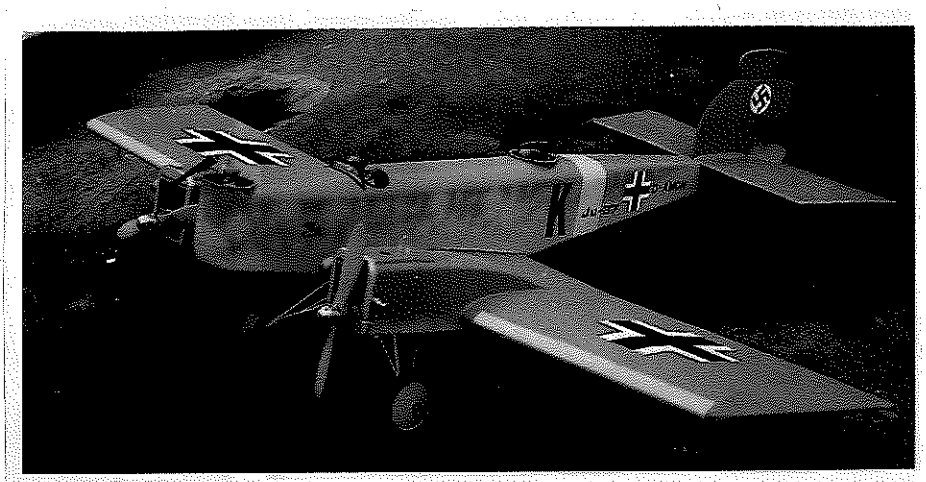
In Canada, you don't always wait for Spring to go flying. If it ain't snowin' or blowin', it's flyin' time. Temperature? What's that?



A view of the JU-37 from a three-quarter front angle. If you happen to have a Midwest Twin Stick, you have it made in the shade. K&B Sportster 20's are perfect power.

ERSATZ BOMBER JU-37

By ALEX McLEOD

Here is a might-have-been airplane built from a Midwest Twin Stick kit or scratch built from these plans. It's as stuntable as any pattern design.

If you have ever been to the Paul E. Garber facility at Silver Hill in Maryland, you will be greatly impressed by the German Arado Ar.234.B-2, which they are restoring there. Frank Rabbit, a very informed guide, impressed upon us the fact that many German technical advances of World War II were far ahead of the Allies, but were too late or lacked strategic materials for large scale production.

The Ar.234 wasn't the only advanced bomber that Germany produced. Back in 1924, when there was a ban on German development of military aircraft, they produced proposed bombers in miniature and made adaptations from existing materials. The Ju-37, Junkers Juwel, was one such proposed aircraft, would you believe, built as a radio controlled model for practical test purposes. (They even used proportional radios like ours today.) The Ju-37 was to be the gem in the crown of the Luftwaffe bomber fleet. Hence their name Juwel (translation Jewel). The miniature test vehicle was never put into production but superseded by more recent aircraft of the 1930s. I wonder if the R/C model was captured by the U.S. Axis Aircraft Recovery team in 1945 and stored with other flying treasures at the Silver Hill facility?

One of the strangest things is that the Ju-37 looks just like a converted Midwest Twin Stick. These kits, like the Ju-37, are not now in production. If you have the Twin Stick kit, then modify it according to the plans. If you don't, then scratch build the whole thing as shown. I hope you believe my story.

This Ersatz (artificial) Bomber was my way of making the Twin Stick kit look like a possible real airplane of the 1920s. The unfortunate fact that the kit is not now produced is really too bad. It is one of the nicest flying twins I have ever built, with pattern ship capabilities and single engine survival. Ed Rogala, of Midwest, confirmed that production of the kit ceased over three years ago, but gave his blessing to this article. If you don't have a kit, then go right ahead and build the little bomber from scratch, since I'll describe construction as if it were not a kit. Please do not feel that the fuselage and rudder shapes need to be exactly as in the plan. Change it to suit your taste. Make it a French, Russian, or Japanese, or any obscure looking bomber. People will say "Oh yeah! I recognize that one from the books, I just can't remember the exact name."

If you've built any other Ugly Sticks you'll realize how aerobatic they are. This one is no exception. Even though it looks like it should fly slowly and awkwardly, it doesn't. It's truly a "Ringer." The K&B Sportster 20s are good, steady, reliable, quiet power, right out of the box. I can't say enough in favor of them; besides, they're inexpensive. So here is your chance to build a twin for the price of a single engine airplane and keep the cost of the airplane, including engines, below $125.00.

CONSTRUCTION

If you're working from the kit be sure to modify it as you go along. The main thing about it is that the fuselage sides are turned upside down, changing it from a high wing plane to a low wing one.

FUSELAGE

Begin with the fuselage sides and cut them from two sheets of very firm 1/8 x 4 x 36 balsa. Use some scrap cut from them to extend the sides down as shown at the leading edge of the wing. Remember, in a twin the fuselage doesn't carry as much as in a single engine aircraft; i.e., motors, landing gears, etc., so our model doesn't need heavy doublers here just what is shown on the plan. Eighth-inch square balsa is used at the edges of the sides both to increase gluing surface and to allow us to round the corners. Cut out former 1B from 1/8 sheet and 3B and 6B from 1/8 lite ply. Glue 3B and 6B, perpendicular to the right side in the indicated place. Then glue the left side to 3B and 6B being sure that the edges of the sides are parallel. Join the rear of the sheets together at the tail and glue in 1B to bring the nose slightly together. The 3/16 sheet saddles can now be glued in, along with the top and bottom cross pieces and 1/8 sheet at former 2B. It's a good time now to install the control rods in the fuselage and support them at every station. They exit the fuselage sides under the stabilizer. Sheet the top of the fuselage with cross-grained medium soft 1/8 sheet and do the same with the bottom rear. Use 1/4 sheet on the bottom of the fuselage in front of the wing. Add the 3/8 sheet nose blocks and triangular stock, then extend the top sheeting over this.

You now have the basic fuselage complete and what you add on top of this is up to you. Follow the plans for a Junkers-like top or vary it according to the type of model you have in mind. Don't forget the 1/4-inch ply blocks for the wing hold on.

WING

In a multi-engined model, the wing center section is the heart of the whole thing, as it must house the motors and the landing gear. On our Ju-37, the wing is built in three pieces, with one-inch or 4° dihedral under each tip at the last rib. The center of the wing is then the heaviest and busiest part of the airplane.

Begin by cutting out 20 ribs from firm 3/32 sheet. Twelve of these ribs will have to be slightly altered to receive the 3/32 sheet on top and bottom in the center section. It's easier to cut all the ribs the same, then alter them as needed. Use very firm and springy strips for spars and leading edge. Careful substitution of spruce would be OK. Build the wing on the plan in one piece, if you have 48-inch wood, or in three pieces, but be careful that they line up. The ribs are flat-bottomed from the spar back, so pin down the 1/4 sq. spar and the trailing edge sheet and then glue in the trailing edge stock; the ribs next, then add the top spars and leading edge. Remove from the plan and add the 1/8 sq. bottom spar. Sandpaper the trailing edge sheets to receive the top trailing edge sheets. Sand the entire wing panels and add the leading edge sheets of 3/32 (medium "A" grain if possible). Join the wing panels and glue in the 1/8 birch ply dihedral braces at the main spar. Be sure the dihedral is the same under each tip. Add the vertical grain webbing as shown. Glue in the 1/8 ply bellcrank mounts. Be sure to angle them so the push rods go down to the ailerons and up to the throttles. Grooved landing gear blocks are well cemented under the center section.

NACELLES

The nacelles are now started by gluing in the 1/8 lite ply nacelle doublers. The short one is outboard on each nacelle, to give about 4° outthrust, which is single-engine insurance that there won't be any surprise snaprolls. These go forward only to the 1/4 ply firewalls, which are now added. Be sure not to have any up or down thrust on the fire walls. Drill the holes in the firewalls for the motor mounts, use either the spider back plate on the K&B Sporsters or a glass filled mount. The center line should be 3/16 of an inch inboard on each mount so that the props emerge at the center line of the cowl. The 3/32 sheet nacelle and cowl sides are glued on, then the tank floor. Install the 4 oz. tanks next and sheet top and bottom, crossgrained. This should be faired into the wing sheeting. Cut out two cowl fronts from 1/16 ply and glue them in place. Build up the fronts with balsa as shown and add the grillstrips from 1/8 x 1/16 spruce so that air can enter for cooling and the carburetor. To make the fronts look like radiators, cut 1/8 x 3/8 strips with the grain running crosswise and wrap them around the cowl at the very front, as shown. Sandpaper everything to shape and separate the cowl tops as shown so that the muffler exit is on this separation line at the right side of each cowl. Be generous with the size of the holes here and on the top for the glow plug so that air can escape for cooling.

LANDING GEAR

Bend up the landing gear as shown. Bind and solder it together using the mount on the wing as a jig for alignment. Add the half-inch strips of spruce as fairings and sand smooth.

TAILPLANE

Both the fin and rudder, and the elevator and stab are cut from light but firm "C" grained balsa. The shape given helps the illusion of it looking like a Junkers, but change the shape to suit the model you have in mind. Just don't change the areas. Sand them to shape and sand the leading and trailing edges, though I prefer a slightly squarish trailing edge because this seems to keep servo centering from being critical. I inlaid 1/4 ply blocks in the fin and stab so that I could use screws to mount them for convenience sake.

FINISHING

The charm of this model is the scale-like appearance, so finishing it in a plain color with stripes or sun bursts, etc., won't do much for it. Keeping in mind that full scale bombers were painted with spray guns then that seems the way to go with this one. Choose whatever fabric works best for you and type of paint you like to work with. I used Sig Koveral and butrate dope.

The finish is only as good as the surface it is put on. Be sure to rough sand the model to shape with 40 to 80-grit aluminum oxide paper, or garnet paper, then progressively finer paper to about 300. Next, dampen the wood with a sponge but don't soak it. When it's dry, the surface will be raised showing indentations of the rough paper. Now sand it again with 300 paper and use Model Magic or similar filler to fill all the dings and hangar rash it acquired while building. Now sand it smooth with fine paper and apply two coats of Sig sanding sealer to the bare wood, sanding carefully between each coat. Next, two coats of clear butrate thinned 50/50 with dope thinners. When dry, lightly sand it.

Apply the Koveral by cutting a piece a half to one-inch larger than the surface to be covered. Lay it on the surface and carefully brushing thinned clear dope through it to the framework underneath but only around the edges, all the while pulling out the wrinkles, particularly around the edges, and moistening the doped edges with the brush if it has to be moved at all. When in position, let dry and then cut off the excess around the edge and dope down the edge left. If it doesn't flatten out on the edge don't worry, because the next step is to use a heat shrink iron and run it around the edge to smooth it out. Now apply more dope over the edges and when dry, use the iron to shrink the Koveral, starting near the middle and working to the edges. This helps eliminate the wrinkles. Then smooth any rough spots on the edges with the iron.

Cover the open spaces this way and anything else that needs strength. Now brush on many thinned coats of clear butrate dope. When asked how many; I don't know, but usually I keep going until I can't tell whether it's wet or not . . . usually well over ten. After about five coats, lightly wet-sand the fabric, etc., with fine wet-and-dry paper. DON'T CUT INTO THE FABRIC! Three to five sprayed coats of thinned color are next. Then mask the model and spray or brush on the trim (an airbrush for camouflage). When everything is painted, add two coats of clear dull dope, or shiny if you like, and it's ready to assemble and put in the K&B 2Os and the four or five-channel (if you want bomb drop) radio.

FLYING

I've flown a number of twin and four-engine airplanes and still have my heart in my throat on the first few flights of each. Not all of them survived many flights. The problem is engine failure on one side close to the ground and the remaining power puts you into an immediate snap. Experience doesn't help here in flying, just in setting up the engines and designing the airplane. The Ju-37 has out-thrust on the engines to keep the airplane from turning towards the dead engine. This also keeps the prop blast on the large rudder for effective steering. One 20 Sportster will maintain height so that you can bring it home. If an engine quits in a near stall condition, that's close to disaster, so don't fly around too slowly but maintain a good margin of airspeed on one engine.

After you are comfortable with the model in the air, try to have one engine cut out (up at least three mistakes high) and try your ability to fly on one. See what happens in a stall, etc., then you'll know. If you run into difficulty, chop the throttles and come in dead stick or on idle. If you keep it light enough it'll glide well. Mine weighs six pounds and has no bad habits.

On your first flight, start the right (starboard) engine first then tune it up to peak and back it off a little. Be sure it can run in all positions. Shut it down next and then start the left (port) engine and tune it as you did with the right. Now restart the right engine and listen to see if they are running fairly close to each other. If the rpms are very close you'll hear a beat. Don't adjust the needle valves. Try the throttles to make sure they'll both idle. Use a tach if you have one. If they are both running well make sure they are well warmed up, then try taxiing around the field to get the feel of the model. Don't be in too much of a hurry to fly. When you feel everything is in order then fly. If anything doesn't seem right, bring the airplane back to the pits and shut down the engines and retune them one by one. When all is in order and if your hands aren't trembling too much, try for a takeoff. Hold the tail down until it gets some ground speed then steer it gently. Don't hoist if off too quickly. Be prepared to chop the throttles and land straight ahead, whatever is there. Climb out without doing anything too abruptly and get lots of height before trying any maneuvers.

My twin will do everything in the book without excessive speed and is as docile as a kitten on landing. The quiet 20s give it the sound of a real twin. Enjoy your bomber and keep them guessing when they ask what real one was.

If you have any questions or suggestions please write to me, Alex D. McLeod, 352 Park St. N., Peterborough, Ontario, Canada, K9H 4P5. Happy Flying. •

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