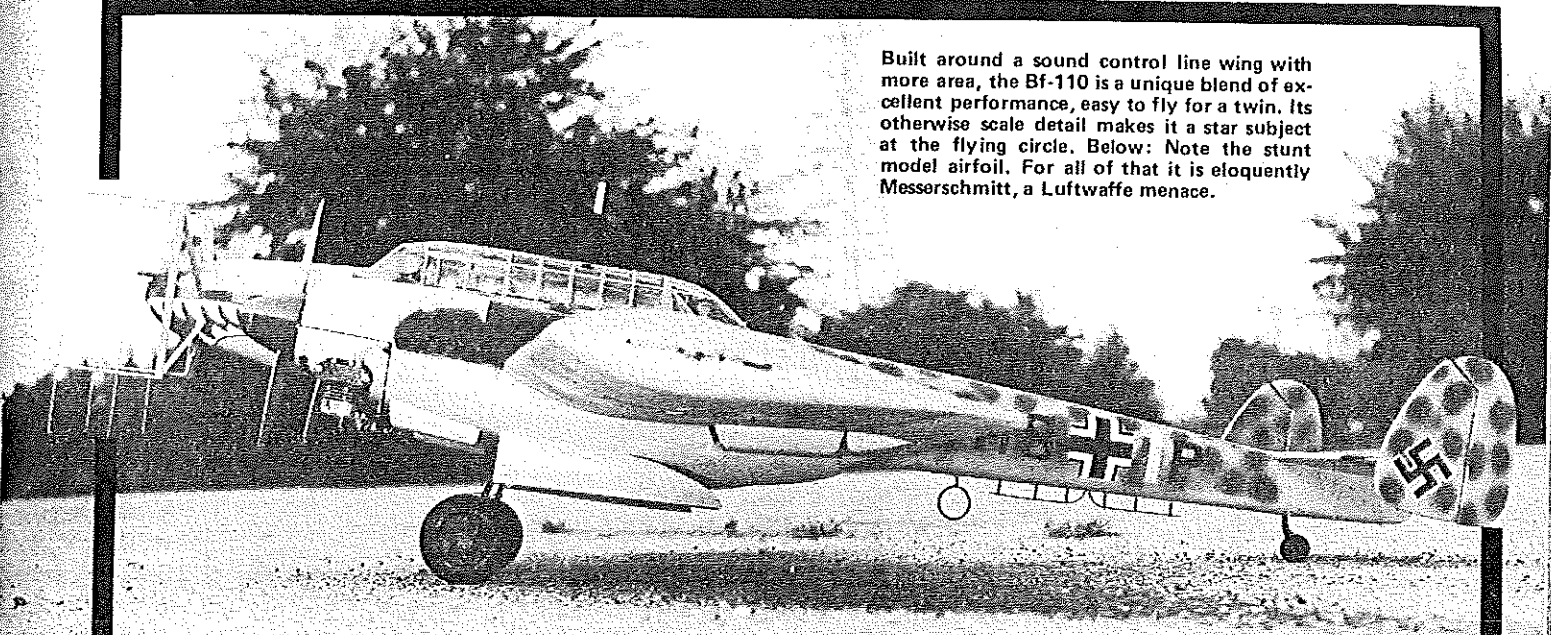
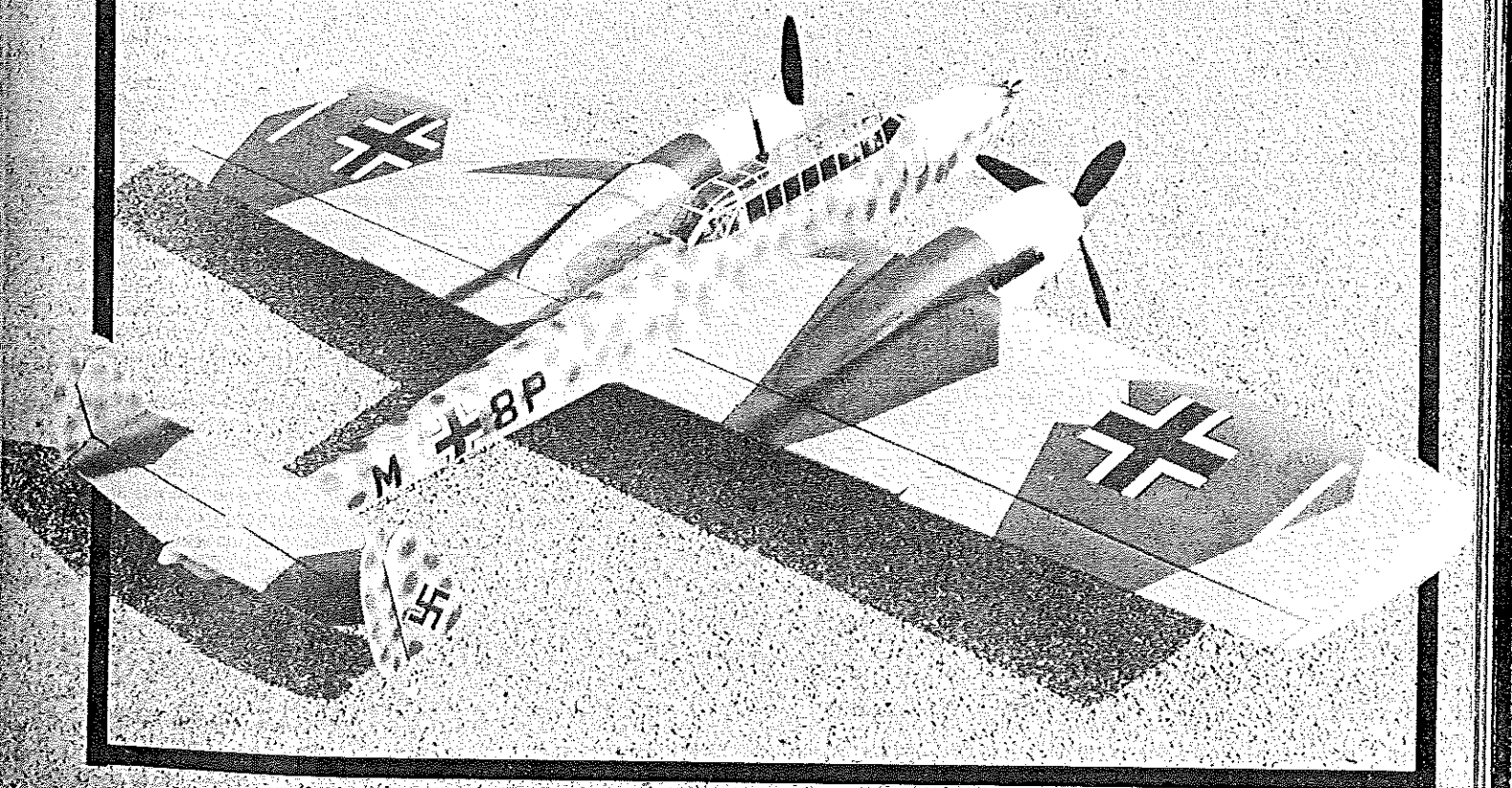


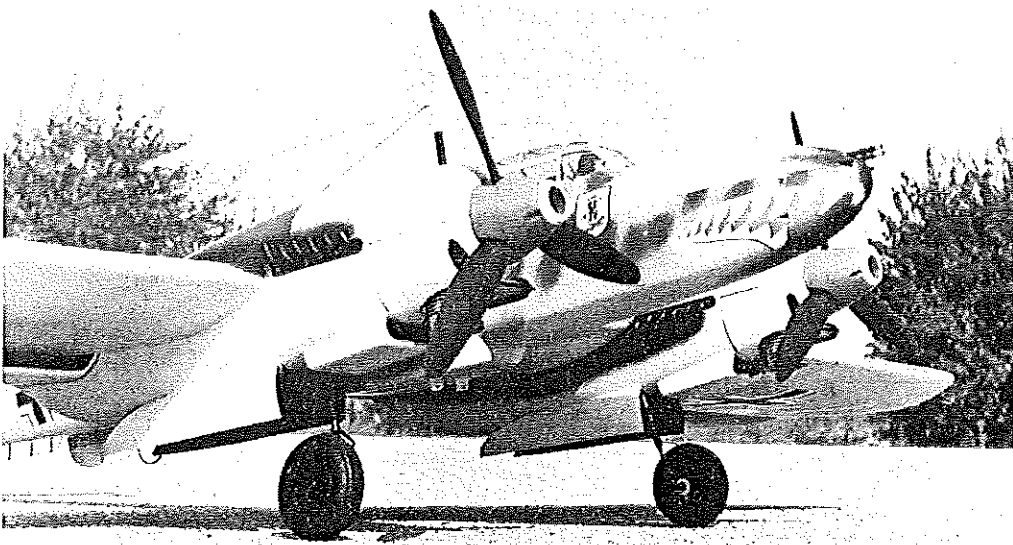
Built around a sound control line wing with more area, the Bf-110 is a unique blend of excellent performance, easy to fly for a twin. Its otherwise scale detail makes it a star subject at the flying circle. Below: Note the stunt model airfoil. For all of that it is eloquently Messerschmitt, a Luftwaffe menace.



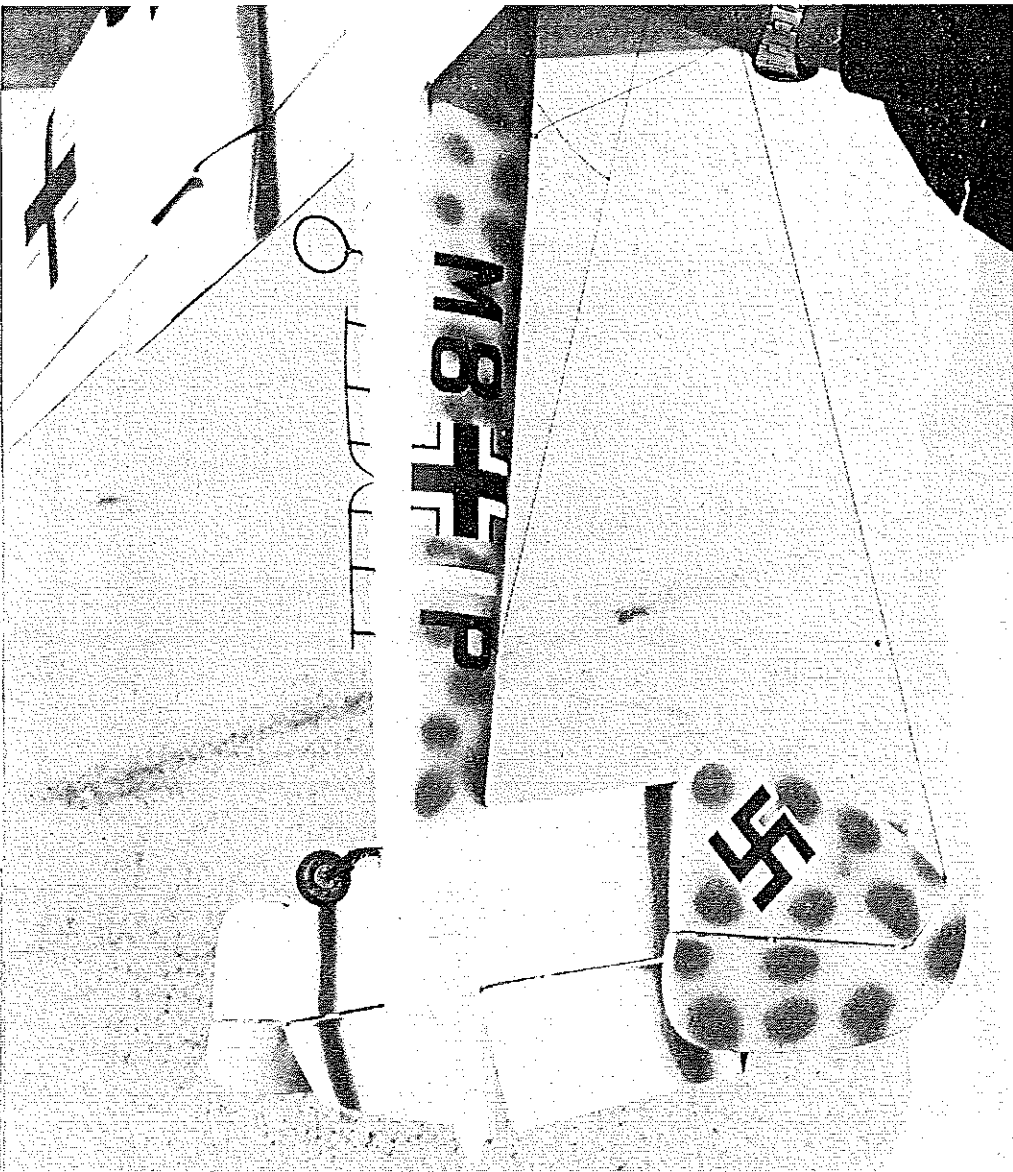
Messerschmitt--Bf110

Otherwise a loser, the Bf-110 excelled as a night fighter—which version is presented here. It is not quite scale since the wing is configured for maximum performance as a control-liner. Two 25s urge it along. And there's nice detailing; the authentic paint scheme, operable flaps, bomb dropping. 'Tis an unusual subject masterminded by one of our finest builders and fliers. Stephen Ashby





Air scoops and landing gear doors—machine guns, antenna, conspicuous markings, three-bladed demo props—make this front-quarter shot awesome. Do note the exceptionally clean handling of the 25s in neat nacelles. One degree offset in outboard engine, a bit more on inboard.



Tail end with split elevator in up, and a 1/4 in. of right offset on both rudders. Finishing details are explicitly described, beginning with filling dinks and dents after sanding with putty mixture of dope and talc, followed by two coats of clear, sanding after each, then covering with dampened Silkspan, two more coats of clear, each sanded. Then two sprayed coats talc/dope. That's about half of it. Markings are achieved by making stencils from mylar and spray adhesive.

BILLED by heavy prewar propaganda, the Bf 110 was to be the Luftwaffe's ultimate heavy-bomber escort and strategic fighter. With its long range capabilities it would accompany its big brothers deep into enemy territory and at the same time the "Zerstorer" would wipe out all opposition along the way.

In early action with the invasion of Poland, in 1939, the 110 was perhaps a mild success, considering it was fighting obsolete but highly maneuverable, high-winged PZLs. With all the 110's firepower, four 7.9-mm MG and two 20-mm cannon located in the nose, its only advantage over the PZLs was a head-on attack. Even though the old PZLs could out-manuever the 110, the small Polish Air Force was quickly defeated by sheer numbers.

During the Battle of France the 110 became even more vulnerable when more formidable allied opposition soon learned to cope with the 110's tactics. German pilots were having to form offensive circles to protect one another from rear attacks, although this did nothing to prevent allied attacks from either side.

Then came the Battle of Britain and the complete demise of the 110 as a long-range strategic fighter. It was simply no match for the British Spitfires and Hurricanes. Many were lost due to lack of maneuverability, rear protection and speed. To prevent further losses, 109s were assigned as escort for the 110s. Even then the 109s didn't have the range the 110s had, thus leaving the 110s unprotected when the 109s returned for fuel.

Although the 110 was a failure in the Battle of Britain, it was beginning to show signs of promise elsewhere. Due to nocturnal raids by the RAF into Germany, a night fighter force was hastily taking shape by the Luftwaffe. This early fighter force was comprised of Me110-Cs, Ju88s, and Me109s with the 110 proving to be best suited aircraft for the task. In fact the first RAF bomber shot down at night over Germany was by a Me110-C.

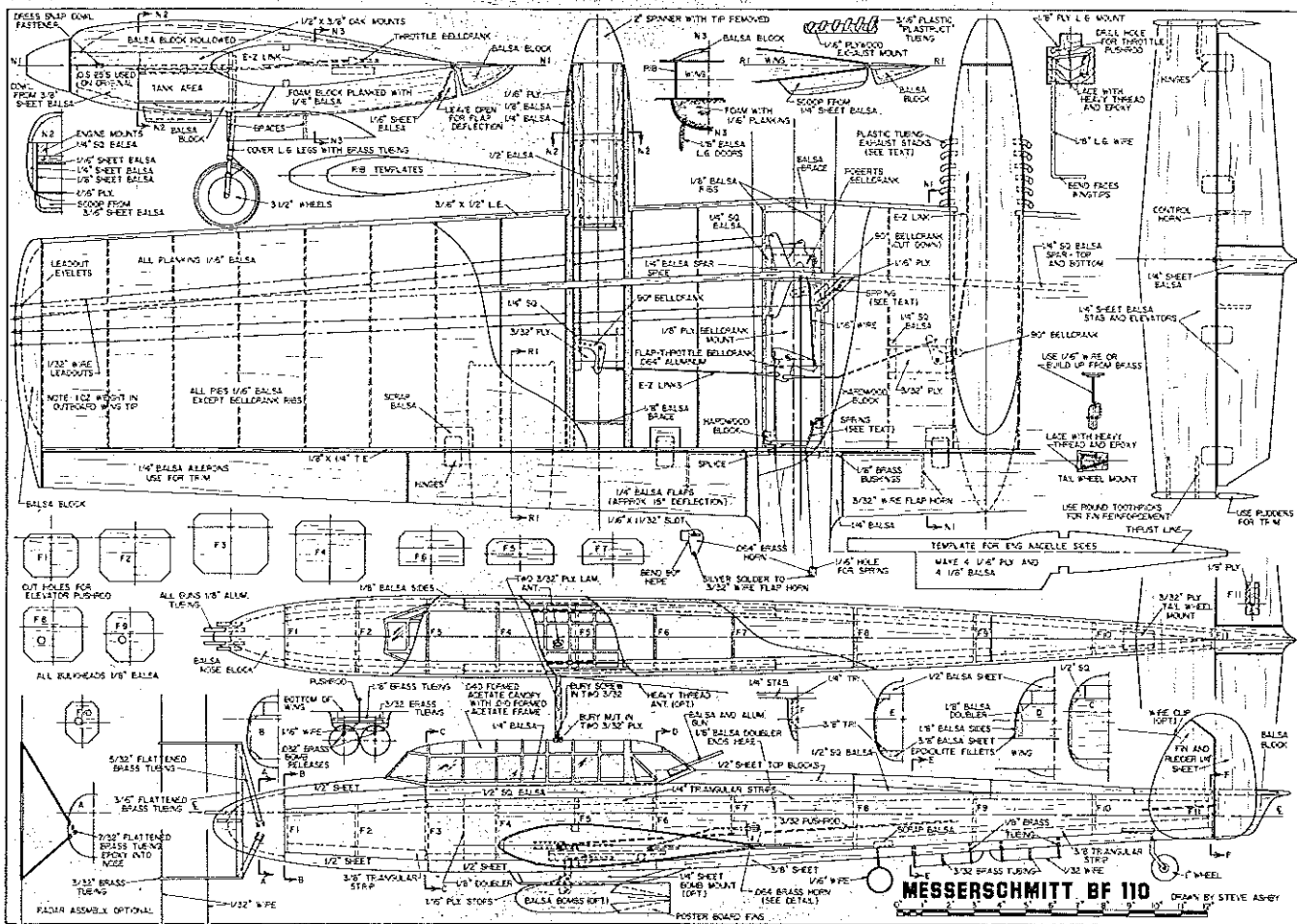
Because of primitive night intercept tactics and equipment, intercepting the enemy at this time was done solely by visual means. This method was at the mercy of the weather. If it was anything but clear, this would seriously hamper visual contact.

To overcome these inefficiencies a network of radar was designed by which a 110 could be guided to enemy bomber streams by scattered radar stations on the ground. The 110 could then use their own radar sets to make actual contact with the enemy bombers.

The RAF countered this tactic by what was known as "window." This was thousands of small strips of aluminum dropped into the slip stream by the bombers, producing a false image to German radar stations on the ground. The Germans countered this move by developing a new radar set with a higher frequency of which "window" could not affect.

The 110's armament was also being constantly upgraded. The best, and certainly the most unique addition, was the mounting of two 20-mm cannon in the rear of the cockpit. Known as "Schrage Musik," meaning jazz music, this pair of cannon was unique in the fact that they could fire in an upwards attitude of about 15 degrees from vertical. In effect, the 110 could attack an enemy bomber from behind and underneath, a position highly vulnerable to the Halifaxes and the Lancasters.

As with practically all the warbirds, there are almost innumerable variations from which a model of the 110 can be constructed and painted. Reference material is plentiful and readily available from local libraries, mail order book publishers and museums. It makes no difference what



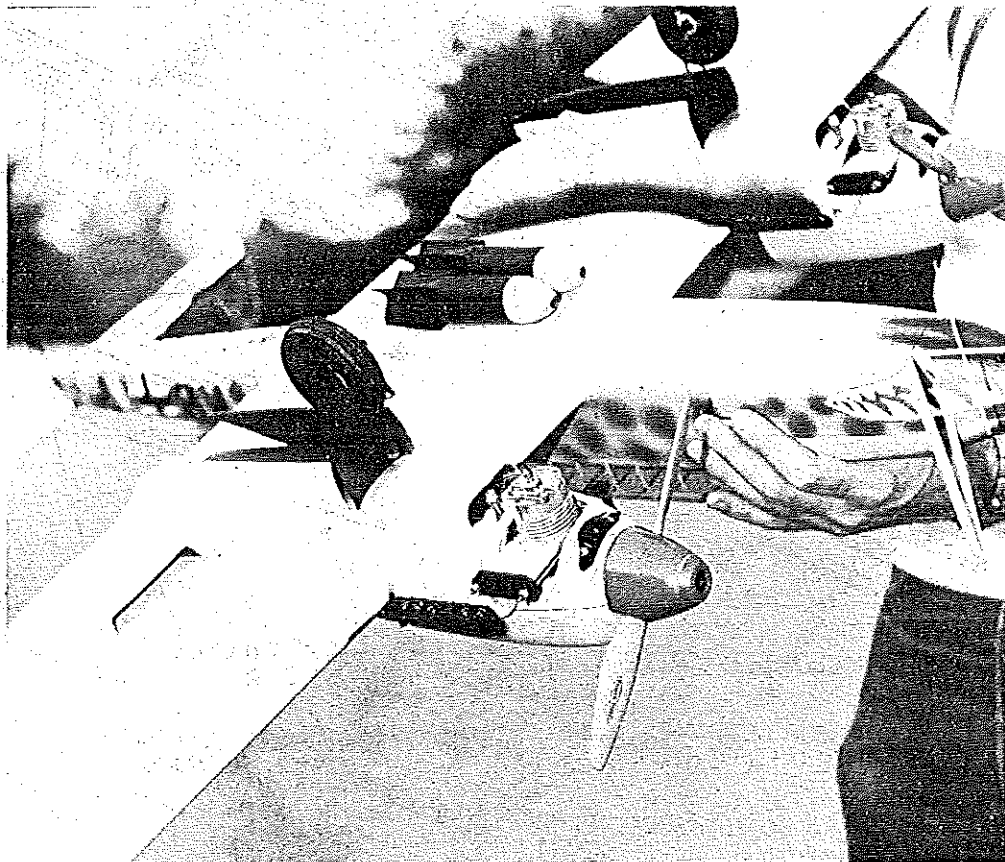
version of the 110 is built or what color scheme is used; the model will be an eye-catcher and quite a crowd pleaser.

Obviously, this model isn't precision scale, primarily due to the fact that the wing was built before I had decided to turn it into a Me110. The wing I had constructed was built for the sole purpose of testing several ideas and designs that I had kicking around.

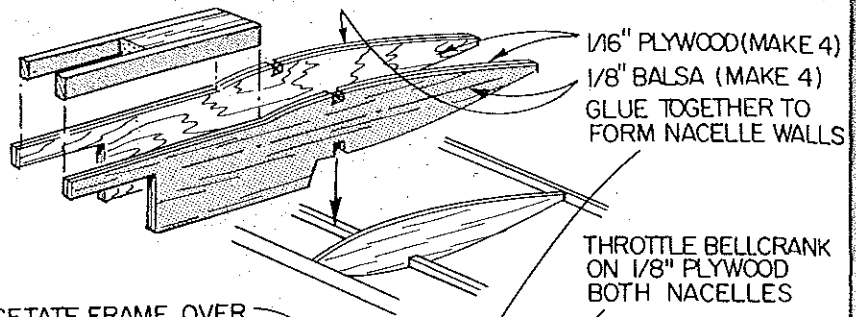
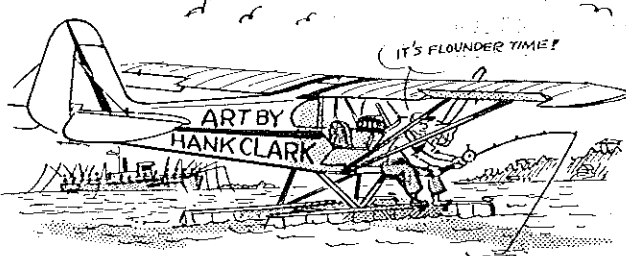
Every minute of time spent building this model will be worthwhile when you first hear the sound of both engines running, throttling down for landings, takeoffs and touch-n-gos. Don't get carried away and get yourself into a situation that I found myself. I merely wanted to hear those two engines run and one thing led to another. Before I knew what was happening the model was in the air. There was one problem, it was dark, pitch black! I didn't see much of the airplane but I did get to hear those engines. A smooth landing was made, due to the model's good flight characteristics.

Preliminary Construction: Construction is straightforward, presenting no problems, contrary to the fact that twins are usually more difficult to build. Study the plans carefully and become familiar with all the parts. Centerlines used during construction makes this project considerably easier. I suggest marking centerlines on all pieces requiring alignment.

Engine Nacelles: Use the nacelle side template from the plans to cut four 1/8 balsa and four 1/16 plywood nacelle sides. Use an aliphatic resin type glue, such as Titebond, to adhere the plywood to the balsa sides. Mark thrust lines on the outside and inside of both nacelles. These will be needed when the nacelles are mounted into the wing. Saw out two 1/8 plywood landing



The compact installation of the O.S. 25s and the muffling show clearly here. The original model weighed 5 lbs. and will fly with engine out. Flying props are an 8 x 6 on the inboard engine and 8 x 4 on outboard. The bombs are optional—in case you want to fly bombing missions.



1/16" PLYWOOD (MAKE 4)
1/8" Balsa (MAKE 4)
GLUE TOGETHER TO
FORM NACELLE WALLS

THROTTLE BELLCRANK
ON 1/8" PLYWOOD
BOTH NACELLES

1/2" SHEET Balsa BLOCK IS SPACER
WHEN JOINING OAK MOUNTS

.010 ACETATE FRAME OVER
.040 ACETATE SHEET 'PANES'
CEMENTED TO 1/4" Balsa DECK

1/16" PLYWOOD
FUEL TANK MOUNT

SPAR
SPLICE

1/2" SHEET

1/2" Balsa
FRONT DECK

1 1/4" Balsa BLOCK
HOLLOWED AND NOT
REMOVABLE

1/2" SQ. TOP
SIDE CONTOUR
FILLER (TO 8)

HOLLOWED BALSABLOCK

TUBING FOR GUNS AND
FLATTENED FOR ANTENNAE

1/2" Balsa BOTTOM SECTIONS (2)

1/8" Balsa FUSELAGE DOUBLER

1/2" X 3/8" OAK ENGINE MOUNTS (4) (SEE ABOVE)

3/8" TRIANGLE
TO 3 ONLY

ROBERTS BELLCRANK
ON 1/8" PLYWOOD

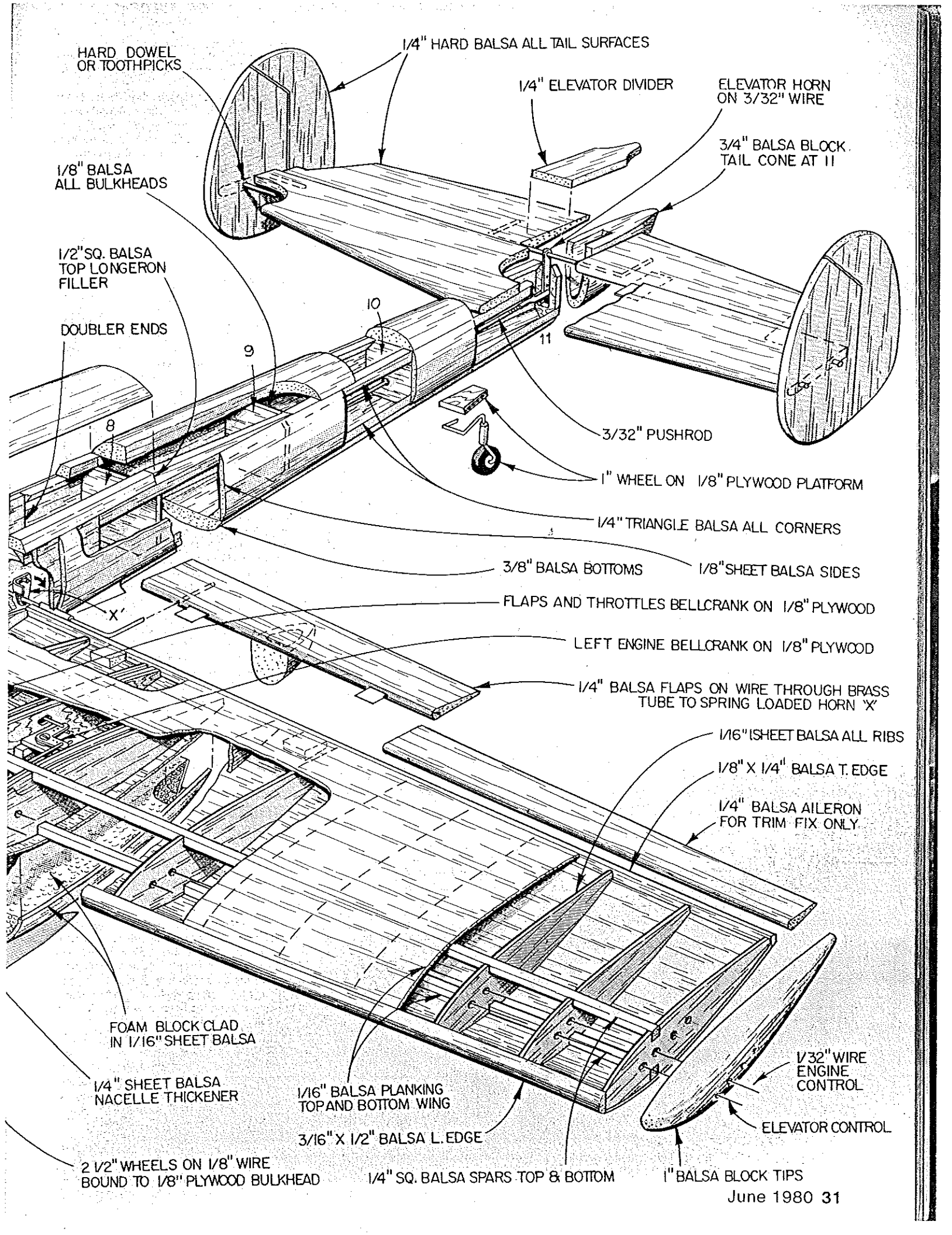
AIR SCOOP

DRESS
SNAPS

O.S. 25 ENGINE (2)

TUBES FOR OLEO

3/8" Balsa WALLS FOR
REMOVABLE LOWER COWL



HARD DOWEL OR TOOTHPICKS

1/4" HARD Balsa ALL TAIL SURFACES

1/4" ELEVATOR DIVIDER

ELEVATOR HORN ON 3/32" WIRE

1/8" Balsa ALL BULKHEADS

3/4" Balsa BLOCK. TAIL CONE AT 11

1/2" SQ. Balsa TOP LONGERON FILLER

DOUBLER ENDS

3/32" PUSHROD

1" WHEEL ON 1/8" PLYWOOD PLATFORM

1/4" TRIANGLE Balsa ALL CORNERS

3/8" Balsa BOTTOMS

1/8" SHEET Balsa SIDES

FLAPS AND THROTTLES BELLCRANK ON 1/8" PLYWOOD

LEFT ENGINE BELLCRANK ON 1/8" PLYWOOD

1/4" Balsa FLAPS ON WIRE THROUGH BRASS TUBE TO SPRING LOADED HORN 'X'

1/16" ISHEET Balsa ALL RIBS

1/8" X 1/4" Balsa T. EDGE

1/4" Balsa AILERON FOR TRIM-FIX ONLY

FOAM BLOCK CLAD IN 1/16" SHEET Balsa

1/4" SHEET Balsa NACELLE THICKENER

1/16" Balsa PLANKING TOP AND BOTTOM WING

3/16" X 1/2" Balsa L. EDGE

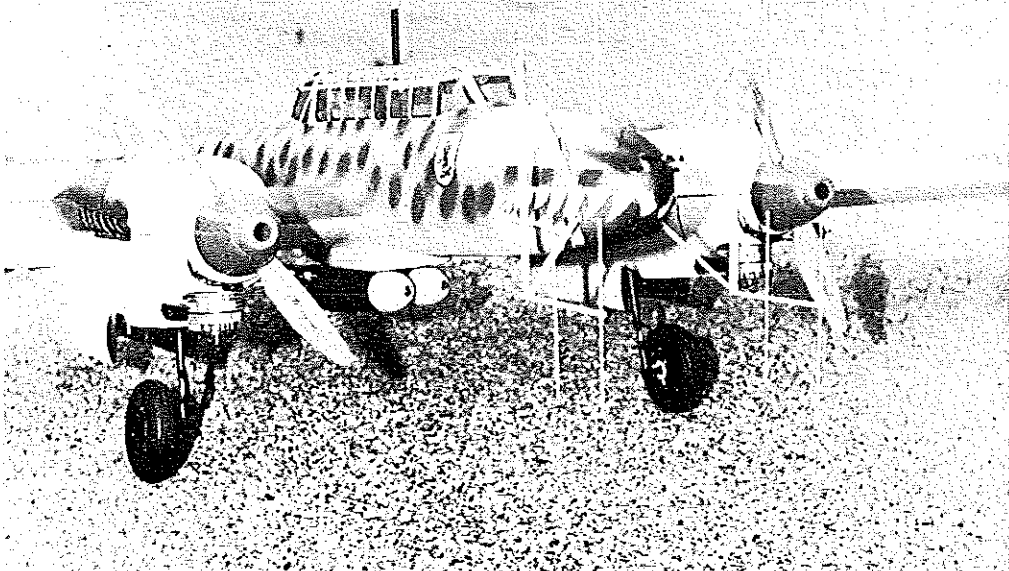
1/32" WIRE ENGINE CONTROL

ELEVATOR CONTROL

2 1/2" WHEELS ON 1/8" WIRE BOUND TO 1/8" PLYWOOD BULKHEAD

1/4" SQ. Balsa SPARS TOP & BOTTOM

1" Balsa BLOCK TIPS



A network of ground radar directed the fighter to the bomber streams where its own picket fence radar antennae enabled the 110 to close in. We don't know how many kills the leading night fighter pilot had but we do know the ninth ranking had 79, including many Lancasters. It is obvious that Ashby is a good pilot, or the machine is good, or both—noseovers verboten.

gear mounts and cut two 1/2 sheet balsa engine mount spacers. (These fit between the oak engine mounts in each nacelle.)

Bend the 1/8 wire landing gear as shown on the plans and lace it to the plywood with heavy thread and epoxy. The landing gear wire can be left simply as wire or it can be built up using brass tubing. Decide before bending the wheel leg of the gear. It is much easier to simply slide the tubing onto the wire than try to build the gear after it's bent. Drill a hole in each mount for the throttle pushrod.

Once the gear and mounts are completed the

nacelles can be epoxied together. An excellent way to insure proper alignment is to invert the nacelles and place the straight area of the top of the engine mounts on a flat surface until the epoxy sets.

When set, add the 1/4 sq. balsa pieces, as on plans, to the top of the tank area. This provides room for the throttle to function and not interfere with the tank itself. Cut a groove in the 1/4 balsa pieces through which the throttle pushrod can move unobstructed.

Drill the engine mounts and install the blind mounting nuts. Although the plans do not show

any offset to the engines, I used about one degree offset for the outboard and just slightly more for the inboard.

Select one nacelle to be the inboard nacelle and install the 90-degree throttle bellcrank along with the pushrod. A nyrod could be used just as well. Mount the engine and hook up the pushrod or nyrod, then check to see that the pushrod or nyrod will not bind. If the pushrod travels through the 1/4 sq. balsa pieces with no binds, the 1/16 plywood "ceiling" can be glued into place.

Wing: Use plywood or aluminum for rib templates and sandwich 12 1/16 balsa blanks between the templates to cut the ribs. Repeat the sandwich process for the opposite wing. Replace the root or bellcrank ribs with 1/2 balsa for added strength to this area. Draw centerlines on the third and fourth ribs of both wing panels.

To keep wing straight and aligned, I strongly suggest that the wing be jugged or blocked up during construction. This will also provide easy access for adding the nacelles to the wing.

Build both halves of the wing with leading edge, trailing edge and bottom spar, but do not add the top spar. Join the halves together and use splices. Add the 1/2 plywood bellcrank mount, along with the 1/4 sq. balsa blocking underneath for reinforcement. The holes for the appropriate bellcranks are drilled in the mount before it is epoxied into place.

Again, with the wing blocked up and firmly into place, cut the leading edge between the third and fourth ribs to accept the engine nacelles. Trial fit the nacelles into place and align thrustlines with the centerlines on the third and fourth ribs. Line up perfectly and when satisfied that the nacelles are in alignment, epoxy in place.

Cut out flaps and ailerons from 1/4 sheet balsa, sand to airfoil shape and add hinges to the flaps.

Throttles and Flaps: The throttle arrangement as shown on the plans is in the position that all the bellcranks should be in for *fast* throttle, this throttle position being with the trigger on the Roberts handle completely to the rear. There seems to be some confusion as to the correct position of the trigger relative to fast and slow throttle. It seems completely natural to me for fast throttle to be at the rear of the handle. If this system is opposite to your liking, then the throttle bellcranks and flap throttle bellcrank can be reversed. The following description is as I have set up the flap throttle system on the original.

Cut the flap throttle bellcrank from .064 aluminum, also the flap horn from .064 brass. Bend the flap horn 90 degrees where indicated by dashed line on the plans, and make the slot to the dimensions also shown on the plans. The purpose of the slot is to allow the throttle system to move from fast to approximately medium without affecting flap deflection. This puts the flap movement on the lower end of the throttle range where it is needed. Slide the brass flap horn, along with the brass bushings, onto the 3/32 wire and then bend to shape. Silver solder the horn to the wire and clean the solder joint well to remove any remaining flux. This prevents any corrosion that may occur around the brass bushings.

Install the outboard 90-degree throttle bellcrank and the flap throttle bellcrank, then hook up all the E-Z links.

Punch holes in the ribs for the appropriate lead-outs then attach the leadouts to the Roberts bellcrank and install onto the 1/2 plywood mount. Tie the Roberts bellcrank to the flap throttle bellcrank with 1/16 wire with Z-bends on both ends.

Do not hook up the flap horn at this time as this

Continued on page 107



A smiling Steve Ashby poses with his unusual warbird and some of the trophies it has won. If you look sharply you'll note the three lead-outs that operate the Roberts' 3-line bellcrank.

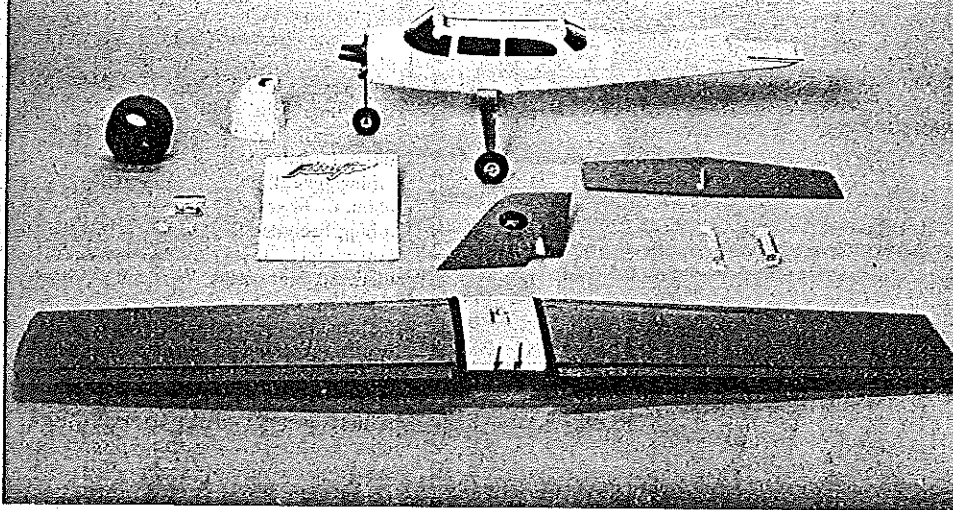
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Messerschmitt/Ashby

Continued from page 32

will be connected after the fuselage has been added to the wing, but do check that there are no binds anywhere in the throttle system, so that it works smoothly. If the bomb system is opted for, then the bomb release bellcrank with its leadout are mounted at this time.

Springs for the bomb release bellcrank and flap return can be purchased at a hardware store, or they can be made very easily. Simply drill a small hole (1/16 dia. or preferably smaller) in a 1/8 dia. piece of brass tubing about 4" in length. Bend a 90-degree angle of about 1/2" in length on a piece of 36", .015 dia. music wire. Chuck up the brass tubing into a variable speed drill and insert the 1/2" bend of the wire into the hole in the tubing. Slowly turn the tubing with the drill until all the wire is wound around the tubing. The spring will flip back in reverse direction when released so use care and keep the fingers out of the way.

The top spar now is added—don't forget to use the splices. Glue the flap hinge reinforcements into place.

Before planking the wing, check for trueness and accuracy, making sure everything is straight, then plank the top of the wing with 1/16 balsa. Turn the wing over, and using the same blocks to keep the wing straight, plank the bottom. Cut holes for the elevator and flap pushrods. Mount the flap horn with epoxy and cloth to secure the brass bushings of the flap horn to the wing.

Fuselage: Saw out both 1/8 balsa fuselage sides, 1/8 balsa doublers and all the bulkheads as per plans. Draw fuselage centerlines on the outsides of the balsa sides and the wing centerlines in the wing

saddle area. Draw centerlines on the bulkheads. Drill holes in the bulkheads for the elevator pushrod.

Use Titebond to adhere the 1/8 balsa doublers to the 1/8 balsa sides. Glue all the 1/4 triangular strips to the top inside edges of the balsa sides, except the 1/4 triangular strips from F3 rearward to the wing saddle.

Begin fuselage construction by gluing F3, F4, F5, F6, into place, using the top view centerline for alignment, and when dry, add F7 through F11. When this is thoroughly dry then the remaining bulkheads, F1 and F2, are glued in place.

If the balsa sides are difficult to bend around the nose bulkheads, use a damp sponge and apply a light coating of water to the outside of the fuse sides from F3 forward. This will cause the outside balsa to expand, and not the inside, thus producing a natural bend. With this completed, add the 1/4 triangular strips from F1 to F3. Also glue the 1/8 triangular strips to the bottom inside of the fuselage.

Now the 1/2 sq. strips are glued onto the tops of the fuselage sides. Notice that the 1/2 sq. balsa starts tapering at F6 rearward to F9, where it stops. Fix tailwheel in the same manner as the main gear, then epoxy the 3/32 plywood mount to the bottom of the fuselage where indicated by the plans. Cut all the 1/2 sheet balsa blocks for the top and bottom and tack glue into place. Also tack glue the balsa nose block onto the nose of the fuselage. Add the 1/4 balsa strips on top of the fuselage sides in the canopy area.

Trace the fuselage cross sections onto cardboard or a posterboard type material and use these as a guide for shaping the fuselage. Line up the centerlines on the templates with the centerlines on the fuselage sides. Carve slowly, checking frequently. Finish shaping process by rough

sanding.

Tail Surfaces: All pieces are 1/4 sheet balsa. Airfoil both fins and rudders along with the stab and elevators. Epoxy the fins to the stab while using the round toothpicks shown on the plans. Drill a starter hole for each toothpick, fill these holes with Titebond, then insert the toothpicks. Let the glue surround each toothpick.

Epoxy the elevator control horn into the elevators along with the hinges. The stab sits on top of the fuselage sides so alignment isn't difficult.

Tack glue the tail block into place plus the 1/4 piece of sheet balsa on top of the tail block. The top of the control horn will have to be ground down to provide clearance for movement but do not grind too much so as to weaken the horn.

Details: Consider these optional details now, for it's much simpler to add or plan for them now than to wait until the construction is finished.

Guns are fabricated from aluminum tubing and Hot Stuff. Additional detail can be added to the guns by simply drilling holes in the barrels of the guns to simulate cooling.

The radio gear, underneath the fuselage, is constructed with brass tubing and wire. Bend 1/16 wire around a broom handle to make the circular antenna and permanently epoxy into place as indicated by the plans. The plans are self explanatory in making the two bottom rear antennae. One helpful hint is that the 3/32 tubing of antenna itself was crimped just slightly. This will give the antennae a tight fit into the 1/8" tubing but at the same time it can easily be slipped in and out of the fuselage.

In building the radar gear on the nose, make sure that all joints are strongly soldered, preferably silver soldered. These parts can be dangerous to any spectator if these come apart or happen to



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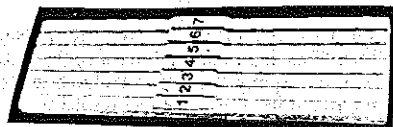
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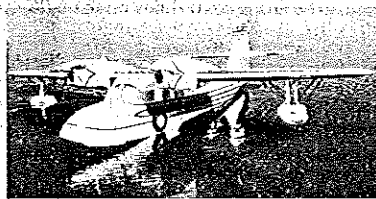
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fall off during flight. Again, make the slip fitting snug to hold firmly, but still removable for transporting.

If the bombs are opted for, build the bomb mount underneath the fuselage with 1/4 sheet balsa, using the plans and photographs as guides for construction. The bombs are blocks of balsa with cardboard fins. Do not use any hard or sharp material for the bombs because, again, they could possibly cause injury to spectators. Use a light gauge line for the leadout and line to the handle because these do not carry any bearing load of the aircraft.

Nacelles: Glue the 1/4 sheet balsa sides to each nacelle, then tack glue the top and bottom block to each nacelle. Epoxy the 1/16 plywood tank floor into the nacelle. Due to the compartment being slightly less than the typical 1 x 2" cross section, a tank can either be scratch made,

or a Fox 3.5 oz. #86815 can be purchased at the hobby shop.

Make the cowlings by epoxying 3/8 sheet balsa together to the desired shape. If the engines have been removed, remount them wrapping a sandwich bag around them to prevent from collecting dust. Cut a hole in the cowling for the engine head and tack glue the cowlings into place. Also mount the 2" spinners so that the top block and cowlings can be shaped to the spinner.

Cut the cardboard template of N2 and N3 cross section to use as a guide for shaping the nacelles. Carefully carve the nacelles to shape and sand the cowlings to the 2" spinners. As shown by the plans, the rearward part of each nacelle is a styrofoam block planked with 1/16 balsa. After the planking has dried, nibble away the styrofoam from the trailing edge of the nacelle block; but leave the planking. Glue the 1/16 balsa backplate in this area and fuel proof

with either dope or resin. This area allows the flap fairings to enter into the nacelle opening upon deflection of the flap.

Carve the flap fairing from a block of balsa and tack glue to the bottom of the flap. When satisfied with the shape of both nacelles, remove the top and bottom blocks and hollow out each one of these then reglue permanently.

The landing doors are made by thoroughly soaking in water a piece of 1/8 balsa, big enough to make both doors of one nacelle. Wrap the soaked wood around the nacelle, using wide masking tape to hold in place. With a hair dryer or a heat gun, carefully dry the wood. When dry, split apart to make two doors and apply two coats of resin along with the braces shown on the plans. Repeat process to make second set of doors.

The engine exhaust stacks are 3/16 "plastruct" plastic tubing. To bend the tubing requires heating and placing into a jig. Sounds difficult, but it's not. First the jig. Wrap sandpaper around a piece of the plastic tubing and sand a groove in a small block of balsa to a 90-degree angle. Heat the tubing by rolling the tubing with your fingers, about 6" or so, above a candle flame. When the tubing becomes limp, quickly place the heated portion into the jig. You should end up with 24 identical bent stacks. With a little practice, this technique can be quickly mastered.

Drill the 1/16 plywood stack plates for the exhaust, then epoxy them to the nacelle sides. Using the exhaust plates as guides, hand-drill into the balsa sides and glue the stacks into position with Hot Stuff. The stacks on the wing tip side of the nacelles point upward, while the stacks on the fuselage side of the nacelles point downward.

The air scoops are built from 1/4" sheet balsa. By placing ordinary window screen in these the "grill" look can be simulated. A resin finish to these gives strength as well as fuel proofing.

Wing: Cut a cardboard template of the root rib and trace the outline onto both sides of the fuselage, using the centerline of the wing drawn earlier. Saw out the wing saddle and the small bottom pieces of the fuselage from F4 back to the saddle. These will be replaced later.

Slide the wing into the wing saddle and check fit and alignment. When satisfied, epoxy the wing into place then add the 1/4 balsa fillets.

Fit the wing flaps onto the flap horn, checking alignment of the flap fairings into the rear of the nacelles. Make sure there is no binding here as the flap lowers. Pop loose from the flaps, hollow, then reglue permanently.

The flap horn stop and spring hardwood blocks are epoxied to the inside of the fuselage sides. Using the wing centerline on the fuselage side, set the flaps at neutral, then epoxy the horn stop block in place. Hook up the spring and the pushrod to the flap horn. Adjust the spring so that there is enough tension to bring the flaps back to neutral easily. The flaps should deflect about 18 degrees.

The wing-mounted radiators, underneath the wing, are made from 1/4 sheet balsa. As with the nacelle scoops, also add the window screen to these scoops.

Fuselage: Pop loose the nose, tail blocks, and all the 1/2 top and bottom blocks and hollow them.

Build the canopy by first carving a balsa block to shape, then apply a finish to the carved block, preferably with resin. Draw a heated sheet of .040 acetate down over the mold. The frame of the canopy is done the same way. With the .040 canopy still on the mold, draw a .010 sheet of acetate down over the already formed canopy. With a sharp X-acto knife, cut out the canopy frame. Use Hot Stuff to adhere the frame to the

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canopy and, as always, use extreme care when gluing with Hot Stuff. Before the canopy is permanently glued into position, there are several things to be completed.

Make the antenna by sandwiching a small 2-56 screw between two pieces of 3/32 plywood, leaving slightly more than 1/8" of the threads protruding from the bottom. The antenna mount is made by first, cutting a hole in the canopy just large enough for the nut, then sandwiching the nut between two pieces of 3/32 plywood. This removable antenna is very helpful during transporting in that it can be unscrewed, not risking the chance of having it accidentally knocked off.

Add the radio operator's gun, pilot and navigator. Check fit, then glue the canopy to the fuselage.

Finish: The finish on the original was achieved by the talc and dope method. I would suggest that if you are not used to finishing in this manner, then stick to the method that you like best. But just in case, here is a guide to achieving a finish with the talc and dope method.

Sand the balsa smooth with #320 sandpaper and fill all dings, dents and canyons with a putty mixture of dope and talcum powder. I usually mix the putty to where the mixture will slowly start to fall when inverting the mixing container.

Spray or brush on two coats of clear dope to the bare wood, sanding between each coat with #320 sandpaper. Apply SGM (medium) Silkspan to all surfaces with the Silkspan lightly dampened. Apply two more coats of clear dope and sand lightly between each coat.

Brush or spray on a mixture of dope and talcum powder with the mixture consistency being thinned just enough to spray. I also like to add a color dope to this mixture, preferably white. This seems to make the flaws in the finish more visible.

Sand with #320, sanding most of the talc away. Apply two more coats of the filler and sand with #400 between each coat. When satisfied that all the grain and flaws are filled, add a coat of 50% thinned dope, then sand with 400 sandpaper, only this time, sand with water. Now the finish is ready for the colors, but don't go too far away from the talc and dope filler. The flaws really seem to jump out after the color coats are applied. Before the color is applied, fuel proof the engine compartments and epoxy the dress snap cowl fasteners into place.

Aerogloss dope was used throughout with the colors being mostly mixed from Military Flats. For the markings I used stencils cut from drafting mylar and spray adhesive. The pieces cut from the stencil were used to cover the markings until the overall color scheme was applied. The shark's mouth was masked with masking tape although liquid masking film would probably have been less trouble. A simple technique for the markings is to always spray the lightest color on first.

The colors were as follows:

Top Surfaces: Light Gray—Storm Gray, Dark Gray—1 part Storm Gray to 1 part Flat Black, White—Flat White, Yellow—1 part Cub Yellow to 1 part Flat White w/touch of Stearman Red, Red—Stearman Red w/touch of talc to flatten finish, Black—Flat Black.

Bottom: Light Blue—1 part Navy Blue to 16 parts Flat White.

The back cover of *Wings* magazine, June 1972, was used as a guide to the colors and camouflage scheme.

Flying: Pick a rather calm day for your initial flight. The 110 will handle the wind but it's always wise to eliminate as many variables as possible.

Balance the model with the CG marked on the

plans, but use this as a guide to your preference. The original needed no nose or tail weight, but that may not always be the case.

Use the ailerons and rudders for trim. I used a rudder offset of about 1/4" and this seemed to work well in keeping the airplane taut on the lines at low throttle. Lightly glue the ailerons at neutral; starting here, they can easily be moved to give the desired results in the field.

Until you are well acquainted with the flying characteristics of this model slow landings and takeoffs directly into the wind should be avoided. Rather, these should be done somewhat perpendicular to the wind. With deflected flaps, when heading into the wind, the model will balloon due to excessive lift, creating loose line tension.

The O.S. 25s pull the 110 with no problem at all. The best prop arrangement seemed to be an 8x6 inboard and an 8x4 outboard. The original weighed just over 5 lbs. and would fly on either engine. I wouldn't suggest doing this, but it is some consolation to know should one or the other quit during flight.

Very realistic takeoffs, taxis, touch-n-gos, and landings can be achieved with the 110. Not to mention the bombing missions and the... Anyway, if you have just one-half the fun that I have had with this model then this project will have been well worth the time spent.

CL Scale/Gretz

Continued from page 34

The full size Lavochkin LA-5 (see photo of Al Arnold's beautiful model) was one of the Russians' leading fighter bombers of World War 2. The all wood airplane was first introduced in 1943 and had a very high rate of production—some factories built more than 50 per day. For simplification, the Lavochkin's undercarriage was interchangeable.