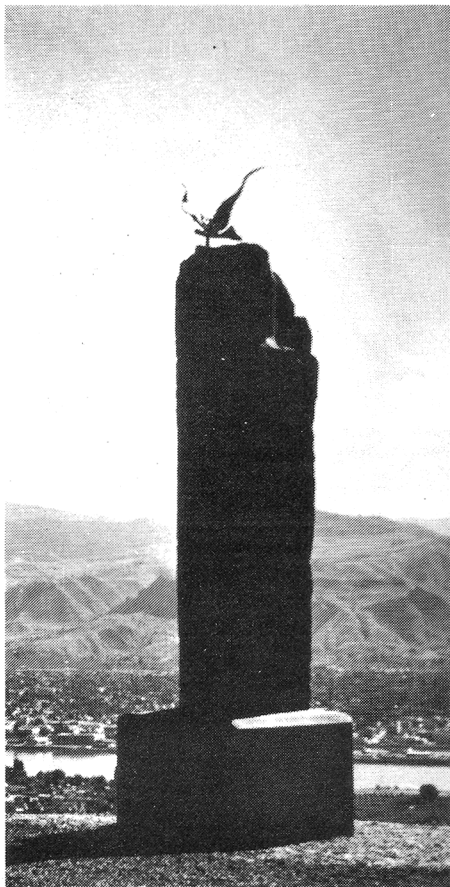
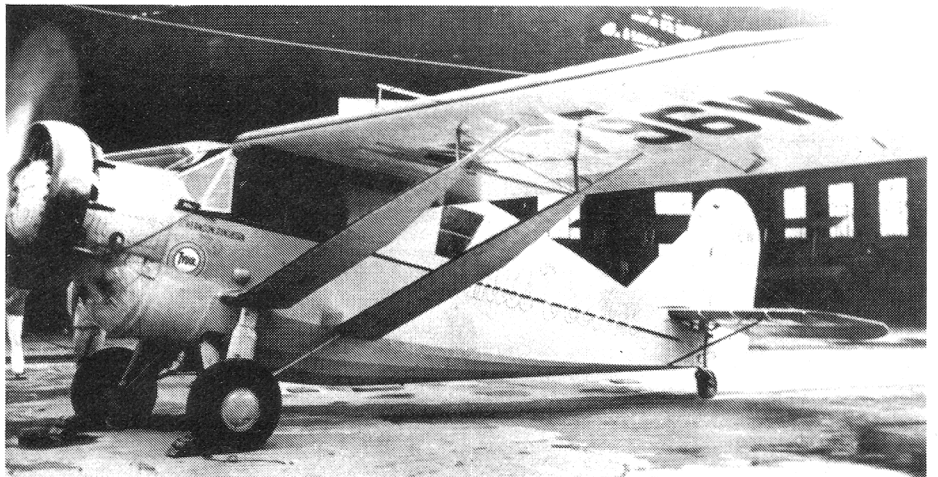




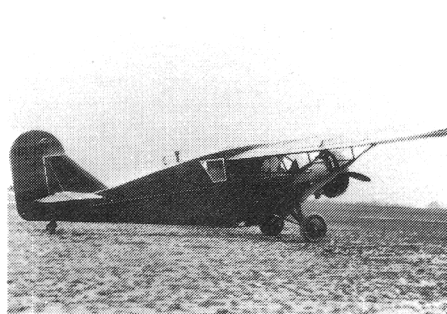
Broad wing struts and convenient size of the model are evident in this photo. Note the wire control line guide and the fact that it forces the leadout wires to slope downward toward wing tip to raise inboard wing during flight.



Pangborn-Herdon Memorial in Wenatchee commemorates the record-making flight.



Clyde Pangborn checks out the Pratt and Whitney Wasp in Japan prior to the Trans-Pacific flight. Note the wide, balloon tires which were necessary for beach takeoff.



Pangborn/Herdon Bellanca Skyrocket appeared as above as it left the factory.



Miss Veeder at the edge of Wenatchee airfield; Pangborn and Herndon at nose.

Bellanca Skyrocket

A 3/4" to the foot scale Control Line model of Miss Veedol, the airplane that accomplished the first nonstop trans-Pacific flight. It's a moment of early aviation history that is easy to build and fly.

by Walter A. Musciano

BELLANCA:

TYPE: Standoff Scale CL
WINGSPAN: 34 3/4 inches
WING AREA: 170 square inches
LENGTH: 21 inches
ENGINE: .15-.23

Scanning by Hlsat

● Our model is an easy-to-build standoff 3/4"-to-the-foot scale ukie of the first plane to fly nonstop across the Pacific Ocean. The fuselage is slab sided, except for the belly and nose, and utilizes sheet balsa construction. The wing is a simple sparless design featuring the scale number of ribs and rib spacing, and is Coverite covered. This is a fun model; a standoff scale type; accurate, yes, but not so super-detailed that the average Sunday flier would hesitate to take it to the flying field for fear of harming his creation. Naturally, those modelers who desire more detail can add it by studying the photographs of the actual aircraft. Any engine from .19 to .29 cu in. displacement can be used in this model. As previously mentioned, the full-size plane after which our model is patterned was a world-famous record breaker, so a few words about the Bellanca and its equally famous pilot are in order before we begin construction.

Record-breaking trans-Pacific flight began when famous aviator Clyde Pangborn and his co-pilot, socialite Hugh Herndon, took off in their modified Bellanca Skyrocket from Roosevelt Field on July 28, 1931 and headed eastward across the Atlantic Ocean. Why head in this direction to cross the Pacific? Well, our intrepid duo was really trying to better the Post/Gatty 'round-the-world flight. Crackerjack flier Pangborn was chief pilot for Standard Airplane Company when he met Herndon, who was a prospective client, and in short time the pair began to plan the flight. It is reported that in exchange for Herndon's financial backing, Pangborn agreed not to give any lectures or endorsements, or capitalize on the flight in any way, for one year after the journey. This agreement contributed to the relative obscurity of the flight.

Giuseppe M. Bellanca's Skyrocket design was selected for the undertaking. This very efficient plane underwent extensive modification in order to increase its range. The original 90-gallon wing tankage was doubled; a 559-gallon fuel tank was installed in the fuselage cabin; and a 136-gallon fuel tank was slung under the fuselage and enclosed in a long, streamlined fabric-covered fairing, which made the plane resemble a "pregnant guppy." Thus total fuel tankage amounted to 875 gallons—almost 10 times the original capacity! Although this load reduced the speed from 155 mph to 114 mph, the superb weight-carrying characteristics of the Bellanca enabled it to lift the extra fuel with little effort. Giuseppe Bellanca's designs made every possible part of the plane contribute to lift, including the wing struts, which also provided the necessary dihedral, as well as the curvature of the top of the fuselage. The Tidewater Oil Company became interested in the flight and agreed to help by contributing their products, Tydol gasoline and Veedol lubricating oil. Hence, the plane was christened "Miss Veedol."

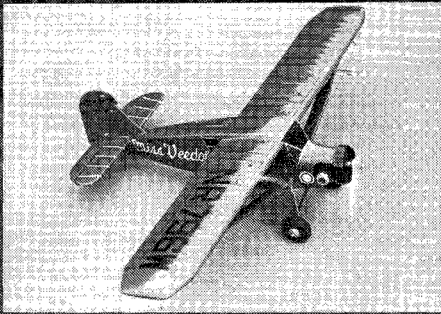
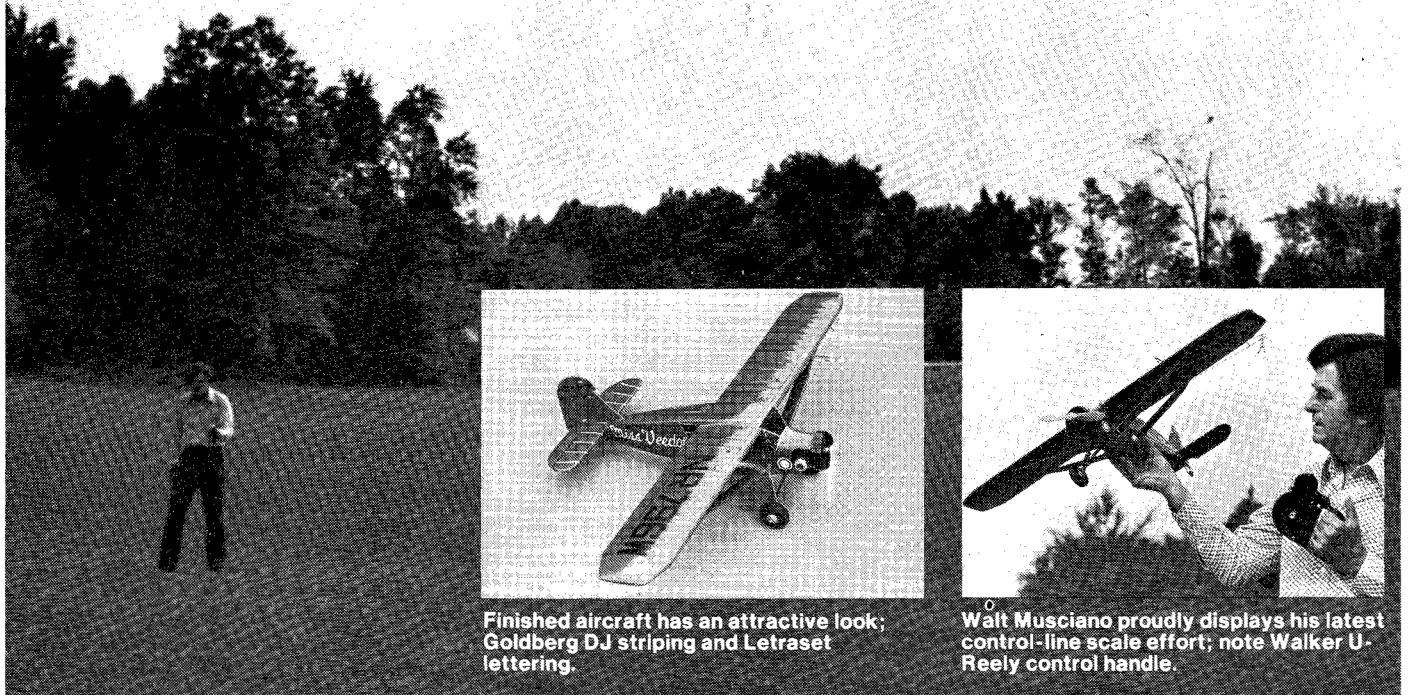
The flight plan was to make stops in England, Russia, Siberia, Alaska and New York, with Pangborn as pilot and Herndon as navigator. Navigation errors delayed the run to Moscow and violent storms over the Ural Mountains, plus more navigation errors, necessitated several unscheduled landings far off course. The landing just north of Vladivostok on the Siberian Pacific coast was on a soggy and rough field, which made Miss Veedol ground-loop, damaging a wing tip. This accident, along with North Pacific storms, further delayed the flight to the point where it was impossible to beat the record set by Wiley Post and Harold Gatty, so the attempt was reluctantly abandoned. When things looked their blackest, a ray of welcomed light beamed across the Sea of Japan: a wire from a Japanese newspaper.

The first nonstop trans-Pacific flight would be rewarded with a \$25,000 prize, said the newspaper, and it suggested that Pangborn and Herndon make the attempt. They agreed and flew to Japan. There they modified Miss Veedol further with an added 50-gallon "chin" fuel tank and extensively reworked the 300-pound landing gear so they could drop it after takeoff. The only place in Japan from which this heavily laden plane could take off was the hard-packed sand of Sabushiro Beach, so the narrow tires of the original Bellanca were quickly replaced with 12" balloon tires to prevent the wheels from sinking in the sand during the long takeoff run. The official sealed barograph, or recording altimeter, was placed on board—to prove that the flight was nonstop—and Miss Veedol was pushed up a long wooden takeoff ramp (this was used to shorten the takeoff run and conserve fuel). After a run of over 4,000 feet she was airborne, the 420 hp Pratt & Whitney Wasp engine pulling her off the beach and over the vast Pacific Ocean.

As the landing gear fell into the sea the Bellanca's drag was reduced by almost twenty percent. The plane carried no radio or sextant, so all navigating was conducted with a couple of compasses and by a star or two at night. Although the wings had been smeared with a Japanese molasses called "Ame" to prevent icing, Miss Veedol was plagued with the white crystals throughout the flight, at various altitudes from 12,000 to 17,000 feet! Once, the drowsy crew forgot to transfer fuel and the Wasp actually stopped dead, but quick action at the wobble pump and fuel transfer valves brought the engine to life.

Landing in the U.S. was made at Wenatchee, Washington, Pangborn's hometown, because Spokane was beset by fog. After flying 4,877 miles over the vast Pacific, Miss Veedol touched down on her belly 41 hours and 13 minutes after takeoff; the first nonstop trans-Pacific flight. The initial excitement of this aviation "First" soon died and it was not until 31 years later that the Japanese erected a monument at the takeoff site at Sabushiro to honor the flight. Through the efforts of Fire Chief T.A. Weaver of Wenatchee, the citizens of the area and the Heritage Committee joined forces to build a Pangborn-Herndon Memorial that marks the landing site of Miss Veedol. Erected in 1969, this basalt and aluminum monument is a U.S. Registered National Historic Place.

Miss Veedol in model form was powered by a .19 engine that gave scale flight characteristics; landing gear and large wheels work well on grass.



Finished aircraft has an attractive look; Goldberg DJ striping and Letraset lettering.



Walt Musciano proudly displays his latest control-line scale effort; note Walker U-Reely control handle.

Bellanca

Now to our model of this famous plane.

CONSTRUCTION. Fuselage sides and bulkheads are traced and cut to shape with coping saw and razor blade. When cutting the bulkheads, be sure that the engine mount holes are spaced to fit the engine you plan to use. Notice that the bulkheads are fitted with tabs that fit into notches in the sides to facilitate assembly and improve strength. Bevel the sides at the rear on the inner surface so that when the sides are joined at the rear, the thickness formed is $\frac{3}{16}$ " to match that of the rudder. Cement the sides together at the rear and hold them in place with straight pins or a clamp until the cement dries. Cement the bulkheads between the sides, starting with the aftermost bulkhead and working forward. Hold the sides firmly against the bulkheads with straight pins or clamps, or even rubber bands, until the cement dries. Do not install firewall bulkhead "B" yet.

Hardwood engine mounts are cut to length, and the hole and countersink for the bellcrank bolt are drilled. Slip the engine mounts into the holes in the bulkheads; when in proper position, they must be very firmly cemented to the bulkheads. Cement all joints several times. Attach the leadout wires to the bellcrank and pass them through the holes in the fuselage sides. Bolt the bellcrank to the up-

per engine mount. Cement firewall bulkhead "B" in place now.

The fuel tank is located between the engine mounts, wedged in place with scrap balsa. Cement well and bind to the mounts with cloth strips soaked with cement.

The landing gear struts are bent into shape from the specified wire. Bind the struts together with very fine, soft wire. Use either copper wire or the soft tinned wire used by florists; the wire from a plastic bag twist-tie can also serve the purpose. Fit the landing gear assembly to the fuselage and adjust as necessary. Solder the joints, making sure that the solder flows between and around the wire binding. Attach the completed landing gear to the bulkheads very securely. We sewed the landing gear to the bulkheads with carpet thread and used plenty of cement, but "J" bolts can be used if you so desire. Smear with cement after the bolts have been tightened.

The engine is now fitted to the mounts. First mark and drill holes for the bolts and blind nuts. Bolt the engine in place and install the blind nuts. Apply some cement to the nuts, then remove the bolts and engine. Add lengths of plastic fuel line to the tank vent, overflow, and supply connections. Pass the fuel supply line through the hole in the firewall bulkhead. Be sure to make the tubing extra long and tape over the open ends to keep the tank clean.

The cabin front and cowl are constructed from balsa for added strength and

simplicity, with painted or decal windows. Carefully build up the cabin and cowling from $\frac{1}{2}$ " balsa planks, well cemented to the fuselage sides, engine mounts, and each other. When thoroughly dry, the blocks are carefully carved to shape with a very sharp knife such as an X-acto No. 26 blade. Be sure to pass the tank fill line through a hole in the blocks.

The fuselage bottom is made by laminating $\frac{1}{4}$ " layers of balsa. Apply one at a time, bending it along the curvature of the fuselage bottom and using plenty of cement. The layers should be held to the fuselage and to each other with straight pins until the cement is thoroughly dry, which should be at least 24 hours. Remove the pins and carefully carve the belly to a streamlined form to fair into the fuselage, checking the photographs and plans as carving progresses. Sandpaper the fuselage with fine sandpaper, using a block for the flat areas of the cabin front and for the nose. Now, very gently and carefully, with a sharp single-edge razor blade, cut off the belly at the fuselage line. With an X-acto gouge, hollow as the plans illustrate and then re-cement the hollow belly to the fuselage very firmly.

The tailwheel strut is now bent to shape and installed firmly to the plywood at the fuselage rear as the plans illustrate.

The tail surfaces are traced and cut to shape and then sandpapered thoroughly. Apply a few coats of sealer and sandpaper

(Continued on page 83)

smooth. Attach the control horn to the elevator halves. When this is dry, hinge the elevator to the stabilizer, using cloth Chinese-type hinges or a commercial hinge. Bend the control rod to shape and pass through the slot in the fuselage side to the bellcrank. Slip the wire control rod into the hole in the bellcrank and secure it. Trial-fit the stabilizer to the fuselage, connecting the control rod to the horn. This is done to insure that when the bellcrank is neutral, the elevator is perfectly horizontal. If it's not, then the control rod was not bent correctly and must be adjusted, or a new one made. Cement the stabilizer atop the fuselage, and attach both ends of the control rod securely to the horn and bellcrank with a commercial keeper or good old-fashioned soldered brass washer. Cement the rudder to the fin, being certain that it is offset as the fuselage top view illustrates. Bevel the forward edge of the rudder to achieve the proper angle. Set aside to dry.

The fuselage top is now added, only from the stabilizer to the wing trailing edge. Be sure that the grain runs spanwise or across the fuselage instead of from nose to tail. Cement the top covering pieces to the fuselage sides, bulkheads, and each other. Sandpaper the entire fuselage with fine and then extra-fine sandpaper. Cement the fin/rudder assembly to the fuselage.

The cowl is very gently cut off the fuselage. Cut only the starboard (right) side away, just enough to form a removable hatch for access to the engine. See the plans. Using a sharp gouge, hollow the cowl and hatch. Cut holes in the hatch for the engine, air intake, propeller shaft, and needle valve. The location and size of the opening will vary from engine to engine. Sand the cowl interior and apply several liberal coats of sanding sealer to the cowl interior, bulkhead, and engine mounts to protect them from fuel seepage. Now replace the hatch and hold it in place with a few droplets of cement.

Wing structure is of sparless design with heavy leading and trailing edges. Cut the leading and trailing edges to proper length and cut the notches for the ribs where the plans indicate. Trace and cut out the wing tips. Do not carve these items in any way except to outline shape with square edges. Cement the wing tips to the leading edge, using plenty of cement. Hold with pins until dry. Cement the trailing edge to the vertical midpoint of the wing tips, again using generous quantities of the adhesive and holding with pins until dry. While this is drying, trace and cut to shape the required number of wing ribs. Notice that some ribs at the wing center are cut out to receive $\frac{1}{16}$ " balsa covering. Pin identical ribs together side by side so the edges can be sandpapered smooth with a sanding block and all ribs will be the same size and shape.

Remove the pins from the wing tips and cement the ribs, one by one, into the slots in the leading and trailing edges. When these are dry, apply more cement to all joints.

Using a very sharp knife such as an X-acto No. 26 blade in the proper handle, carefully carve the leading and trailing edges and wing tips to shape. Cut and fit the wing center balsa sheet covering in place. It will be necessary to use more than one piece to make up the distance between the leading and trailing edges; however, the spanwise dimension must be in one piece for strength. Cement the balsa covering pieces to the ribs, leading and trailing edges, and each other. Use plenty of cement and hold in place with pins until dry. When this is thoroughly dry, sandpaper the entire wing framework until smooth. Check the plans and photographs to insure that the wing is properly shaped. Bend the wire control line guide and attach it very firmly to the wing structure as the plans illustrate. Cement a 1 oz lead weight to the outboard tip as shown.

Wing covering material can be any of the contemporary covering materials such as Coverite, Wing Span, or Super MonoKote, or it can be one of the long-time favorites such as silk or silkspan. It's your choice. When the wing is covered, and treated if necessary, and is ready for painting, it should be very firmly cemented atop the fuselage in the slot provided in the sides. Incidence angle should be zero; if the fuselage sides were cut with care, this will be achieved automatically. Complete the fuselage top covering onto the wing. This should be bevelled before it's cemented in place so that it fits into the wing. The dummy chin fuel tank is carved and cemented in place. Cut a slot in the bottom for the landing gear spreader.

Fuselage and empennage sealing is started after all the wing and tail surface joints with the fuselage are re-cemented, which is accomplished by wiping several coats of cement along the joints. Apply several liberal applications of sealer to all exposed wood surfaces and, when dry, sandpaper thoroughly. Repeat this several times until the surfaces are smooth and free from wood grain.

The wing struts and landing gear fairings are now cut to shape. The wing struts can be cut from pre-shaped trailing edge stock, which will save some carving effort. All struts must be trimmed to a streamlined section and sandpapered smooth. The wing strut stub is now fitted to the forward landing gear wire and to the fuselage. Cut a slot into the strut so that it slips on the wire landing gear. Trim as necessary, and cement to the fuselage and landing gear wire. The landing gear fairings are also slotted and trial-fitted on the struts. Ce-

ment in place. When the adhesive is dry, press Green Stuff or other modeling fillet compound into the slots and sandpaper when it's dry. Fit the wing struts in place, trimming a little at a time as required until the proper length and bevel have been attained. Apply several coats of sanding sealer to the struts and fairings; sandpaper after each application. Continue until the struts and fairings are smooth and ready for the paint. Cut out and assemble the pitot from dowel and wire.

Wing fuel tanks are simulated with oak tag or similar hard-finish card stock. Cut to shape, following the plans, and cement atop the wing. The seam strips are cut from the card material and cemented atop the card stock tanks. Fabricate the dummy tank filler connections and cement in place, along with the vents and expansion domes.

FINISHING. Painting is accomplished when all surfaces are sealed and smooth. The entire plane is Crimson or Insignia Red. Brush or spray the finish. Using 500-grit finishing paper, give the model a thorough sandpapering after each coat has dried. While you're waiting for the plane to dry, paint the struts and pitot. Several coats of paint should be applied to the airplane until a suitable finish is achieved.

Trim details are now added. Begin with the fuselage stripe. This is cut from a thin strip of balsa because it must be a three-dimensional stripe rather than a flat painted one. Sandpaper two corners of the $\frac{1}{16}$ " sq strip so as to form a "U" cross-section. Also sandpaper the ends of the stripe so that they form a streamlined shape. Seal the stripe and then paint it black. Mark the stripe location on the fuselage sides and carefully cement in place by starting at one end and using the cement sparingly. Cement only about one inch and hold this in place with masking tape until it's dry. Very carefully spring the strip away from the fuselage side and apply cement to the strip with a thin sliver of scrap balsa. Quickly press against the fuselage in the proper location and hold the strip in place with pieces of masking tape until the cement is dry.

Cabin windows and windshield are cut from black solid-color decal sheets or, alternatively, they can be painted black after the outlines are well masked. After the windows are thoroughly dry, the aluminum color window trim can be added. We made the window from Goldberg silver DJ Multi Stripe, $\frac{1}{16}$ " wide. The stripes on the stabilizer were made from Goldberg white DJ Multi Stripe, $\frac{1}{8}$ " wide, and appear on top and bottom. The silver window trim strips should be placed

directly over the black/red, window/fuselage color line. Cut each piece oversized and trim to proper length when it's in place. Fuselage hatch and hatch rail are cut from sheet plastic or heavy smooth-surface card, and are then painted and cemented atop the fuselage.

The drag ring is assembled from 1/4" balsa rings cemented together cross-grained. When this is dry, carefully carve to the proper shape and sandpaper smooth. We used Williams plastic engine cylinders for the dummy engine. Make shallow holes in the cowl for a short length of dowel. Cut the 1/8" dowel to size and cement it into the holes. After this has dried, slip the cylinders on the dowels and fit the drag ring in place over the cylinders. If the drag ring doesn't fit, trim the bottom of the cylinders as required. When all is well, cement the dowel to the cowl, and the cylinders to the cowl and dowels. Seal the drag ring on all surfaces and cement it to the cylinders. Cut lengths of 1/16" dowel to simulate engine pushrods and securely cement them to the cowl and the drag ring. These aid in holding the drag ring in place. Use aluminum tubing or hard plastic tubing for the exhaust pipes. Paint the engine flat black and the cowl glossy black.

FLYING. Balance the model at the point shown on the plans. The prototype is balanced perfectly without added weight, but if your model is tail-heavy or nose-heavy, add lead weight to the extreme front or rear of the fuselage to remedy the imbalance.

Flying can be with .010" lines from 40 to 65 feet long; it is suggested, however, that the first flights be made from shorter lines. Although we have successfully flown from grassy sites, paved surfaces are recommended. Happy flying!

I wish to express my sincere thanks to Bruce Reynolds and the San Diego Aero Space Museum; Walter Boyne and the National Air & Space Museum, Smithsonian Institution; Peter Doyle Jr.; and Michael Rosen for their kind assistance in providing historical and technical information and photographs that made this article possible. ■