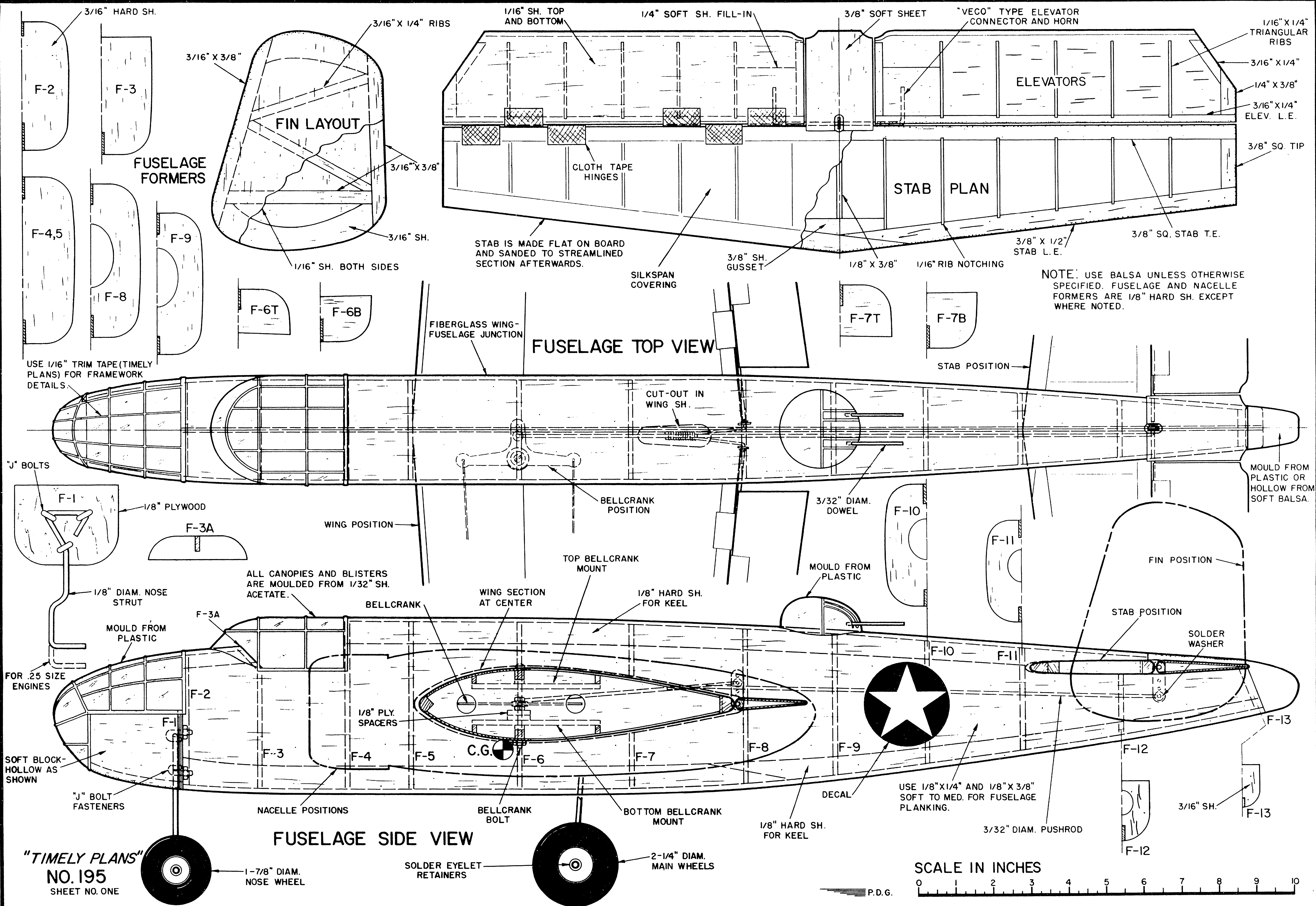
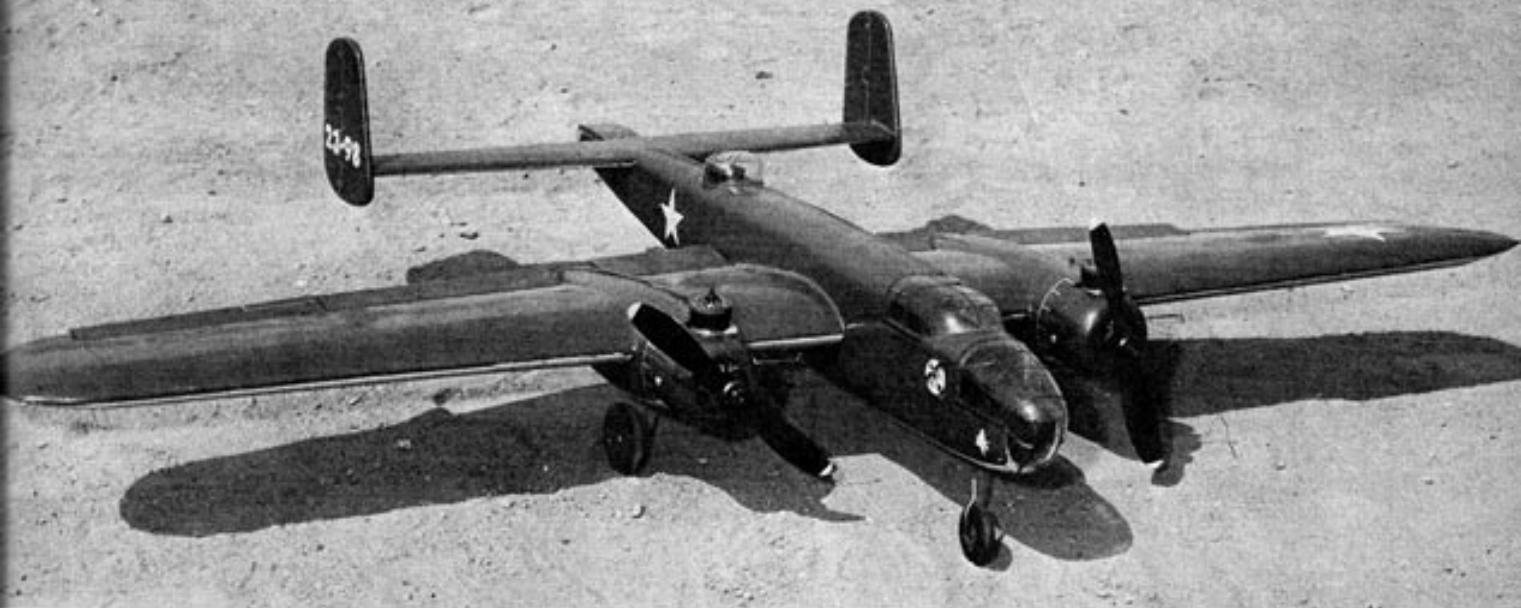






Twin engined ships sound wild in the air, add thrills to flying sessions. Handles well with one-engine out, use strong pull-tested lines.

by Paul DelGatto



SEMI-SCALE TWIN ENGINE STUNTER...

From every angle, it has the look of a B-25. Actually it is modified for stunting requirements, simplified in structure for active flying.

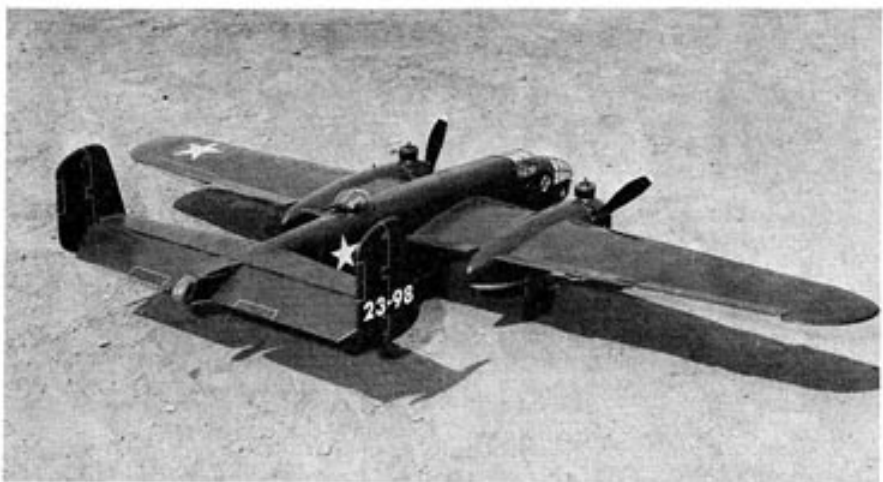
B-25 "MITCHELL"

FULL SIZE "TIMELY PLANS" AVAILABLE

► Few aircraft in the 60 year popular span of aviation history, have achieved the notoriety, and become such a popular favorite as the North American B-25, "Mitchell". This could be attributed chiefly to the three historic "firsts" it achieved in World War II. It was the first bomber to sink a German U-boat after hostilities broke out; it was the first AAF bomber to attack the Phillipines after they were captured by the Japanese; and the final and most important "first" was of course the attack on Tokyo led by General Jimmy Doolittle.

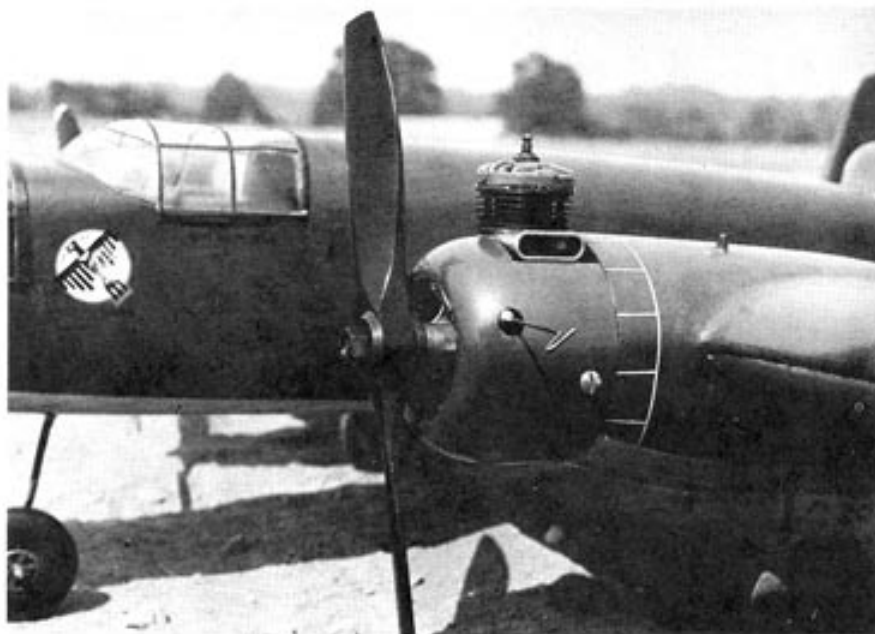
This superb medium bomber served in every theater of war completely around the world. It also achieved the distinction of being the most heavily armed bomber of its type in action on any front. The successful installation of the 75 MM cannon in the "Mitchell" in itself was a historic development of War in the air. The "B-25" was without a doubt North America's greatest contribution in World War II and a tribute to the engineering staff who made it all possible.

In designing a twin-engine stunt model of this popular craft we made several departures from scale, but tried always to maintain the rugged lines of the original scale version. From the side view there is very little to indicate that it is not scale. The fin and rudder assembly were enlarged slightly, and this was done to accommodate the enlarged stab and elevator. The scale wingspan would have been approxi-



B-25

... continued ...



The semi-scale "Mitchell" is a real powerhouse, turns in a nice stunt performance, though maneuvers are of a wider radius than normal craft.

Takes .15 to .25 Engines, 54" Span

mately 44", but on our design we increased it a full five inches on each side, as well as increasing the average chord. The nacelles were enlarged slightly to accommodate the wider wing with its thickened airfoil section. Fundamentally there were no changes to the basic outline of the fuselage with the exception that the wider wing reduced our tail moment arm slightly, and this we held to be in our favor.

Building the model was not quite as formidable as we had anticipated, this we could attribute to our desire to keep it functional and for all around flying pleasure. Noticeably absent are retractable landing gears, engine control, landing flaps and other interesting niceties which an aspiring modeler can of course add, but which our own limited building and flying time would not permit.

CONSTRUCTION: Begin by assembling the essential materials required for the job. Since most of the parts are stock you should experience little or no difficulty. With this particular model, it is best to start the actual construction with the wing, primarily because it is twin engine, and also because it features a "Trike" gear, moveable flaps, and all that sort of wing mounted structure.

Since this was primarily a stunt model, we did away with the slight inverted "gull" dihedral which the "Mitchell" had. The absence of this made it possible to build the basic wing structure in two halves. Several "tab" ribs helped to speed leading, trailing edge and spar alignments, thus insuring a perfectly symmetrical structure, which is more ideally suited for stunting. The heart of the airplane of course is the bellcrank installation, and

while not at all difficult to do, it does require your best ability.

We recommend a 3" Sullivan nylon bellcrank or a 3" Veco bellcrank. With a model this size, a 4" bellcrank with the same ratio setup would be even better, except that no one as yet has seen fit to produce one. However, with a little care and effort you can make one, should you prefer it.

Install the bellcrank in the standard manner, and bend .072" diam. wire for the flap rod, but do not bend the flap horn end at this time. (Make certain too that it is oversize.) Install the lead-out lines at the same time the bellcrank installation is made. Use $\frac{1}{2}$ " to $\frac{3}{4}$ " length eyelets for the leadout guides. Do not complete the ends of the lead-out wires until the remainder of the control installation is made.

Having completed the basic structure of the wing and bellcrank installation minus flaps and linkages, the next phase is the basic structure of the fuselage and the wing structure of the fuselage and nacelles, all of which are assembled around the wing structure.

Fundamentally, the fuselage and nacelles, consist of a center keel, $\frac{1}{8}$ " x $\frac{1}{4}$ " and $\frac{1}{8}$ " x $\frac{3}{8}$ " soft strip planking and $\frac{1}{8}$ " sheet balsa or plywood formers. Begin, by bending the required landing gear struts and bolting them to the plywood formers with "J" bolts. All the formers located on top of or below the wing are cemented in position and the center keels of $\frac{1}{8}$ " hard sheet are added. Add remaining formers fore and aft and permit thorough drying. Several planking strips, should be added to the top and bottom of all units to insure alignment and sufficient

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rigidity before proceeding further.

The next step would be to make the split flaps assembly, and this is done very simply. Since the top and bottom of each unit are symmetrical, cut the required amount of $\frac{1}{16}$ " sheet surfaces to the desired outline. Pin one set to a board and then cement the flap leading edge pieces in position. When dry, glue the flap ribs and fill-in sheet to the leading edge and sheet planking. Then remove from board and cement remaining sheet covering. The split flap linkages are made entirely of $\frac{1}{16}$ " diameter wire.

Originally on this model, both ailerons were made of $\frac{1}{4}$ " soft sheet balsa and were both fixed in position. However, after test flying the model the first time we decided to use a weighted aileron, so balanced that it remained in the "up" position at low speeds and "feathers" out as speed increases. This proved highly satisfactory and made flying the model, a much simpler task.

The tail surfaces are built up very simply over the plans. The fin and rudder frame is constructed entirely of the light sizes specified and after removing from board, they are planked with $\frac{1}{16}$ " soft sheet. Afterwards sand smooth and round to streamlined shape on all edges.

The stabilizer frame is constructed flat on a board, and after removing from surface, the leading and trailing edges are shaped and rounded until the desired cross-section has been achieved. The elevator is constructed similarly to the wing flaps, so first cut the four required $\frac{1}{16}$ " soft sheet outlines for the top and bottom. Then cement the elevator leading edges to one side of the elevator surfaces. Since the elevator ribs are curved, it will be necessary to prop up surface at trailing edge, before cementing ribs in position.

When thoroughly dry, remove from board and add fill-in pieces and planking to remaining side. Shape and smooth sand completed surfaces and join together with a "Veco" type horn and connector. Standard "over and under" cloth tape hinges are used to join the elevator and stab together. With the tail surfaces finished we can also complete the control linkages and the pushrod installations. While doing this, see that bellcrank is locked in the neutral position, in order that the movable surfaces can be adjusted in accordance. Once the elevator pushrod has been determined exactly, it can be secured on the elevator control horn with a soldered retaining washer, after which the stabilizer-elevator assembly is permanently cemented to the top of the fuselage. Add additional planking strips to the fuselage at this point, but only in those areas where work has been completed.

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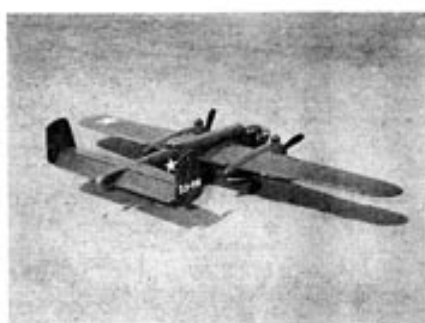
Before proceeding any further, it would be advisable to install the fuel tanks in the nacelles, locating them such, that the fuel intake is only slight below level of engine air intake. Drill the engine mounting holes in the hardwood mounts, allowing 2° right thrust in the outboard engine only. At this point, all remaining fuselage and nacelle planking can be completed and filler blocks added.

Now comes the big job of smooth sanding, filleting, and then applying several coats of wood filler to all the surfaces. Two to three coats of wood filler should prove satisfactory. Also,

Apply a clear, hard finish to your wood patterns. First with a filler compound and then with a clear lacquer. Smooth sand, between each coat, and apply a sufficient number of coats to eliminate all traces of wood grain and other blemishes. A certain amount of care has to be exercised in moulding the heated acetate sheets over the wood forms.

The cowl assemblies on our model are made of aluminum, and formed with a mallet over a hardwood pattern. However, if you prefer to stick to an all balsa cowl, it will look just as realistic when properly made. The cowl fasteners, are simply two wood screws, one on each side of the cowl, which pass through and are secured into the engine mounts.

With the cowls complete, all that remains is to cover the wing and stabilizer surfaces and then cement the fin and rudder assemblies in place. Also, it is advisable to fiberglass or reinforce with cloth tape, all surface to surface joints, wing root, stab roots, the underside of the fuselage nose and rear. For added strength and durability, it is also recommended the all wood covered surfaces such as the fuselage, flaps, elevators, fin and rudder, be covered with a lightweight Silkspan, though this is not a prerequisite.



FINISHING AND FLYING: Begin by applying at least three coats of clear fuel-proof dope to all wood surfaces and at least four coats to all paper covered surfaces. Gently smooth-sand between each coat, and before you do, make certain the surfaces have dried thoroughly. Colored fuel-proof dopes are then applied, and we recommend at least two good coats, preferably three. For those who would prefer the added lustre of a hand-rubbed finish, at least four to five coats would be in order. The model's colors are olive drab for the top side and battleship gray for the complete bottom. $\frac{1}{32}$ " white or silver trim tape (Timely Plans) can be used for all surface details and outlines. Decals are all available commercially, but it may take a little shopping before you can get what you want.

Install the engines of your choice and hook up the fuel lines. At this point, the model is ready to be checked out and then flown. Test the control surface movements to be certain they are smooth but not sloppy. There should be no evidence of binding under load, and of course make pull test to be certain that controls will stand up even under adverse flying conditions.

Although the model is large enough and has substantial enough power to be flown in windy weather, it would be advisable to make your first few flights under more ideal climate conditions. You'll find that with two .19 size engines you have plenty of power to spare for any of the stunt maneuvers, though the maneuvers would hardly be in a class with a "Shark 45" or a "Dobler".

One thing we'll grant you, that is that you'll find it much more thrilling! Also important too, if one engine cuts out on you, you should have no problem getting it out of trouble.

Two .25 size engines, will provide you with a real powerhouse to fly. If the model is not unusually heavy, two hot .15 engines should turn in respectable performances as well. At any rate, have yourself a ball and show the layman how real models are built and flown.

BILL OF MATERIALS

(Balsa unless otherwise specified)

- (7) $\frac{1}{8}$ " x 3" x 36" (soft)—Planking for wing and tail surfaces
- (4) $\frac{1}{8}$ " x 3" x 36" (hard)—Wing ribs, stab ribs,

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- elevator ribs, flap ribs
- (2) $\frac{3}{32}$ " x 3" x 36" (hard)—Wing ribs, fill-in sheet, end ribs, bracing
- (5) $\frac{1}{8}$ " x 3" x 36" (hard)—Fuselage and nacelle formers, keels, wingtips, bracing
- (1) $\frac{1}{4}$ " x 3" x 36" (soft)—Ailerons, formers, fill-in
- (4) $\frac{1}{8}$ " x $\frac{1}{4}$ " x 36" (soft)—Wing Capstripping
- (27) $\frac{1}{8}$ " x $\frac{1}{4}$ " x 36" (soft-med.)—Fuselage planking
- (20) $\frac{1}{8}$ " x $\frac{3}{4}$ " x 36" (soft-med.)—Fuselage planking
- (2) $\frac{3}{16}$ " x $\frac{3}{16}$ " x 36" (hard)—Wing leading edge
- (4) $\frac{1}{4}$ " x $\frac{1}{4}$ " x 36" (hard)—Wing spars
- (3) $\frac{3}{8}$ " x $\frac{1}{2}$ " x 36" (med.)—Wing trailing edge, Stab leading edge
- (1) $\frac{3}{16}$ " x $\frac{1}{4}$ " x 36" (med.)—Flap leading edges
- (1) $\frac{3}{16}$ " x $\frac{3}{16}$ " x 36" (med.)—Stab trailing edge
- (1) $\frac{1}{4}$ " x $\frac{1}{4}$ " x 36" (med.)—Elevator leading edges, Fin leading edges
- "Veco" connector; 2" diam. nose wheel; 2 $\frac{1}{2}$ " diam. main wheels; $\frac{1}{8}$ " plywood for formers and mounts; $\frac{3}{8}$ " x $\frac{1}{2}$ " hardwood engine mounts; $\frac{1}{8}$ " diam. wire connectors; .072" diam. wire landing gear struts; $\frac{1}{32}$ " sheet acetate for moulding canopies; (2) alum. cowls (balsa optional); med. Silkspan covering for tail surfaces, flaps and fuselage; heavy Silkspan covering for wing surface; 3" "Veco" or "Sullivan" bellcrank; $\frac{1}{32}$ " diam. braided wire lead-outs; "J" bolt L.G. fasteners; cloth tape hinges; fibre glass reinforcement; fuel-proof decals; (2) .15 to .25 engines; fuel-proof cement; clear and colored fuel proof dopes; $\frac{1}{32}$ " White or silver trim tape (Timely Plans) for surface details and outlines.

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