



THIS AIRPLANE certainly doesn't require a detailed introduction. It has been written about in all the aviation publications and modeled in almost as many sizes as there are engines to suit them. I first saw the SU-26 in a small three-view that appeared in the January '85 issue of *Air International*. Thinking that it might become a very popular aerobatic model, I started to develop a set of plans for a version with an 82-inch-wingspan. But I never got past the roughing out stage, and I never built the plane. I should have followed my instinct and completed the plans because the model *did* become very popular. The December '87 issue of *Model Aviation* had an excellent article about it.

Micro Air Show

SUKHOI SU-26 Mini

by NICK ZIROLI SR.



Nick Ziroti Sr. and his mini Sukhoi. Though it's small, it has big performance!

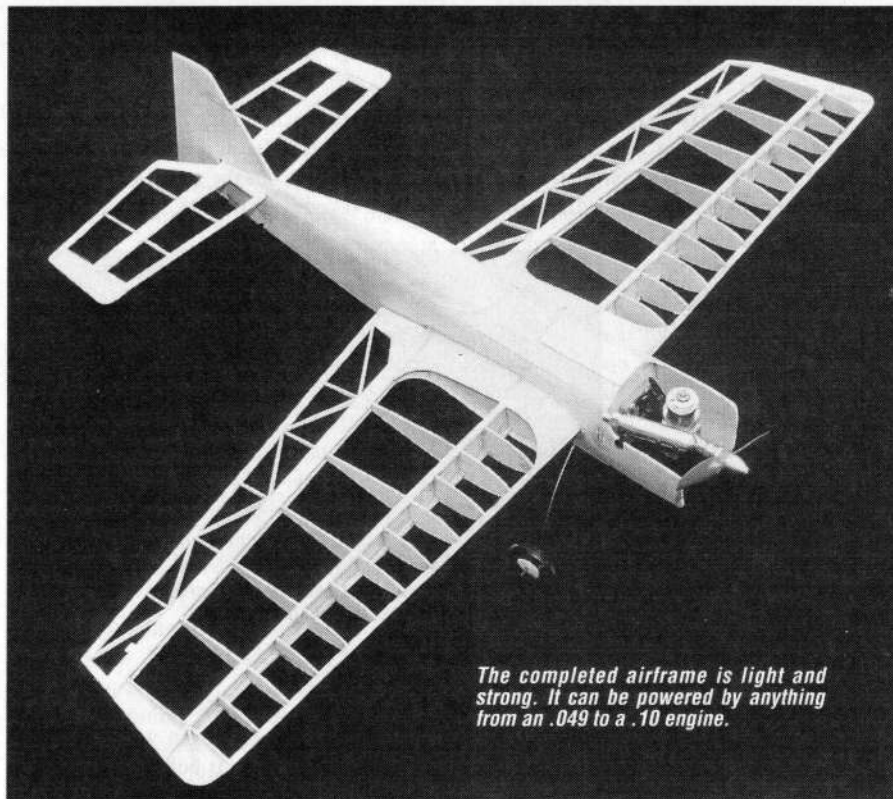
Scale documentation catalogues offer three-views and photos of other versions of the SU-26. Bob Banka's Scale Model Research* catalogue has more than a dozen listings for the SU-26. Alain Proteau, proprietor of Repla-Tech International,* has just released a new catalogue that contains a wealth of information. There are hundreds of side-view drawings of all types of aircraft—well-known and obscure—and six three-views of the SU-26. I highly recommend both catalogues as excellent documentation sources for your next serious scale project.

1/2A POWER

I don't consider this version of the SU-26 a serious scale project. Its design is based on its engine: the Cox* .074 Queen Bee. There's no mistaking this for anything other than a Cox engine, but there *are* some differences between it and other Cox engines. It has a very attractive, effective expansion-chamber muffler. Like most Cox engines, it has a rear reed-valve intake system, and a simple but effective barrel-type carburetor has been fitted to it. The usual glow head has been replaced with a standard short-reach glow plug. No special clips are required to start the engine. It's mounted on side lug mounts, and a drilled plastic mount is also available.

JUST DUCKY

The SU-26 requires a mini airborne radio system, and the Hitec* Focus 4 FM easily meets this requirement. The Micro 535 receiver and four HS80 servos are among the smallest available. This transmitter doesn't have dual-rate switches; in their place are front-panel adjustment controls to set the servo throws. This way, while I'm flying, I can have someone adjust control sensitivity until I'm comfortable with it. When you're satisfied with the setup, the linkages can be readjusted and the servo travel can be dialed back up to take advantage of the full servo travel. This should be done if any of the control-surface movements have been cut way down. I rarely change rates after the first few trim flights, so this works well for me, and there are fewer switches to deal with. Although I use a 4-channel setup, there's no reason why two channels—



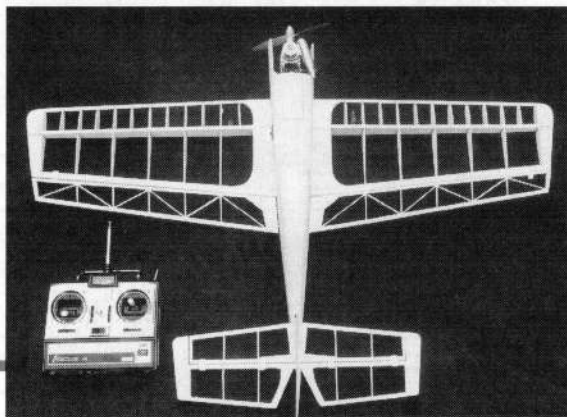
The completed airframe is light and strong. It can be powered by anything from an .049 to a .10 engine.

aileron and elevator—couldn't do the job. The model would be a couple of ounces lighter, and I think that it would perform well with a Cox TD .049 or an .051.

One item that I wasn't sure I'd like is the new "Rub'r Duck" antenna. It takes a few flights to get used to the feeling that there's something missing or that you've forgotten to extend the antenna. Flying the small Sukhoi fairly close in most of the time never presented any range problems, but what would happen at a crowded fly-in or contest?

I found out when I put this receiver in my Giant Taube and with the Rub'r Duck-equipped transmitter, flew at the Old Rhinebeck Jamboree at Rhinebeck, NY. This two-day contest has six flight lines in three groups of two. Most

of the time, there are six planes in the air. I was flying from one of the center flight lines, and I had to fly close to two other flight lines at opposite ends of the field. Even in this very busy environment, I didn't experience any glitches or control problems. I thought that this was a valid test; it proved to me that this antenna does work as advertised.



Shown here with a Hitec radio, the model has full-house controls. It can be flown satisfactorily with ailerons and elevator only.

Materials

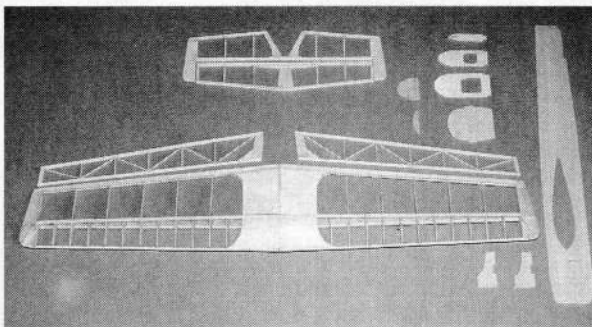
- One sheet of 1/16x3x36-inch hard balsa (wing).
- Three sheets of 1/16x3x36-inch medium balsa (fuselage top and bottom).
- Two sheets of 3/32x3x36-inch medium balsa (fuselage sides and formers).
- One sheet of 1/8x3x36-inch medium balsa (cut up for strips, formers and tips).
- 3/16x3x12-inch piece of medium balsa (ailerons and nose).
- Three 3/16-inch-square pieces of medium balsa (leading edge and fuselage stringers).
- 1/8x6x6-inch piece of plywood (firewall, servo mounts and elevator joiner).
- One piece of 1/32-inch-diameter wire (pushrods).
- One piece of .078- or .093-inch-diameter wire (landing gear).
- As required: hardware, horns, links, wheels, etc.

CONSTRUCTION

The Sukhoi SU-26 was designed to be a small, relatively simple, aerobatic plane with eye appeal, and it isn't difficult to build. Covering the top of the fuselage is the most difficult task, and that's easier than it looks. For maximum maneuverability, I made all the control surfaces extra-large. Its lightness and large surfaces make the model fly smoothly and perform aerobatics well. The prototype weighed 20 ounces; this was achieved with carefully chosen off-the-shelf balsa.

With the .074 Queen Bee, performance is good. A larger, light .09 or .10 would be outstanding. For those inclined, I think that the Sukhoi would make a very good, small, control-line, stunt model. The moments are almost ideal for this. A bellcrank would

have to be linked to the flaps, and elevator would have to be added, but everything else would remain the same. If you're into it, you'll know what to do. Just a thought.



The wing has to be built first because the fuselage is built over it. There's a minimum of parts in the fuselage.

WING

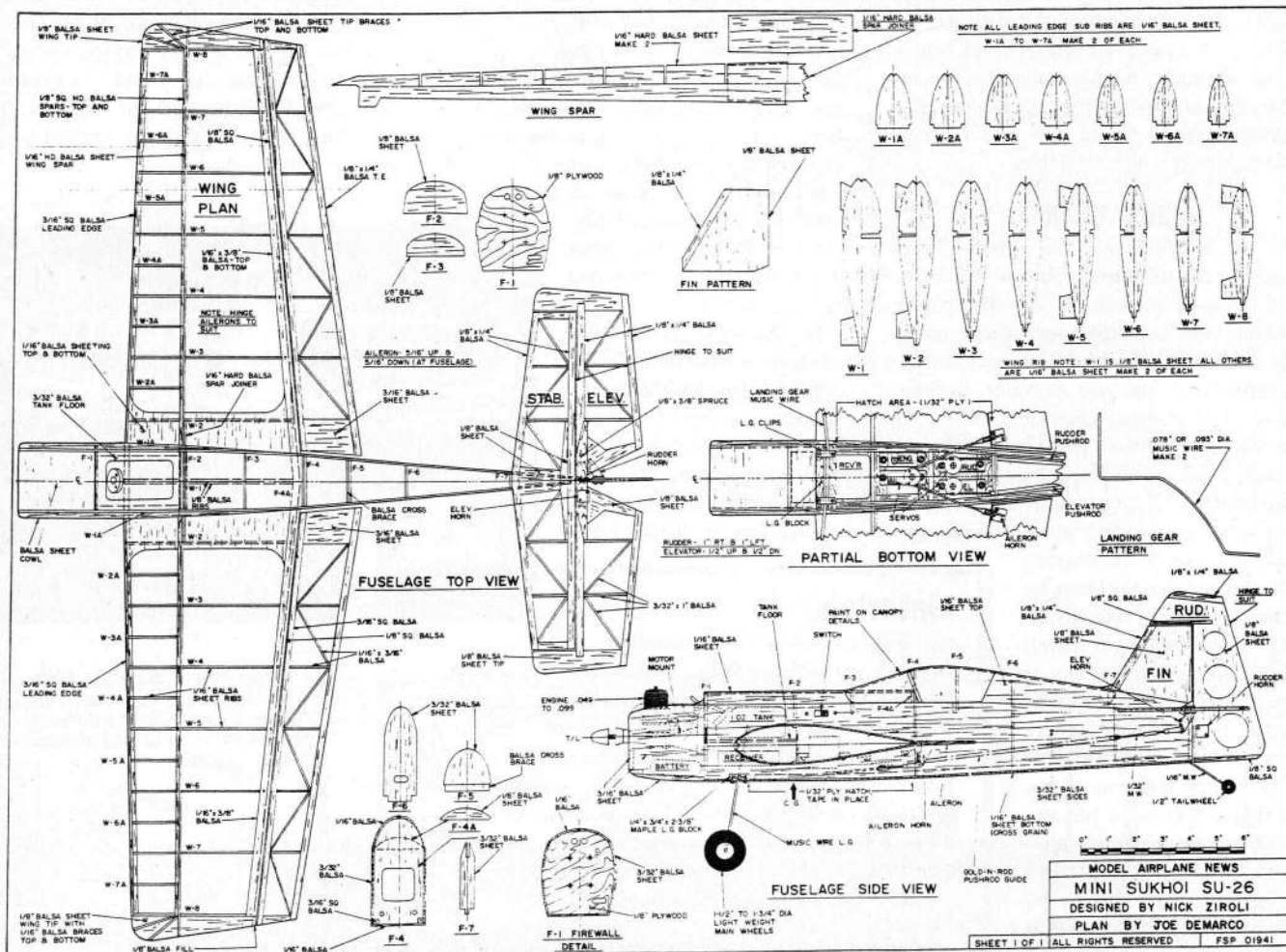
Construction must begin with the wing because the fuselage is built around it. Join the spar halves against a straightedge so that the tip and the center legs are in line.

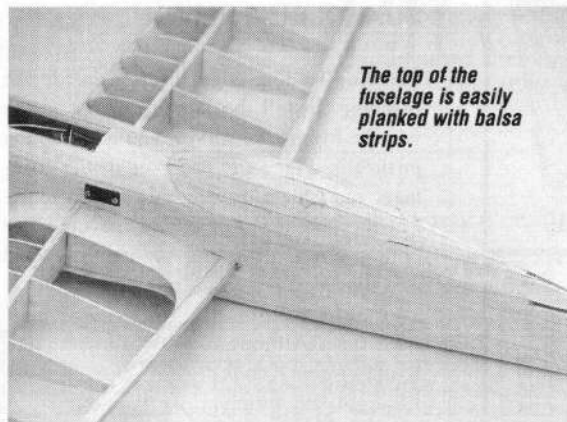
Use hard, 1/16-inch balsa for the joiner. The joiner side is the trailing-edge side of the spar. Working over the plan, attach ribs W-1 and W-8 to the spar. To produce an accurate wing, you must build it on a flat surface. Fit the ribs in place on the spar, but don't glue anything yet.

When I build wings of this type, I prefer to pre-assemble the trailing edges first. If they're made straight, it will almost guarantee a true wing. Using scrap balsa, make eight assembly jigs of the same shape as the aft end of rib W-4; these will act as temporary fixtures—four on each side—to hold the top and bottom open at the correct angle. Pin the wing to a flat surface to dry.

When the finished trailing edges are put into place on the ribs, the leading-edge notches should line up. Glue the ribs to the spar and the trailing edge. Add the $\frac{3}{16}$ -inch-square leading edge and the $\frac{1}{8}$ -inch-square top and bottom spars. Fit and glue all the false ribs (W-1A to W-7A) into place. Sheet-cover the center section with $\frac{1}{16}$ -inch-thick balsa, as shown on the plan.

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The top of the fuselage is easily planked with balsa strips.

like the ones used on the Jim Walker "Firebaby" 1/2A control-line models, which we enjoyed flying more than 40 years ago. It isn't a pressure tank or a pen-bladder tank—just a balloon that, in its deflated state, has enough volume for the required amount of fuel.

Insert a piece of rigid plastic tubing—such as Ace's* EZ Flex Tubing—into a 9-inch-

diameter deflated balloon, and cut off the excess just outside the neck. Slide 1/2A fuel line over this tube so that it passes through the neck, and tie the neck closed using heavy thread or string. There should be no vents. Fill the tank through the feed line using a squeeze bulb, but before you attach the bulb, squeeze it a little so that when it's released, it will collapse the balloon tank and remove all the air. Hold the plane and the bulb nose-down, and back-fill the tank. I've found that, with this tank, the engine runs well whether the tank is full or down to the last drop.

FINAL ASSEMBLY

Build the tail surfaces and the ailerons over the plan. The tail is made of 1/8-inch-thick balsa. The ailerons are 3/16 inch thick with a 1/8 x 1/4-inch trailing edge. Build the ailerons flat on your building board, and using a sanding block, taper them from 3/16

inch at the leading edge to 1/8 inch at the trailing edge. Cut the fin and the rudder out of 1/8-inch-thick balsa. Sand a radius on the appropriate edges of the ailerons and tail surfaces.

I prefer to cut the hinge slots before I cover the surfaces—especially if transparent covering is to be used—because balsa slivers always seem to end up inside the covering. I also think that it's best to cover or finish stabilizers—and, in many cases, fins—before you install them. In this case, both should be covered with an iron-on film before they're installed.

Carefully install the stabilizer and the fin so that they're square with the fuselage from the top and aligned with the wing from the front. Cover the aft end of the fuselage with 1/16 x 1/2-inch strips of balsa. Dampen them, if necessary, and then bend them over the top of the canopy. Sand the fuselage in preparation for covering. Bend the landing gear to shape, and trial-fit it to the fuselage. Don't install it permanently until after your model has been covered. I always brush on a coat of Coverite's* Balsarite before I apply any iron-on material. Cover the plane and the control surfaces with whichever iron-on film you prefer. There are many good films to choose from, and they come in a variety of colors. After you've covered your model, hinge all the control surfaces with sheet-plastic hinges, such as those offered by Sig* or Ace.

To make room for the receiver, cut away

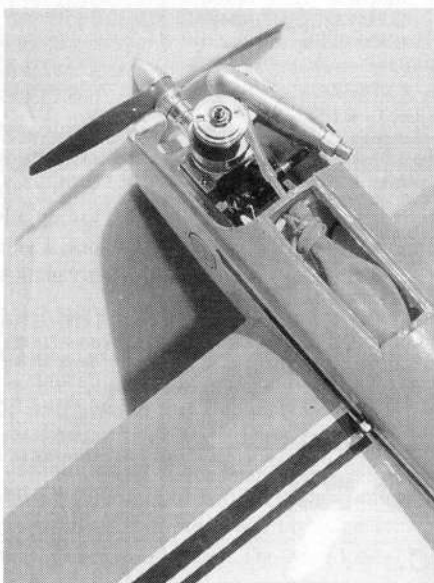
Add the wingtips, the leading-edge braces and the trailing-edge filler blocks. Using a long sanding block and 180- or 220-grit sandpaper, sand the wing so that the ribs and the joints are smooth and even. Sand the trailing edge flat where former F-4 fits against it.

Cut out the fuselage sides, and glue the 3/16-inch-square balsa along the bottom edge. Cut out the wing opening a little under-size, and join the sides and the wing, but don't glue them yet. With the sides on the wing, glue the firewall into place, and use masking tape to hold it until the glue has dried.

The firewall should have very little right thrust—no more than 1 degree. Add F-4, and glue the tail together. Be sure that the fuselage is square with the wing. Glue in the remaining formers, and glue the fuselage to the wing. Cut away enough of the top leading-edge sheeting between the fuselage sides, and add the fuel-tank floor. Do the same on the bottom for the servos, and install the servo mounts. Add the landing-gear-mount block. Temporarily fasten the engine mount to the firewall with no. 4-40 screws and blind nuts. Put in the pushrod guides and the inner "Gold-N-Rod" tubes. They cross over inside the fuselage. Glue the bottom into place.

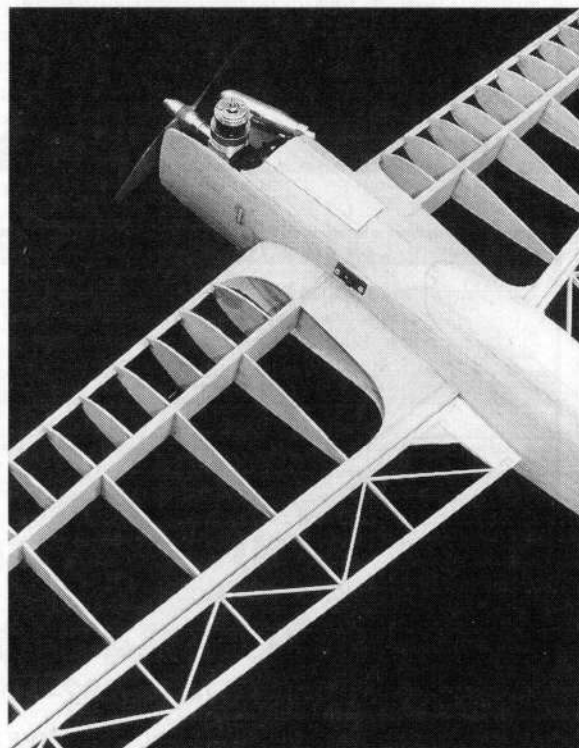
TRICKY FUEL TANK

Install the fuel tank and the radio switch in the side of the fuselage. Cover the nose from the firewall back to F-4 with 1/16-inch balsa. You can make a hatch for access to the fuel tank, if desired. I don't use a conventional fuel tank in my model; instead, I use a simple balloon tank



Above: with the hatch removed, you can see my balloon-type fuel system. It provides consistent engine runs.

Right: though the wing has a lot of open area, it's quite strong when covered.





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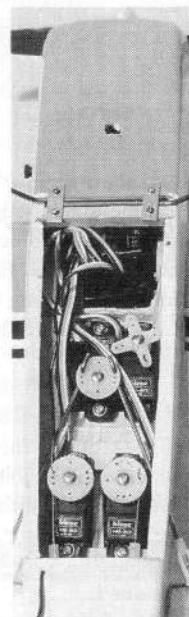
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SUKHOI SU-26 MINI

the wing leading-edge sheeting inside the fuselage. Install the landing gear and the wheels. Mount the servos, and hook up the pushrods. Place the receiver in the fuselage, and isolate it using thin foam rubber. Let the antenna trail out of the tail. The bottom cover is made of 1/32-inch plywood or a thin plastic sheet and held in place with tape. Although it may seem crude, it's light and simple, and it doesn't have to be removed often. For the flight-pack battery, wrap a 250 to 270mAh pack in wide plastic packing tape to seal it against fuel, and epoxy it to the bottom of the cowl. Again, it's crude but functional. To complete the model, mount the engine and the fuel tank.



A hatch in the fuselage's belly allows radio access. Notice that the aileron pushrods exit the fuselage at the sides.

Make sure that the balance point is where it's shown on the plan. The prototype didn't require any additional weight. Start with the control-surface travel that's called for, and adjust it to suit after flying. Takeoffs from the ground aren't a problem—even from grass, if it isn't too long. All our flying has been ROG. The Sukhoi is a highly maneuverable model, and with the Queen Bee, it can be flown from an extremely small area. With a larger, more powerful engine, it will use up a lot more sky. I hope you like this one. I've enjoyed the change of pace from my giant-scale models.

**Here are the addresses of the companies mentioned in this article:*

Scale Model Research, 3114 Yukon Ave., Costa Mesa, CA 92626.

Repla-Tech Intl., P.O. Box 461000, Cole Branch, Los Angeles, CA 90046-1000.

Cox Hobbies, 350 W. Rincon St., Corona, CA 91720.

Hitec/RCD, 10729 Wheatlands Ave., Ste. C, Santee, CA 92071.

Ace R/C Inc., 116 W. 19th St., Box 511C, Higginsville, MO 64037.

Coverite, 420 Babylon Rd., Horsham, PA 19044.

Sig Mfg. Co., 401 S. Front St., Montezuma, IA 50171. ■

