MiG 21d

NATO calls it Fishbed, but this deadly Soviet jet is one of the world's finest fighters. Model uses high-revving, light-weight, 40 engine.

ROLAND H. BALTES

FULL SIZE PLANS AVAILABLE — SEE PAGE 60

HOW many control-line flying models of jet aircraft have you seen lately? Very few, if any. The jet age has been with us for some time but the modeling of jet airplanes has not kept pace. The reasons for this are varied and interesting.

Probably the biggest contributor is the lack of a suitable jet engine. The pulse-jet-type engine — around for so many years — has enough power, but also has serious limitations. The ducted-fan propulsion system once enjoyed popularity in free-flight; however, it has been applied only to control-line by a very small group of dedicated modelers. Not until somebody markets commercially the necessary fans will this become common.

So what we are left with is the glow-plug engine and propeller combination. Egads, you say, a propeller on a jet? But this is really nothing new. Look at many of the current control-line stunt designs and the jet influence is quite noticeable. The same holds true in radio control where the building and flying of jet-type models have been on the increase. Besides, it even was prototype practice in the early jet days to test airframes using piston engines with props.

Obviously, I'm trying to justify the use of the prop on my MiG-21, the chances that the real MiG ever used one are almost nil. But how many real planes have you seen that used a rubber band for a motor, or were flown at the end of some wires?

We selected the MiG-21 not only just because we liked it, but also because it had several features which were very desirable, such as: a fair amount of wing area, a nose radome that could be disguised with a spinner, and a simple fuselage. We also had a good set of 3-views and pictures. The real MiG-21 is in service with many of the Communist countries and apparently available to any country that has money to buy one.

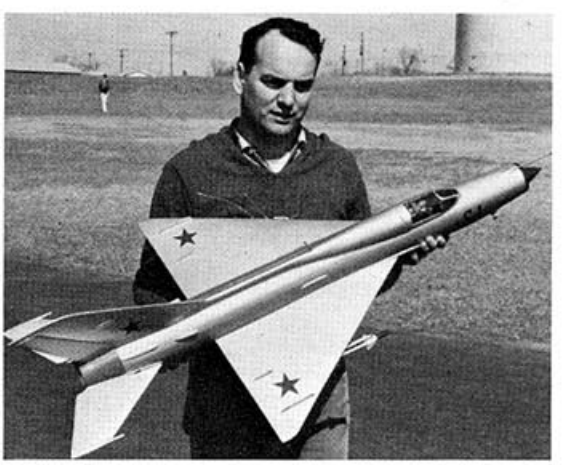
The model we decided on goes under the NATO codename "Fishbed D" and can be distinguished from the earlier "C" models by the larger hump behind the canopy and the nose probe on top of the fuselage. The model is built to a scale of 1" equals 1', which is a good-size model. Ours weighed 4 lbs.

This brings up a little problem which can be easily overcome if you plan ahead. The model most likely will be nose-heavy when built. We therefore used plywood quite liberally in the rear. No sense building a flimsy model, then having to add lead weight. Common sense should be used in building the front end strong but light. The lightest but most powerful engine available should be used. We show a K&B 40 on the plans but other 40's, like the ST G21/40, would work.

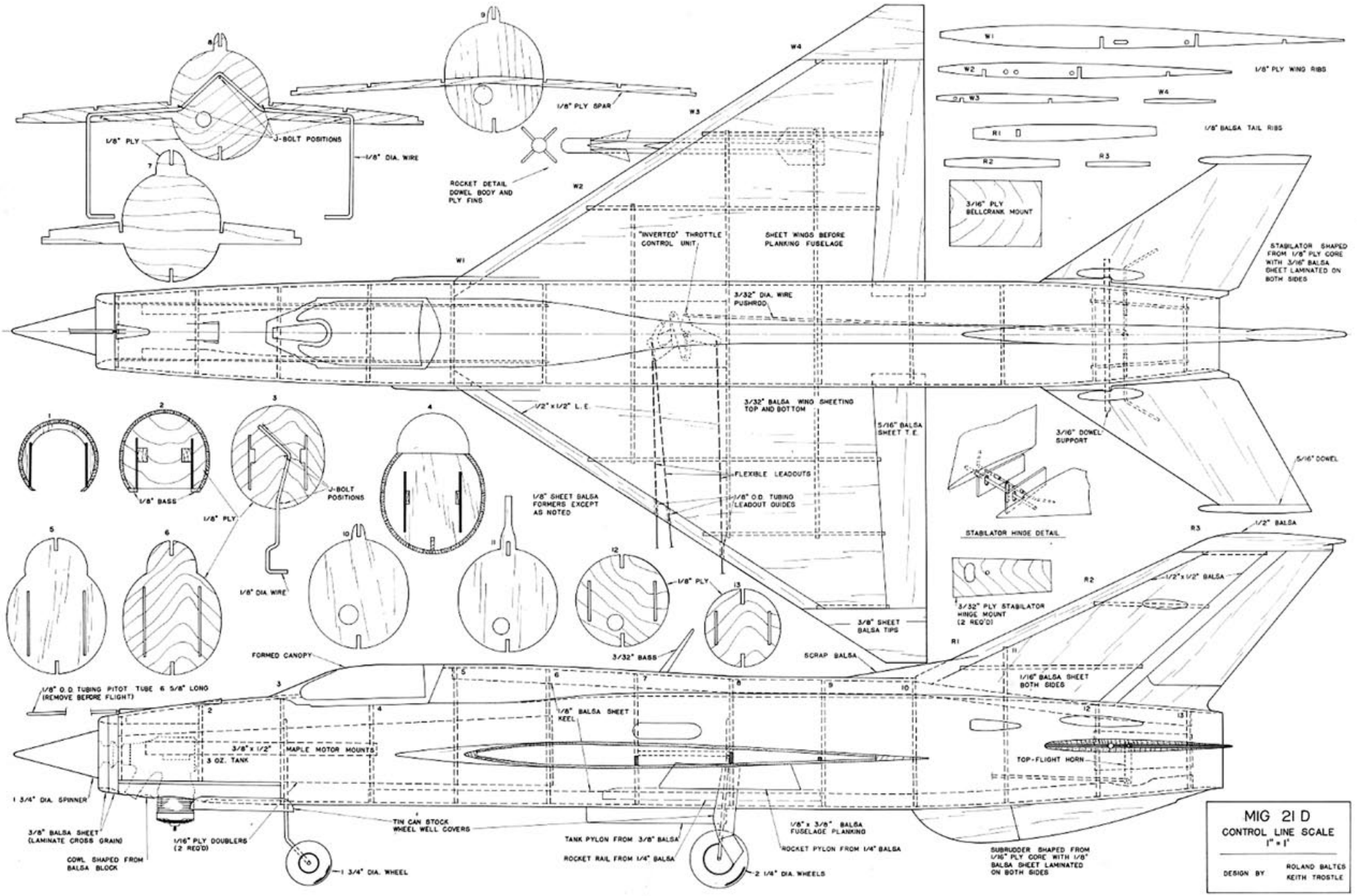
By now you may be wondering about the flying characteristics of the model. We were somewhat dubious ourselves, however the first flight — which lasted less than a lap — did demonstrate excellent ground handling qualities. After a little more weight was added to the tail the subsequent flights were very realistic, which means that it does take

Continued on page 50

In constructing your version of the MiG, the Karlstrom centerspread drawings on the following pages will provide the scale details for a championship job. Fast and stable, the MiG also will gain high flight points.



Model could have been designed for Dynajet, but it is noisy, requires heavy insulation, can't be throttled. You won't see the propeller in flight anyway!



MIG 21 D

CONTROL LINE SCALE

1" = 1'

DESIGN BY ROLAND BALTES
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MiG 21D

Continued from page 38

full power and a pretty long takeoff run before the model gets into the air. Our concern that the model would yaw outward on takeoff or during flight did not materialize. The MiG is very stable and flies with a slight nose-up attitude.

Construction: For those that don't like cutting out wing ribs, this model is for you since there are very few. The fuselage has to be built first since it is the backbone. Start by cutting out all formers and wing ribs from material as shown on the plans. Then cut out the rear wing spar from 1/8" plywood and glue to Former 9. Bend the nose and main landing gear from 1/8" wire and install on Formers 3 and 8 using J-bolts. Apply epoxy glue to nuts since the gear takes a beating and has to be mounted securely to the formers and spar.

Shape the motor mounts as shown on plans and glue to Formers 2, 3, and 4, making sure these formers are lined up properly. Keep glue out of the slots for the plywood doublers, which will be added later. The horizontal stabilizer-elevator assembly—which we will refer to as the stabilizer—has to be made next, since it will be installed as a unit. Cut out the two hinge mounts from 3/32" plywood, drill the holes for the control horn and then cut out the pivot slots. Bend a large Top-Flite horn as shown in the top view of the plan and then install the plywood hinge mounts to the horn. Refer to the sketch on the plans for details.

The stabilators are laminated with a 1/8" plywood core and 3/16" balsa sheet. Cut out the cores and also the 3/16" hardwood dowel support. The slots in the cores for the dowel support and the hinge must be cut out accurately. The tricky part is gluing this assembly together. To keep it properly lined up, clamp the trailing edges of the stabilator cores to the work bench, making sure the spacing is proper.

Slip the support dowel through the slots in the hinge mounts, then glue the ends of the dowel and the ends of the horn into the slots of the stabilator cores. The use of an epoxy glue is strongly recommended. Add the top and bottom balsa sheets and the tip dowels,

Continued to page 52

then sand the stabilator to an airfoil shape. Finally slip the stabilator hinge mounts into Formers 12 and 13. Line them up accurately, then glue again with epoxy.

Now we can return to the front of the fuselage. Slide the 1/16" plywood motor mount doublers into Formers 5 and 6; then slide this assembly into Formers 2, 3, and 4, which were previously glued to the motor mounts. Again, all the formers added will have to be lined up properly, then glue all joints. Now you can also add Former 1. After this has dried, cut out the lower keel from 1/8" hard balsa. Mark position of the Formers, then glue to Formers 4, 5, and 6. Now you can install Formers 7 through 11, and the stabilator assembly.

Cut out and install the top keel. The bellcrank platform now can be put in. For a bellcrank we used the Roberts unit sold by Sturdi-Built, which is used for engine throttle control. Most well-equipped hobby shops should have them.

At this point the fuselage may be pretty shaky, so install wing ribs W1, W2, and W3. Also install a strip of 1/8 x 3/8" balsa along both sides of the fuselage. Now is the time to drill the holes for the engine bolts, install a tank, and make the necessary holes in the formers for the fuel lines. Since we did not want to spoil the appearance of our model by having the tank-fill and vent lines stick out of the fuselage, we installed them to be accessible through the nose-wheel well, which is open.

Now is the time to install the throttle pushrod. This requires making appropriate holes in formers. If you can get hold of a Veco extension shaft, it will allow moving the engine further back to ease the CG problem.

Finish up the wings by installing the leading and trailing edges and adding wing ribs W4. Flank the wings using 3/32" balsa sheet. The vertical stabilizer is made next. Pin the leading and trailing edges to the plan, then glue in ribs R1 through R3 and plank with 1/16" sheet balsa on both sides. Add the tip block, then sand to shape.

The rudder is made from 1/2" sheet balsa. Install vertical stabilizer so that slot in rib R1 slips over Former 11 and glue well. Install elevator pushrod, using heavy music wire (at least 3/32"). The major remaining task is the planking of the fuselage with 1/8 x 3/8" strips of balsa. Glue the strips to the formers and to each other. Patience will save work later on. Nose and tail blocks, wing tips, and engine cowl can be added now. Also, the sub-rubber can be laminated together, and then glued to the fuselage.

I have found out there is no magic way to get a good finish without work. The appearance of this model, like any others, will depend on how you proceed from here. First of all, sand the whole model completely with medium to fine paper. Then fill in all nicks, dents, and cracks with plastic balsa. You may have to go over the model several times to catch all the cracks and large grain marks.

I applied two coats of clear dope with a brush and sanded again with fine paper. Apply two more coats of clear, sand again. I covered the model with Silkspan, applied wet, and using dope. When it dries, it looks like a mess, but ignore it and slop on two more coats of clear dope.

Use real fine wet-or-dry sandpaper (No. 320 or No. 400) and sand, but be careful not to sand through the Silkspan. Apply five coats of sanding sealer, lightly sanding with fine paper between each coat. Before applying the final coat of paint, install a canopy and add the various fuselage bulges, air-scoops, and the pitot-tube support. These items need to be filled in before applying four coats of silver dope.

Add the insignia and aircraft numbers. I used solid decal sheets from which I cut the Russian insignia. Finally add wheels, landing-gear doors, and the antenna mast. The pitot tube can be made from a thin dowel or tubing. It has to be removable.

A Veco 1¾" needle-nose spinner is used for display and flying. The rockets are made from wood dowels with plywood fins. Pylons are made from balsa.

I fly my model on 60' lines. A paved flying surface is a must!