DETAILED INSTRUCTIONS

Study plans, perspective sketches [illegible] model. The following few additional building materials other than those supplied are necessary to build this airplane model: A razor blade (preferably one with a heavy rounded back), [illegible] upon which to work and cement parts [illegible], a pair of pliers for bending shafts, some small pieces [illegible] and a piece of waxed paper 12x36 inches.

STEP 1 • SANDPAPERING

Material: Wood Block and Sandpaper [illegible]

For sandpapering obtain a small block of wood [illegible] tightly around it. Rub sandpaper covered block with [illegible] material LIGHTLY and SQUARELY on all wood [illegible] edges of square longitudinal pieces.

STEP 2 • SPARS, ETC.

Material: Sanded Wood Strips

From the sanded strips select the correct sizes as required on the plan for leading edge, spar and trailing edge. Do this before any notches are cut in ribs so that fit will be very close or tight. A good close or tight fit requires less cement. Consequently, less weight will be added to the finished model.

STEP 3 • WING—RIBS—WING TIPS

Material: Printed Wood Rib Sheet

With a razor blade cut out illustrated ribs and wing tips from rib sheet as they are needed in the process of building the wing. This will prevent pieces from being lost. Begin assembly by working over the wing in the top view. It is advisable to place a piece of waxed paper over plan to prevent wood parts from adhering to and tearing or soiling plan when they are removed.

While working over plan hold down wood parts with small thin pins. The wings are assembled in two units, namely, right and left panels. Place spars and trailing edges in position and insert ribs beginning with A, B, C, etc. After all ribs are in place, fit leading edges in position and complete wings by inserting all curved pieces. Cement all joints carefully and when they are thoroughly dry remove wings from plan.

STEP 4 • ELEVATORS AND STABILIZER

Material: Wood [illegible] sq., [illegible] x [illegible] and Printed Rib Sheet

The tail is assembled in two units, namely, stabilizer and elevator. Sandpaper all strips as explained in Step 1, before cutting to required lengths. Use waxed paper and pins in assembly. Cut cross members and cross braces to required sizes and cut curved tips from rib sheet. First, place cross members and then front and rear edges in position. Pin down firmly. Apply small amount of cement to cross braces and curved pieces before inserting and pinning down into position. When all pieces are in their proper places, allow cement to dry thoroughly before removing from plan. Two black strips are printed on plan. These are to be used for paper hinges. Cut off hinges to required sizes and slit wood cross members at positions indicated and insert hinges. Apply cement only to outer edges of hinges.

STEP 5 • RUDDER

Material: Wood [illegible] sq., [illegible] x [illegible] and Printed Rib Sheet

Cut required parts from rib sheet. Assemble rudder in two units, namely, first the fin and then the rudder. [illegible] Rudder is assembled in the same manner as stabilizer. Allow cement to dry thoroughly before removing from plan. [illegible] hinges can now be inserted.

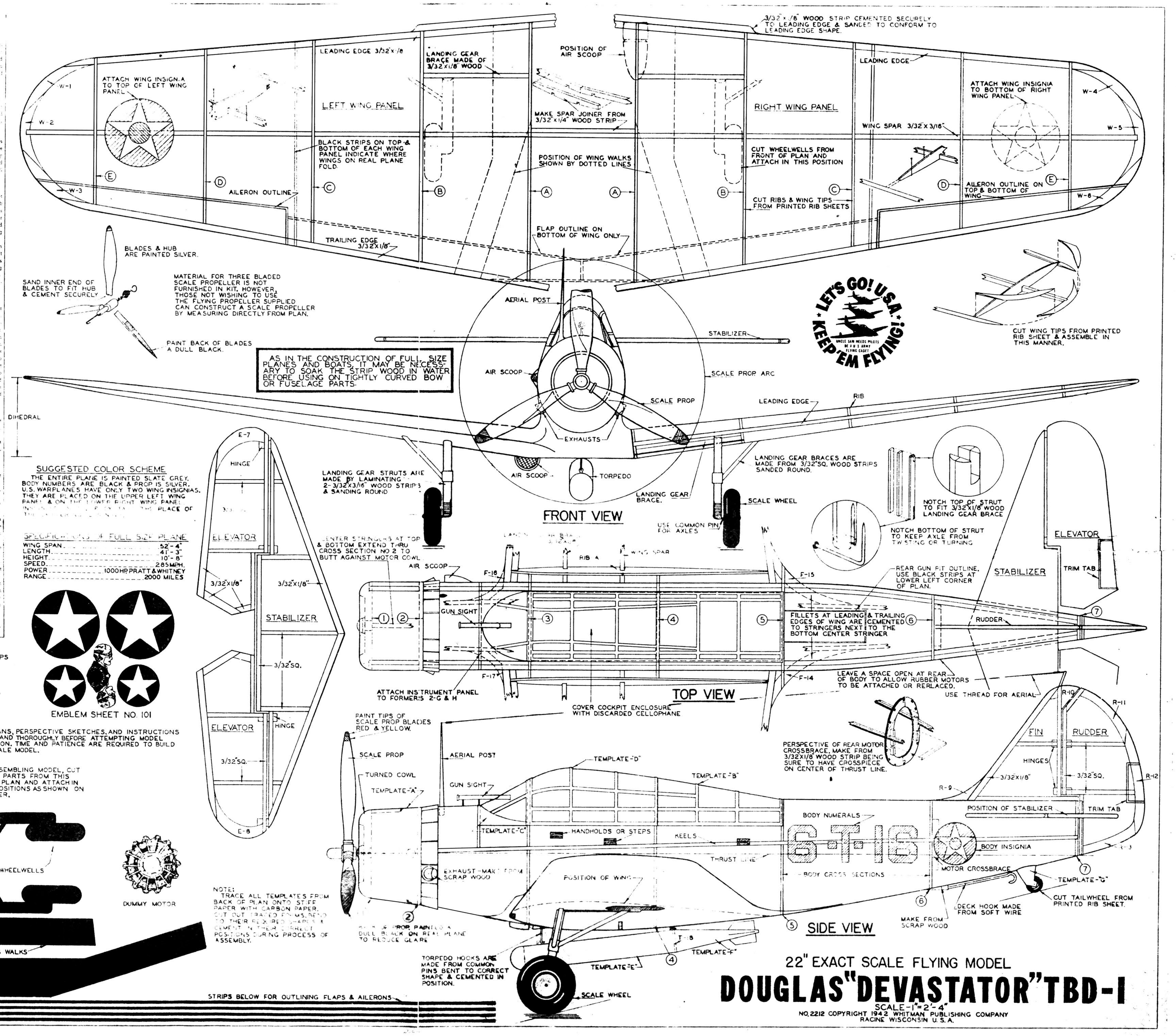
STEP 6 • BODY CONSTRUCTION

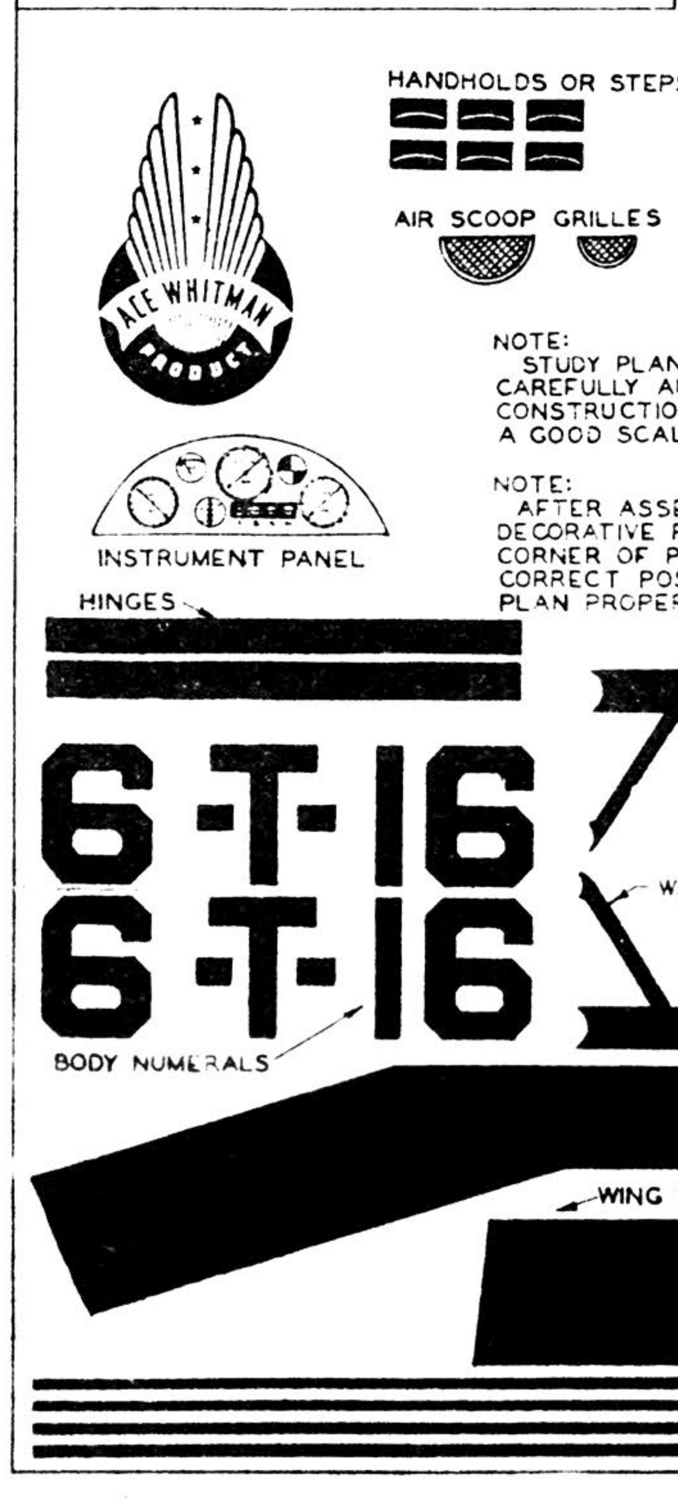
Material: [illegible] sq. Wood [illegible] Printed Rib Sheet

[illegible] Views and Body Cross Sections with waxed paper. Begin [illegible] by building keels. Two keels are needed. Each keel [illegible] of two [illegible] strips laminated [illegible] Bend to [illegible] in place with pins [illegible] As two keels are needed [illegible] remove from plan until thoroughly dry.

While keels are drying assemble cross sections [illegible] body Cross Sections drawn on plan. Cement all EXCEPT THE CENTER JOINTS AT TOP AND BOTTOM securely. Allow to dry thoroughly before removing from plan. After removing from plan, cut out notches for keels. Construct two body sides in the following manner: Pin Cross Section halves in an upright position on Body Construction side view as shown in perspective sketches. Place keels in position and be sure to cement securely to each Half Cross Section. Be sure all Half Cross Sections are square and in correct positions before allowing cement to dry.

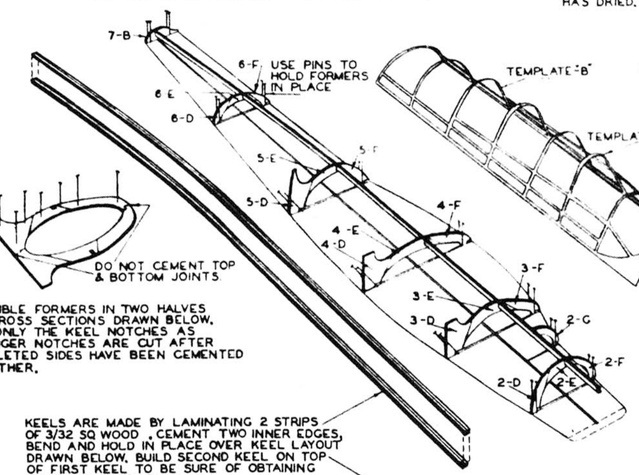
(Above instructions duplicated and continued on back of plan)





BUILD BODY IN TWO HALVES ON CONSTRUCTION SIDES DRAWN BELOW. CROSS SECTION HALVES ARE PLACED IN POSITION AND HELD BY PINS, AFTER WHICH THE KEELS ARE CEMENTED IN POSITION. DO NOT ATTACH ANY STRINGERS UNTIL THE TWO SIDES HAVE BEEN CEMENTED TOGETHER.

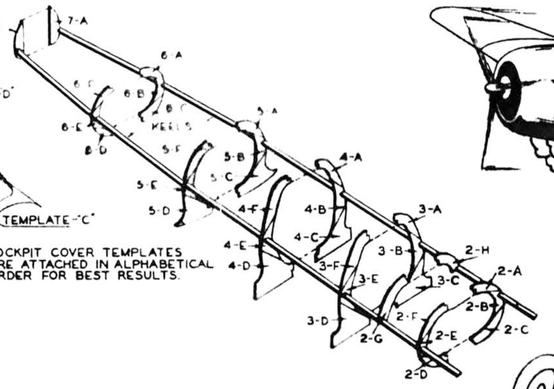
AFTER ALL JOINTS HAVE DRIED, REMOVE SIDES FROM PLAN AND CEMENT TOGETHER. NOTCH COWL AND ATTACH IN POSITION BEING SURE BODY IS TRUE AND IN LINE. CUT STRINGER NOTCHES AFTER CEMENT HAS DRIED.



DO NOT CEMENT TOP & BOTTOM JOINTS

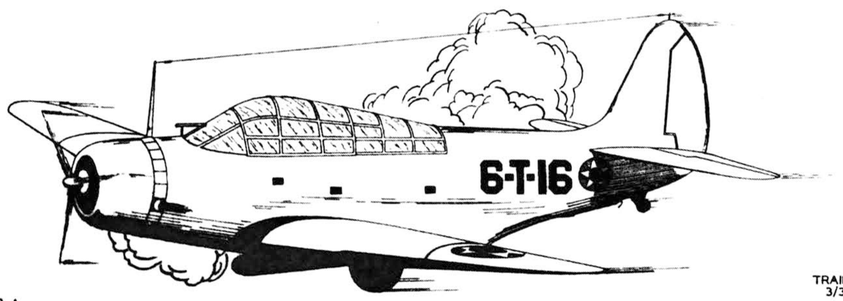
ASSEMBLE FORMERS IN TWO HALVES ON CROSS SECTIONS DRAWN BELOW. CUT ONLY THE KEEL NOTCHES AS STRINGER NOTCHES ARE CUT AFTER COMPLETED SIDES HAVE BEEN CEMENTED TOGETHER.

KEELS ARE MADE BY LAMINATING 2 STRIPS OF 3/32 SQ WOOD. CEMENT TWO INNER EDGES, BEND AND HOLD IN PLACE OVER KEEL LAYOUT DRAWN BELOW. BUILD SECOND KEEL ON TOP OF FIRST KEEL TO BE SURE OF OBTAINING SYMMETRICAL SIDES.

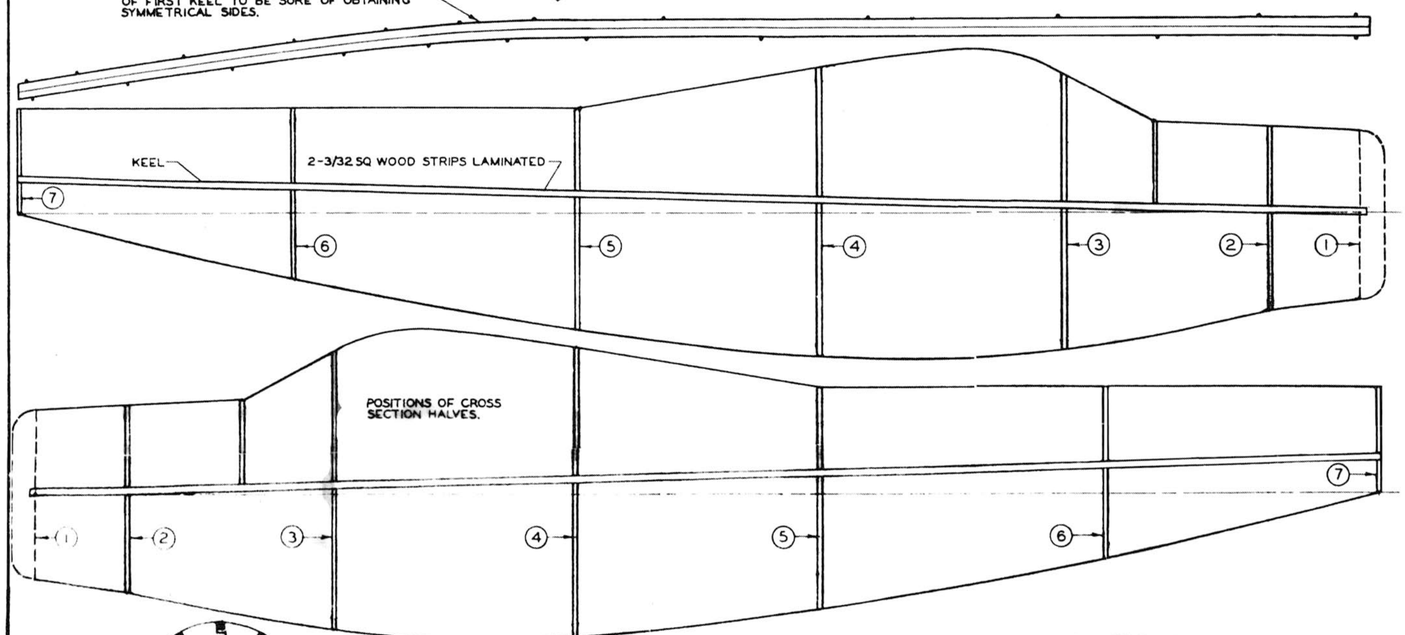


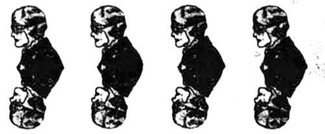
COCKPIT COVER TEMPLATES ARE ATTACHED IN ALPHABETICAL ORDER FOR BEST RESULTS.

TURNED HARDWOOD COWL NOTCHED 1/16 DEEP FOR KEELS.

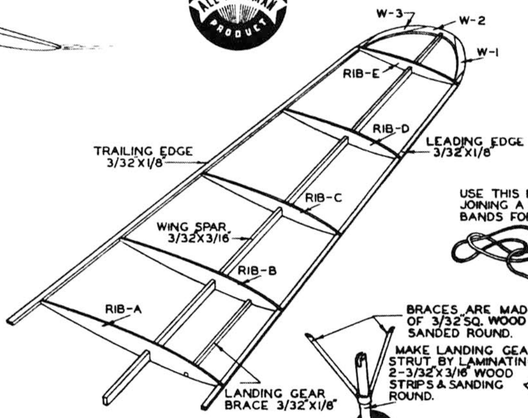


DOUGLAS "DEVASTATOR" TBD-1

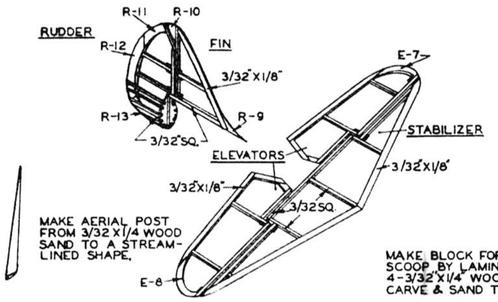




ACE WHITMAN PRODUCT

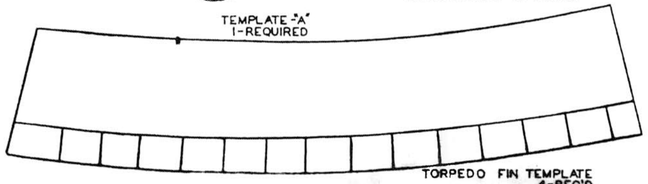


USE THIS METHOD WHEN JOINING A NUMBER OF BANDS FOR RUBBER MOTOR

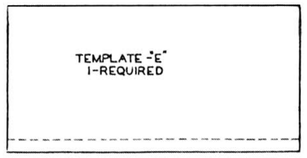


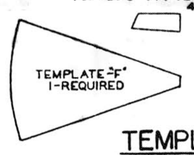
MAKE AERIAL POST FROM 3/32 X 1/4 WOOD SAND TO A STREAM-LINED SHAPE.

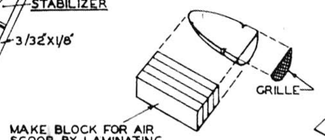
TEMPLATE "A" 1-REQUIRED



TORPEDO FIN TEMPLATE 4-REQ'D.





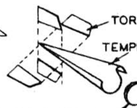


MAKE BLOCK FOR AIR SCOOP BY LAMINATING 4-3/32 X 1/4 WOOD STRIPS CARVE & SAND TO SHAPE.

LANDING GEAR ASSEMBLY

BRACES ARE MADE OF 3/32 SQ. WOOD SANDED ROUND.

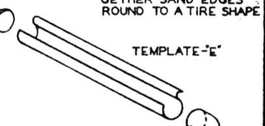
MAKE LANDING GEAR STRUT BY LAMINATING 2-3/32 X 3/16 WOOD STRIPS & SANDING ROUND.



CUT FORMER DISC FROM RIB SHEET.

PAINT BLACK

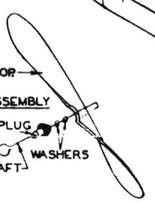
CUT TAILWHEEL DISCS FROM RIB SHEET & CEMENT TOGETHER SAND EDGES ROUND TO A TIRE SHAPE



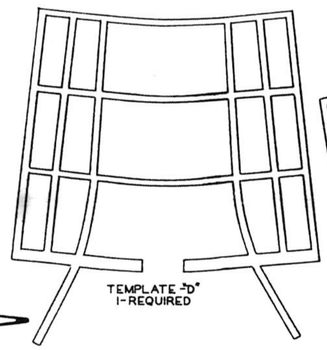
SCRAP WOOD BLOCK

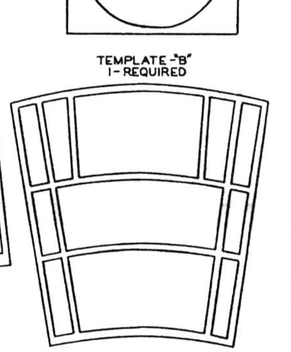
PAINT FINISHED TORPEDO GREY.

TORPEDO HOOKS MADE OF PINS OR SOFT WIRE.

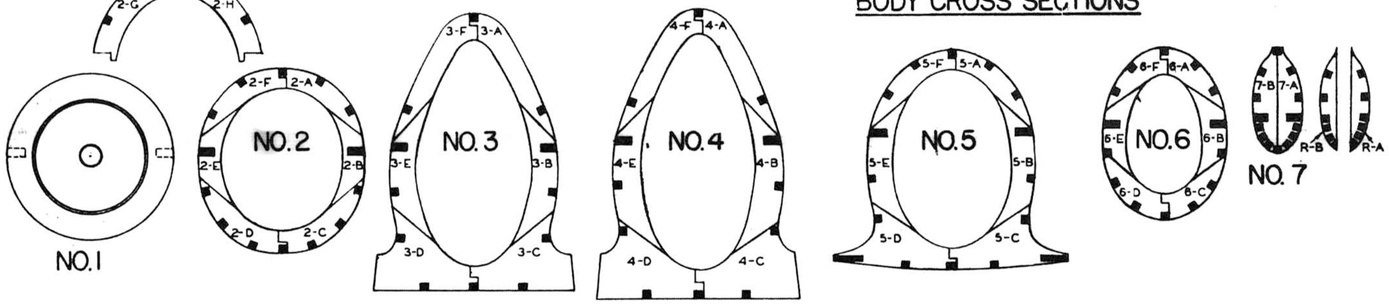


TEMPLATES

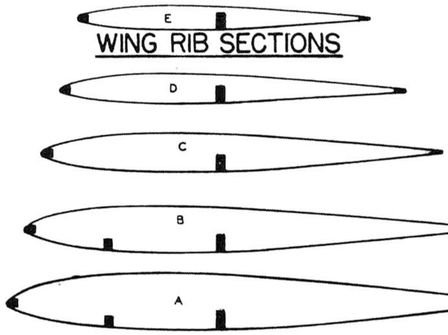




BODY CROSS SECTIONS



WING RIB SECTIONS



DETAILED INSTRUCTIONS

Study plans, perspective sketches and instructions carefully and thoroughly before attempting model construction. Time and patience are required to make this exact scale model. Always bear this in mind. The following few additional tools and materials, other than those supplied, are necessary to build this airplane model: A razor blade (preferably one with a heavy rounded back), a small board upon which to work and cement parts, about fifty small thin pins, a pair of pliers for bending shaft, some small pieces of sandpaper, and a piece of waxed paper 12x36 inches.

STEP 1 • SANDPAPERING Material: Wood Block and Sandpaper (not furnished)

For sandpapering obtain a small block of wood and fold sandpaper tightly around it. Rub sandpaper covered block with an outward motion LIGHTLY and SQUARELY on all wood strips. Avoid rounding edges of square longitudinal pieces.

STEP 2 • SPARS, ETC. Material: Sanded Wood Strips

From the sanded strips select the correct sizes as required on the plan for leading edge, spar and trailing edge. Do this before any notches are cut in ribs so that it will be very close or tight. A good close or tight fit requires less cement. Consequently, less weight will be added to the finished model.

STEP 3 • WING—RIBS—WING TIPS Material: Printed Wood Rib Sheet

With a razor blade cut out illustrated ribs and wing tips from rib sheet as they are needed in the process of building the wing. This will prevent pieces from being lost. Begin assembly by working over the wing in the top view. It is advisable to place a piece of waxed paper over plan to prevent wood parts from adhering to and tearing or soiling plan when they are removed.

While working over plan hold down wood parts with small thin pins. The wings are assembled in two units, namely, right and left panels. Place spars and trailing edges in position and insert ribs beginning with A, B, C, etc. After all ribs are in place, fit leading edges in position and complete wings by inserting all curved pieces. Cement all joints carefully and when they are thoroughly dry remove wings from plan.

STEP 4 • ELEVATORS AND STABILIZER

Material: Wood $\frac{1}{16}$" sq., $\frac{1}{16}$"x $\frac{1}{8}$" and Printed Rib Sheet

The tail is assembled in two units, namely, stabilizer and elevator. Sandpaper all strips as explained in Step 1, before cutting to required lengths. Use waxed paper and pins in assembly. Cut cross members and cross braces to required sizes and cut curved tips from rib sheet. First, place cross members and then front and rear edges in position. Pin down firmly. Apply small amount of cement to cross braces and curved pieces before inserting and pinning down into position. When all pieces are in their proper places, allow cement to dry thoroughly before removing from plan. Two black strips are printed on plan. These are to be used for paper hinges. Cut off hinges to required sizes and slit wood cross members at positions indicated and insert hinges. Apply cement only to outer edges of hinges.

STEP 5 • RUDDER Material: Wood $\frac{1}{16}$" sq., $\frac{1}{16}$"x $\frac{1}{8}$" and Printed Rib Sheet

Cut required parts from rib sheet. Assemble rudder in two units, namely, first the fin and then the rudder. Work over side view. Rudder is assembled in the same manner as stabilizer. Allow cement to dry thoroughly before removing from plan. Paper control hinges can now be inserted.

STEP 6 • BODY CONSTRUCTION Material: $\frac{1}{16}$" Sq. Wood and Printed Rib Sheet

Cover Construction Views and Body Cross Sections with wax paper. Begin construction by building keels. Two keels are required. Each keel is built up of two $\frac{1}{16}$" wood strips, laminated to make a keel $\frac{3}{32}$"x $\frac{1}{2}$". Build keels as follows. Select two strips of $\frac{1}{16}$" sq. wood of about the same hardness. Place cement on two edges to be joined. Bend to correct shape over keel layout on plan and hold in place with pins, placed in positions shown by dots on plan. As two keels are needed build one directly over the other. Do not remove from plan until thoroughly dry.

While keels are drying assemble cross section formers over the body Cross Sections drawn on plan. Cement all EXCEPT THE CENTER JOINTS AT TOP AND BOTTOM securely. Allow to dry thoroughly before removing from plan. After removing from plan, cut out notches for keels. Construct two body sides in the following manner. Pin Cross Section halves in an upright position on Body Construction side view as shown in perspective sketches. Place keels in position and be sure to cement securely to each Half Cross Section. Be sure all Half Cross Sections are square and in correct positions before allowing cement to dry.

STEP 7 • BODY ASSEMBLY

After all joints are thoroughly dry remove the two sides from plan. After making sure that all joints match perfectly, join the two sides by cementing together. Hold sides together until cement has set. Cut notches in Turned Cowl and drill hole for nose plug before attaching to front of body.

STEP 8 • BODY-STRINGERS Material: Wood $\frac{1}{16}$" sq.

The same kind of materials are used for both keels and stringers. Smooth with sandpaper, cut to required lengths and cement into positions indicated BY NOTCHES IN FORMERS as stringers are purposely not shown on plan. They run lengthwise along outside of body to help round out body and support covering. Top and bottom center stringers extend through Cross Section No. 2 to butt against motor cowl.

STEP 9 • TEMPLATES Printed on Plan

All stiff paper templates are shown in full size on plan. With carbon paper trace these templates onto stiff paper. Use plain white paper about the same thickness as the box material. Cut out traced forms to exact size, bend to required shape and cement into position during the process of assembly. Apply cement to proper edges and hold or pin into position until cement is thoroughly dry.

STEP 10 • PROPELLER Material: Wood

A machine-cut propeller is supplied. However, it is not completely finished. Sandpaper corners and edges round. Propeller must be balanced. Do this by piercing propeller center with a very thin pin which in turn is stuck to the edge of a board, thus permitting propeller to revolve FREELY. When propeller is properly balanced it will remain stationary, on its shaft, in any position. Sandpaper heavier blade until balance is attained.

STEP 11 • BEARING, ETC. Material: Furnished

The bearing, shaft and washers are all ready to use. Note that the shaft is placed first through the bearing then through the ... and next through the propeller. Bend shaft over into a "U" pull back into hub of ... and cement securely. Be sure shaft is aligned properly with blades so they will revolve ... tension of rubber motor will hold nose bearing in position DO NOT cement it to nose block. This will permit propeller unit to be readily removable from front of ship. Now insert rear motor crosspiece into position shown in side view. Cement securely.

STEP 12 • LANDING GEAR AND TAIL WHEEL Material: Wood $\frac{1}{16}$" sq., $\frac{1}{16}$"x $\frac{1}{8}$"

The main strut of landing gear is $\frac{1}{16}$" thick. This must be built up from the surplus leading edge stock. Cut to correct length and cement two pieces of $\frac{1}{16}$"x $\frac{1}{8}$" together to obtain a piece $\frac{1}{16}$" sq. Form and assemble parts into complete landing gear mechanism as shown. Method of inserting wheel struts is shown on plan.

The tail wheel is made from separate pieces. Cut them from the rib sheet. Cement pieces together "cross grain." This is done to obtain extra strength and to avoid warping. After cement is thoroughly dry, round outer edges to a tire shape. Cement tail wheel to Template. Attach tail wheel assembly after model has been covered.

STEP 13 • COVERING, ETC. Material: Tissue

All individual complete parts are to be covered all around or on all sides. First sandpaper all rough edges and make all corners slightly rounded. Fit the tissue paper first, a section at a time, then apply cement and finally attach tissue and allow it to dry. Cover all parts completely and apply as much tissue in one section as possible without undue wrinkling. Cover body sections, where stringers are used in narrow longitudinal strips applied between each stringer over entire length of body. This prevents undue wrinkling and produces a much smoother appearance when tissue is tightened by shrinking, as explained. With a very fine atomizer or insect gun, spray entire covering of framework very lightly with water. Allow parts to dry. The tissue shrinks as it dries. This gives the parts a smooth tightly stretched covering. When parts are completely covered and dry they are ready for final assembly.

STEP 14 • ASSEMBLING

When all individual parts are completed they are ready for final assembly. Cement elevator and rudder into positions shown and allow cemented joints to dry thoroughly. Attach wing panels and block up wing tips until proper dihedral angle is attained. Insert landing gear struts. After these parts are completely dry attach tail wheel. The model is now ready for decorations.

STEP 15 • DECORATIONS Material: Printed on Plan and Emblem Sheet

Cut various decorations from plan and Emblem Sheet. Apply a thin layer of cement to backs and place in position. Cut emblem from Emblem Sheet and cement in positions designated on plan proper.

STEP 16 • RUBBER MOTOR

Attach rubber motor between propeller shaft and motor crosspiece at rear. Rubber motors are easily installed by threading or pulling into position with a piece of string first dropped through body. A portion of body at motor crosspiece should be left uncovered for ease in changing or attaching rubber motors.

STEP 17 • FLYING

When model has been completely assembled it must be checked for center of gravity balance before a trial flight is attempted. Place the forefingers at the midpoint of the wing tips and lift model to see whether it balances. If tail has a tendency to drop it denotes tail heaviness, which may be overcome by adding a little weight to nose of ship. If nose has a tendency to point downward, add a little weight to tail. Use this procedure until proper balance is attained. Tacks or pins can be inserted into front or rear of model to produce proper balance. When plane remains horizontal, while suspended on finger tips, it can be considered balanced. A few short trial glides should be made AFTER the model has been properly balanced (not before). When gliding, if ship has tendency to climb and if it does not make a gradual glide downward, it indicates that tail is still a little too heavy. This must be offset by additional weight at front of model. To be certain that ship is correctly balanced, hold it, unwound, in position for launching and if the glide after leaving the hand is steady and consistent and goes forward 10 or 15 feet, ship can be considered as making a normal glide. Model is now ready for its trial flight. When gliding the ship do not launch it upward. Launch it with the nose pointed slightly downward which permits gravity to take effect. Before trying a powered flight it is advisable to test motor by winding propeller with right forefinger. Permit rubber motor to unwind completely, two or three times. At this time check trueness of propeller rotation. While turning propeller and thus winding rubber motor, hold model firmly by its noseblock. The proper number of turns for rubber motor is attained when its coils or twists are fairly small and tight.

For convenience of model builder all ribs, formers, etc., as shown on printed sheets are duplicated on this plan for use in final checking, repairing and for the building of additional models. Plan can now be filed away for future reference.

NOTE • Rubber bands for motors are not available in these kits during the war. Model builders can usually obtain sufficient rubber from old kits, stationery stores, etc., to power this model.

As Balsa lumber has been frozen for the duration, little if any can be supplied in this kit. However, where slightly heavier or stronger stripwood is supplied it can be bent nearly as easily as balsa, if soaked in water for fifteen minutes before bending. (Years ago, before balsa was available for airplanes, model builders boiled basswood sticks and then dried them partially in the sun before using.) It is not necessary to soak the stringers in this kit except when bending them into short or tight curves.

OF SPECIAL INTEREST • In some versions, the prototype of this model warplane carries its torpedo within the body of the ship.

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