

Bücker Jungmeister

by Don Scrull



Photos by John Preston

A Classic Aerobatic Biplane in the popular Schoolyard- Scale size

• Schoolyard scale continues to grow in popularity as quality radio systems shrink in size and price. These .02- to .10-powered compact models will fit, assembled, into the trunk of almost any car, and a pint of fuel will last for months. Another attraction of the small model is that it offers a chance to build any one of those favorite scale subjects each of us has rather quickly, without investing the time and money required for the larger competition-type scale models. Although some special competitive events are occasionally offered for the schoolyard scaled models, these compacts are principally in the domain of the weekend sport flier, the guy who doesn't give a hang about competition—low-pressure fun flying is what he's after. It is in this spirit that the little Jungmeister is offered.

As a modeling subject the Bücker Jungmeister is hard to fault. It has proven to be an exceptional scale configuration for everything from free flight rubber up through quarter-scale R/C. The particular version selected in this case is the prototype Bü133A powered by an inline 6-cylinder Hirth engine. The model is built to a scale of $1\frac{1}{2}''=1'$, which gives a span of about $32\frac{1}{2}''$ and a length of about 30". The model is close to scale in all exterior respects; basic structural members, number of ribs, airfoil, dihedral, cowl panels, etc., are all reproduced on the model. The model is intended for use with two channels controlling either rudder and elevator, or ailerons and elevator, and powered with an .049 to .09 glow engine or a 1.0cc diesel. Three servos to provide rudder, aileron, and elevator could also be used along with the larger engines to provide truly outstanding aerobatic performance, although weight would have to be watched closely. Although I personally haven't tried it,



Original German photo of prototype Bücker Jungmeister on an early flight. (Fooled ya! It's really Don Srull's beautiful replica.)

I'm sure the little Jungmeister could also be adapted for pulse rudder or even free flight if the weight was kept low enough.

The Jungmeister is not the ideal choice for a first scale R/C project, since some building skill is required to build a light and straight biplane airframe. Also, the model, like its full-scale counterpart, has more performance and maneuverability than a basic trainer requires.

The full-size Jungmeister has been a popular and effective aerobatic performer world-wide since the mid-1930's. In 1933 when Carl Bücker returned to his native Germany, he set up a small aircraft manufacturing firm near Berlin called *Bücker Flugzeugbau*. Prior to this time Bücker had been the managing director of *Svenska Aero AB* in Sweden. The first aircraft to come from the new Bücker firm was a remarkably efficient sport and aerobatic training biplane and was designated the Bü131A Jungmann ("young man"). It was a two-place biplane with gracefully swept wings and a long slender fuselage and was powered with an 80 hp inverted, 4-cylinder Hirth HM60R. The Jungmann's acceptance was immediate and enthusiastic; quantity production was quickly started with most deliveries going to the German "civil"

flying schools which were then training pilots for the still clandestine Luftwaffe.

In 1935 a new single-place biplane, the Bü133A Jungmeister ("young champion") was introduced. It was slightly smaller though very similar to the Jungmann, and in fact many components were interchangeable. The first prototype Bü133A bore the civil registration D-EVEO and was powered with a 135 hp inverted 6-cylinder Hirth HB6. Its incredible aerobatic capabilities quickly brought the Jungmeister widespread popularity. Only one Jungmeister with an inverted engine was built in Germany, as all subsequent production models were fitted with the 150/160 hp Siemens Bramo Sh 14A seven-cylinder radial engine. These radial versions were designated Bü133C. Like the Jungmann, the Jungmeister was stressed for unrestricted aerobatic flight and, because of its snappy performance and remarkable rate of roll, it quickly became a favorite of many European, and later American, aerobatic virtuosos. Early in 1936 the by-then official Luftwaffe adopted the Bü131B as its official standard primary trainer, and the Bü133C as its standard advanced aerobatic trainer. Production in Germany was increased substantially, and in addition



the Bucker biplanes were license-built in Holland, Spain, Czechoslovakia, and Switzerland.

Our schoolyard scale model of the Jungmeister should not present any serious building problems for a person having some previous R/C building experience. The one caution I cannot overstress is to keep the model as light as possible. The flying characteristics of these smaller models are greatly affected by their weight. My model weighed 24 ounces ready-to-fly (which equates to a wing loading of about 12 ounces per square foot), and it is the maximum weight I would recommend. The plans have been modified to eliminate some of the unnecessary and heavy structures used on the original. A carefully built model should weigh between 18 and 22 ounces, depending on the radio, engine and covering material used. To help keep weight under control, select your balsa and other material very carefully; do not beef up the structure shown on the plans—it's plenty strong enough; go easy with the epoxy—it's heavy stuff—white glue and cyanoacrylate glues are lighter and just as strong in most applications; keep the covering and finish as light as possible; and, last but not least, try to use one of the newer mini- or lightweight radio systems weighing 6 ounces or less.

The prototype model used a Cox Tee-Dec .051 and later a 1.0cc diesel for

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The photos reveal elegant, free-flight-style construction of this pretty little schoolyard flyer, now available in kit form from Flyline Models. A genuine, original, Don Srull cigar butt is optional at extra cost.



for longerons. Before planking the nose/cowl section, bend the cabane from $\frac{1}{16}$ " piano wire, epoxy to the ply cross-members and cement in place. Take care to align these parts accurately to avoid problems later when the upper wing is fitted to the cabane. The $\frac{1}{32}$ " piano wire cross-braces are bound with thin copper wire and soldered to the cabane struts after the cabane is in place. This is also the time to install the one-ounce clunk tank. Once the tank is in place and all necessary external plumbing is hooked up, the nose section can be sheeted with $\frac{1}{16}$ " balsa. The nose block is carved from a balsa block while tack-glued to the front fuselage former. It is then removed, hollowed out and the appropriate holes are cut for cooling, needle valve, etc. Rather than cut a large hole for a glow plug clip, I prefer to permanently wire the glow plug to a clip and run the wires to a miniature plug mounted on the surface of the cowl. It not only looks neater, but it is much easier to attach the starting battery to the plug, and on inverted engines it is much less likely that the prop will eat the starting clip wires.

The wings are fairly straightforward. Note that the dihedral is different if you plan to use rudder control and not aileron control. Also note that in either case the dihedral of the top and bottom wings is different. Due to the 11-degree sweepback of the wings, the dihedral braces must be carefully trimmed to fit the "V" in the spars at the dihedral breaks. Before final sanding the wings, cut holes and add pieces of $\frac{1}{16}$ " dowel to simulate the "hand holds" in the upper center-section and on the lower wing tips. For the little extra effort involved, they add a nice scale touch.

For the tail surfaces, use laminated outlines for light weight and for the scale appearance they provide.

The landing gear struts are bent to shape from piano wire, wrapped with fine copper at all joints and soldered. The balsa framework can be built in place over the wire legs and sanded to shape.

The wings can now be fit to the fuselage. Set the top wings on the cabanes and clip the forward ply hold-down tabs to the wing spars with clothespins. Adjust the wings by bending the cabane wires and by sliding the ply tabs until the wing is perfectly aligned. Spot-glue the tabs on with epoxy and mark the position of the hold-down screws on the rear spar plywood strips. Remove the top wing and drill the pilot holes for the hold-down screws. Attach the top wing again, but this time use the hold-down screws. Now trim the bottom wing cradle on the bottom of the fuselage as necessary so that the bottom wing is perfectly aligned with the top wing and the fuselage. Hold the lower wing in place with rubber bands and pins while you drill the two hold-down screw holes, and epoxy the hold-

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power and employed aileron and elevator controls. A simpler and somewhat lighter system would be to use rudder and elevator, with a slight increase in dihedral as shown on the plans. With this setup the rolling maneuvers will be almost as good as with ailerons. As mentioned previously, the model should make a fine pulse rudder or even free flight flyer if the weight is kept down to 16 to 18 ounces.

The engine selection is pretty much limited to a Cox .049 to .09, or one of the lighter weight 1.0cc (.06 cu. in.) diesels currently on the market, such as the British M.E. Heron. All other .09 engines that I am aware of are much heavier than the Cox TeeDee or Medallion .09 and are not recommended for that reason. The Jungmeister performs well on the original TeeDee .051, but its performance is smoother and more solid on a 1.0cc diesel. The diesel has only a slight edge in power, but it swings an 8" prop compared to the .051's $5\frac{1}{2}$ " to 6" prop, and that seems to help a great deal. I have not tried a Cox .09 as yet but I am sure it would turn the Jungmeister into a spectacular stunter!

Before starting construction, determine what control setup you plan to use; i.e., rudder/elevator, aileron/elevator, or rudder/aileron/elevator, as this choice will affect some details of the wing and fuselage structure.

The fuselage is built up from two sides, bulkheads and stringers in the usual fashion. Note that $\frac{1}{8}$ " square spruce is used

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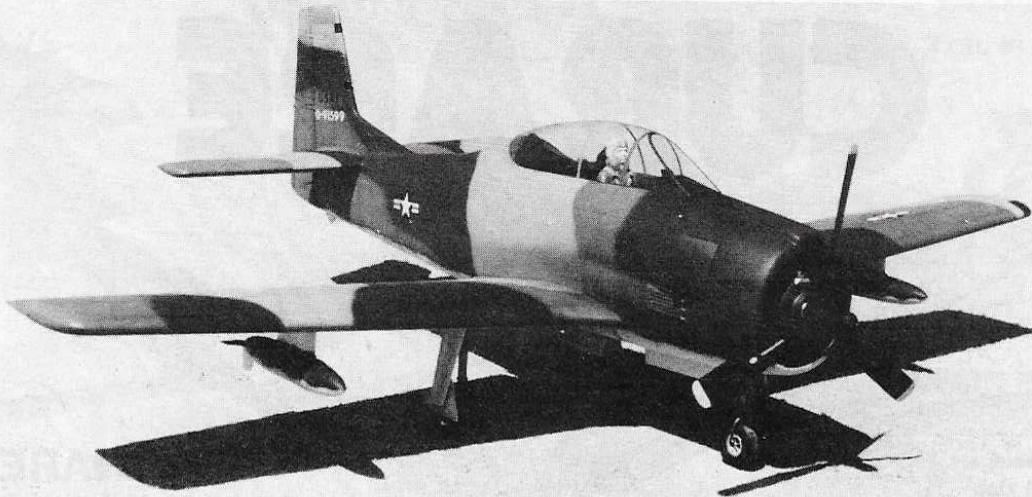
	
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down dowel into the wing leading edge. With both wings attached, cut and fit the interplane struts.

After a final overall sanding, the Jungmeister is ready for covering and finishing.

Scale color schemes for the Bü133A are rather limited. The one and only German example of this configuration was the prototype, and many photos and other documentation exist for this particular aircraft. It was finished in silver (aluminum pigment) paint overall, and had black registration letters "D-EVEO" on the fuselage sides and on the upper top wing and lower bottom wing. A final note on the Bü133A prototype color and markings: Most of the three-view general arrangement drawings (including the excellent ones found in the October, 1958 issue of *Aeromodeler*) incorrectly show the rudder/fin markings on this particular aircraft. These markings are usually shown as a red horizontal band with a black swastika in a white circular disc on both sides. As several photos show, and consistent with German regulations of the 1936 period, the port side of the fin was finished as described above. However, the starboard side had three horizontal, equally-sized bars of the German national colors of black, white, and red (top to bottom).

Plastic shrink film will provide the lightest and simplest covering and finish possible. If you use this covering, however, I would recommend that the cowl and nose block be covered with silk and finished with dope or paint to provide a more fuel-proof nose section. If you enjoy painting your models as I do, you may prefer to use the more traditional (and heavier) materials for covering. The prototype's fuselage and landing gear struts were covered with lightweight silk. The nose block and engine compartment were coated with thinned epoxy to seal these surfaces against fuel. The wings and tail surfaces were covered with medium-weight silkspan. Butyrate clear dope and sanding sealer were brushed on, sanding lightly between coats, until the surfaces were sealed and smooth. White glue "rivets" were next applied to the cowl panels, after which two light coats of silver butyrate were sprayed on. Masks for the registration letters and fin markings were cut from vinyl contact shelf paper and the markings sprayed on. Panel lines, the rudder trim tab outline, and the "Bücker Jungmeister" logo on the cowl and fin can be added with black ink and a drafting pen. Spray a light coat of clear butyrate dope over these inked details to fuel-proof them. Other details such as the windscreen, cockpit coaming, instrument panel, wing and elevator trim tabs, and a stern German pilot can

continue to be added until your little Bücker looks authentic enough for you. As a final scale detail, you can simulate the flying and landing wires with lightweight nylon monofilament fishing leader. However, for general sport flying, they are an unnecessary annoyance.

Getting through the first few test flights will be greatly simplified if you follow these steps: Carefully check for warps or misalignments in the wings or tail surfaces, and remove any that are visible. Make sure that the model balances at the position shown on the plans. The proper CG is difficult to guess on a swept-wing biplane, so please use the one shown for the first few flights. The radio system and the engine should be tested and both must work flawlessly. Adjust the control surface movement so that the maximum deflections at the trailing edges are as follows: elevator $\pm 1/4"$, ailerons (if used) $\pm 1/4"$, rudder (if used instead of ailerons) $\pm 3/8"$. After getting accustomed to the Jungmeister's flight characteristics, the control surface movement can be increased as much as you wish to increase its maneuverability; however, the reduced movements will tame the little rascal down and tend to prevent overcontrol during the first few nervous flights.

For a model this size without throttle control I prefer to hand launch the first flights. If a large, clear and smooth take-

off area is available, you may wish to R.O.G. instead. With rudder control this can work all right, but I would not recommend it with ailerons and no rudder. Directional control during the takeoff roll will be almost non-existent. If you decide to hand launch, tune the motor just a little on the rich side of maximum rpm and have a trusted friend give you a hand launch. After getting up to a reasonable height, test each of the controls gently while continuing to climb in anticipation of the engine cut-off. In the glide make all turns very wide and easy, and keep up a reasonable amount of speed. You will be pleased at the Jungmeister's flat glide and solid control response all the way to touchdown. The glide of the prototype, minus rigging, was better than anticipated, and during the early flights this caused a tendency to overshoot the landings a bit. After the model is trimmed out it should be taken up to a safe altitude and felt out. Find out the speed and attitude at which it will stall, both power on and power off; in which direction does it roll best; will it spin; etc. After these flights it will be safe to carefully increase the control movements and move the CG back. Be aware, however, that the CG position is very critical; a movement of 1/4" rearward will have a significant effect.

With a 1.0cc diesel or a Cox .09 engine, the Jungmeister at about 20 ounces total weight is a dynamite stunter. And with its classic and graceful lines, it's a tough model to beat, either in competition or at the local flying patch. Who knows, you too may become a *Jungmeister!*

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