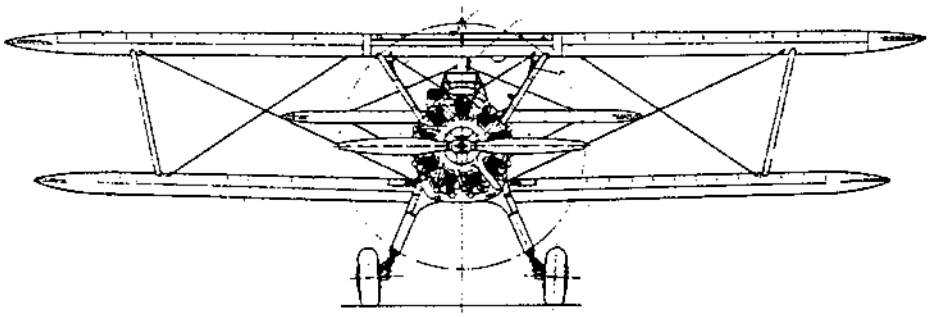
BOEING

# PT-17 STEARMAN



## BUILDING INSTRUCTIONS

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CONGRATULATIONS ON HAVING JUST PURCHASED ONE OF THE FINEST SCALE MODEL KITS AVAILABLE TODAY.

THERE IS A GREAT DEAL OF INDIVIDUAL DETAIL TO BE TAKEN CARE OF PRIOR TO GLUING A TO B SO SIT BACK, RELAX AND CONSIDER THE FOLLOWING PRELIMINARIES.

YOUR CHOICE OF THIS KIT WAS INITIALLY MOTIVATED BY SOME PRIOR EXPERIENCE OR PREFERENCE FOR THIS PARTICULAR MODEL. PERHAPS IT IS A REAL PLANE OF THE SAME DESIGN YOU HAVE FLOWN OR MAYBE OWN NOW. THE POINT IS, RIGHT NOW, ONLY YOU ARE FAMILIAR WITH THAT FEELING. HAVEN'T YOU NOTICED THAT WHEN YOU SPEAK OF THIS BEAUTIFUL SCALE JOB THERE IS THE CASUAL INDIFFERENT LOOK ON YOUR COMPANION'S FACE? WOULD YOU BELIEVE THE SAME INDIFFERENT FEELING COULD BE IN THE JUDGE'S MIND AS HE INSPECTS THIS BEAUTY YOU WILL CREATE? 'TIS POSSIBLE, ISN'T IT?

THE ABSOLUTE FIRST THING YOU MUST DO AT THIS VERY TIME IS DETERMINE WHETHER THIS IS TO BE THE "ULTIMATE SCALE JOB" OR AN "EYEBALL SCALE". IF YOU CHOOSE "EYEBALL SCALE", WHICH IS JUDGED FROM 25 FEET AWAY, THEN YOU MAY AS WELL TURN TO CONSTRUCTION TECHNIQUES AND START BUILDING! HOWEVER, IF YOUR CHOICE IS "ULTIMATE SCALE" , THEN YOUR PROJECT HAS NOT YET BEGUN.

THE NEXT DECISION YOU MUST MAKE IS WHICH PARTICULAR TYPE, MODEL AND SERIES YOU INTEND TO DUPLICATE TO THE NTH DEGREE. THE TYPE (THAT IS BOMBER, FIGHTER, ETC.) HAS ALREADY BEEN DECIDED AS YOU BOUGHT THE KIT. THE MODEL (THAT IS 24-25-26 ETC) MAY NEED TO BE YOUR CHOICE AS FOR INSTANCE, THERE IS NO EASILY RECOGNIZABLE DIFFERENCE BETWEEN A B-44 AND A B-50. THE SERIES VARY WIDELY AND YOU WILL NEED TO MAKE THIS DECISION YOURSELF. FOR INSTANCE THERE IS VERY LITTLE DIFFERENCE BETWEEN A B-52B, B-52C, B-52D. AND B-52E TO THE CASUAL OBSERVER, BUT TO THE TRAINED EYE OF A COMPETITION SCALE JUDGE THIS MAKES THE FIRST GREAT DIFFERENCE.

ONCE YOUR CHOICE HAS BEEN MADE AS TO EXACTLY WHICH TYPE, MODEL AND SERIES YOU WILL BUILD, YOUR NEXT TASK WILL BE TO COMPLY WITH THE "SCALE PRESENTATION". BY THIS I MEAN YOU MUST ASSEMBLE AND ARRANGE THE "PROOF" YOU INTEND TO USE, TO THOROUGHLY CONVINCE THE JUDGE THAT YOURS IS THE BEST OF THE BUNCH! KEEP IN MIND THAT YOU CAN'T "TALK" HIM INTO IT SO EXTRA EFFORT SPENT AT THIS STAGE REAPS GREAT BENEFITS LATER.

START WITH AN ACCURATE, AUTHENTIC 3-VIEW DRAWING PREFERABLY FROM THE MANUFACTURER, AND WHICH GIVES DIMENSIONS OF THE REAL PLANE. IF NOT AVAILABLE, THEN SUCH GREAT WORKS AS THE COMMERCIAL SCALE 3-VIEWS BY NIETO, NYE, WYLAM, SUPERSCALE, ETC. ARE ACCEPTABLE. I KNOW THIS BECAUSE I JUST READ IT IN THE CURRENT AMA MODEL AIRCRAFT REGULATIONS BOOK WHICH INCIDENTALLY IS THE BOOK BY WHICH YOUR EFFORT WILL BE RATED. NEEDLESS TO SAY, BEFORE YOU GO ANY FURTHER, GET REAL FAMILIAR WITH THE RULES FOR SCALE.

ONE MORE WORD OF ADVICE ABOUT THE "SCALE PRESENTATION". THE BETTER IT LOOKS, THE BETTER YOUR SCORE WILL BE SO DON'T CUT CORNERS OR GO SECOND CLASS! NUFF SAID?

NOW THAT YOU'VE ASSEMBLED THE 3-VIEW, TECH DATA, PICTURES AND REFERENCES AND CONSTRUCTED A WELL ORGANIZED, WELL PLANNED, EYE APPEALING PRESENTATION, YOU MUST STUDY, COMPARE, MEASURE AND CAREFULLY PLAN THE MODEL YOU WILL BUILD.

To apply the covering, cut it oversize, hold in place and spray with a FINE FINE mist water sprayer carefully working out all the wrinkles and dope it while still wet with the brush nearly parallel to the surface and lightly, lightly stroking it. If done while wet, the dope will "float" on the damp surface and dry "white or cloudy" but will require far fewer coats and the cloudy look will disappear after the 2nd or 3rd coat.

Carefully trim (with a double edge razor blade) and sand the "rough" areas but be careful not to "cut" or "sand" out the fibers over a "high" place like a rib.

When surface remains smooth after a coat of dope (3rd or 4th coat) it's time to thin the mixture and add talc or cornstarch for filler "body". Sand after each coat until desired smoothness is acheived. Then assemble the parts and spray paint the final colors to suit. Just remember alot of planes modeled are glossy when the prototype was not. This mistake costs points. As I mentioned earlier, I won't presume to advise on achieving the "ultimate scale" finish, but if in doubt, there are volumes written on the subject. There may even be a "scale nut" in your area who can help. Don't forget the plastic modeler who knows finishes. Remember also, the plastic model is an excellent source of scale detail as well.

## AIRCRAFT ALIGNMENT

This sheet is included as an addition to the normal instructions in hopes that you may benefit from the information it contains. The time it takes to accurately align an airplane is repayed many, many times by the superior performance of the aircraft.

All alignment information is included on the plans. Note that wing and stab angles, thrust angles, etc., appear near their component locations. Generally, the angles are referenced to a fuselage centerline which is also drawn on the plans.

Most angles are expressed in degrees of angular offset. Don't let this stop you from using them! The least expensive conversion method is to borrow an algebra book which has trigonometry sections. Use the formulas to convert the degrees to fractions of an inch of offset. The easiest method is to use a Robart incidence meter. This device is calibrated in degrees and allows direct readings of the incidence angles.

The first step in aligning the aircraft is to transfer the centerline to the fuse sides. Usually the centerline runs parallel to a major piece of the fuse such as the top edge of the side. Use a felt tip pen and draw a line parallel to the centerline above the wing saddle and below the stab saddle.

Next, mark the centerlines of the leading and trailing edges on the stab and wing. Make a template from the plans to transfer this location.

Place the fuse on the workbench and block up so that the centerline is parallel to the table top. Now place the stab in its saddle and trim and skim it until the leading and trailing edges are at the required different angles. Let's say the plans call for 1 /16" positive incidence. That means the center of the leading edge is 1 16" higher (referenced to the top) than the center of the trailing edge. It makes no difference how far up the trailing edge is from the work surface--just make the leading edge 1 16" higher. The stab may have positive, negative, or no incidence depending on the design.

ALIGN THE WING THE SAME WAY. A METHOD TO USE, WHERE DOWELS ARE EMPLOYED ON THE LEADING EDGE IS TO DRILL THE DOWEL HOLES IN THE BULKHEAD HIGHER THAN NECESSARY (TOWARD THE TOP OF THE FUSE IN A LOW WING DESIGN). NOW, WHEN THE WING IS PUT IN PLACE, THE TRAILING EDGE WILL STICK UP OFF THE WING SADDLE. USING A RAT TAIL FILE, ELONGATE THE HOLES DOWNWARD UNTIL THE WING IS AT THE CORRECT INCIDENCE IF THERE IS A GAP ALONG THE WING SADDLE USE BALSA, PLY, OR FILLER TO CLOSE. IF YOU WANT TO USE WING SEATING TAPE, BE SURE TO MAKE ALL YOUR MEASUREMENTS WITH THE TAPE IN PLACE.

THE WING AND STAB MUST ALSO BE CHECKED TO BE SURE THEY HAVE THE SAME LENGTH EXTENDING OUT FROM THE FUSELAGE. USE A BALSA STICK OR YARDSTICK AND BE SURE THAT IF THE TOTAL WINGSPAN IS 70 THAT 35' MINUS 1 2 THE FUSE WIDTH EXTEND ON EACH SIDE OF THE FUSELAGE.

NEXT, BE SURE THE WING AND STAB ARE NOT SKEWED ON THE FUSELAGE OR TO EACH OTHER. USE A PIECE OF NON-STRETCHABLE STRING AND TIE A LOOP IN ONE END. PIN THROUGH THE LOOP ATTACHING THE STRING IN THE EXACT CENTER OF THE FUSELAGE. FOR THE WING ATTACH NEAR THE TAIL. (NEAR NOSE FOR STAB) MEASURE OUT TO ONE TIP AND THEN GO TO THE OTHER TIP. IT MUST BE THE SAME DISTANCE. DO THIS FOR THE WING AND STAB.

THE LAST THING TO CHECK IS THAT THE WING AND STAB ARE NOT TILTED. CAREFULLY SIGHT FROM THE FRONT AND BE SURE THAT ONE TIP OF THE STAB DOES NOT DROOP LOWER THAN THE OTHER.

AS YOU CAN SEE, THESE 5 PARAMETERS MUST BE COMPLETED TAKING INTO ACCOUNT THE OTHER 4 AS ONE IS BEING WORKED UPON. USUALLY, WE ESTABLISH THE STAB INCIDENCE, EQUAL EXTENSION, SKEWNESS FIRST, AND THEN GLUE THE STAB IN POSITION WHILE SIGHTING FROM THE FRONT WITH A STRAIGHT ROD RESTING ON THE WING SADDLE.

THE LAST DIFFICULT AREA IS THE FIN AND RUDDER. BE SURE THE FIN IS PERPENDICULAR TO THE STAB. A LARGE RIGHT TRIANGLE IS NECESSARY FOR THIS STEP. ALSO, SIGHT CAREFULLY FROM THE FRONT TO BE SURE THAT THE FIN IS INLINE WITH THE TOP CENTERLINE. SIGHT FROM THE FRONT AND MAKE SURE YOU SEE THE SAME AMOUNT OF EACH SIDE OF THE FIN.

MOTOR OFFSET IS DIFFICULT TO MEASURE. IF THE ROBART GAUGE IS USED, IT IS EASY. INCASE YOU DON'T USE THE GAUGE, ABOUT THE BEST METHOD IS TO DRAW THE THRUST LINE ON THE NOSE OR NACELLE AND THEN EXTEND THIS LINE WITH A STICK. MEASURE FROM THE CRANKSHAFT TO THE STICK AND COMPARE WITH WHAT THE PLANS CALL FOR. REMEMBER THAT THRUST ANGLES MAY BE ALTERED WITH SKIMS OR OVERSIZE MOTOR MOUNT HOLES. WHEN YOU VERIFY THAT THE THRUST IS CORRECT, FILL THE UNNEEDED PART OF THE HOLE WITH EPOXY TO MAINTAIN STRENGTH.

WE ARE SURE THAT IF YOU TAKE THE TIME TO COMPLETE THE ABOVE STEPS YOU WILL HAVE MUCH MORE SATISFACTION FROM YOUR NEW MODEL.

## BALANCE AND FLIGHT

THERE BEFORE YOU, IS THE RESULT OF THESE MANY EFFORTS. ALL OF THE WORK IS DONE, YOU SAY. NAY, SAY I. ALL OF WHAT IS DONE, ANYONE COULD DO. WHAT LIES AHEAD IS IMPORTANT FOR IT MAKES AN ALMIGHTY DIFFERENCE.

THIS PHASE BEGINS WITH THE MODEL READY FOR FLIGHT AND ENDS WITH A SUCCESSFUL LANDING. BEGIN WITH THE AIRPLANE ASSEMBLED AS IF TO FLY. SET IT ON A SMOOTH SURFACE WITH A PLAIN UNBROKEN BACKGROUND AND GO AROUND BEHIND THE CRAFT AND "EYEBALL" IT. VERY CAREFULLY CHECK TO SEE THAT THE RUDDER AND VERTICAL FIN ARE PERFECTLY ALIGNED. IN THE CASE OF TWIN RUDDERS, MEASURE THEM ACCURATELY. IS THE HORIZONTAL STABILIZER PARALLEL TO THE WING? ARE THERE ANY WARPS IN ANY OF THE FLYING SURFACES? IS THE FUSELAGE STRAIGHT? IF THE ANSWER IS YES TO ALL THESE QUESTIONS, YOU ARE IN GREAT SHAPE. IF NOT, ADJUST IT SO IT IS. YOU KNOW WHAT MUST BE DONE TO ALIGN SURFACES BUT WAIT AWHILE TO DO THAT WHILE WE CONSIDER WARPS.

WARPS ARE CROOKED OR "BENT" SURFACES. THEY CAUSE MOST ACCIDENTS. IT ISN'T NECESSARY AS THEY CAN BE FIXED. ON ANY WOOD AIRPLANE WHICH HAS BEEN DOPED OR PAINTED WITH ANY OF SEVERAL DIFFERENT PAINTS THE PROBLEM IS TO SOFTEN THE PAINT AND TWIST THE SURFACE OPPOSITE THE WARP, THEN LET IT HARDEN AGAIN.

THE PAINT CAN GENERALLY BE SOFTENED TWO WAYS. IT CAN BE HEATED OR DISSOLVED. TO HEAT IT, USE STEAM. IF A SMALL SURFACE IS THE PROBLEM, A TEAKETTLE OVER A STOVE DOES NICELY. IF A LARGE SURFACE IS WARPED, THE OUTLET BEHIND A STEAM CLEANING PLANT WILL DO THE JOB. YOU APPLY BOTH SIDES OF THE WARPED SURFACE TO THE STEAM UNTIL GOOD AND HOT, THEN HOLD OPPOSITE WARP, REMOVE FROM STEAM AND ALLOW TO COOL WELL. WAIT AWHILE, THEN CHECK AGAIN. DO THIS UNTIL THE WARP IS GONE.

TO DISSOLVE THE PAINT, USE MORE COATS OF PAINT OVER BOTH SIDES OF THE WARP. THIS DOESN'T WORK ON ALL PAINT, BUT HAS BEEN DONE SUCCESSFULLY WITH DOPE AND LACQUER. I HAVE ALSO SEEN GUYS FASTEN THE SURFACE DOWN IN PROPER POSITION AND PAINT AND PAINT UNTIL IT WILL STAY. THAT'S THE HARD WAY.

NOW THAT ALL THE WARPS ARE GONE, REASSEMBLE THE PLANE, PUT IT ON A TRUE FLAT SURFACE AND MEASURE THE DISTANCE FROM THAT SURFACE TO LEADING EDGE OF WING, THEN FROM THE SURFACE TO TRAILING EDGE OF WING AT SAME STATION (CHORD POINT) AND VERIFY THAT IT AGREES WITH THE INCIDENCE SHOWN ON THE PLANS. DO THE SAME FOR THE TAIL. IF IT DOESN'T AGREE, DO WHATEVER IS NECESSARY TO MAKE IT AGREE.

NEXT CHECK THE THRUST. FASTEN A STRING TO THE CENTERLINE OF THE PLANE BACK NEAR THE TAIL AND COMPARE THE DISTANCE TO EACH PROP TIP WITH THE PROP HORIZONTAL INSURING THAT THE OFFSET AGREES WITH THAT SHOWN ON THE PLANS. THEN VERTICAL FOR DOWNTHRUST.

NOW, CHECK THE BALANCE POINT TO BE SURE IT IS EXACTLY AS SHOWN ON THE PLAN. IF NOT, ADD WEIGHT OR RELOCATE THE RADIO IN SUCH A MANNER THAT IT AGREES WITH THAT SHOWN.

LASTLY, TURN THE RADIO ON AND OPERATE ALL THE SURFACES ONE AT A TIME TO INSURE THAT THEY MOVE IN THE PROPER DIRECTION, DO NOT BIND, DO NOT INTERACT WITH OTHER CONTROLS AND DO RUN SMOOTHLY. WHEN YOU HAVE SATISFIED ALL THESE REQUIREMENTS, PUT THE OUTFIT ON CHARGE ALL NIGHT BEFORE YOU GO FLY.

WHEN YOU GET TO THE FIELD, DON'T BE AFRAID TO ASK AN EXPERT TO FLY YOUR PLANE FOR YOU IF YOU ARE A NOVICE OR IF YOU HAVEN'T FLOWN IN AWHILE.

IF YOU DECIDE TO FLY IT YOURSELF, PLAN YOUR FLIGHT FROM TAKEOFF, THROUGH CLIMB, TURNS, PATTERN, APPROACH AND LANDING WITH CAREFUL CONSIDERATION GIVEN TO WIND DIRECTION, RUNWAY ORIENTATION, OTHER TRAFFIC AND RELATIVE POSITION OF THE SUN.

I HAVE SEEN EVERYTHING MENTIONED IN THIS CHAPTER CAUSE A SCALE JOB TO CRASH WHEN NOT DONE PROPERLY, SO IF YOU WILL CAREFULLY TEND EACH ONE OF THESE POINTS, YOUR ODDS WILL BE MUCH MUCH BETTER. DON'T YOU AGREE?

GOOD LUCK AND HAPPY LANDING!

FIRST, SELECT THE SCALE RATIO YOU WILL USE. THIS HAS BEEN APPROXIMATED IN OUR KITS BECAUSE THERE ARE SO MANY VARIANTS BETWEEN EACH DIFFERENT SERIES OF THE BASIC AIR PLANE. YOU MAY CHOOSE THE SERIES WHICH IS CLOSEST TO OUR KIT - STILL YOU WILL HAVE TO MAKE ADJUSTMENTS, PERHAPS AN INCH IN WINGSPAN, 1 2 INCH IN LENGTH OR SO ON. THE POINT IS--THIS IS THE TIME TO PLAN FOR THESE ADJUSTMENTS AND THEY MUST ALL BE THE SAME RATIO FOR MAXIMUM POINTS.

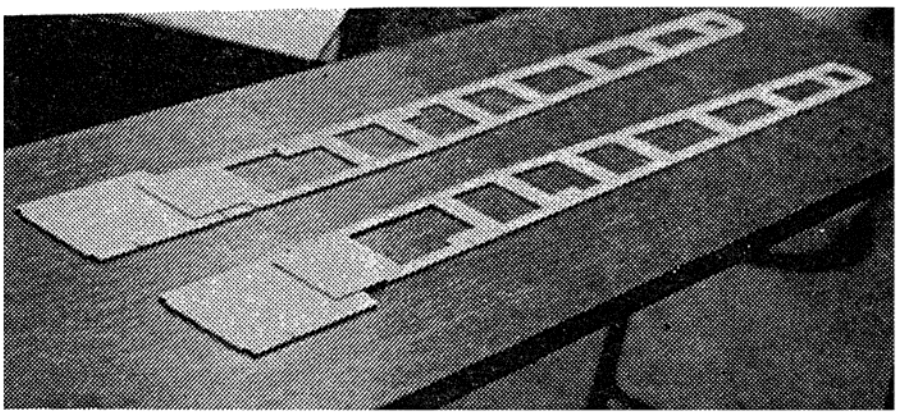
THE EASIEST WAY TO DO THIS IS TO OBTAIN A PAIR OF "PROPORTIONAL" DIVIDERS. THIS IS A TOOL WITH A MOVEABLE PIVOT IN THE MIDDLE AND WHEN OPEN LOOKS LIKE AN "X" WITH NEEDLE POINTS AT EACH TIP. WITH THESE YOU MAY SET THE "RATIO" SO THAT MEASURING WITH ONE END OFF THE 3-VIEW WILL GIVE THE DESIRED MEASUREMENT AT THE OTHER END. CAREFULLY ADJUST THE DRAWINGS WE'VE PROVIDED TO EXACTLY MATCH THE 3-VIEW YOU WILL USE.

NEXT, CAREFULLY STUDY THE MATERIAL YOU'VE GATHERED AND MAKE NOTE OF EXACTLY WHICH DETAILS YOU WILL INCLUDE ON YOUR MODEL AND WHERE AND HOW THEY WILL BE INCORPORATED. FOR INSTANCE, DO YOU PLAN ON FLAPS? RETRACTABLE GEAR? LIGHTS? THOUSANDS OF TECHNIQUES ARE INCLUDED IN MAGAZINES AND COLUMNS WHICH ARE DEVOTED TO SCALE CONSTRUCTION TECHNIQUES SO I'LL LEAVE YOU TO HUNT UP ALL THAT FOR YOURSELF.

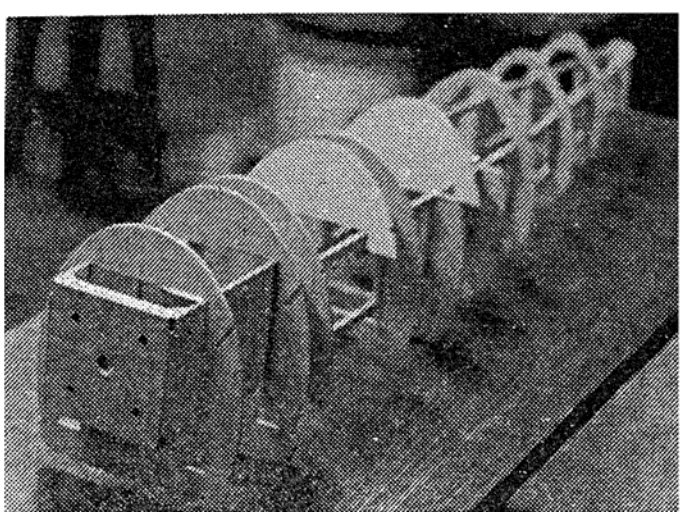
WE WILL NOW CONSIDER THE BASIC AIRPLANE AND THEN IT'S CONSTRUCTION.

## PT-17 FUSELAGE

1. Glue together plywood fuselage sides, FA, FB, FC. Make sure you make up a right and left side. Do this on a flat surface to insure that they are straight.

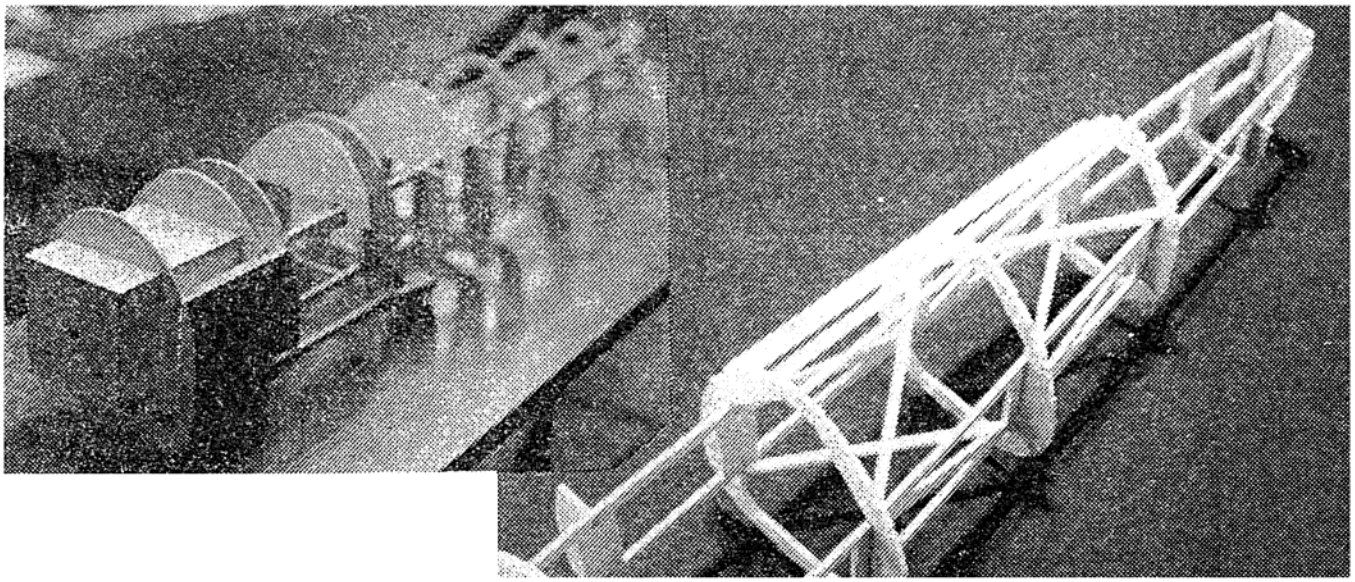


2. Slide formers F1 to F14 into place on the fuselage sides. Use some tape if necessary. Line up everything, and when satisfied, glue into place. Drill holes in F1 to suit the engine mount to be used.

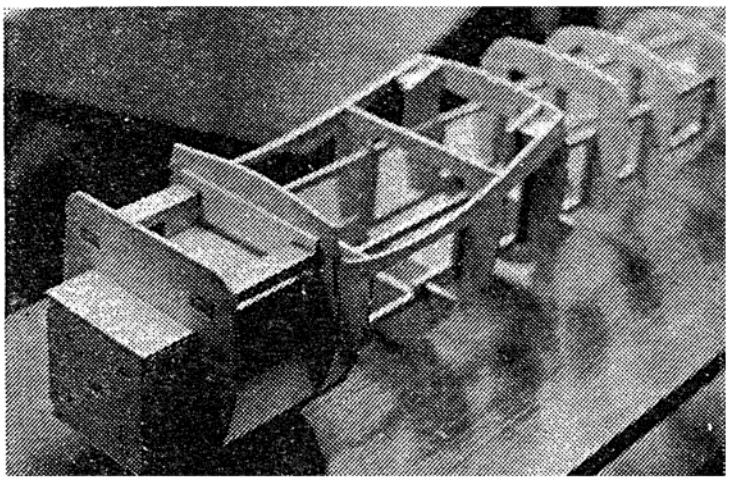


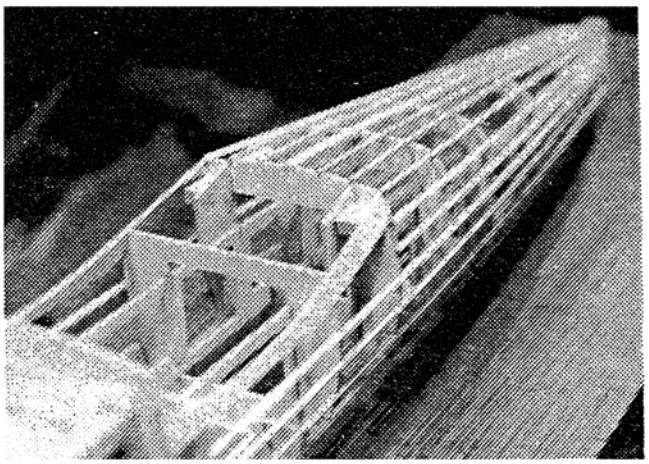
3. Add triangle stock to rear of F1, then F18 and F19. Also 3/32 cockpit floor sheeting. Glue F2-A's in place and F16, F17 parts.

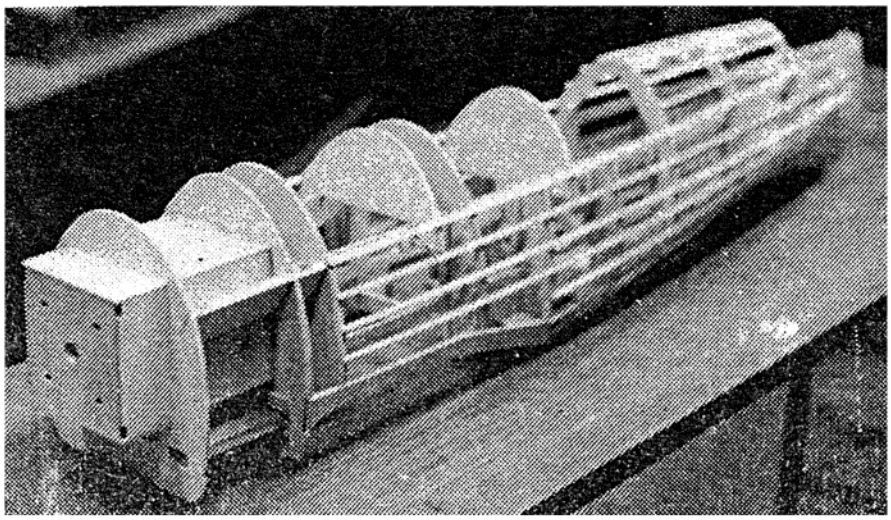
4. Make up F20, 20A and 20B assembly and glue in place. Add 3/16 square stiffener stringers at rear of fuselage.

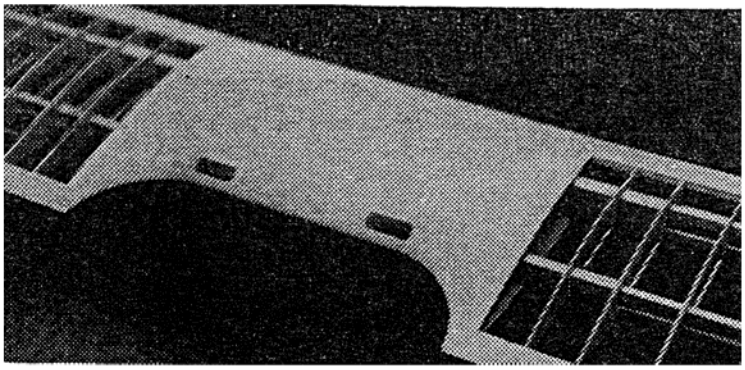


5. Add F21, also F15's.







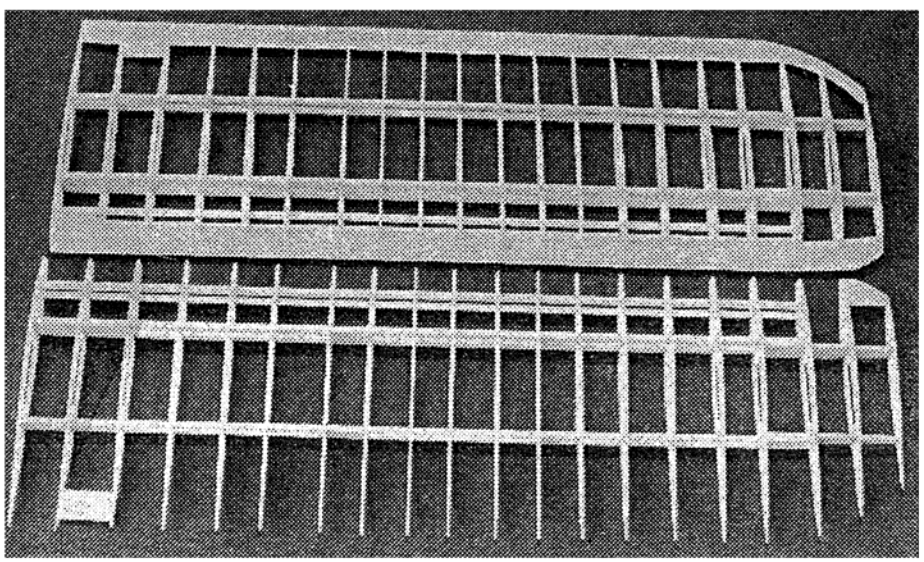


## LOWER WING

1. Make up wing spars with 3/16 X 3/8 balsa. Add 3/16 X 3/8 fill. Add W14 and W15 to tips.

2. Pin lower balsa TE in place and mark rib locations. Pin ribs W1 to W5 in place on the TE. Slide spar assemblies in place. Mark rib locations on 3/32 X 3/8 balsa LE and pin in place. Get everything square and glue all parts.

3. Remove from plans and add 3/16 sq. front spars.



4. Add W22, outer ribs, W6 and W7, also W16 and W13. Glue W21 in place.

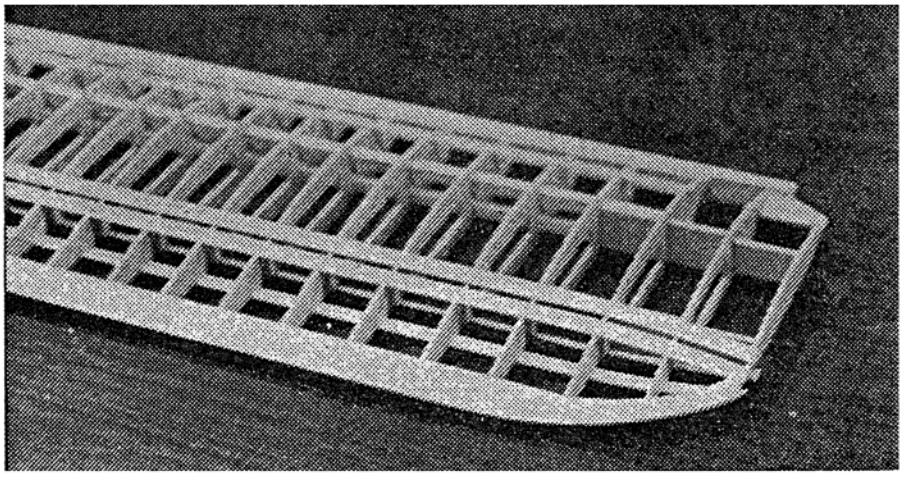
5. Cut ribs W1 for plywood W19 and 20 joiners.

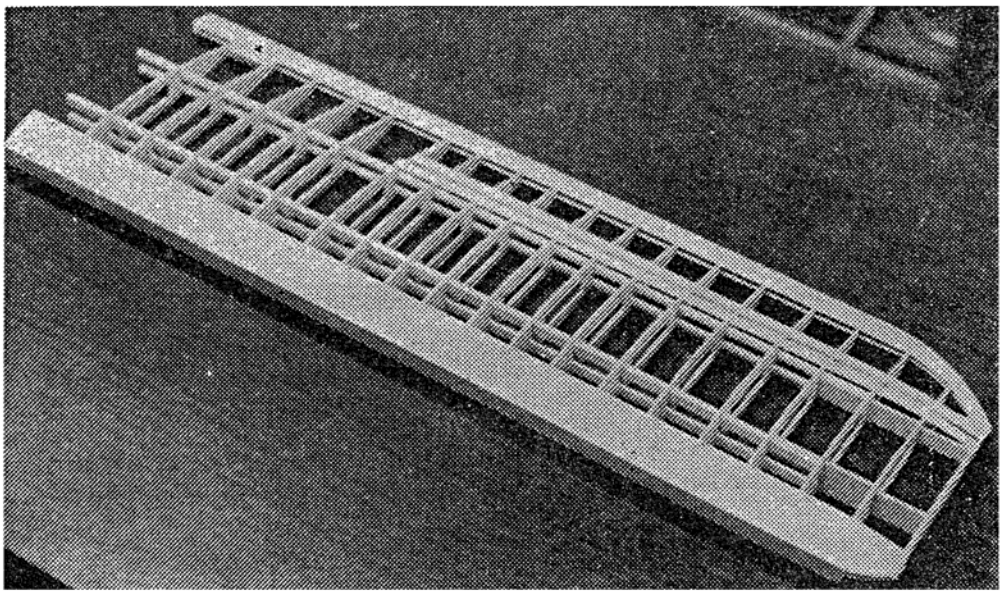
6. Add to TE sheeting.

7. Glue WB's in place. Sheet LE with 3/32 balsa.

8. Glue 9/32 X 3/4 LE in place.

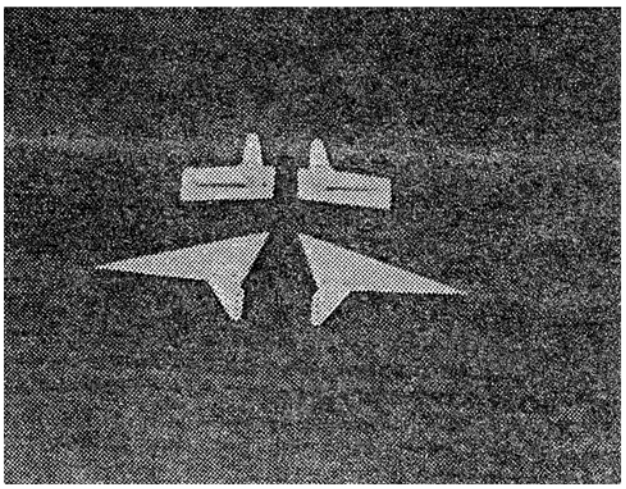
9. Add 3/32 X 3/8 balsa caps to ribs W3 to W7 for ailerons. Note how they meet at tip section.





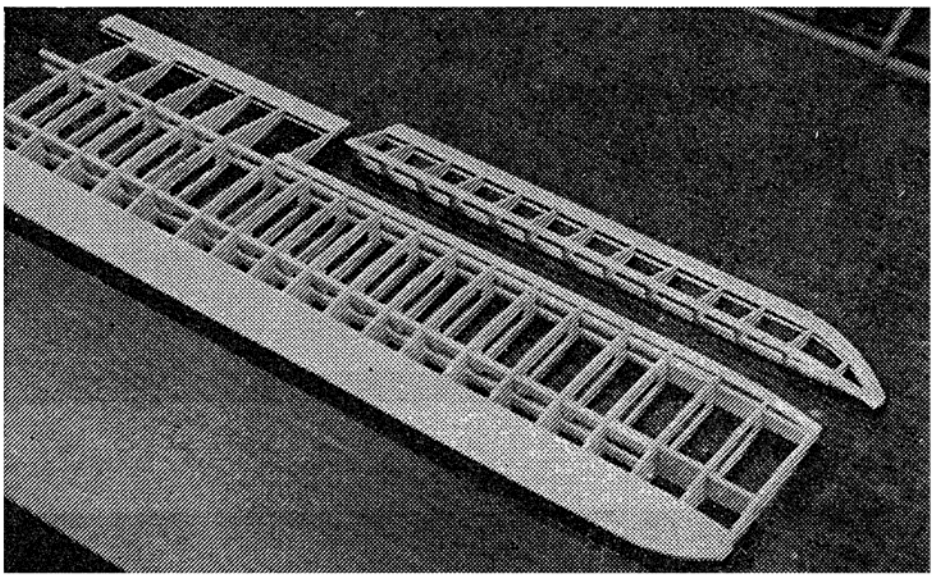
10. Add W12 and W11 with horn installed. Don't forget scrap 3/32 by W3 at the rear.

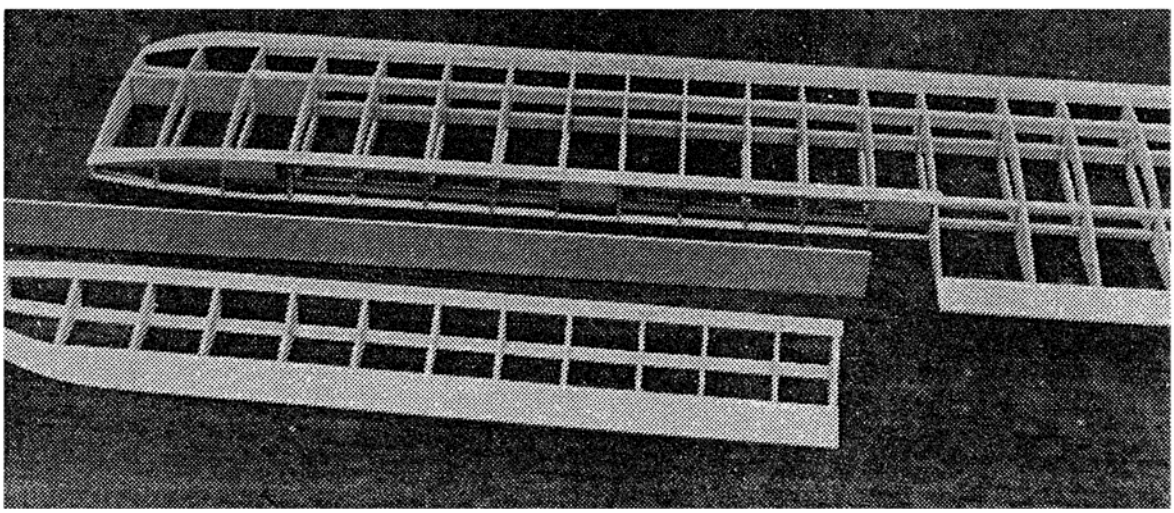
11. Mount bellcrank on W10 and install. Drill or cut holes for aileron pushrod to center section. Cut rib W1 for servo area. Install pushrod.



12. Fit and glue W18's in place. Add scrap 3/32 on bottom where aileron pushrod and horn are located.

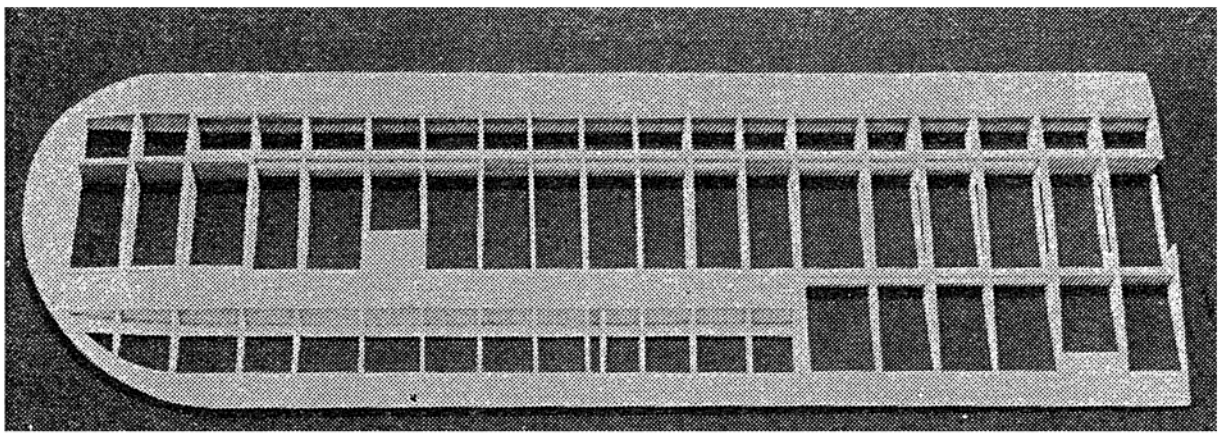
13. Cut away aileron as shown. Glue W8 in place.

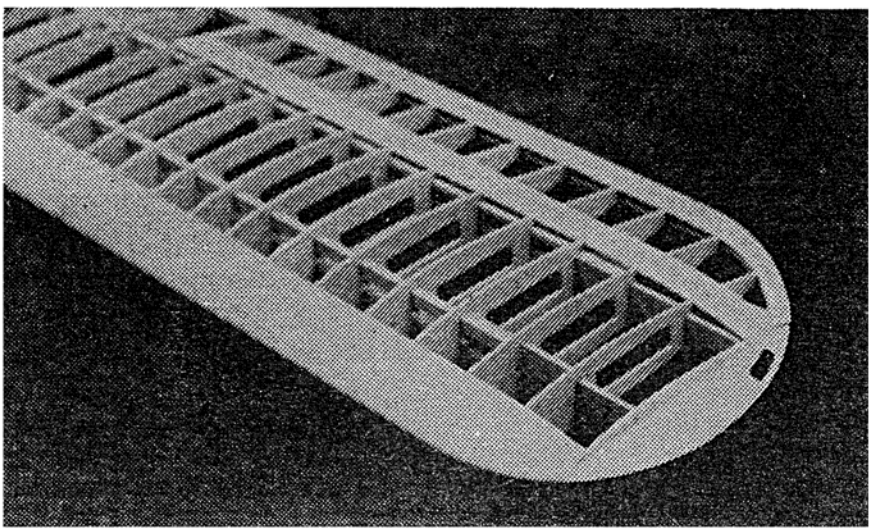


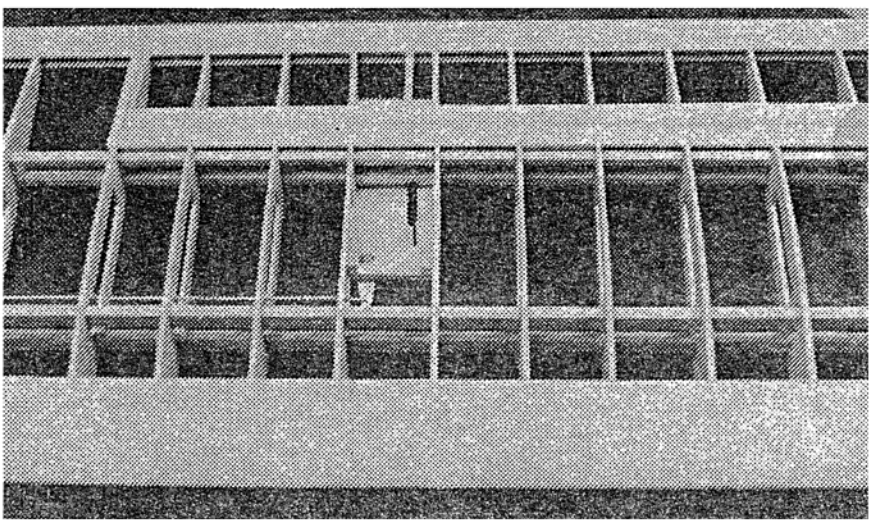


14. Cut aileron ribs to proper angle and glue W9 in place. Hinge aileron and install but do not glue.

15. Install pushrod to aileron. Add wing tip W17 and scrap balsa at rear. Glue W23 in place at tip. Sand wing to shape. Cut tip for hand hold.

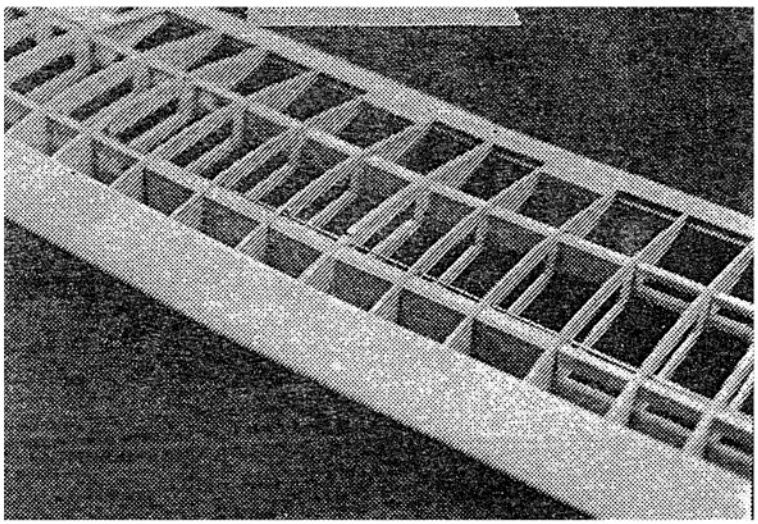




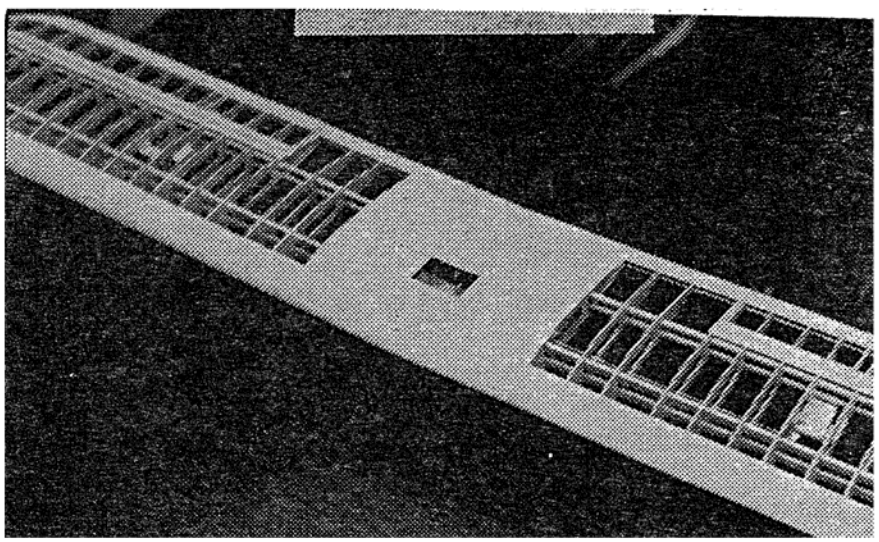


16. Build other wing panel.

17. Join wing panels with W19's and W20.

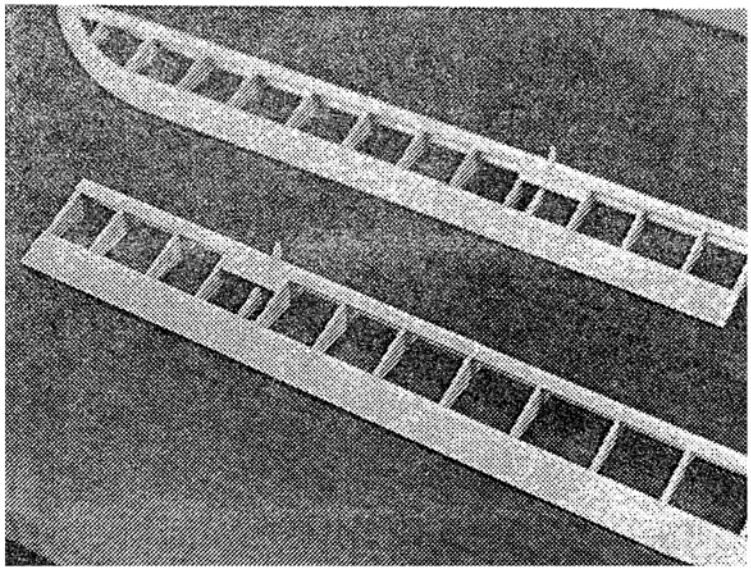


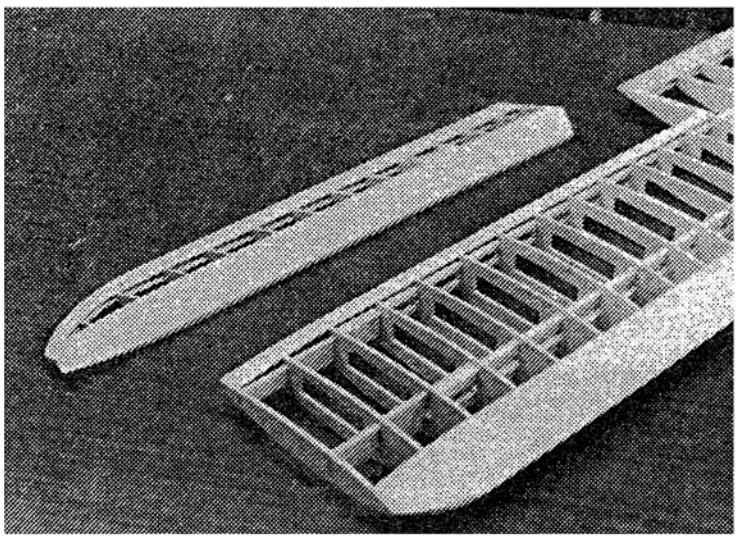
18. Sheet wing center section as shown on plans and sand wing to shape.



19. Fit lower wing to fuselage. Drill holes for 1/4 dowels and rear bolt wing hold down.

20. Add W26 and drill for bolt. Glue W24 and 25 in place after drilling for dowel. Sheet with 1/8 balsa to fair into fuselage.





## PT-17 CYLINDERS & ENGINE

1. There are a lot of parts. Make sure you number everything. We suggest some small bags to hold each part and remove as needed.

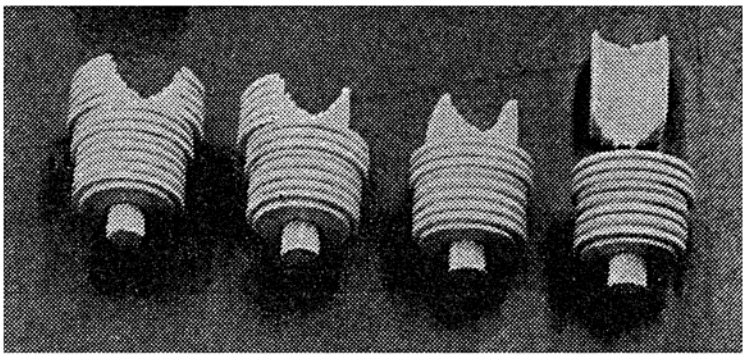
2. Make up the cylinder head center sections first. Glue parts K, J, I, H, G, and F together - see plans. Repeat for other side. Sand slightly. Put aside for now.

3. Cut 3/8" dowel to length - you should have 8 of these. (We will make the dummy engine with 8 cylinders, and then you can cut away as needed for engine clearance.) Add 5 "A"'s and 5 "B"'s to the dowel. Leave enough at the bottom so it will fit into N-3 assembly later on. An "A" should be at the bottom.

4. Add the upper cylinder fins, 3 "C"'s and 2 "B"'s to the assembly. Start and end with a "C".

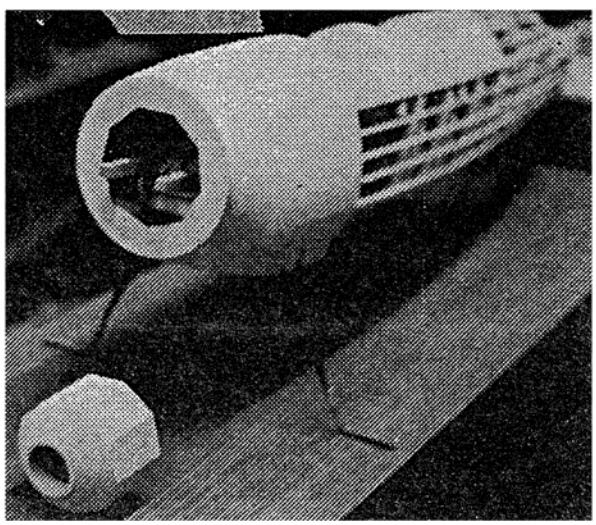
5. Glue a completed "K-F" assembly to the center of the head.

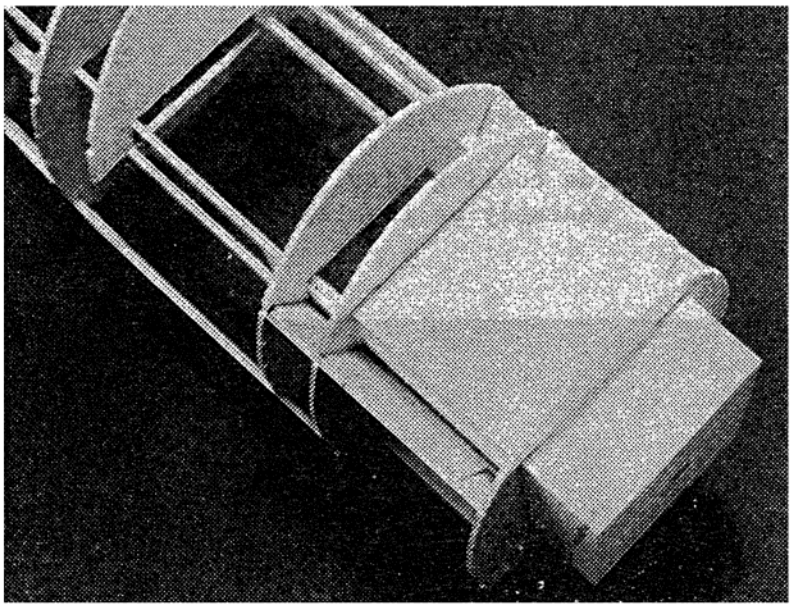
6. Add and glue the side cooling fins, 5 each "D"'s and "E"'s to the side of the "K-F" assembly on the top of the cylinder.



7. Shape the Rocker Box Covers from 3/16 X 3/8 balsa to fit. **Do not** glue in place.

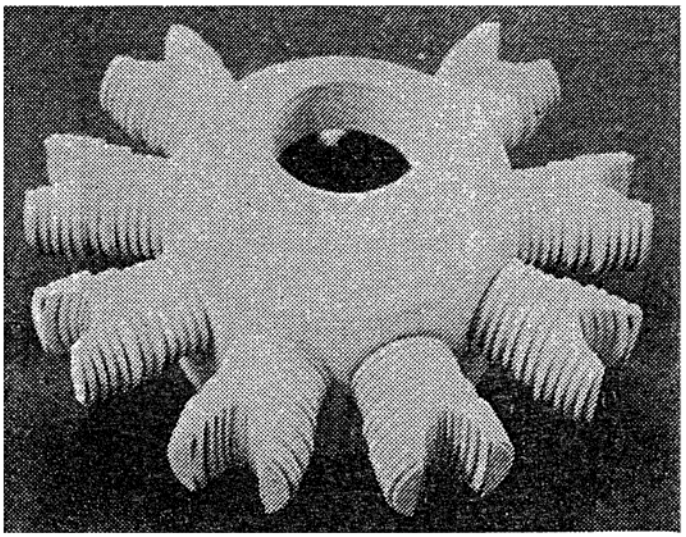
8. Glue N2's and N1 together. Shape as shown on the plans.





9. Stack N3's together and drill holes for engine cylinder dowel. Glue N3's together and add front assembly, N1 and N2. Sand to shape.

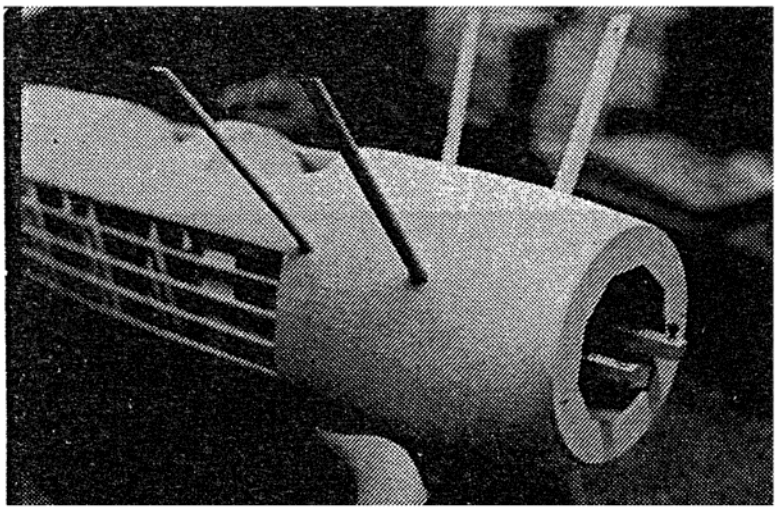
10. Trial fit cylinders in place with Rocker Box Covers and dowels for pushrods. Do not glue.



11. Install engine mount and engine. Cut away front area as needed to install engine.

12. Attach tubing for Exhaust Collector Ring.

13. Up to the top of fuselage now. Shape and sand the cabane struts. Fit into place, but do not glue right now.

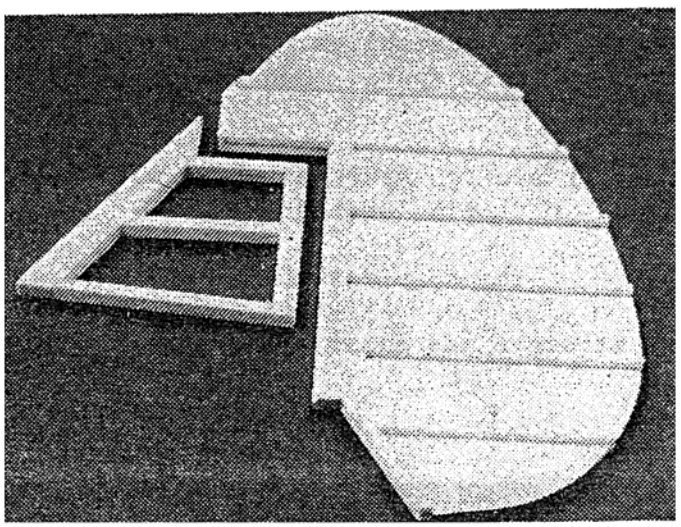


## PT-17 VERTICAL FIN AND RUDDER

1. Glue R1, R2 and R3 together. Mark for 1/8 X 3/16 ribs.

2. Glue R4 and 3/16 square balsa in place. Add 3/16 X 3/8 scrap at horn location.

3. Make up fin with V1 to V5.



4. Slot for hinges; do not glue them in. Sand assembly to section shown on the plans.

5. Add navigational light fairing on rudder.

## HORIZONTAL STAB

1. Mark rib locations on S8. Pin to the plans so that the ribs will be vertical.

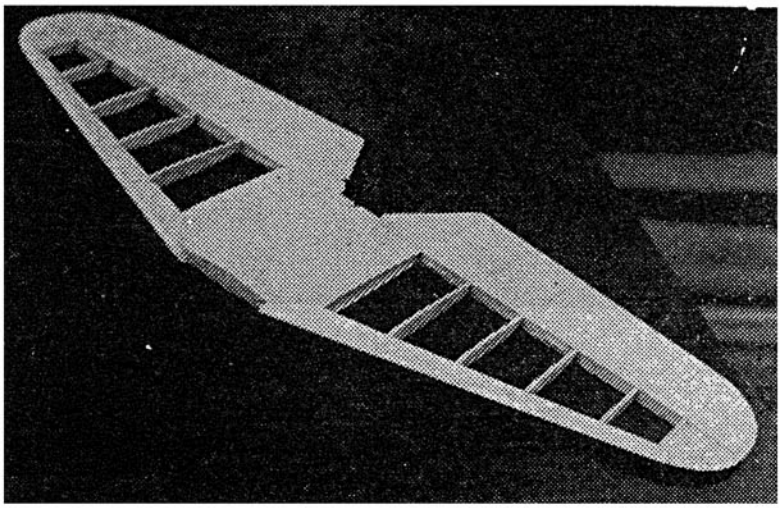
2. Glue ribs to the S8, making sure they are square. Add 1/8 X 3/16 false balsa LE. Add S9 along with the balsa tip ribs and S10.

3. Remove from workbench and sheet center section. Cut out LE as shown.

4. Mark rib locations on E1's. Add E2's to the front, then E3 and E4. Cut and fit the 3/32 X 3/16 ribs.

5. Fit elevator horn in place. Notch for the hinges and install; do not glue.

6. Sand the horizontal stab and elevator to shape.

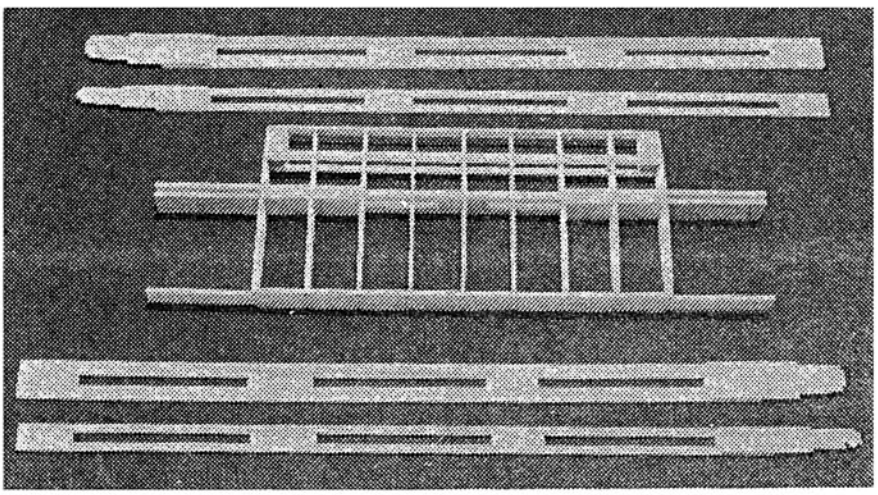


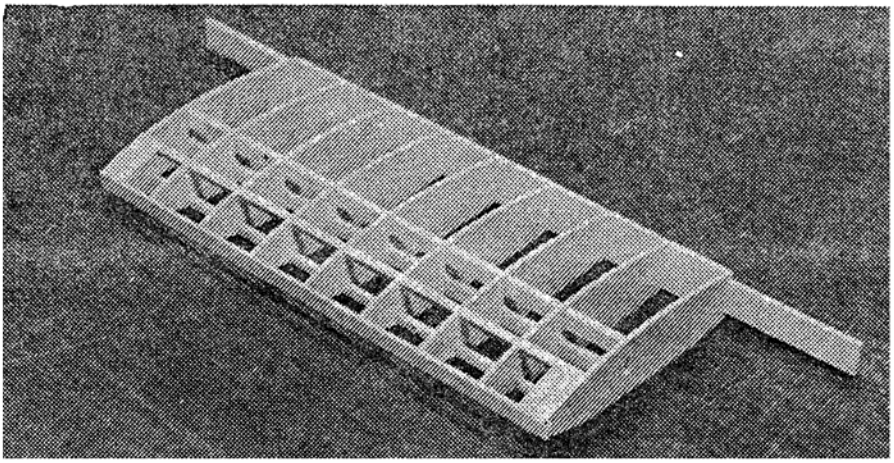
PT-17 TOP WING

1. Make up the outer spar assemblies. Glue up W14U and W15U to the completed 3/16 sq. balsa spars. Add the 3/16 X 3/8 scrap fill. Mark rib locations.

2. Make up the center section spars as shown with 3/16 sq. and scrap 3/16 X 3/8 fill. Mark rib locations.

3. Slide ribs W1U's on the spar assembly. Add W20U at the rear. Mark rib locations on 3/32 X 3/8 balsa LE and pin in place. Make sure everything is straight and square, and glue.

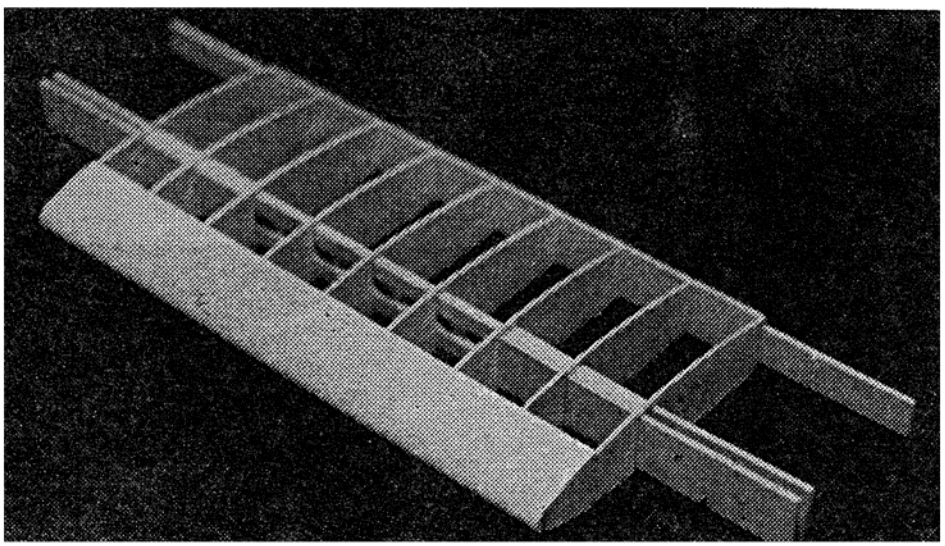


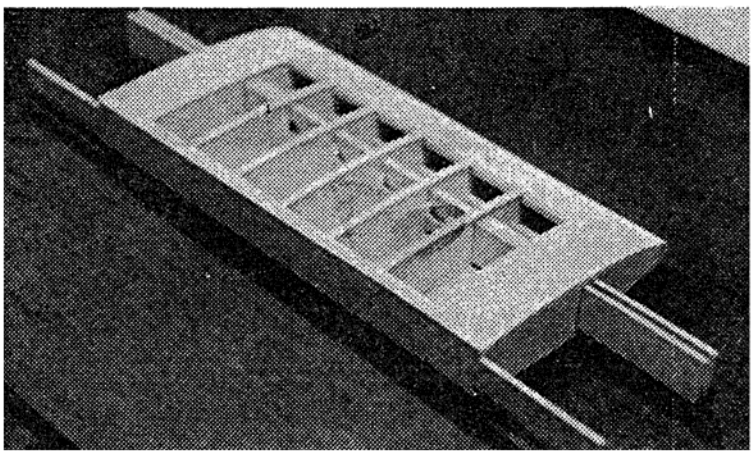


4. Cut W1U ribs for W19U joiners and install. Add WA blocks.

5. Sheet LE with 3/32 balsa. Also sheet top and lower area as shown. Add the cap strips on the bottom and the 3/32 X 3/8 strip on the bottom.

6. Glue 9/32 X 3/4 balsa LE in place and sand to shape.



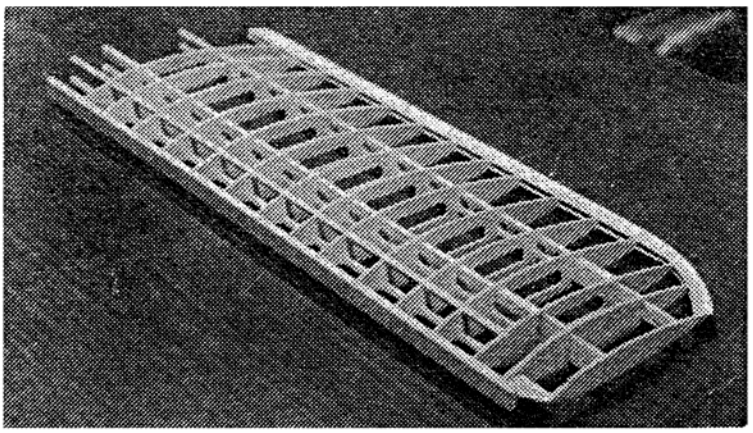


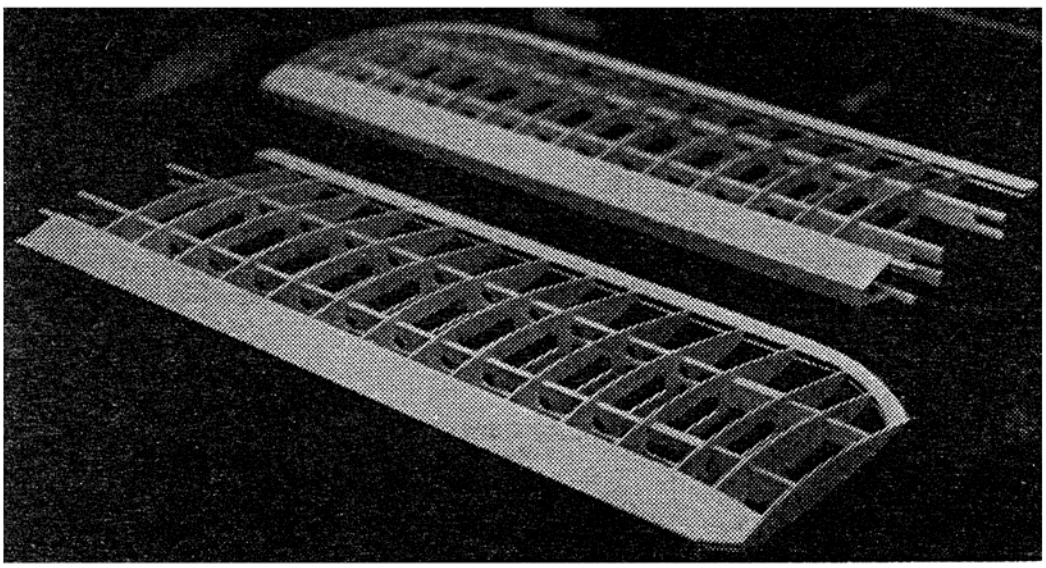
7. Pin lower 3/32 X 1 balsa TE in place over plans. Mark rib locations. Pin ribs W1 to W5U in place. Slide front and rear spars in place. Add 3/32 X 3/8 balsa LE with pins. Fit WD and WC in place. Add W13U and outer ribs W6U and W7U with W16U.

8. Check that everything is square and glue all parts in place.

9. Remove from plans and add 3/16 sq. front spars top and bottom. Add top TE sheeting.

10. Sheet LE with 3/32 balsa, add 9/32 X 3/4 LE and tip W17U. Cut W1 and W2 for plywood joiners.





11. Build other top wing panel.

12. Join wing panels. Add W22U and W23U to center section. Cut out W23U as shown for hand holds. Carve and sand wing to shape.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