Modelers seem to have a special affinity for this aircraft. Maybe it is because so much balsa was used in its construction. The model at 1/12th scale uses two .10 engines and four-channel controls. It's to scale except for the out-thrusted nacelles, a feature which gives the model amazing one-engine-out performance. ■ **Frank B. Baker**

Distinctive wing plan shows off nicely when it is aloft. If only it had retracts, the illusion would be complete.

The model Mossie really is of fair size, evident when the author poses with it. Site is Bill Kettle Memorial Field. Engine out-thrust, a big factor in one-engine-out safety, is barely noticeable.

THE PROTOTYPE is one of the best known British aircraft of World War II. For most of the war it was the fastest thing in the air. It was involved in many daring exploits, such as putting a bomb through the front door of the Gestapo headquarters in Oslo, Norway. The Mossie was also flown by a number of squadrons in the U.S. Army Air Force.

A few still survive. Air Progress magazine has reported that Kermitt Weeks of aerobatics fame has one in Florida, but its flying status was not given. Amazingly, the prototype Mosquito survived the war

The seemingly short nose moment is very deceiving. It actually is quite long for balancing, as the author found out that it was a bit nose-heavy at first.

DH98M

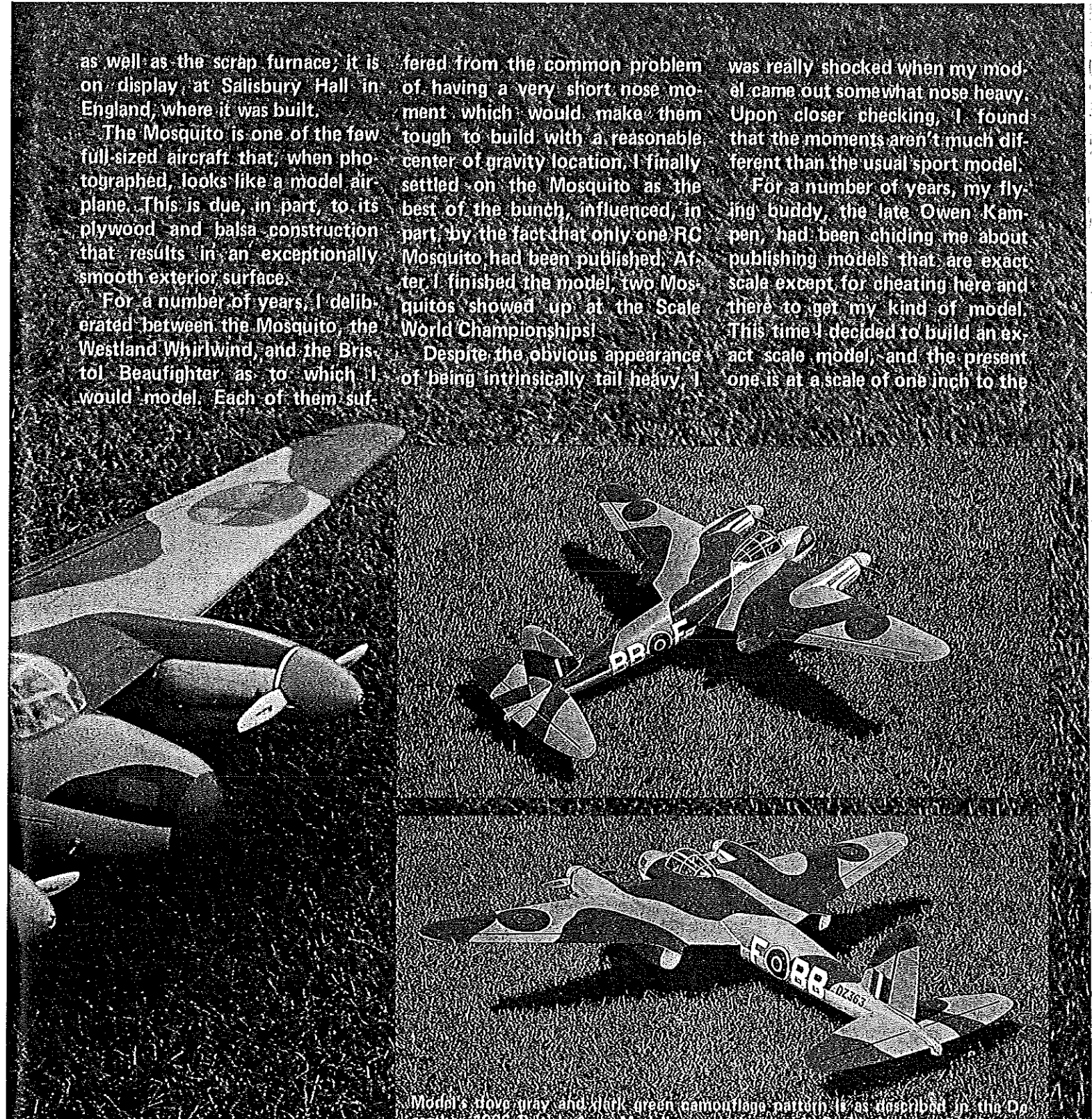
as well as the scrap furnace; it is on display at Salisbury Hall in England, where it was built.

The Mosquito is one of the few full-sized aircraft that, when photographed, looks like a model airplane. This is due, in part, to its plywood and balsa construction that results in an exceptionally smooth exterior surface.

For a number of years, I deliberated between the Mosquito, the Westland Whirlwind, and the Bristol Beaufighter as to which I would model. Each of them suffered from the common problem of having a very short nose moment which would make them tough to build with a reasonable center of gravity location. I finally settled on the Mosquito as the best of the bunch, influenced, in part, by the fact that only one RC Mosquito had been published. After I finished the model, two Mosquitos showed up at the Scale World Championships!

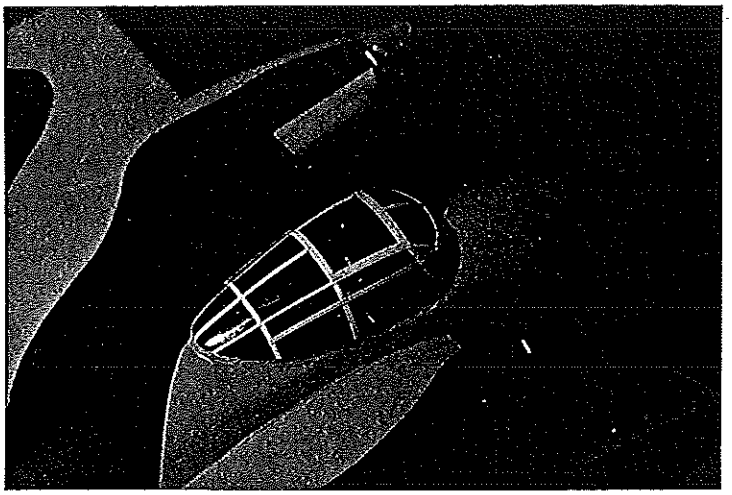
Despite the obvious appearance of being intrinsically tail heavy, I was really shocked when my model came out somewhat nose heavy. Upon closer checking, I found that the moments aren't much different than the usual sport model.

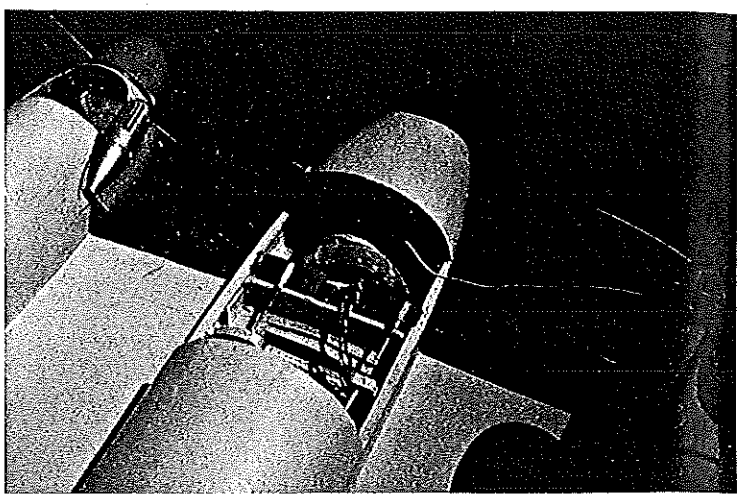
For a number of years, my flying buddy, the late Owen Kampen, had been chiding me about publishing models that are exact scale except for cheating here and there to get my kind of model. This time I decided to build an exact scale model, and the present one is at a scale of one inch to the



Model's dove gray and dark green camouflage pattern is as described in the December 1966 British Aero Modeller magazine and in Profile Number 52. Control surfaces are of scale size and very effective.

losquito



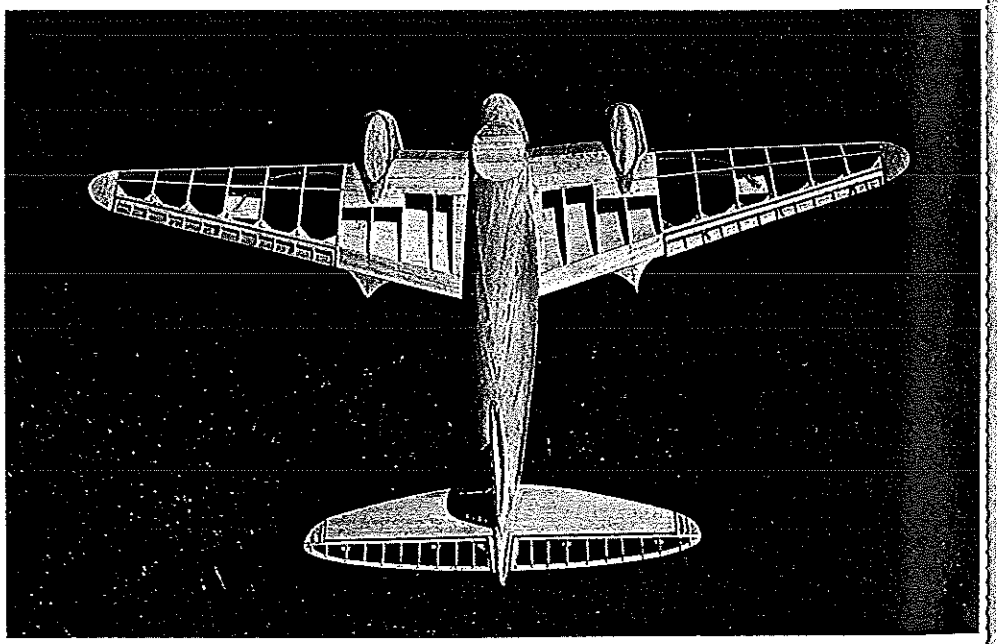


Left: The canopy is made of 1/32-in. butyrate sheet that is heated and shaped over a balsa form. The material is from Sig Mfg. Co. Right: Radio receiver and battery pack are tucked in the front fuselage ahead of the servos. There's a lot that can be learned from studying the pictures.

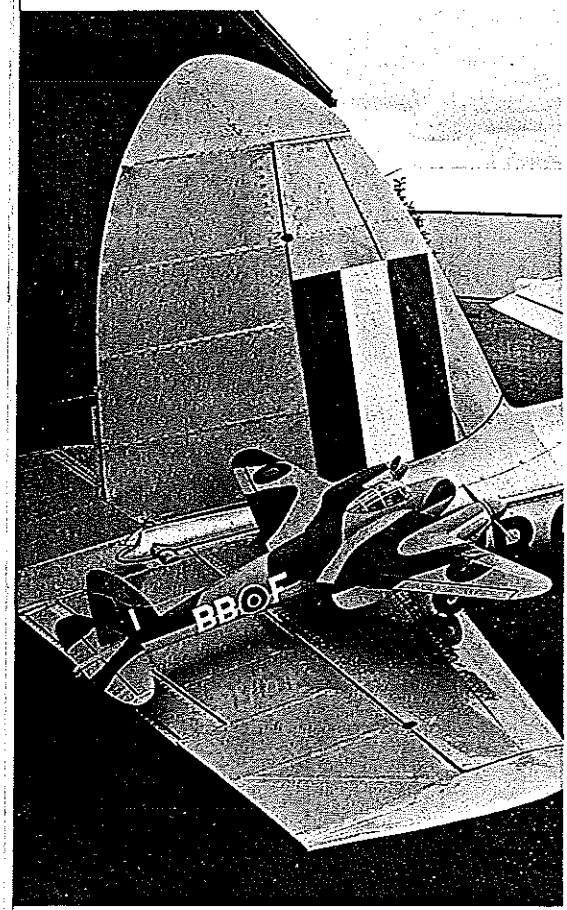
foot for a 54-in. wingspan.

I started from the excellent drawings that appeared in the December 1966 issue of *Aero Modeller*. During construction, however, I couldn't find any scale spinners and had to settle for some C. B. Associates units. They were deeper than scale, so I had to cut out about ⅛ in. of the nacelle so that the fronts of the spinners were in the correct position (there went my exact scale!). The plans show both the scale spinner and nacelle as well as the shortened version.

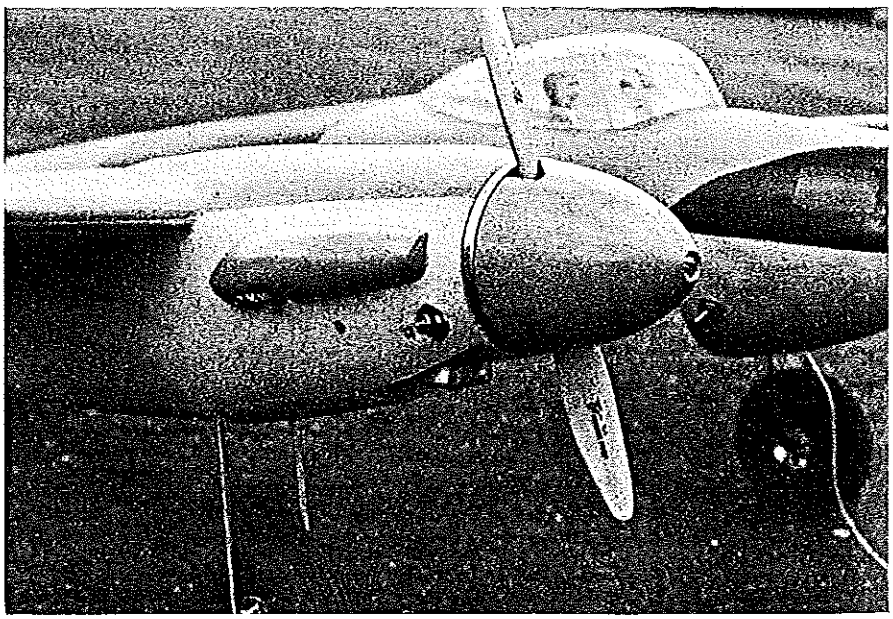
Every time I publish a twin-engined model, I get phone calls from modelers ask-



Completed airframe, ready for covering. Note that ailerons are sheeted only on the bottom. Also note the plates for aileron feed-throughs. As the author says, the fuselage is a balsa bender's delight.



Distinctive De Havilland tail is common to the Mosquito and Jerry Miller's full-size Chipmunk, on which the model seems to be lifting a ride.



Well-hidden engines get adequate cooling. Filler pipes for metal tanks are under the exhaust shroud.

CHUCK WOOD by Hank Clark

"NO WEAKLINGS WANTED"

1/16" BALSA T.E.

1/32" SHEET COVERING FIN AND STABILIZER ONLY

1/4" SQ. DOUBLED FOR FIN AND RUDDER POSTS SAME ON STABILIZER, ELEV.

1/2" STOCK L.E.

1/16" BALSA RIBS

3/32" M. WIRE INTO RUDDER

ELEVATOR HORN

3/32" SHEET BALSA FUSELAGE WRAP

MOULDED CANOPY

SOLID BALSA NACELLE TOP

1/8" SHEET FORMERS

1/8" X 3/8" TOP KEEL

RUDDER HORN

ONE PIECE SPAR THRU

1/4" SQ. KEEL

1 1/2" TAILWHEEL ON 1/16" WIRE

1/8" X 1/4" STRINGERS IN FUSELAGE

HOBBY LOBBY FLEX CABLE

1/16" SHEET BOTTOM ONLY TO OUTER NACELLE

AUTO BODY PUTTY FILLET FAIRING

3/8" STOCK SPAR (X-SUGGEST THRU TO WING ROOT)

3/8" STOCK AILERON SPAR

1/16" SHEET BOT. ONLY

ROBART HINGES

OIL COOLER COWL FORMS

NOSE BLOCK HOLLOWED OUT

ACCESS HATCH 3B TO 6B

1/8" X 1/4" SPRUCE

1/4" PLYWOOD L.E. DIHEDRAL BRACE

HATCH CLIPS

.10 FSR ENGINE

3/8" X 1/2" MAPLE ENGINE MOUNTS

3/16" PLYWOOD NOSE AND FIREWALL

METAL TANK

3 1/2" DUBRO WHEELS

1/8" PLYWOOD L.G. FORMERS SANDWICH 5/32" M. WIRE L. GEAR

1/16" BALSA WEBS 3 RIBS BEYOND NACELLE

1/16" PLYWOOD DIHEDRAL BRACE THRU TO OTHER NACELLE (OR LONGER)

1/16" SHEET WING TOP BACK TO SPAR ONLY

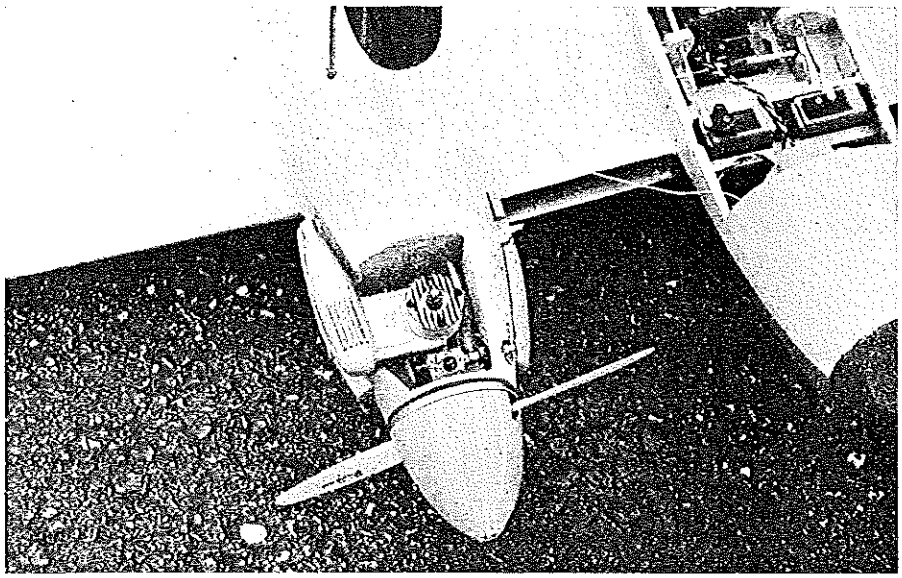
3/8" X 3/4" BALSA L.E.

1/8" X 1/4" TOP SPUCE TO C/L

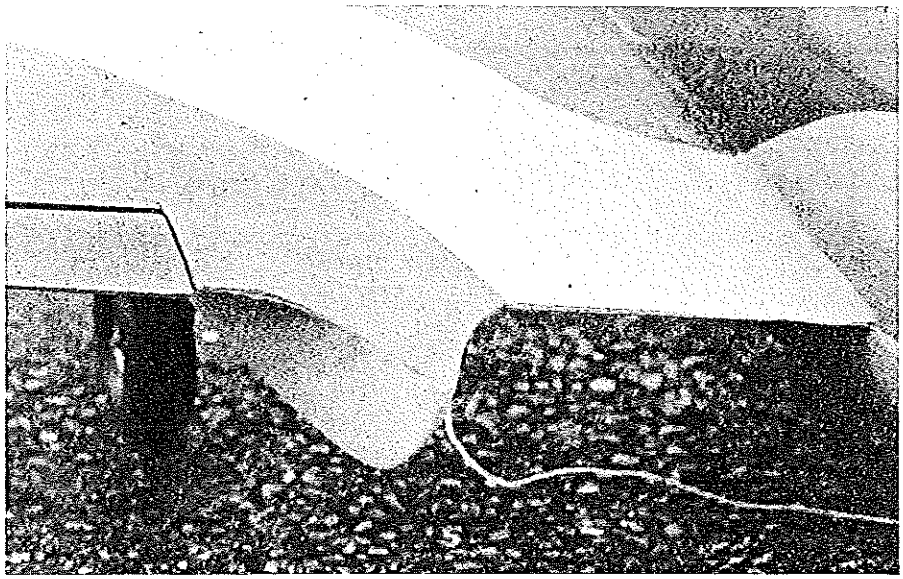
1/4" SQ. SPRUCE BOTTOM SPAR

BALSA BLOCK

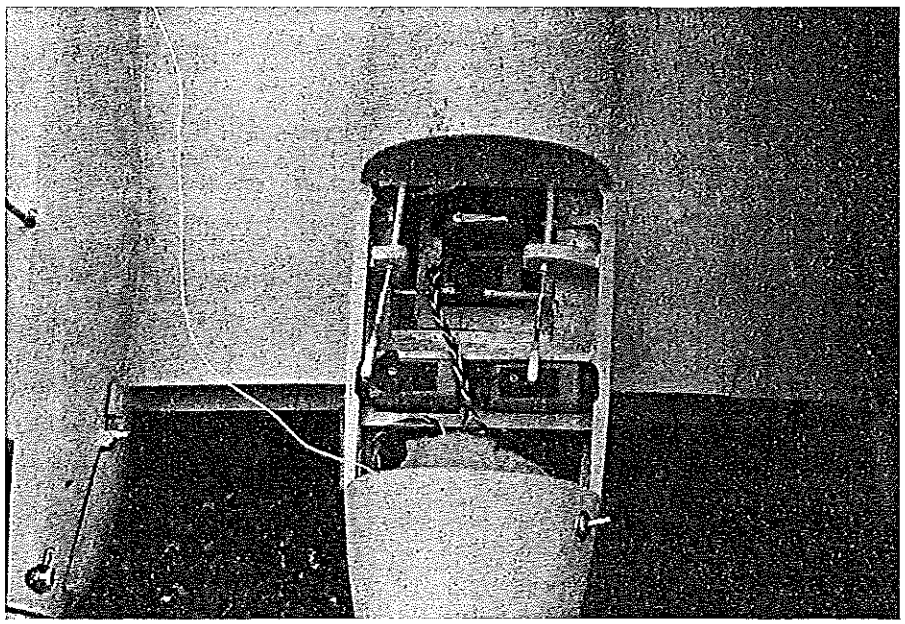
3/32" SHEET ALL RIBS



Half-round tunnel in nacelle provides clearance for the muffler, the latter a must for peaceful flying.



Aero Modeller magazine says that most modelers forget to round the tip of the nacelle rear end. The full-size nacelle has unusual contours to provide airflow control.



Plans show an enlarged hatch to improve access to the two rear servos. Rudder and elevator cables must be installed before the fuselage is sheeted.

ing about using bigger engines. Each time I explain that there is a balance between the overall size, wing area, weight, and engine displacement that was used as the basis for the design. If I had wanted bigger engines, I would have designed the model for them. The callers never seem to be convinced, and I'm sure there are some overpowered "bombs" out there that should have been docile sport models. Anyway, I designed this model for OS Max .10FSR engines, and it flies perfectly at a weight of 4½ pounds.

Construction. While not difficult, the Mosquito must be built in the proper order. Since this model is not for a beginner, I will not give a step-by-step account but will highlight some of the major things that must be done in proper sequence, as well as some of the innovations.

Wing. You must begin here. Construction is conventional. Build the basic panels, and install the nylon tubing for the motor controls (Sullivan 507 GRC-3) and the ailerons (Hobby Lobby HLH 805). Be sure to bring the motor control tubes out the bottom of the wing at the leading edge. Note that the right control tube is on the inside of the nacelle while the left one is on the outside.

Butt-glue the wing panels together with the proper dihedral (2 in. at Rib 12 of each wing). Use a razor saw to cut a 1/32-in. slot through Ribs 1-5 behind the spruce spars. Put plenty of glue in the slots, and slip the 1/32 plywood dihedral brace in place; be sure to bend it (but not break it) at Rib 1. When the glue is dry, soak the 1/16 plywood dihedral brace in water; put it in a vise, and crease it at the center line to the proper bend. When glued in place, you will have a strong but lightweight dihedral brace that will drive Hank Clark to despair!

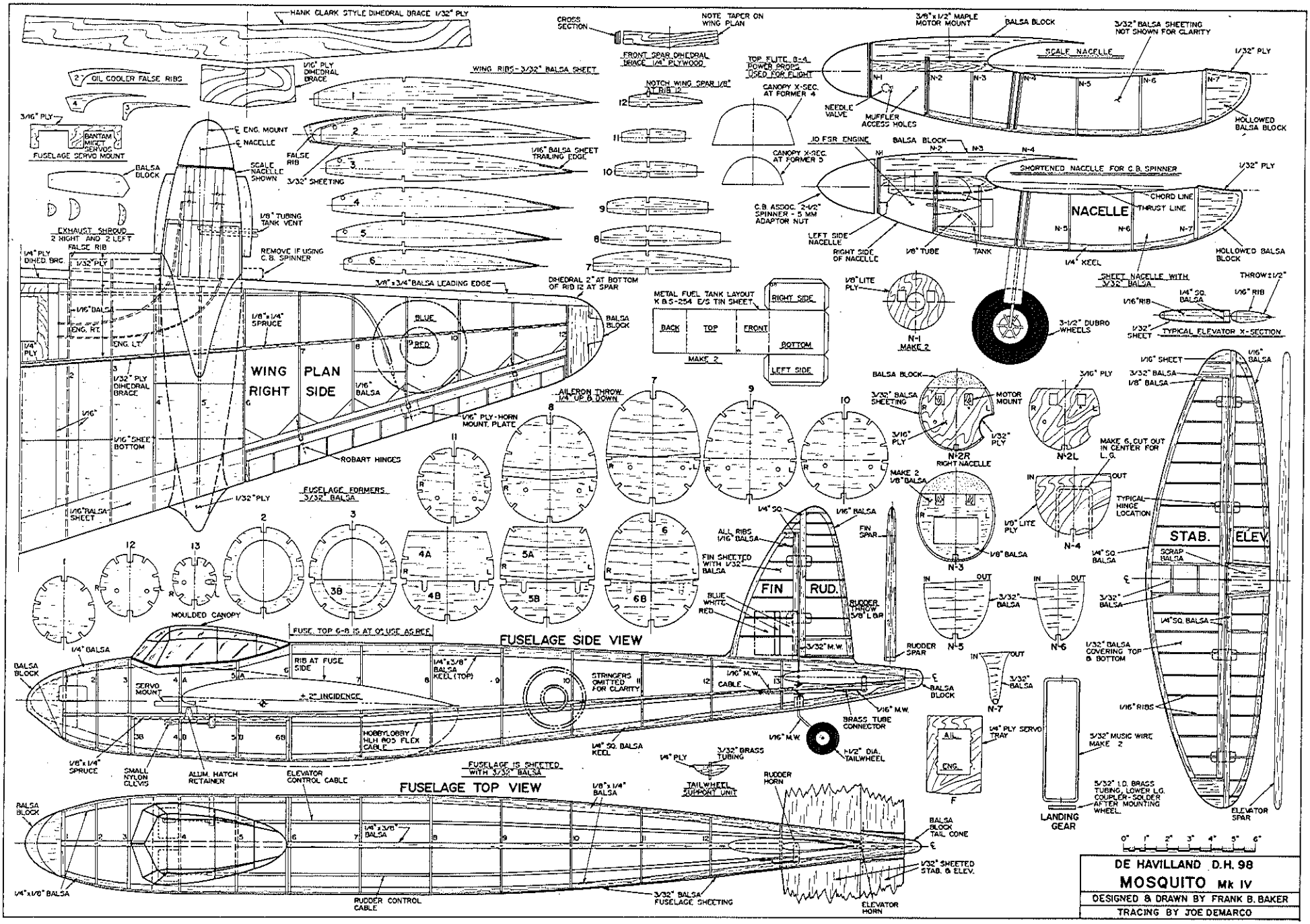
Install the plywood servo mount, and put connectors on the control cables. Slip the cables in the nylon tubes, mount the engine and aileron servos, and check all controls for free and easy motion.

Once all the controls work smoothly, sheet the top and bottom of the wing. Pay attention to the plans, as there is little 1/16 sheet on top of the wings; 3/32 sheet is used forward of the spars. Set the wing aside for now.

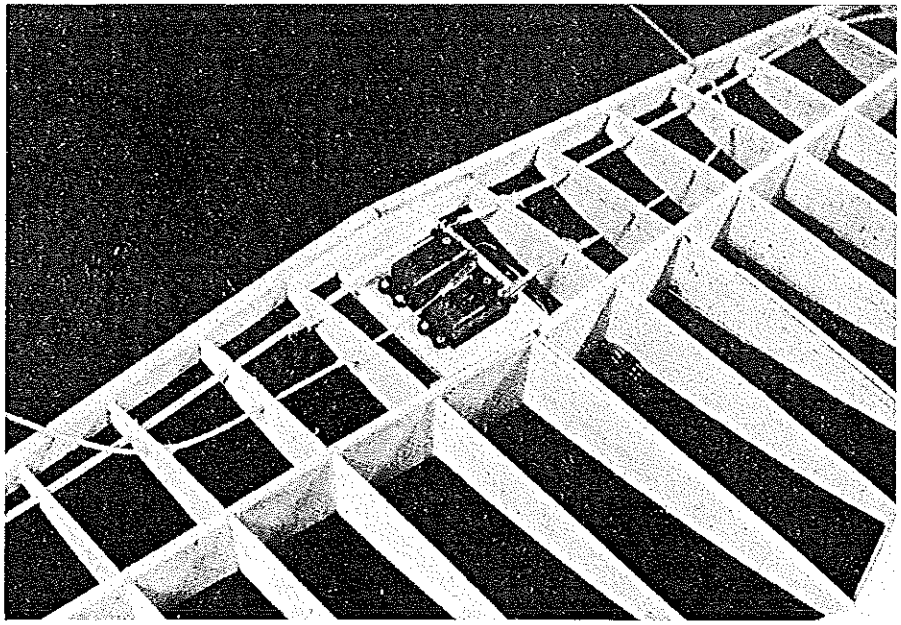
Fuselage. Build the ¼ balsa keels. The top one has a lot of changes of directions; I made it by gluing sections together to form the complete keel. The bottom keel is cut from ¼ sheet (F1-F8); a piece of ¼ sq. is spliced on at F8. A similar approach is used to make the ⅛ × ¼ side keels.

Make all the fuselage formers. Use a saw to almost cut out the wing slots in Formers F5a-F8 (leave enough material so the formers hold together). Assemble all the formers on the top keel. When the glue is dry, install the side and bottom keels as well as the top two stringers.

Once the basic fuselage is together, cut out the wing slots, and slip the wing into place. The top of the fuselage from F6-F8 is the zero-degree reference line. Set the wing at +2



FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 172



Install both the aileron and engine control cables before sheeting the wing leading edge.

degrees (a Robart Incidence Meter is good for this), and pin it in place. Also check to see that it is perpendicular to the fuselage center line. When all is square, glue the wings to the fuselage formers.

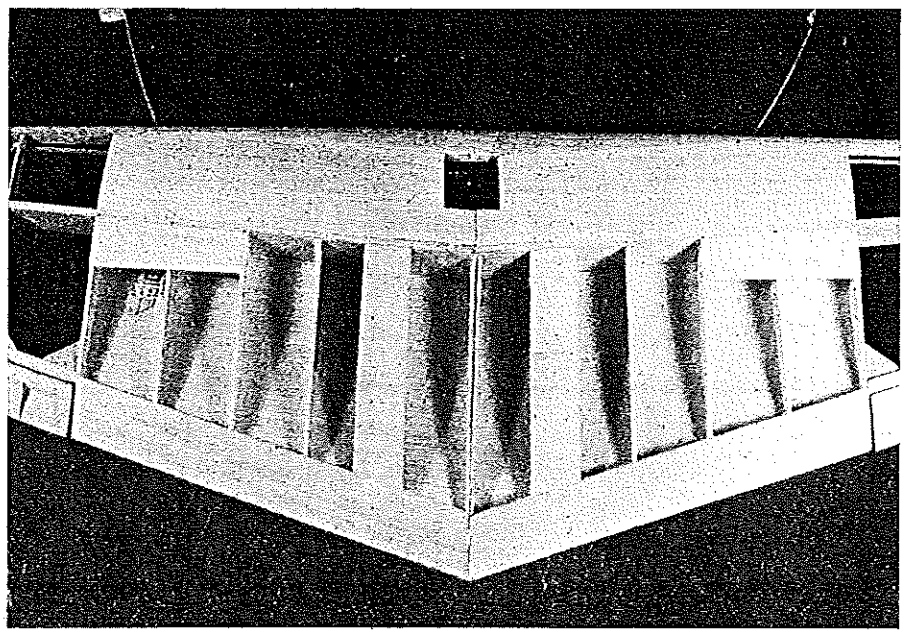
Glue in all the stringers. Leave enough space between Formers F3 and F3b as well as F6 and F6b for a razor saw—so that you can cut out the belly hatch later. Be sure to install the nylon tubes for the rudder and elevator controls at this point.

Once the stringers are in, the whole fuselage is sheeted with 3/32 balsa. I love to bend balsa sheet, and this fuselage is a bender's delight. What I do is cut 3-in by 36-in. strips of heavy artist's paper and use them to find out how the sheet will fit (a lot cheaper than trial and error with balsa!).

Start by fitting a paper sheet from F6 to the tail, and align it with the ⅛ × ¼ side keel. Use the paper to find out the fit around the wing—cut a V-slot at F8 to relieve the buckling due to the side-view bend. Also trim off the excess at the top and bottom center line. Once the paper fits, select 3/32 balsa that is lightweight and able to bend; use the pattern to cut the sheet.

Soak the balsa in hot water. Put glue on all the stringers and formers to be covered by the sheet. I use Pica Gluit, as this really hangs onto the wet sheets. Pin the sheet in place, trim where necessary to get a good fit around the wing, and gently bend until it conforms with the fuselage. Then use masking tape to hold everything in place.

Do the two side sheets first, and check the fuselage for alignment as each sheet is glued. It is easy to get a bent fuselage if you don't continually check alignment! Once the two side sheets are in place, the remainder is very easy. I covered the whole fuselage using only five sheets. Once fully sheeted, cut out the cockpit area. Use a flat sheet to form the top. Also cut out the bottom access hatch. A few locator pen marks during sheeting will make this a lot easier.



The top sheeting is omitted where it's not needed, as a weight-saving measure. Sheeting at second ribs provide an anchor for the covering. A light wing loading makes for good flying.

Engine nacelles. Cut out all the formers and the ¼ sheet keel. Mount the wheels on the landing gear, and epoxy-glue the N4 sandwiches together with the landing gear wires in the center layer. Use epoxy glue to make a unit consisting of Formers N1-N3, the ⅛ × ½ maple engine mounts, and the metal fuel tanks. Note that the tank vents face to the right on both. Make a right-handed and a left-handed unit; check against the plans to make sure you have done so.

In order to get the necessary three degrees of engine out-thrust and not make the nacelles look funny, they are built with the insides having more curvature than the outsides.

Glue formers N4-N7 to wing sheeting, and install the keel. Use epoxy to glue the mount unit to the leading edge of the wing and to the keel. When doing so, place the fuselage on the workbench with the top of F6-F8 at zero degrees. Use a level to ensure that the engine mounts also are at zero degrees up and down. Use a protractor to make sure the engines have three degrees of out-thrust.

You can now sheet the nacelles with 3/32 balsa with the same technique as on the fuselage. The top block is shaped and fitted next. Carve to shape and hollow-out the nacelle tail cone. Note that the 1/32 plywood top is curved. The actual Mosquito has a rather peculiar shape to the nacelle wing fillets, which results in a non-symmetrical nacelle shape at the trailing edge of the wing (some sort of a vortex control scheme). I used auto body putty to form the fillets.

When the nacelles are finished, install the false ribs and the 1/32 plywood and 1/16 balsa that form the wing between the nacelle and the fuselage. Sand the rear of the sheets until they fair smoothly into the wing. The 1/32 plywood is used in this area to prevent breakage when you pick up the airplane.

The tail surfaces are of conventional construction. The airfoil shape is sanded in after assembly. Sheet the vertical fin and stabilizer with hard 1/32 balsa. Install the control horn in the elevator but not the rudder. Make up the tail wheel assembly, including the steering arm. Remove the fuselage above the lower surface of the stabilizer and elevator.

Cut a slot in the lower keel, and glue the tail wheel assembly in place. Insert the proper length of control cable into the rudder tube, install 1/16-in. music wire into the tail wheel steering arm, and solder it to the control cable. Insert the second piece of 1/16-in. music wire into the rudder horn, and also solder it to the rudder cable. Be sure to get the rudder horn aligned with the tail wheel steering arm.

Solder the 1/16-in. music wire and the connector to the elevator control cable, and install it in the nylon elevator tube. Now we need to pay attention. Poke the 3/32-in. rudder control horn wire through the stabilizer from the bottom, hook up the elevator horn to the control cable, and place the whole works in the fuselage. Shim the fuselage until it is level sideways and F6-F8 is at zero degrees. When

ter's experience could have put it all together for us in such an enjoyable way.

John Worth, Executive Director
Academy of Model Aeronautics

Editor: The World of Model Airplanes, *regularly priced at $19.95, is available for $16.00 from AMA HQ, Supply & Service Section, 1810 Samuel Morse Dr., Reston, VA 22090.*

Mosquito/Baker

Continued from page 37

plywood half-rounds, and sand the edges flush with the nacelle. Mount the mufflers and check for clearance; ⅛ to 3/16 in. is proper. Also finish the throttle linkages and check for proper motion. Trim the exhaust shrouds to clear the mufflers on the left side and the tank vents on the right side. At this point construction is complete.

Finishing. One of the difficulties with Scale models is that the Mylar film coverings do not come in the proper camouflage colors. The only Mosquito I've ever seen was assigned to an RAF vice-marshall. It was painted a beautiful medium blue and had a hand-rubbed wax finish. I was tempted to use this scheme, but didn't as I felt that few modelers would recognize it as legitimate. However, see Profile No. 52 for examples.

The airframe was given several coats of clear dope, and the sheeted areas several more coats of Aerogloss Balsa Fillercoat. Repeat this with sanding after each coat until the sheeted areas are smooth. I covered the complete model with silk, and brushed on clear Aerogloss until the pores were filled. Once the base finish was done, I glued on the exhaust shrouds. I then sprayed on two coats of aluminum Aerogloss with a light sanding after each coat.

Next, I sprayed the whole airplane with one coat of Cessna gray. The dark areas were masked off and given one coat of Stinson green that had been darkened with flat black. The bottom of the whole airplane was given a coat of Cessna gray lightened with a lot of white. There should be a definite contrast between the two grays.

I carved a cockpit canopy from a balsa block and used it as a male mold. To mold the canopy, I used Sig butyrate sheet material that softens at about 220 degrees; it pulls down nicely around the form. I used one of the instant glues to hold the canopy onto the fuselage, and that was a mistake. The glue caused the inside of the canopy to fog in places, and I couldn't get inside to remove the fog. The Williams Bros. 1-in.-scale pilots are the proper size, and I used two in the cockpit. The copilot sits slightly behind the pilot.

Flying. In order to get enough propeller outside the spinner, I used Top Flight 8-4 wooden Power Props. They have a fairly thin blade, and the OS Max .10s can turn them at a reasonable rpm.

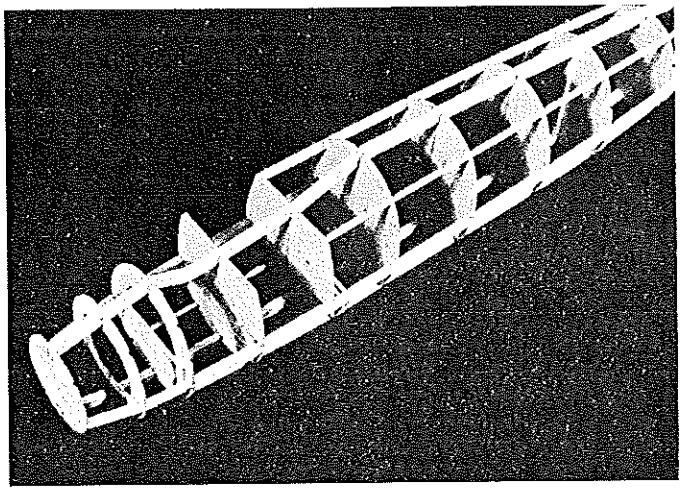
I must remind the reader that this is a Scale model, and it must be flown with respect. On takeoffs the tail will lift rather quickly, but do not break ground until a lot of speed has been built up. Then use just enough elevator to lift off and climb at a modest angle of attack. Once airborne, the Mosquito is quite fast.

The narrow, pointed tips make it quite sensitive to ailerons. This is especially noticeable at higher speeds. I would experiment with throws until the ailerons are effective without being sudden.

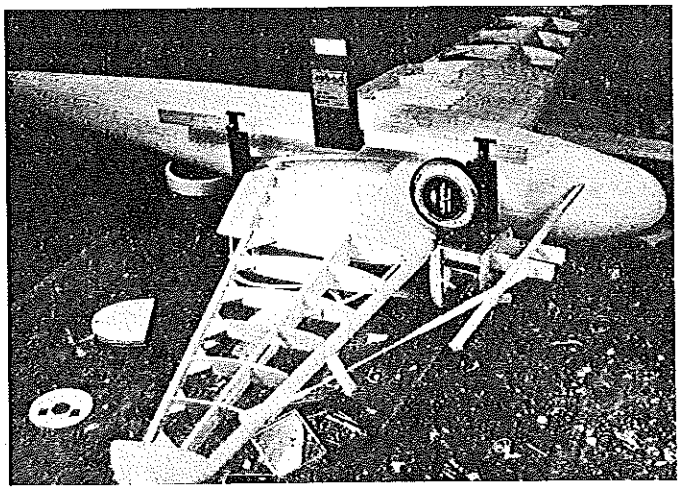
Landings are really fun. Set up a long, flat approach, and control the descent with the throttle. I let it keep flying in a level attitude until the wheels touch, and then I go to full engine idle.

The single-engine performance is outstanding. On several flights I have lost one engine and not realized it until on final, where I could see the stopped propeller.

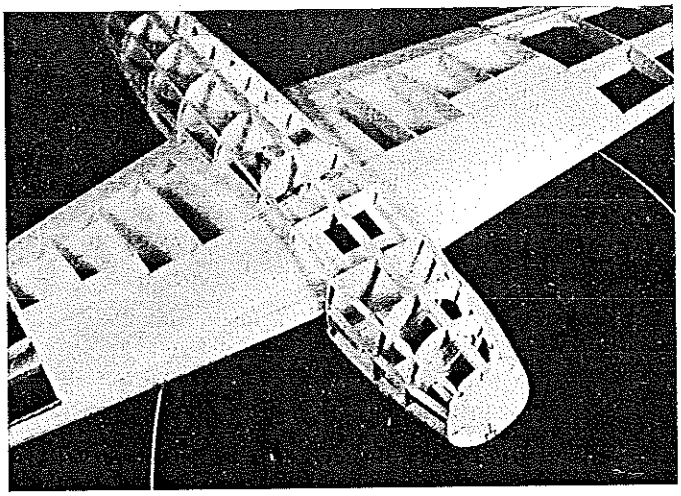
A final caution: the gray color and the camouflage is quite effective, and it is easy to lose orientation if the plane gets too far out. I punched-in the Mosquito once due to visual misorientation—hardly scratched the plane, though. Keep it in close. It is a lot prettier up close, and you can see what you are doing. Overall, the Mosquito is a very smooth-flying model, and it looks very scalelike in the air. My ultimate goal is to install retracts. What a sight that would be in the air!



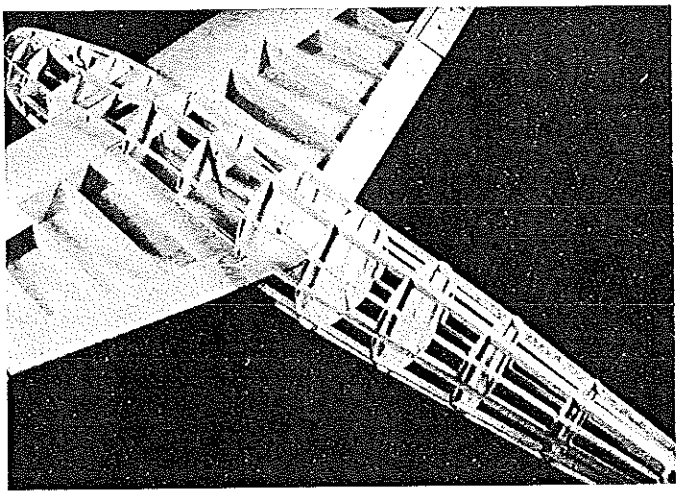
Basic fuselage is of crutch construction with ¼-in. longerons cut from sheet. Though not a beginner's model, it isn't overly complex.



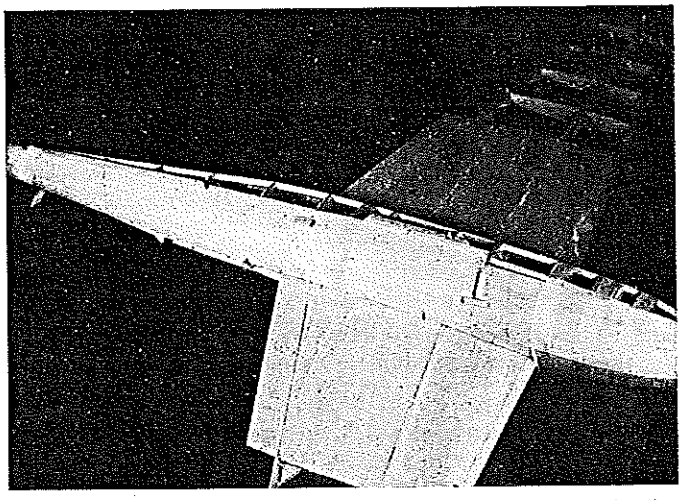
Alignment is very important. Robart Incidence Meter reads +2½° while level reads zero. Visually check for level engine mounts with ¼ sq.



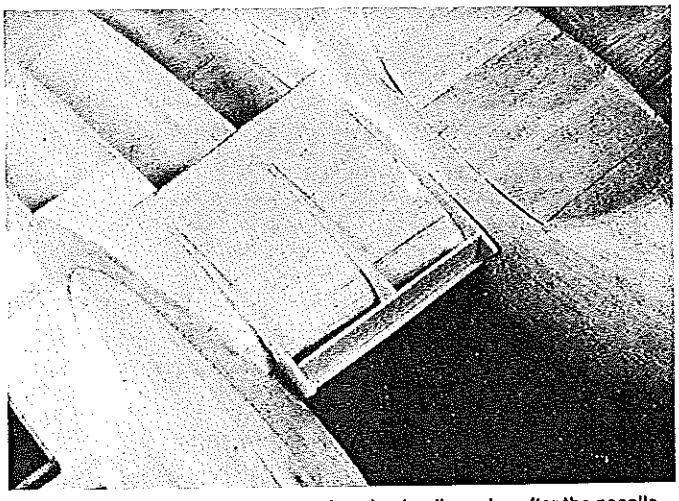
Wing mounted in fuselage framework before sheeting. Note hole for servos to protrude through the top sheeting.



Fuselage formers are removed with razor saw cuts before slipping the wing in place. Make sure alignment is correct before gluing together.



Pins, ¼ sq. balsa, and masking tape are used to hold the fuselage sheeting of wet 3⁄32 balsa in place while the glue dries.



The oil cooler section is added onto the wing leading edge after the nacelle top has been shaped.

properly positioned, actuate the control cables from the belly hatch area. Make sure that both the rudder and tail wheel swing properly and that the elevator goes up and down. When all is well, glue the stabilizer in place; be sure to use a bit of masking tape to hold on the rudder horn (if it falls off the 1/16-music wire, you are in deep trouble!).

Replace the fuselage above the stabilizer and elevator with a balsa block, sand to fit, and install the rudder and fin. Ensure that the tail wheel and the rudder are in alignment. Minor differences can be taken care of by bending the rudder horn wire. Finally, add the tail cone. When all the glue is dry, install the rudder and elevator servos and the associated connectors, and check for throws and freedom of movement. I used some scrap pieces of ¼ balsa to support the forward ends of the nylon control tubes.

To finish off the belly hatch, cut F4 and F5 to get proper clearances, and install the .020 aluminum hatch keepers. I glued small blocks of spruce inside the fuselage sheeting behind F4 to accept the screws that hold the hatch.

Install the two OS Max .10FSR engines, and locate the holes needed to mount the mufflers. Cut out the wedge-shaped pieces from the sides of the nacelles, glue in the 1/32

Continued on page 145