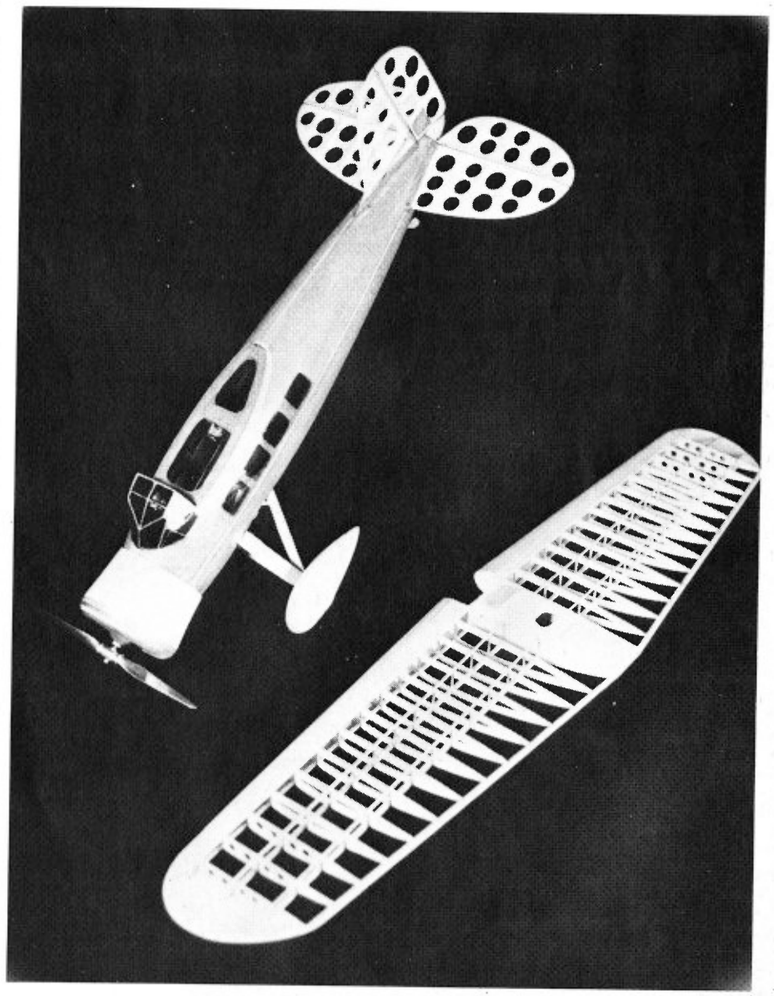
Make up the tail surfaces with the warp proof type construction as shown on the drawings. Make the rudder and elevator hinges of 1/16″ aluminum tubing bound and glued to the rudder, fin, stabilizer and elevators. Be sure the hinges move freely. Make the elevator horn out of soft iron wire so it can be bent easily for elevator adjustments and glue and bind to elevator. Box in both sides of the rudder at the torque rod juncture with 1/64″ plywood and bend the torque rod as shown on plans. Check and make sure the rudder does not move more than 2° to the right and left. The pendulum rudder is necessary to stop the model from going into a spiral in the cruise position of the motor run as the batteries lose their power.

Cut off the tail end of the fuselage and make a tail cone of balsa. Hollow out to approximately 1/32″ thick. This will clear the elevator horn when the tail surfaces are installed.

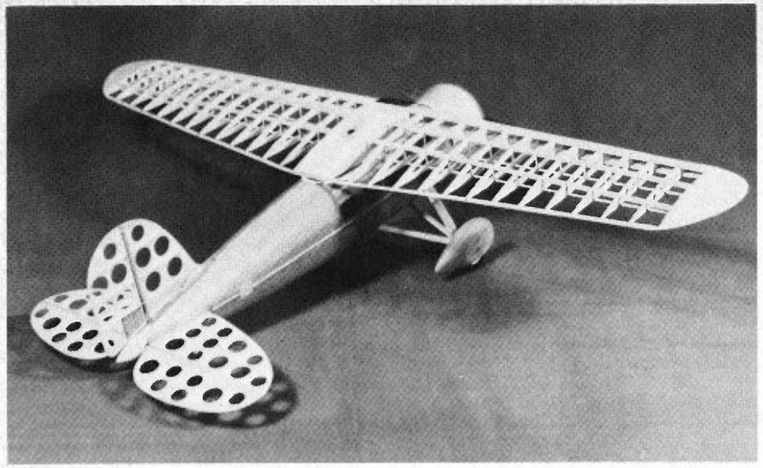
Build the motor mount as shown on the drawings. Make the plywood tube enough oversize so the motor can be shifted for thrust adjustment. Tap the motor mount ring for the mounting screws furnished with the motor. Glue the motor mount to the firewall and install the 1/8″ balsa triangle to reinforce the mount. Install motor with small pieces of rubber fuel tubing between mount and motor. This will allow thrust line adjustments by tightening and loosing the mount screws.

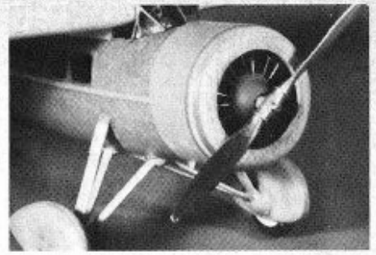
Assemble up the engine cowl as shown on drawings. Use a William Brothers 3/4″ scale engine. Trim the cylinders off so they will just slip inside the engine cowl opening. Cut out the inside of the crankcase so it is a snug fit on the VL Hytork 48 Motor case. Make a crankcase extension out of a section of plastic Easter egg to just clear the prop adaptor of the motor. The engine can now be easily removed to make thrust adjustments of the electric motor.

To build the wing, cut the ribs out of 1/32″ sheet balsa as shown on plans. Laminate the wing tips of two pieces of 1/32″ x 1/16″ basswood. Form around a waxed cardboard pattern. Glue the strips together with Titebond Glue. Assemble the wing upside down over the drawing. Glue in the center upper spar first, then add the front and rear upper spars. Assembled this way it will give the wing tips a natural washout which is desirable. Now add the leading and trailing edges and the wing tip bowl. Install the lower spars. The wing structure will now be flat on the top and have a dihedral angle on the lower side only, due to the taper of the ribs. Install the fillers between the spars of the center-section of



Save weight where you can. Electric motors require batteries. Lightening holes in the empennage saves nose weight. Bridge-like spars, hollow ribs. A smooth flying design, not a novice project.





The hollowed foam fuselage houses a weighted pendulum trimming surfaces, "piloting the aircraft." **Photos at right:** Close in on the cowling, gear attachment, filleting and cabin's side detailing. **Beneath:** A three minute charge when all trimmed out, even, reliable, gradually lessening thrust.

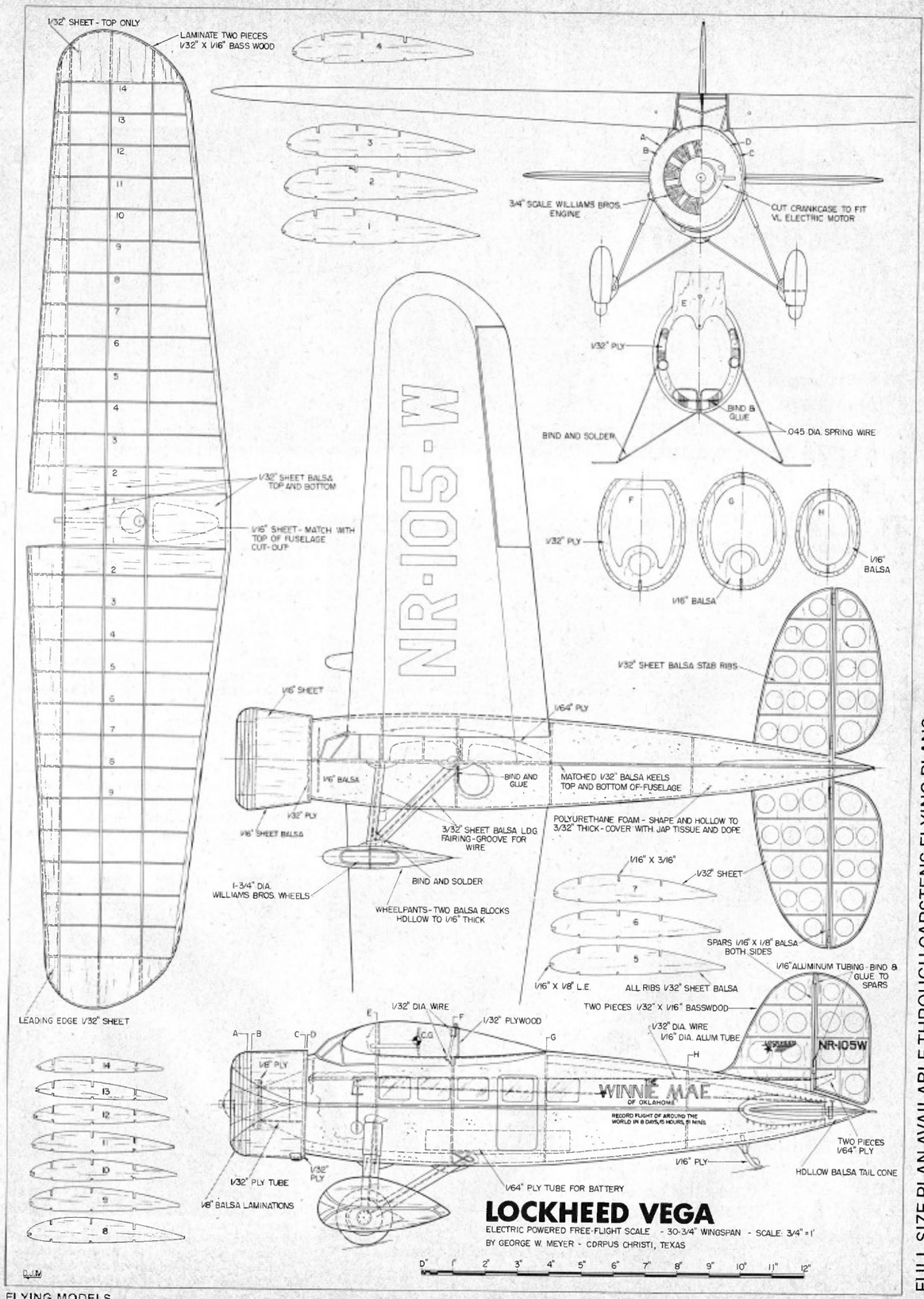
the wing and the 1/32" ply doubler at the center spar to hold the wing retaining hook. Install the 1/8" dia. dowel front wing locating pin. Cover the leading edge with lightweight 1/32" sheet balsa and plank the top and bottom of the wing with 1/32" sheet balsa between the spars and ribs as shown on the plans. Center portion of the wing only. Plank the top of the wing tip section with 1/32" sheet balsa. Make a wing locating piece of 1/16" balsa sheet. Glue this to the bottom of the wing center to match the cutout in the 1/16" plywood top of the fuselage. Cover the wing and tail surfaces with Jap tissue. Give the surfaces three coats of 50-50 nitrate dope and thinner.

Very carefully cut out the aft end of the fuselage to fit the stabilizer and fin. Glue them in slots in the fuselage with Titebond Glue. Bend and cut the torque and pushrods to the correct length. Now the pendulum assembly can be epoxied in place in the forward part of the fuselage.

The windshield and cabin windows can now be installed. Make them of clear .020 plastic. Mask off the windshield and cabin windows, wheels, etc., then get a bottle of Floquil white paint. Pour off the liquid on top of the pigment. Mix the pigment with nitrate dope, and thin to spraying consistency. Use an airbrush and dope the entire model until a good white color is obtained. The fuselage will take a couple more coats since the foam is naturally green and it takes a little more to cover it. Mask off the fuselage for the light blue paint. This includes the area for the dark blue also. Now mask off the light blue, leaving the area to be dark blue. Mix the light blue the same as the white. Mask off the wing and make the identification numbers of masking tape for the top of the right wing. The tape with numbers removed can be used on the bottom of the left wing. Now spray the dark blue dope on the wing and fuselage. I made the Winnie Mae and other lettering on clear drafting transfer plastic and stuck them in the proper places on the fuselage.

Assemble the model and head for the tall grass, Test glide until the correct C/G is located. Remember, shift the flight batteries to balance the model. Give the batteries about one minute charge for the first test flight. After that you may have to bend the elevator horn to get the correct climb and glide. Give the batteries a three minute charge and put on your running shoes.

For scale authentication: Excellent colored three views of the Winnie Mae by Bjorn Karlstrom in the November 1975 issue of R.C. Sportsman Magazine. Excellent drawings of the Lockheed Vega by William A. Wylam in Book 11 of the Best of Wylam. The first part of this article taken from the U.S. Civil Aircraft, Volume 1 by Joseph P. Juptner.



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