SKYPHONIC

PLANE ON THE COVER
Swept wing sport flyer performs easily on one or two channel radios. Builds up like a Jr. Falcon. / by Mike Saponara

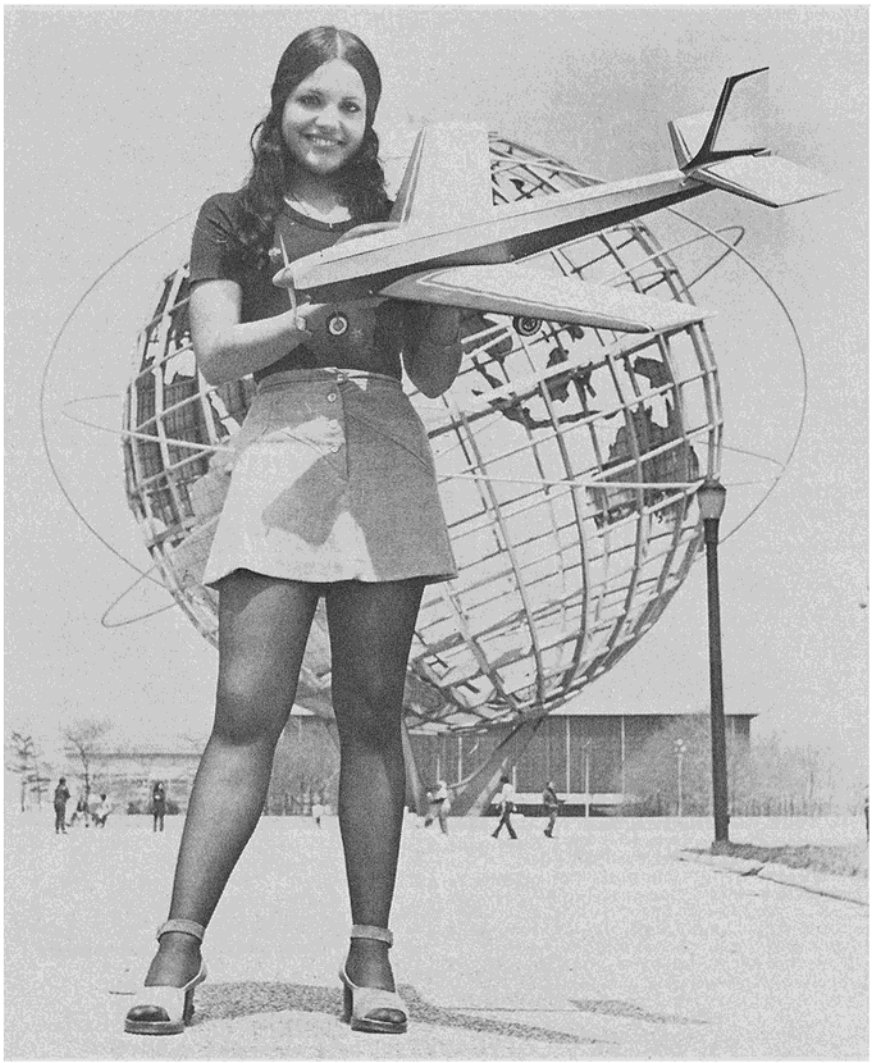
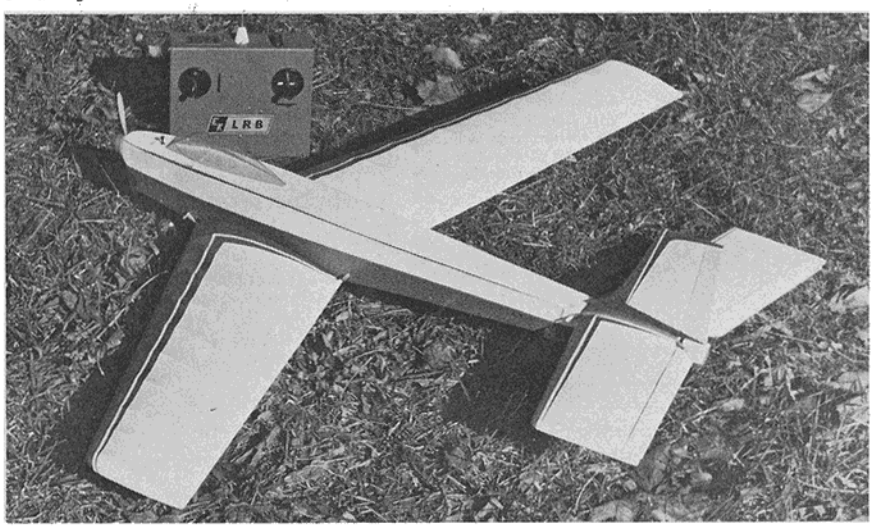


Photo by Julian Delarosa

Sylvia Rivo poses with the model in front of the Unisphere at the site of the New York World's Fair of 1965-1966.

Suitable for single- through three-channel systems, but author prefers two-channel brick-type equipment such as the E.K. LRB set. Canopy and nose gear are available on order from Goldberg Models for 50 cents each.



The Skyphonic is a sport swept-wing model with clean lines. It is very simple to build and, as important, easy to fly. The model is designed around the relatively inexpensive two-channel proportional units but it may be flown using single-channel proportional, the ACE Galloping Ghost, or, for the more experienced, the model will accept three channels with a Cox .09R.C. Medallion. If, on the other hand, your funds are limited, you need not install any RC gear. Fly it free flight using a 15-sec. engine run.

Skyphonic means "sky sound"; there is a double meaning here. The sound of a Cox 049 in the air needs no explanation, but also, this ship is extremely stable and forgiving, truly a sound flyer in the sky. Unlike other swept-winged designs I've read about, this model has no bad tendencies.

Construction techniques used are those used by Carl Goldberg in his .049 RC kits. I used his techniques because they produce a quick building and strong model.

The plane is so stable I would highly recommend it for a beginner, even as a first plane, as long as he has the building experience of one or two planes behind him. The only unusual tool needed is a coping saw for cutting out the hardwood and this can be bought for about one dollar including blades in any hardware store.

Construction

I will assume you are a beginner, but even if you're not, read through as there are some tips you'll find new. First, using a razor blade, not scissors, cut out the ribs, formers, etc. from the plans. Next, buy a stick of rub-n-glue and apply the glue to the back of the ribs.

We'll start with the wing first. Lay the ribs on the balsa sheet and rub the ribs with the other side of the rub-n-glue stick. Now trace the rib pattern with a soft sharp pencil or a fine tip ball point pen. Using the rub-n-glue allows you to trace the rib without holding it in place and it can be easily peeled off from the balsa without ruining the rib pattern. Make two of each rib and be sure to make two 4a & 5a ribs (rib doublers). When you're through using the rib patterns, put them in an envelope for future use. Next, using a single-edge razor blade cut slots for the ribs in the shaped leading edge and trailing edge. Make sure you make one left and right trailing edge.

Lay the wing plan on your building board and lay a piece of waxed paper over the plan, then pin down the trailing edge over the plan making sure the notches line up. Glue ribs 3 and 10 to the trailing edge and pin the ribs to keep them in position on the board. Cut three strips of 1/16 x 1/4 x 1" balsa and lay down next to ribs 3, 6 and 10. Lay the leading edge on top of them and fit

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ribs 3 and 10 to their respective notches on the leading edge and glue. This raises the leading edge but allows ti to rest flat, assuring a true wing.

Begin gluing the remaining ribs with the exception of 1, 4a and 5a. Now cut taper in wing spar and carefully slide the spar through the ribs and glue in place. When dry, turn wing plan upside down and build the right wing panel in a similar manner. Make sure the leading edge, spar and trailing edge lengths are correct where the two panels join, and taper their edges so the required dihedral can be made.

Dihedral is made by laying one panel over four 1/4 sq. in. strips of balsa placed next to ribs 2 and 11 under the leading and trailing edges. Pin down panel so it stays in place 1/4 in. above the building board. Now raise the bottom of the other wing panel tip 4¼" above the board using a book and 6-in. length of 1/4 sq. balsa strip on top of the book to ensure the leading and trailing edges are raised equally. Glue the leading and trailing edges together and pin to hold in place. I recommend a five-minute epoxy here as it will greatly speed building time.

Next, glue straight leading edge piece in place, let dry, cut off pointed tip and sand leading edge round. Now glue ribs 1, 4a and 5a in place. Sheet top and bottom center section with 1/16 med. balsa with the grain running perpendicular to the ribs. Sand sheeting smooth and apply 3/4 in. reinforcing tape along leading and trailing edges that come in contact with the fuselage, and along the top and bottom center section of wing.

Landing Gear Brace: Cut brace from 1/8 in. plywood. Bend landing gear strut from 3/32 dia. music wire. Cut wire with metal cutting blade for the coping saw. Drill holes in brace as shown on plan and with picture wire mount strut to brace. Install j-bolt and apply epoxy liberally around strut in contact with brace to insure the strut is held rigidly in place. After both braces are made, epoxy them to wing.

Fuselage: Cut out formers as shown on plan and fuselage sides and doublers. Glue doublers to fuselage sides—be sure to make one right and one left fuselage side. Mount nose gear to firewall in same manner that wing landing gear strut was mounted. Glue the firewall and F-2 in place to one of the fuselage sides. To do this, turn the fuselage side upside down over top view of plan and line up firewall and F-2 with side.

A word of caution: The formers are not perpendicular to the fuselage but are at an angle with the sides as shown in top view. I would recommend five-minute epoxy here. Be sure to be as accurate as possible.

Next, glue former F3 in place. Now take the other fuselage side and glue it to the firewall and F-2, and let dry. After firewall and F-2 are in place, glue F-3 to other fuselage side. Glue fuselage tail ends together and let dry. Now install formers F-4 to F-7. Add top and bottom sheeting, being sure that grain runs perpendicular to fuselage sides from F-3 to firewall and parallel to the sides from F-3 to F-7. Between F-2 and F-3, the fuselage sides will tend to bulge out slightly, but this is normal. When adding top sheeting, press the sides together to eliminate the bulge; hold until the glue is dry. Again five-minute epoxy would be most helpful here. Finally drill dowel holes and place 1/8 in. dowels in position.

Stabilizer: Lay plan on building board and lay a sheet of waxed paper over it. Pin the trailing edges in place and join them with 1/8 x 1/4 joiner (as shown on plan). Now sand 1/4 sq. leading edge to shape.

Glue ribs S-2 and S-5 to trailing edge and to keep the ribs in position stick a pin through the rib tabs to the board. Pin the left leading edge in place, glue and let dry. Add the right leading edge glue and let dry; then add 1/8 in. leading edge joiner. Glue the remaining ribs in place. Be sure ribs S-1 are in place exactly 1/16 in. apart as this is where the tail is mounted. Slide the 1/4 x 1/8 spar carefully in place and glue.

Now remove the stabilizer from the building board and cut off tabs from ribs S-2 and S-5, then add top and bottom 1/16 balsa center sheeting. When dry, cut center slot for tail on top of stabilizer only. If you are going to fly two or three channel with elevator control, cut trailing edge on dotted line and hinge as shown on the plan. A word of caution: Do not join the elevators together at the center as they must work independently of each other, being driven by a separate pushrod as shown on the plan. Also be sure the control horns are mounted in the same position on the right and left elevators to ensure that their up and down throw is equal.

Cut out the tail and rudder from 1/16 med. balsa and hinge the rudder to tail as shown on the plans.

Painting: Doping of the framework is done by using full-strength clear dope. Give fuselage, wing, stabilizer and tail two coats, sanding between coats with extra-fine sandpaper or No. 400 wet or dry sandpaper. This will seal the pores completely; more coats will only add unnecessary weight.

Now paper the wing and stabilizer. The best method is to cut the Silkspan to size and when papering bottom of wing be sure to cut a small hole where the wing landing gear strut is located. Wet the paper and cover the bottom of the wing panel first, then lay out over the wing eliminating all the wrinkles. Now thin some of the dope down adding 50% thinner to 50% dope. Brush dope on liberally over the Silkspan along the leading and trailing edges, wing tip and center sheeting. Using your finger, rub the dope in to ensure that the Silkspan will adhere to the framework. Trim off paper around the edges with a sharp razor blade. Now paper the top of the wing in a similar manner.

Cover the stabilizer in the same way, but use one piece of Silkspan to cover the top and bottom panels. When the Silkspan is dry, dope it using full-strength dope; give two coats, sanding lightly between coats with No. 400-500 wet or dry sandpaper. Using the thinned-down dope, apply three coats and sand lightly between coats. The fuselage and tail may be covered with Silkspan to cover the wood grain. The paper is applied wet and doped on in the same manner as it is applied to the wing.

Color Doping: I spray my planes with colored dope using the convenient spray cans available in many colors. The Skyphonic is white; one coat is sufficient when spraying. If you wish to brush on the dope, thin down and apply four coats. You shouldn't need more than one 4 oz. bottle or a 16 oz. can of spray colored dope and a can of 8 oz. clear to cover the plane. I use Aero Gloss dope and it is excellent, but I found that if you use their spray dope you must let it dry for at least one week before applying trim or the dope will wrinkle or curdle.

Trim: Color of the leading edges and pin striping on fuselage is Bonanza Blue. The second trim color is Stearman Red. Lay masking tape down and seal the edge of the tape with clear dope to avoid the color dope from seeping underneath the edge, then paint on desired trim color.

One note concerning the canopy. It is to be glued to the hatch cover only. The back of the canopy is to slip underneath a piece of scrap acetate which is glued to the fuselage.

Flying

If flying single-channel, the stabilizer must be raised 1/16 in. under the trailing edge (this gives up elevator). This must be done as the glide will be too fast. The stabilizer as shown on the plans is for the two-channel flyer using elevator control. Depending on the weight of the model slightly more shim under the elevator might be needed. Don't raise up more than 1/8 in. as stalling flight will result. The rudder must be offset to the right by 1/16 in. (looking down on the tail) to overcome left engine torque.

Check the center of gravity by placing the finger just past rib 6 as shown on the plans. The rearward center of gravity position isn't critical, but the plane will not fly satisfactorily forward of the CG position shown. I recommend the Cox Golden Bee or Babe Bee or, if flying three channels, a Cox 09. Do not use the Cox blue can fuel as it is *not* strong enough for the engine to develop the power it needs. Use either Cox racing fuel (silver trophy on can) or Fox Missle Mist. I have seen many beginners lack success due to their engine's not running at its peak. Take my advice and use these fuels. Also do not use an old engine that runs in and out of peak, as this will mean disaster. A model going too slow is much more difficult to control than one going slightly fast.

Make sure you fly on a calm day. With engine running and radio checked out, hold model shoulder height just behind the wing trailing edge, run into the wind and, when you feel the model lifting, release, and the model will immediately start a moderate climb. It will probably turn slightly to the left, so give a small amount of right trim. The model will fly straight as an arrow once you find the correct trim position. Once in flight, you can do simple stunts. When doing loops and spiral diving, elevator control might be needed if the model is on the heavy side. Other stunts are pos-

sible depending on pilot skill. Recovery from a stunt is always quick and positive with no tendency to fall off. The model with an 09 is a sparkling performer for the more advanced modeler.

When the engine stops, if flying with elevator control, give a little bit of up and the plane will slow down to a nice gentle glide. A 40-second glide is usually the case from 400 ft. up, even in still air. If flying single-channel, the extra up you made by shimming the stabilizer should give you a similar glide. If the glide is fast, even though the powered flight is alright, shim up the stabilizer more (up to 1/8 in maximum).

I would like to hear any comments on the design you might have. Would you like to see the plane kitted and in what category? Also, if your letter has questions on the Skyphonic I guarantee you an answer. Write your questions or comments to: Michael Saponara, 31-21 29th St., Long Island City, New York 11106.

And remember that good building, and a good RC installation with a good engine, means good flying.