

An RC Combat model built by Leningrad model aviation club members. Derived from a design by famous Combat flier and former FAI World Champion Doroshenko, the plane is as easily flown by beginners as by more experienced fliers, and it need not be limited to Combat.

**It isn't easy to keep your eyes on two models at once as you zero in on the kill, but that just heightens the thrill for RC Combat fliers both here and in the former Soviet Union.**

■ **Svetlana Filippova**

THE PLANES streak straight up, then descend in a spin, silver wings glimmering as they zoom through a series of breathtaking maneuvers. They're stable and aerobatic at the same time.

These are models, of course, not full-scale airplanes, and some of the credit for how capably they fly goes to the skill of the RC pilots guiding them. Even the uninitiated can see that these planes represent military aircraft. That is, except for the streamers floating behind them.

Yes, RC Combat is being flown in my country too. In the former Soviet Union as in the U.S., people are always searching for new forms of self-expression, new sensations. The process of inventing new types of sport, or variations on an existing sport, is a never-ending one.

Our first RC Combat meet took place in Leningrad during the summer of 1991. People were invited from other cities. While these out-of-towners probably looked upon the event mainly as a show, modelers in Leningrad saw it as the first test in an exciting new adventure.

Who knows whether RC Combat will take hold in my country or eventually be forgotten? The development of any RC event in the former Soviet Union is hindered by the problems with our indigenous radio systems. But for now, you guys in the U.S. are not alone. Maybe knowing a little bit about our experiences and building techniques will help motivate you to continue. Even if you're just starting out in RC flying and definitely not ready for Combat, you may find it useful to read

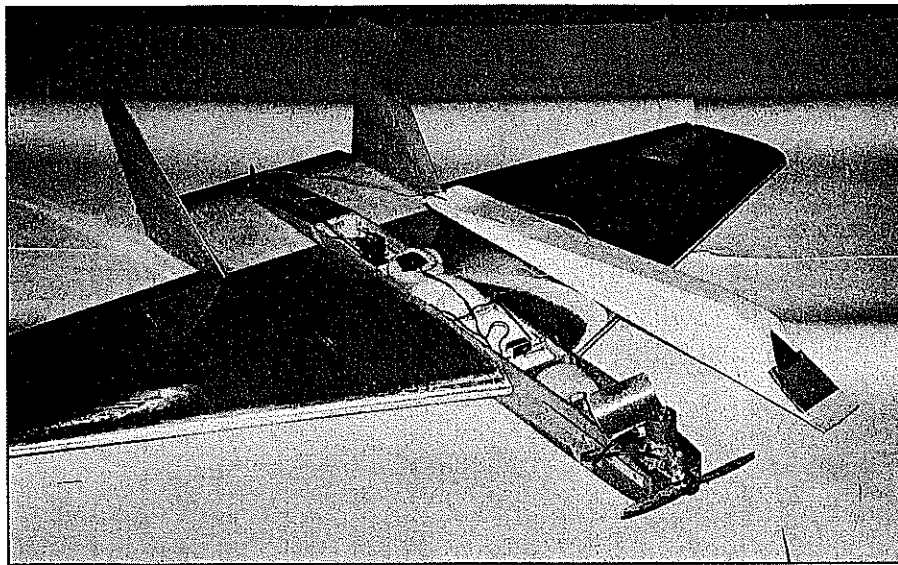
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## SVETLANA'S

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# RC COMBAT PLANE

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One of A. Dranenkov's versions of the Doroshenko design has foam plastic/balsa/ fiberglass wing leading edges and an aluminum alloy plate between engine and fuel tank.



(L to R): Ponevin, Dranenkov, and Panov, professional modelers with the Leningrad club, show their RC Combat designs.



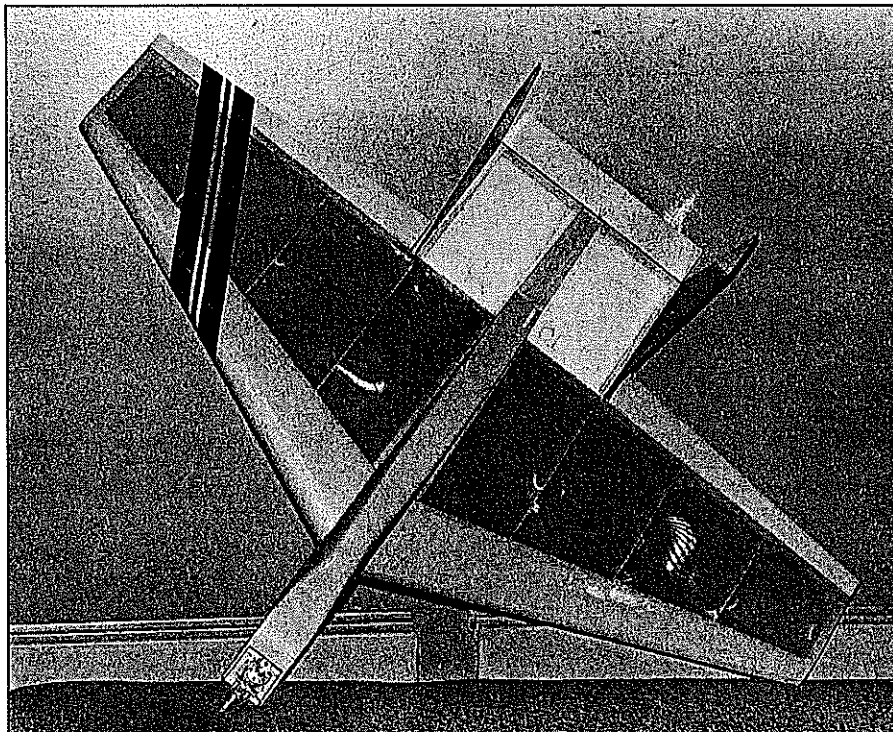
Anatoliy Ponevin holds one of his renditions of this outstanding Combat design. Ponevin has been flying models since 1976.

about the model featured in this article. It's very easy to build and fun to fly.

Now a few words about the three professional modelers who founded RC Combat in my country. Valeriy Panov, Anatoliy Ponevin, and Anton Dranenkov work at the Leningrad model aviation sport club. All three are really nice gentlemen and experienced modelers, with a special concentration in RC. Valeriy has been flying RC models for 25 years; that's a pretty long time. Anatoliy flew FAI Combat for a number of years.

Wanting to learn more about how RC Combat is structured, I asked them some questions. Anatoliy outlined the following rules for the event:

- 3.5cc maximum engine size
- Four minutes' duration
- Each crew (pilot and mechanic) may use only one model for each flight. The



Close-up of a Doroshenko design variant built by Anton Dranenkov. The outward deflection of the fins is achieved by shaping the balsa side beams prior to installation.

mechanic runs the engine and hand releases the model just as in CL Combat events.

- The flight box is 75 by 100 yards. Judges subtract points when a model flies outside the box.
- Streamer length was determined experimentally.
- As in FAI Combat, points are determined according to time spent in the air and number of cuts. Four official judges are used.
- An engine shutoff system is required. All types of fuel and tuned pipes are allowed.

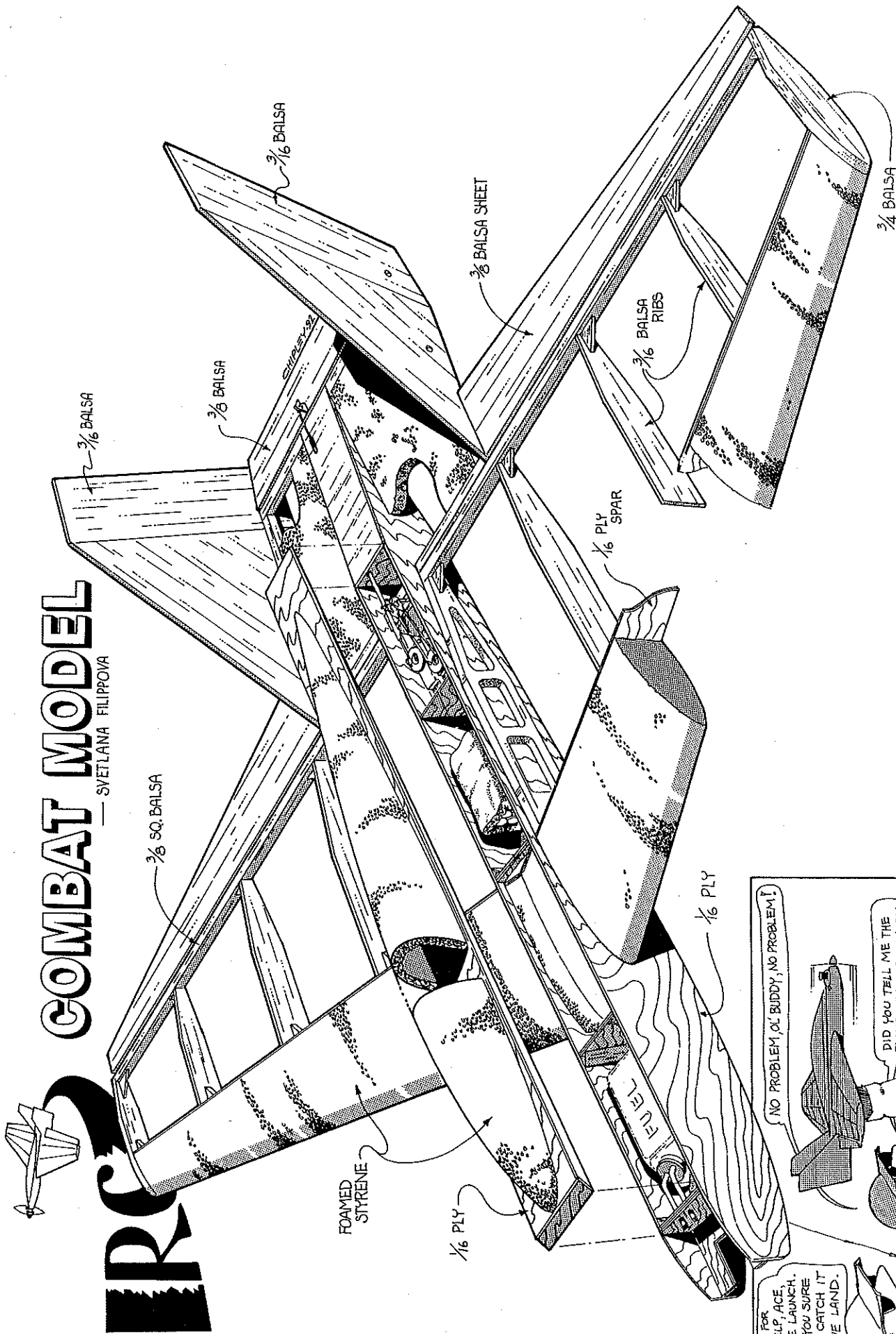
Two other Leningrad modelers who are actively involved in RC Combat are Sergey Amelin and Konstantin Karpov.

Both fly their own designs. The two groups of enthusiasts use contrasting methods to achieve the same aims. Amelin's and Karpov's models are radically different from those flown by Leningrad model aviation club members.

Club members fly models based on a design by famous Combat flier and former World Champion Doroshenko, of Sverdslovsk. Doroshenko built the prototype for air shows and found its characteristics perfect. Panov, Poneven, and Dranenkov have each built three individualized interpretations of Doroshenko's basic design. Victor Dubov of Leningrad designed the 2.5cc engines. The models have a flying weight of 2.8 lb.

# RC COMBAT MODEL

— SVETLANA FILIPPOVA



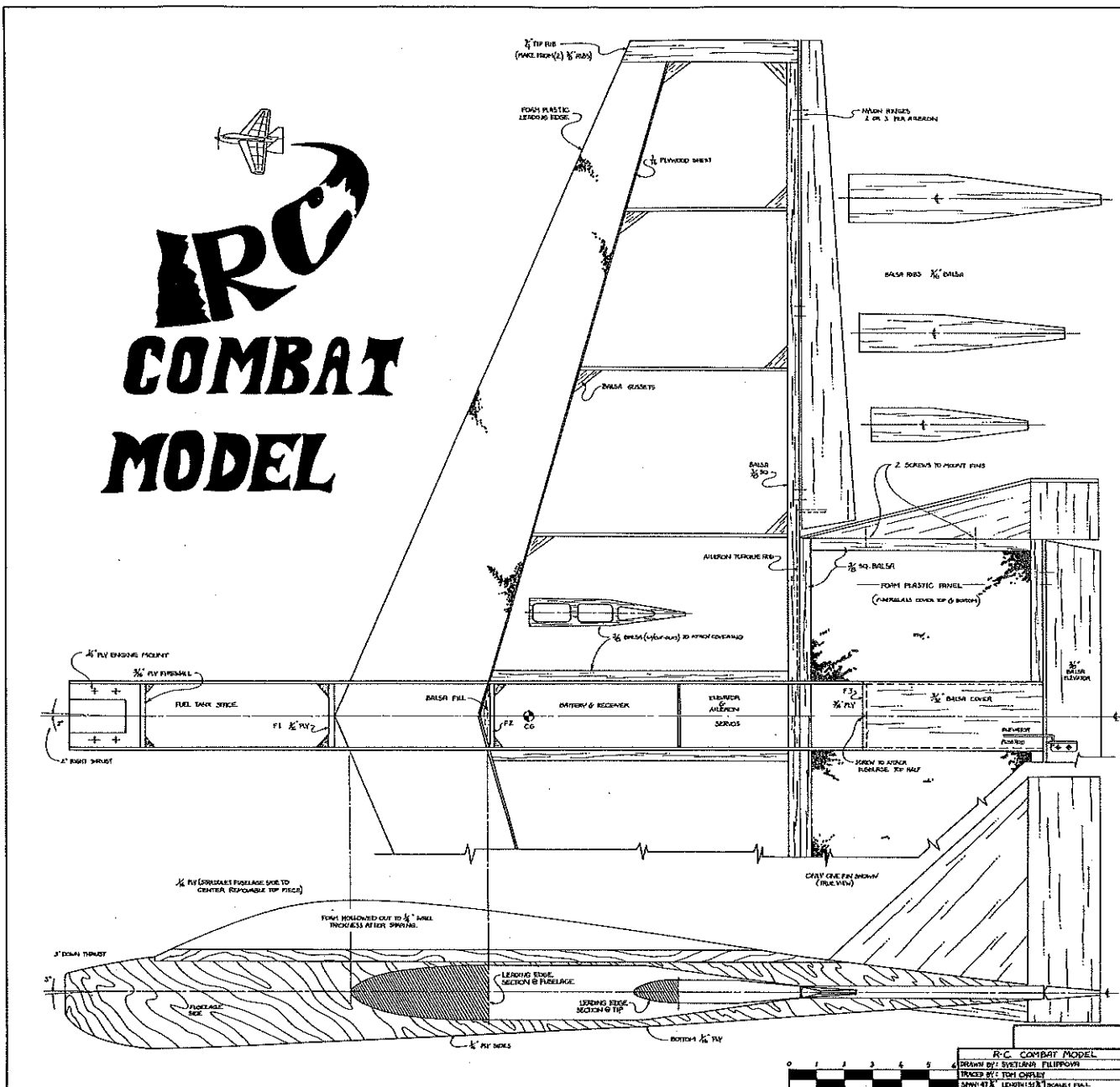
NO PROBLEM, OL' BUDDY, NO PROBLEM!

DID YOU TELL ME THE PLANS WERE DRAWN ON THE BACK OF AN OLD MAP OF THE U.S.S.R.?

THANKS FOR YOUR HELP, ACE, WITH THE LAUNCH. ... ARE YOU SURE YOU CAN CATCH IT WHEN WE LAND.



# RC COMBAT MODEL



## Svetlana's RC Combat Plane

**Type:** Combat

**Wingspan:** 47 1/2 inches

**Recommended engine size and type:** 3.5 cc (.21 cu. in.)

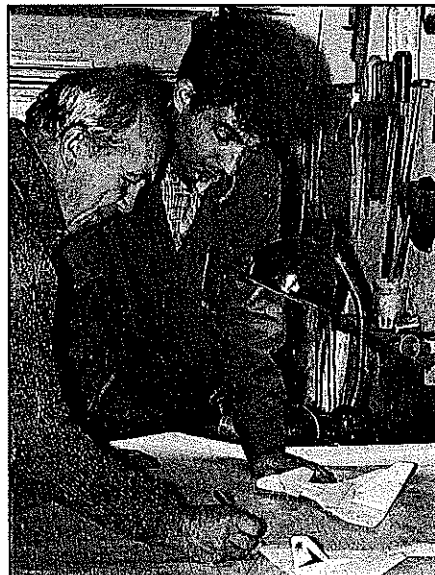
**Number of RC channels recommended:** three

**Expected flying weight:** Not available

**Type of construction:** foam/ply/balsa/fiberglass

**Type of covering/finish recommended:** film/paint

**Construction.** As a look at the plan and photos will show, this is a simple model.



Those of you who are familiar with Dan Rutherford's article "Beliaev's Winner" in the January 1991 *Model Aviation* will have no difficulty recognizing the shared design elements typical of Combat aircraft in our country.

Since construction is basically straightforward, I'll keep detailed instructions to a minimum.

**Wing.** The structure combines balsa ribs and trailing edge with a foam plastic leading edge. The ailerons are cut out of balsa. Two or three nylon hinges will be sufficient. The ribs are cut out of balsa sheet; dimensions are shown on the plan.

Cut the leading edge, using a hot wire if desired, then glue the plywood web to the inside surface. The leading edge assembly is wrapped in drafting paper secured with thinned (50/50) aliphatic

V. Sokolov (L) and K. Karpov designing an original RC Combat model, which was built later by Karpov and Sergej Amelin.



Amelin with his RC Combat ship. Like Karpov, Amelin broke from the design conventions used in the Doroshenko model.

resin. We did not use the CL Combat technique of reinforcing the structure with Kevlar thread.

The left and right leading edges are simply glued together. As a Stunt flier who's accustomed to taking into consideration the great stresses on the wing during maneuvers, I thought the joint would be too weak. For Combat flying, however, it's as sturdy as it needs to be.

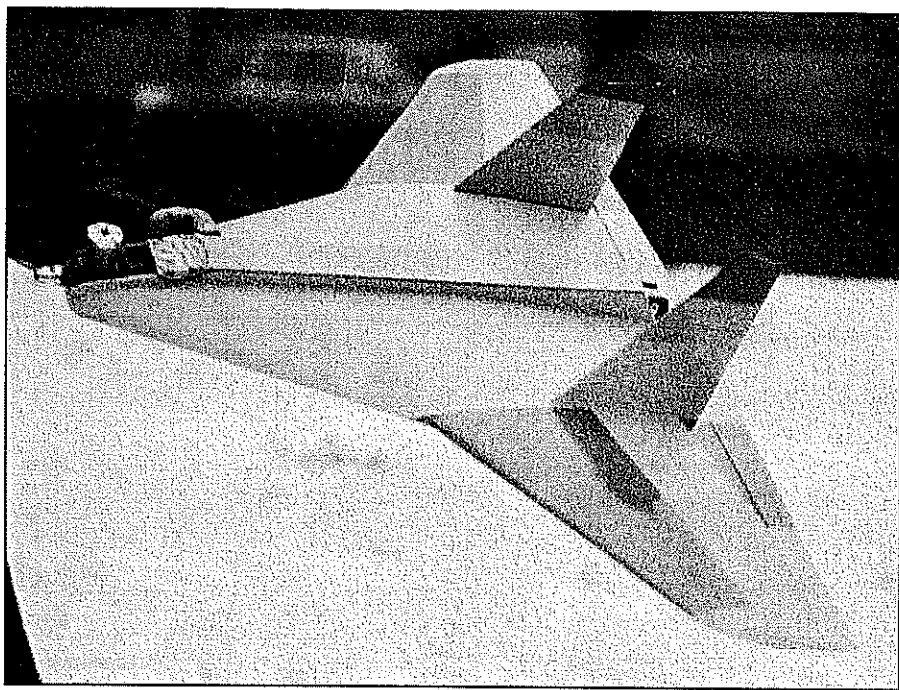
Using lightening holes reduces the weight of the thick balsa ribs enough that you can cover them. We use Laysan in our country; in the U.S., an appropriate substitute would be Mylar adhered with 3M 77 spray.

The unusual part of this wing construction is the foam plastic leading edge. The simple, flat foam plastic sheet is framed with balsa beams and covered on both sides with fiberglass sheet. The trailing edge is glued to one of the sides, with the balsa elevator attached to the opposite side. The two balsa fins are secured with two screws each to the two remaining sides. Easy enough?

**Tail surfaces.** As a secondary element of the construction, the fins need not be extremely rigid and hence can be made of balsa. Still, I recommend gluing together several balsa sheets with the grain running in different directions as shown on the plan. Shape the balsa side beams so that the fins will slope outward after they have been attached.

**Fuselage.** Because of the extensive use of plywood, this structure is extremely strong. Except for the top, about which I'll say more below, the fuselage is a conventional plywood box.

The configuration of the sides determines the fuselage shape, and the bottom is bent accordingly. Think of the configuration shown on the plan simply as a starting point. A single shape won't satisfy every taste, so a little creative license is in order.



Close-up of Amelin's RC Combat design. Amelin has since modified his craft to close the performance gap with the Doroshenko-style models.

Bend the bottom to suit the fuselage configuration, then glue the sides and bottom to the plywood formers.

The fuel tank is positioned between the firewall and former F1. Be sure to drill a hole (not shown on the plan) in the fuselage side for the fuel line from the tank to the engine.

Formers F1 and F2 reinforce the wing. The leading edge abuts F1, and there is balsa filler between the wing and F2.

Make cuts in the fuselage for the wing and tail surfaces before gluing these parts in

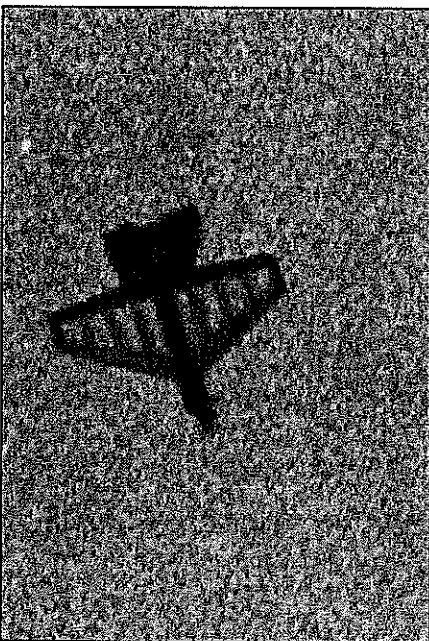
place. The batteries and servos are located between F2 and F3, with a plywood piece glued between the trailing edge and the fuselage sides. The servo layout is up to you. Don't forget to cradle the fuel tank and batteries with foam rubber to prevent vibration.

The 0.25-in.-thick foam-plastic top part is hollow but has small formers. It may be cut in any shape desired. The top rests on the fuselage by means of two plywood pieces, with one glued to each of its lateral edges. These pieces are cut 0.2 in. deeper than the edges they abut to assure that the top does not move. Two screws hold the top to the firewall and F3.

Make cuts in the top for the aileron and elevator pushrods. The placement of these cuts will be determined by your particular servo layout.

Cover the top with fiberglass and epoxy to protect it against the harmful effects of paint and fuel.

Finally, install the sheet balsa top part extension. Make certain to offset the engine thrust line as shown on the plan.



An RC Combat model built by Leningrad fliers rivets onlookers as it darts and swoops through a spate of maneuvers.

**This highly maneuverable aircraft** has succeeded so much better in RC Combat than Sergey Amelin's and Konstantin Karpov's models that Amelin decided to improve his own design.

To me, RC Combat still seems—well, impossible. Having had some experience in CL Combat, I can imagine how hard it would be to cut your opponent's streamer while flying your model RC. Even in CL Combat, where you can control your plane simply by feel while keeping your eyes on

*Continued on page 70*

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## Up and Around/Aldrich

Continued from page 60

Open Stunt day proved not unlike many others in subsequent years. One circle was considerably higher in scoring than the other. In those days, the best single flight won, so you'd better not blow it on the high circle. All the hard work paid off, however, as we scored highest on both circles. I say "we" in truth, for a young senior contestant named Frank McMillan came out to practice each day with me. We critiqued each other all week, and he helped a lot in my shaping of the new hourglass maneuver.

Gerald Wagner, placing a close second, scored 610 points to my 618. Gerry flew a modified Chief called Black Midnight, with a Torp .35 up front. I haven't heard of Gerry in years, but if someone knows where he is, tell him to come back and fly Nostalgia with us; we miss him. Rolland McDonald was a solid third with his big Strathmore.

Frank went on to place just behind Senior winner Art Pawloski. Art flew his own Detroit-influenced Atom design, while Frank had his original Gambler, later to be published in *Model Airplane News*. Bob Winks topped all in the Junior event flying a modified Palmer Thunderbird.

We arrived at the Stunt circles Saturday morning to misting rain. As I remember, Art Pawloski was first up, and the rain increased during that first flight. About the only thing I recall, other than winning my second Walker trophy, was using my finger as a windshield wiper to clear the water from my glasses.

My decision to fly the black Nobler proved more than correct—it was fated. On Sunday, while I was flying a demonstration before thousands of spectators, the bellcrank in my other model came loose, and it smashed into the concrete!

When you write and want a reply, please enclose a SASE. If this is done, I will always answer. I will accept phone calls, but please don't call if writing will suffice. I do have a business to run. My address is 12822 Tarrytown, San Antonio, Texas 78233. Phone: (512) 656-2021. The fax answers after six rings.

## Svetlana's RC/Filipova

Continued from page 28

your adversary's model, all too often it's your airplane's wing, and not the prop, that touches your opponent's streamer. Think how much harder it must be to try to cut your opponent's streamer while keeping your eyes on two models at once. These RC Combat guys say it can be done, but it certainly can't be easy.

I hope some of you will consider building this simple RC model. Even if you never try it out in RC Combat, I know you'll find it just plain fun to fly. →

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