

Construction

Der Jaeger has become a classic in biplanes, and this great model is no exception.

DER JAEGER

by FLOYD MANLY

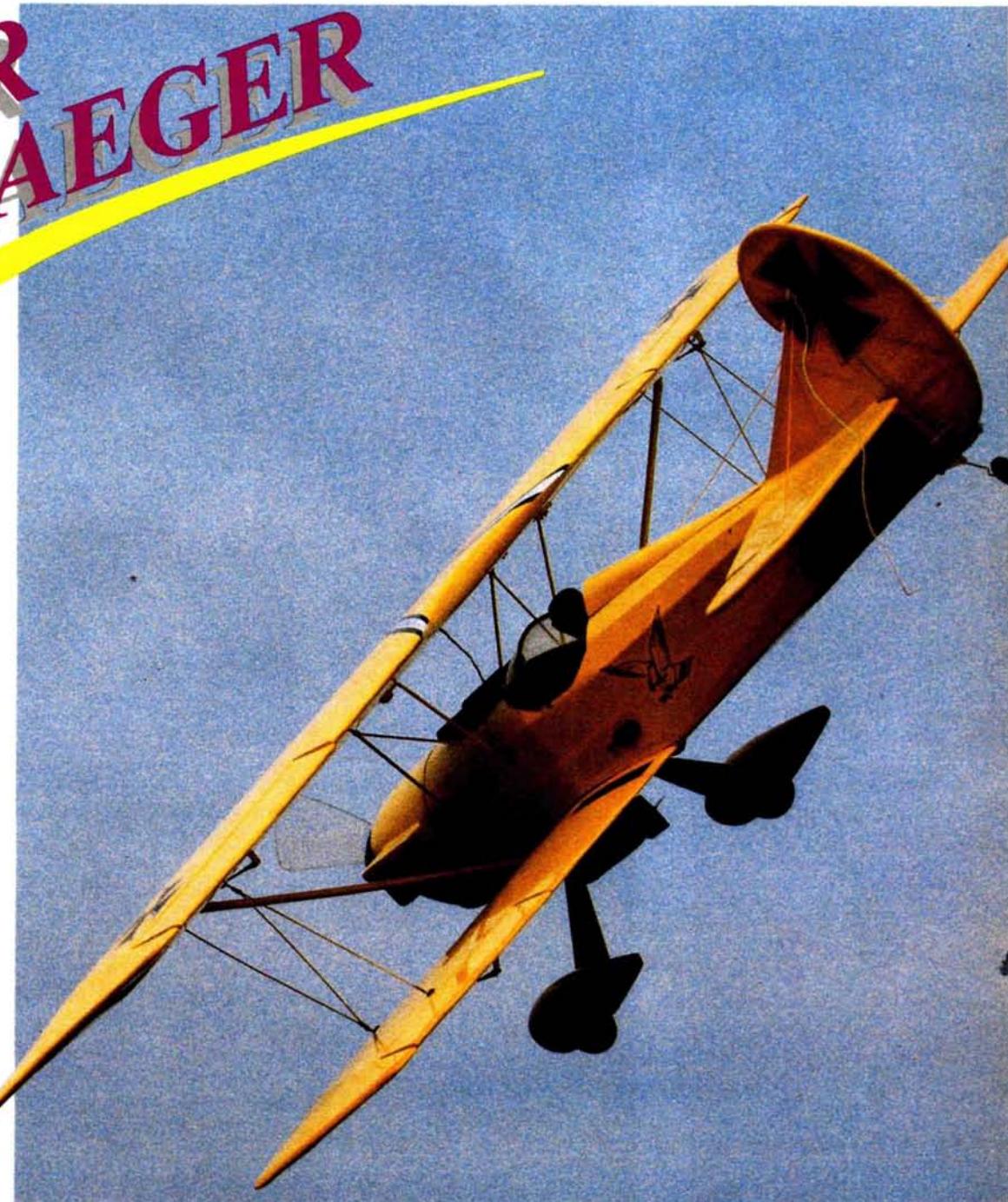
WELL, *Model Airplane News* has to take direct credit for this design. In the November 1984 issue they ran a page titled "Planes Worth Modeling," with four-views of the Der Jaeger that just begged to be built. Because I am a bipe nut and I had recently seen a $\frac{1}{4}$ -scale Der Jaeger that I liked, I was hooked!

The four-views were helpful in laying out my plans and I came up with a wingspan of 48 inches, or approximately $\frac{1}{5}$ -scale. I figured that a Fox* .40 I had on hand would fill the power requirements.

Before I get into the building sequence, there are a few construction features I'd like to talk about. I built up the cowl by carving a piece of white foam to shape, then painting it with a water-based Latex before applying the glass and resin. I then hogged out the foam and washed the cowl with gasoline—outside in the open air, of course!

The motor mount/tank box is designed to allow adjustment of over $\frac{1}{2}$ inch to fit your favorite engine. A Semco Pitts Jr. muffler fits nicely.

I used aileron servos in

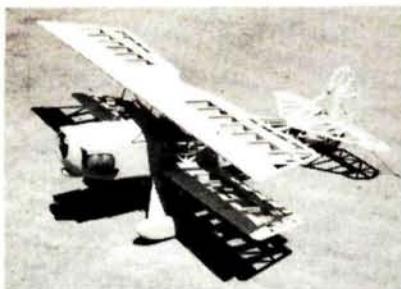


each wing because it is the easiest way of having four ailerons operating in sync. This also assures that the ailerons are in positive alignment with their respective wings during every pre-flight. Having an extra servo as a backup doesn't hurt either.

The wings are almost

industry-standard D-tube construction; extreme rigidity at a minimum cost in weight. Rib spacing is scale and their shape is fully symmetrical like a Skybolt or a Pitts. Wire landing gear is shown because I couldn't find a suitable bent aluminum one. The fairings are easy to build for scale points, but can be left off for

Type: Sport Scale
Wingspan: 48 inches
Wing Area: 707 square inches
Engine: .40 to .50 two-cycle
 .46 to .61 four-cycle
Channels: 4



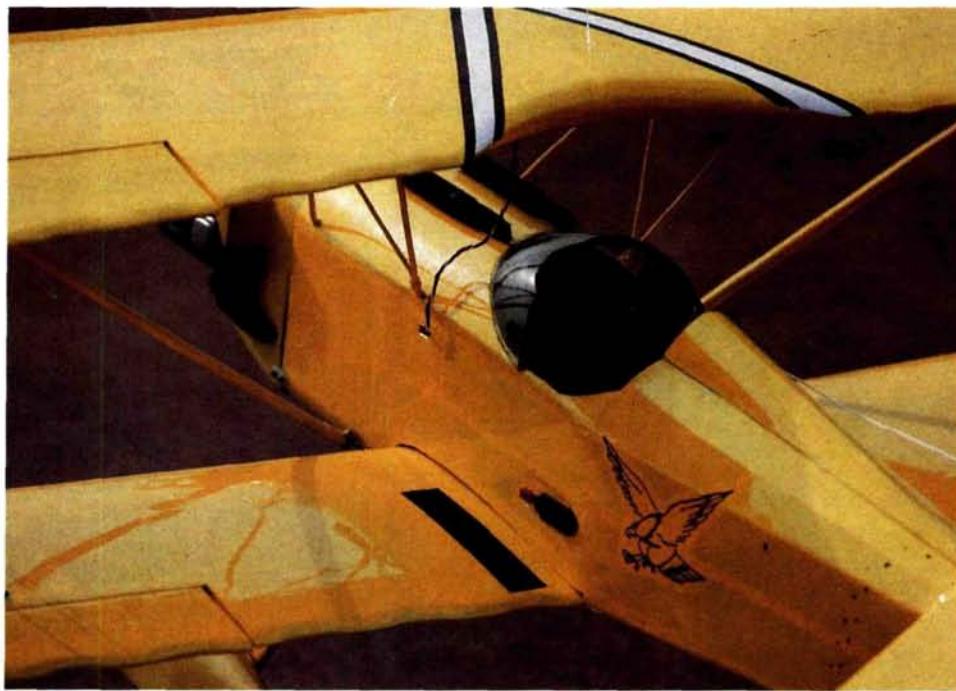
Manly's Der Jaeger exhibits good building techniques for an excellent flying model.

sport flying. The peculiar cabane attachment results in perfectly aligned wings at all times. All interplane struts are cosmetic only and the Der Jaeger will fly without them, but a biplane doesn't look right without all that garbage hanging out. Anyway, I wanted a plane that was *quick*, not necessarily fast.

Back at the tail I added flying wires—again, just for cosmetic reasons—by punching holes in the surfaces and stringing heavy black thread. Cyanoacrylate glue holds them in place and stiffens the wires.

CONSTRUCTION. Protect your plans with waxed paper. I used cyanoacrylate throughout, except as noted on the plans.

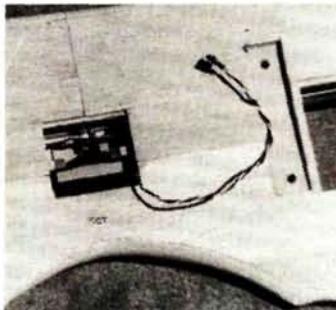
Build two identical fuselage sides including the tail post and wing saddles. Cut the $\frac{1}{4}$ -inch ply firewall from the plans pattern. Before cutting the motor mount/tank box, attach the motor to the mount, then measure exactly from the back of the mount to the back of the spinner you intend to use. This measurement will determine how long the tank box needs



FULL-SIZE PLANS AVAILABLE...PAGES 116, 117



Nose cowling block is built-up. Note dummy engine.



Aileron servo is mounted in top wing.

to be. Trial-fit the box into the hole in the firewall; you'll want a snug fit.

Glue the $\frac{3}{16}$ -inch balsa sides to their frames, one left and one right, of course. Then pin or weigh down the fuselage, inverted, over the edge of your bench so the firewall is butted against the

bench. Check for alignment and attach the firewall to the sides with thick glue. Add the gussets.

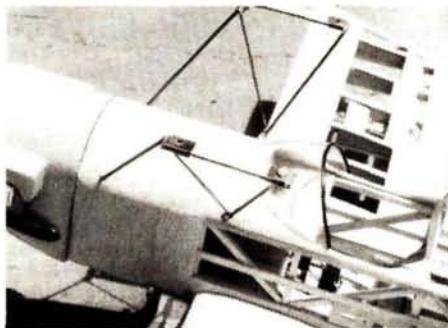
Cut the cabane plate, slip it under the inverted fuselage, and glue it to the firewall and fuselage side stringers. Leave the landing gear plate off for now.

(Continued on page 98)

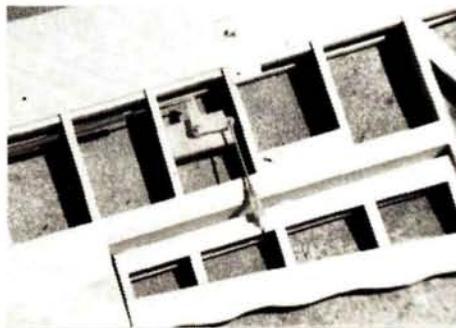
I put her through the paces and she high-stepped all the way.



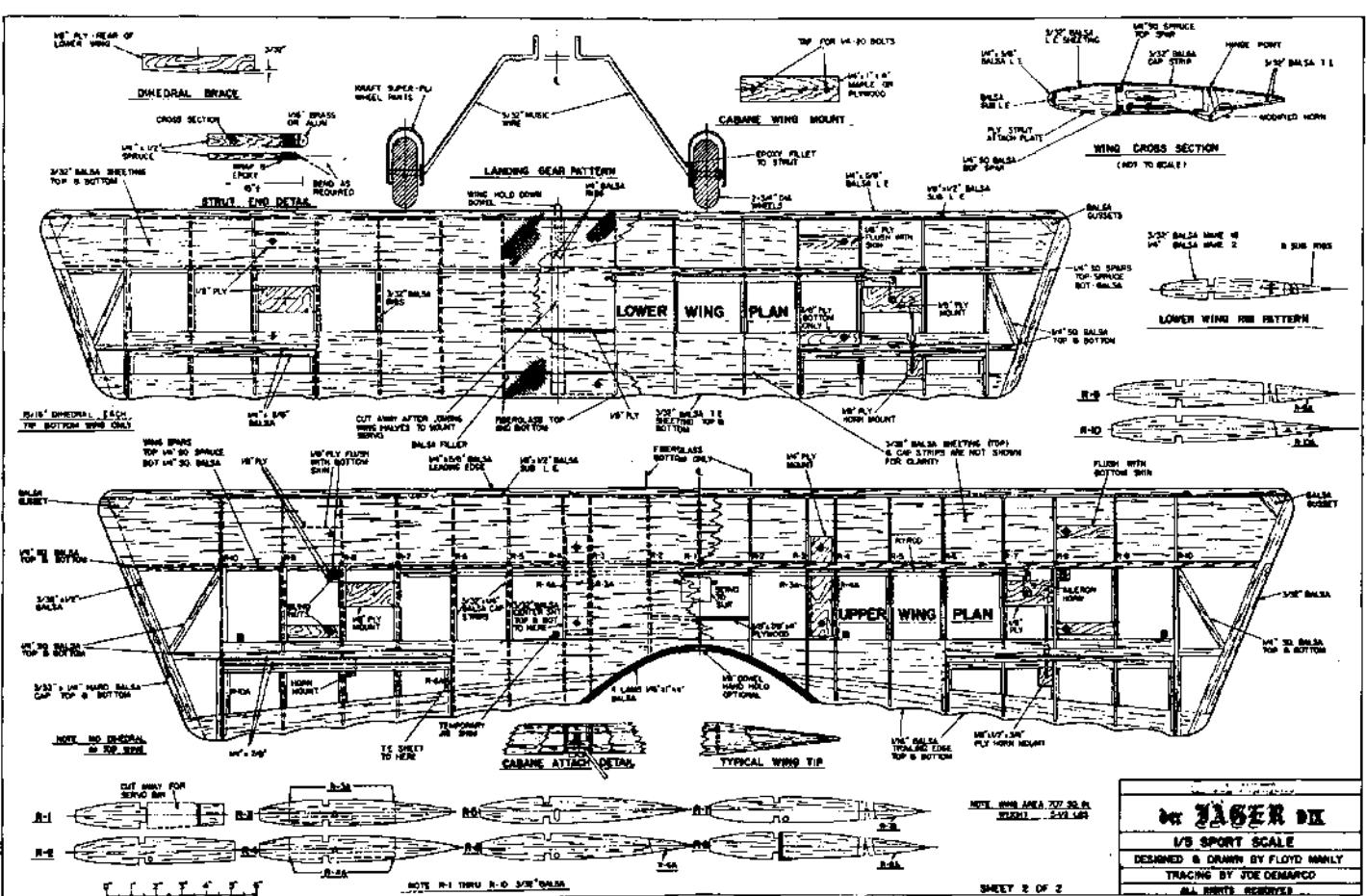
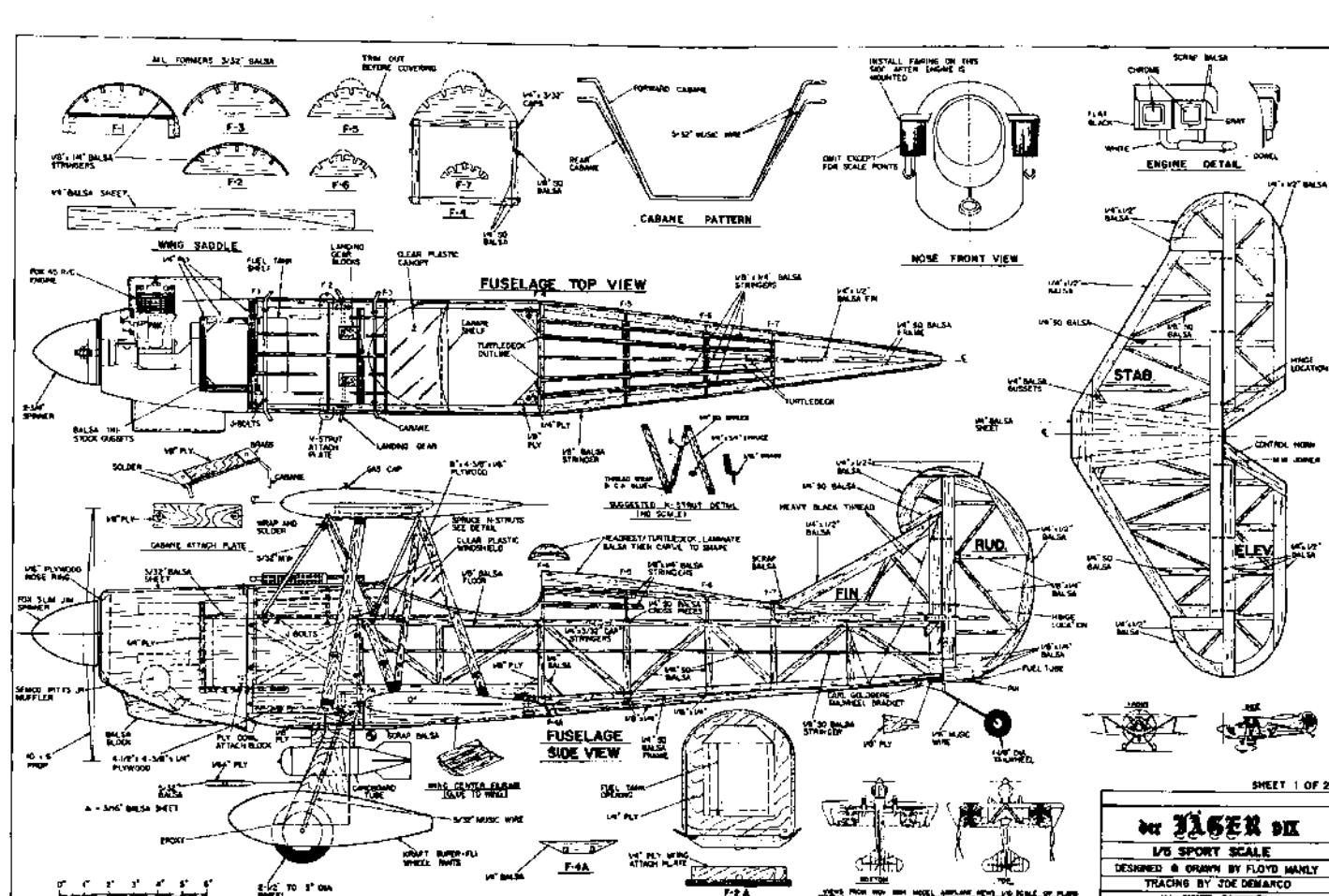
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DER JAEGER

(Continued from page 47)

Add the $\frac{1}{4}$ -inch ply wing dowel plate, and glue to the wing saddle. This will assure true, square sides. Cut and glue the bottom cross braces, as you pull and align the tail together. Use a pair of Perma-Grit sanding sticks back-to-back (or folded sandpaper) at the tailpost to shape the stringers and the post to the

proper bevel. Align and glue the posts together. Cut the $\frac{1}{8}$ -inch ply tailwheel plate and use thick cyanoacrylate glue. Flip the fuselage over and add the top rear cross braces. Each should be cut exactly the same size as its bottom mate.

Use hard balsa for the $\frac{1}{8} \times \frac{1}{8}$ -inch side stringers. Start at the front end and glue each side alternately, working toward the tail while making sure the overall alignment is still true. Add the $\frac{1}{4} \times \frac{1}{8}$ -inch stringers to the top and bottom edges in

the same way. Then add the aft bottom stringers.

The top turtledeck will take some sanding and fitting, but will finish up the aft fuselage. Don't glue it in place until the fuselage is covered.

The last thing to do before the wings are completed is to glue the bottom wing attaching blocks and their gussets.

Note: It will be easier to work on the top wing cabanes if the front formers F1A, F2A, and F3A and their stringers are left off for now. The best sequence is to complete both wings before continuing, so skip that part of the construction, then pick up here later.

Seat the bottom wing, checking for skew on overall alignment and for firm seating. Measure for, or use an incidence meter to make sure you have 0° incidence in relation to the fuselage thrust line. Drill, tap, and install the wing bolts. Bend the wire cabanes per the drawing outlines and attach to the ply shelf with J-bolts.

Make up the top wing mounting plates and install on top of the cabanes. Bolt the wing to the cabane and check for alignment, incidence, and fore/aft position in relation to the bottom wing. Make the Z-bend braces, then wrap each end to the cabanes with copper wire. Solder their bottom ends to the cabanes, then check the wing placement again before soldering their top ends.

Recheck all wing alignments again. This is the most important check you can make; a biplane will not fly right when its wings are not true.

Make a pair of V-struts approximately the same length shown on the plans. Wrap and epoxy the top attaching plates only, leaving the bottom plates as slip-fits until checking the relation of the top and bottom wings again. Make all necessary adjustments to the cabanes! Don't use the V-struts to push or pull the wing for alignment.

The interplanes are the last set of struts to make. These are mainly cosmetic, but be sure they don't induce a warp in your panels. Now that the cabanes are in their final positions, add the top fuselage formers and sheeting. Trial-fit the $\frac{1}{4}$ -inch ply landing gear plate. Cut and glue the landing gear blocks to former F2. Drill holes for the landing gear wire, fit the gear and attach with J-hooks. Glue the landing gear plate in place. Fit, carve, and epoxy the balsa chin plate over the landing gear plate. Except for the tailfeathers, this should finish up major construction.



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The top wing has no dihedral, and is easiest to build upside down over the plans because all of its attaching plates and cutouts are on the bottom. Cut out all the ribs in pairs. Do not cut the ailerons loose yet. Just notch them for cutting later.

Cut the $\frac{1}{4} \times \frac{1}{4}$ -inch spruce and balsa spars to length between outboard ribs. Cut the leading edge and sub-leading edge to length from wing tip to wing tip. Cut the leading edge sheets to length between outboard ribs. Pin down the top leading edge sheet over the plans and glue the spruce spar to it. Pin down a $\frac{1}{4} \times \frac{1}{4}$ -inch jig stick over the index marks on the plans.

Place each rib over the spar to rest on the jig strip and glue them to the spar only. *Do not glue to the leading edge sheet yet.* Glue the previously assembled leading edge to each rib, taking care that the ribs are square with the spar and centered on the ribs. Glue the bottom balsa spar to all the ribs.

Glue the bottom leading edge sheet to the leading edge and sub-leading edge. Soften the wood for bending by brushing water on its outside surface, then carefully bend it down to be glued to the balsa spar. Glue the rear sheet from the center rib to the outboard rib. This will cover the aileron hinge area to be cut loose later. Note on the plans that these are actually two pieces of balsa. Outline the center section cut out, curved portion of the wing with a French or flexible curve. Trim and sand it to shape after the top sheeting is added.

Complete the center sheeting, then cut through the sheet and the balsa spar carefully to add the cabane wing fixtures. Drill and tap them for the attaching bolts when the wing is ready to be fitted to the cabanes. Add the bottom cap strips to stiffen the wing sufficiently enough to turn it over for work to be completed on the top side.

After installing all the top sheeting and cap strips, the wing will be stiff enough to flip-flop it around as you need to add the strut attaching plates and bellcrank brackets. Mark the ailerons and cut them out with an X-Acto knife and saw, *after* completing both wing tips.

Make a suitable cutout and brackets for your servo. Add the pushrods and bellcranks, then do the final sanding on the scalloped trailing edge. These are the final steps for the top wing.

Build the bottom wing in the same sequence as the top wing, however, build it in two halves with shorter pieces of material because of its dihedral.



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barassing thunk! The wheel pants and medium short grass just wouldn't let her build up enough speed for elevator control.

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(Continued on page 101)



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DER JAEGER

about 10 seconds she resembled a drunken bumble bee, but she was flying!

I have to brag that the trim was almost right on. I put her through the paces and she high-stepped all the way. She did everything I had expected of her—snap rolls, inverted flight, knife-edges, and spins. Throttling back for slow flight, she coasted around nose-high, steady as a rock, except for a tendency to yaw. Earlier, during the loops, I noticed that she wouldn't hold a line over the top, but I blamed it on the strong winds. Later investigation and discussion revealed that the left ailerons weren't aligned. Two turns on the bottom clevis solved the problem.

The landing was an attention-getter. The Der Jaeger is a "dirty" aircraft in that it has a lot of wires, struts, pants and a bomb to slow it down. You have to come in under power with the nose up, or dive her to the numbers if you're dead-stick. She slows down real quick! The first landing ended the way the first takeoff attempts started, only in reverse. A beautiful flare, an almost three-point touchdown, a nice roll out, and a nose-over just before the tail was ready to drop. Thank you for glass props.

I had proved that she would fly; quite well from the remarks overheard, so I didn't push my luck with high-power slow-speed takeoffs anymore. That would be begging for a snap roll. Later flights from a paved runway were so scale-like that they sent tingles up the spines of all gathered biplane nuts!

*The following is the address of the company mentioned in this article:

Fox Mfg. Co., 5305 Towson Ave., Fort Smith, AZ 72901. ■

SCHLUTER CHAMP

(Continued from page 65)

Head Lock Remote on one of the engine mounting bolts to allow starting with the cabin in place. The fan shroud is the same nice unit found in the Superior. It consists of two interlocking molded pieces and a vacuum-formed extension which is trimmed to fit the engine and bolted to one half of the shroud. The extension should be at least $\frac{1}{4}$ inch from the engine or it will melt.

Construction continues with the tail-boom, and tail rotor gearbox, which are identical to the Superior.

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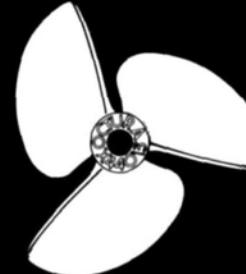
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