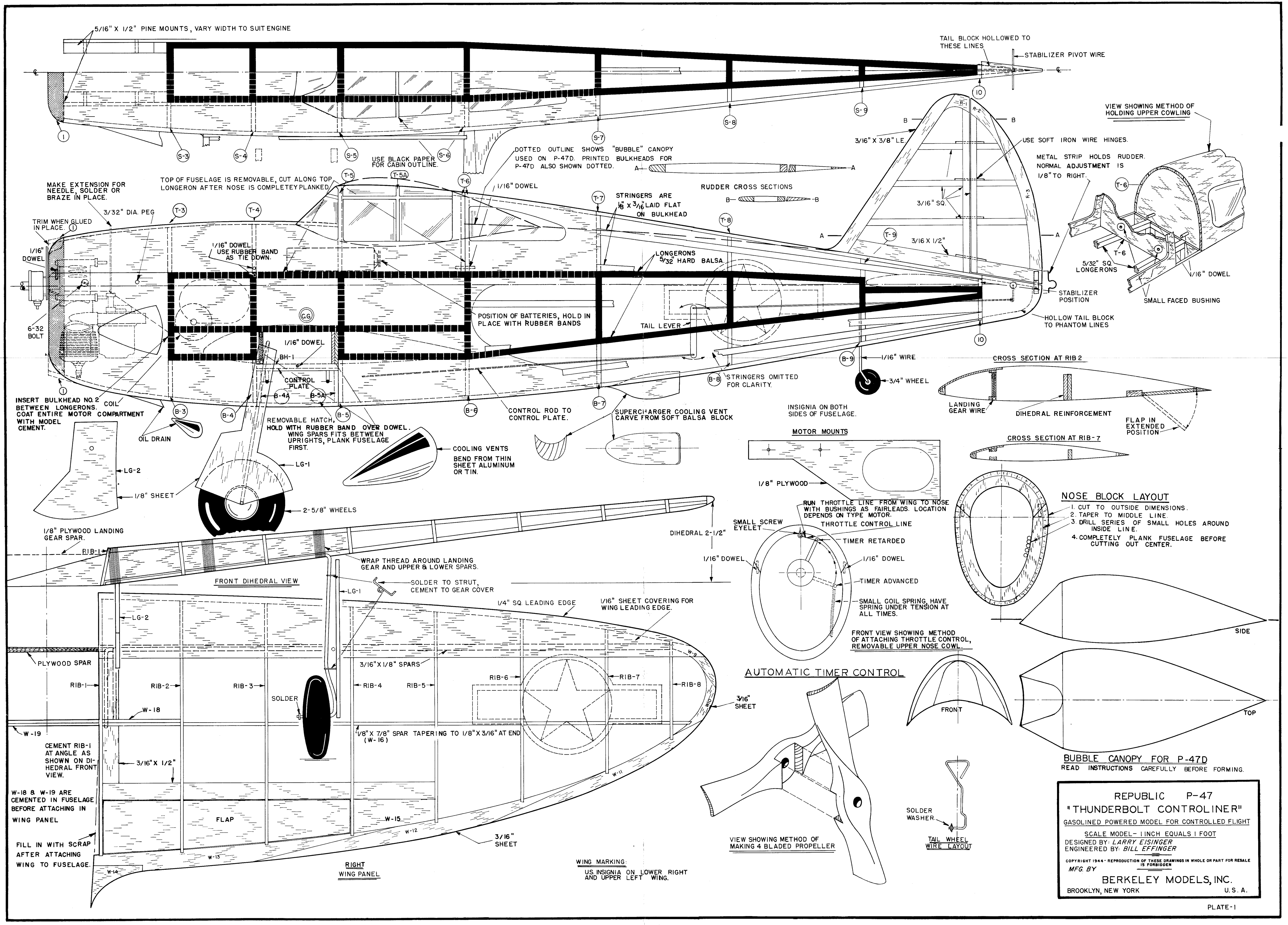

REPUBLIC P-47 "THUNDERBOLT CONTROLINER"

BUILDING INSTRUCTIONS

When building the BERKELEY model of the Republic P-47, either as a control-line flying model or an exhibition scale model, the proper tools, selected beforehand will add to the quality of the finished product.

The following tools are therefore recommended as basic requirements:

a. A set of good sharp model-making knives
b. Several grades of sandpaper
c. A clean, smooth, flat board approximately 10" x 36" for layout work
d. A package of large straight pins or small wire nails
e. Wax paper to place between drawings and construction work
f. For installing the power plant and rigging the control lines, the following tools will be required:
   1. Soldering iron, with resin core solder
   2. Cutting pliers
   3. Screw drivers, large and small

FUSELAGE CONSTRUCTION

1. Actual construction of the model begins with the layout of the 5/32" square fuselage longerons and cross-members. Lay out the strips directly over the solid and broken solid lines shown in the side view of the model. Make a second similar structure directly over the first.

2. Separate the two side structures and insert the horizontal cross-members between them. Put the front members in first, then cement rear together. The intermediate cross-members are inserted and alignment is carefully checked.

3. The motor mounts and bulkhead No. 2 should be cemented to the frame. Next add all the bottom and side bulkheads.

4. Add 1/8" x 1/4" stringers to rear half of fuselage. These stringers rest flat against the bulkhead. Outside edges of the stringers should be sanded round. The tail block is made in two halves and hollowed out.

5. Cement Bulkheads T-3 to T-6A lightly in place. This part of the fuselage is removable so only "spot glue" bulkheads at outside corners.

6. Cement balsa planking over front half of fuselage. The procedure in doing this step is to bevel the sides of each strip slightly. Using the widest strips first, begin planking each side, working around toward the top and bottom. Use narrower strips where the bulkhead curves are sharpest. It will be necessary to taper the forward ends of the strips slightly to conform with the reduction in size at the nose. After all the strips have been attached, sand the planking to a smooth finish. The next step is to slit planking along top longeron and between T-6 and T-6A to remove hatch. Dowel pegs are used to hold the hatch in position on the fuselage. Cut out rear cockpit window and removeable bottom hatch. This hatch is also held in position with dowel pegs.

7. Cut slot in balsa planking for plywood wing spar. Spar is not inserted at this time. W-18 and W-19 are inserted and cemented to fuselage.

MOTOR INSTALLATION AND WIRING

8. The motor is designed to withstand nose-over crashes by having a 3/32" dowel shear peg. In the event that the propeller hits an obstruction, this peg will shear off and the mount will rotate about the 6-32 bolt. The motor installation as shown will fit most engines of .19 to .45 displacement for other size motors, mount blocks must be made wider or narrower, accordingly. When installing the motor, be sure that the motor is in line with the axis of the body, then locate holes for the motor mount bolts. Drill 1/8" holes for the bolts.

9. Shellac entire internal wood structure forward of bulkhead No. 2. Cement will not hold on a shellaced surface, so do not shellac any unfinished structure.

10. When installing engine, remember that centrifugal force of the plane in flight will throw the gasoline to the right side of the tank. If the fuel line tube is on the left side of the tank, the following change will be necessary; File off needle valve tube about 1/4" from the top. Slip on a piece of neoprene tubing (do not use rubber tubing). Replace tank with tubing against right wall of tank.

11. The wiring diagram is shown in the sketch. It is standard for all engines. All wiring should be neatly soldered with resin core solder. This is essential for maximun engine performance. A standard multi-cell 3v battery is recommended.

WINGS

12. The wing construction is started by placing waxpaper over the plan cutting the 1/8" rear spar, and bottom front spar to size and holding in position with pins. (Never put pin thru the wood itself, but stagger the pins along the outside). Rib 1, 2, and 3 must be cut into two pieces for plywood spar.

13. Next cement plywood spar in position on top of front spar. Add all the ribs.

14. The leading edge is rounded to shape. (See typical rib drawings). The trailing edge and tips are tapered to shape. Note that ribs are notched into the trailing edge for extra strength.

15. Reinforce rib-1 with 3/16" x 12" as shown in drawing.

16. Attach wire landing gear, binding with silk thread as shown.

17. Cover the leading edge and top with 1/16" veneer for additional strength.

18. The left wing panel is made in exactly the same manner by turning the plan over, and rubbing lightly with an oil cloth, it will become transparent. Spreader must be attached to rib 4. In addition, flap operating mechanism and timer control must be installed as shown in detail sketch.

19. The wing is attached to the fuselage by cementing rib 1 to the planking and the plywood spars to fuselage.

20. The flaps are attached to the wings after they are attached to the fuselage.

TAIL SURFACES

21. The tail surfaces are of simple, self-explanatory construction and should offer no trouble to the builder. The hinges are made from soft steel wire in the same manner as the flap hinges.

22. The rudder adjustment plate is made from a piece of old tin, obtained from any can.

CONTROL MECHANISM

23. This model is designed primarily for tether controlled flight using two wire or fish line control lines to operate the elevators and a third line for time and flap control.

24. Using a handle (see sketch), by increasing the tension on the upper wire, the model will climb. Likewise, putting the tension on lower cable will cause the model to dive. The "Trigger" controls the timer spark advance. When the trigger fully extended, the spark should be at full r.p.m. The speed of the engine will decrease as the trigger is pulled tighter. When the trigger is pulled the full length of the slot, the spark will be fully retarded and the flaps will release. Personal choice will dictate whether you retard the spark sufficiently to stop the engine before dropping the flaps or, if you prefer, land the model with power on.

25. The control lever in fuselage is made from plywood with eyelet inserts as bearings. These are two positions for mounting the tail lever wire in the control lever. The "Training Position" is for test flying and speed flights. The "Stunt Position" is for maneuvers and is used only after the manipulation of the controls in training position is fully mastered.

COVERING AND PAINTING

26. The model complete with controls and wiring installed is now ready for covering and painting. It should be covered with standard "GM" silkspan. It will be found that covering the model with dampened silkspan, using thinned cement or heavy clear dope as an adhesive, is the simplest method. The fuselage should be covered first, using small pieces.

27. Since speed is a prime desire in tether controlled models a smooth, clean finish is necessary. Before painting, cover the planked fuselage with a lightweight "00" silkspan, using clear dope as an adhesive. After the dope has dried sand over the entire covering job with the finest sandpaper ("0000" grade or finer). The best prime coat is Berkeley wood filler. If this is not available, give model a coat of clear dope. Brush or spray two coats of olive drab when the clear dope has dried. For a finished coat, spray with thinned (one part clear dope to one part thinner) dope. Wax with a good automobile wax and rub to a fine finish.

28. Only after the paint job has been completed, apply decals and attach celluloid cockpit details.

29. Cowl for P-41B is easily made from flat celluloid stock. To make bubble canopy used on P-47D it will be necessary to carve a pine block to the shape of the canopy. Then heat the celluloid in very hot water and draw to shape over the block.

CONTROL LINE AND REEL (HAND-CONTROLLED FLIGHT)

30. Cut out control handle according to sketch. Round off all edges to your own individual grip. (See sketch).

31. .010" Music Wire is best for control lines, although fish line may be used. Always handle wires carefully to avoid any kinks. To prevent kinks it is best to build a reel for the wire as follows:

Cut a circle about 6" in diameter from 1/4" plywood or other wood. Lay coiled control wires centered on circle of wood and drive finishing nails 1" apart around the inside of the coil at about a 45 degree angle. Through a small hole in the center of the reel, nail on a short piece of dowel for a handle, allowing the reel to turn freely.

Drive a nail for a crank near the edge of the reel on the side opposite the slanted nails. Insert two nails to hold control line handle on crank side of the reel, using a rubber band to fasten handle securely.

32. Short fish line controls should be attached to the control lever in plane. This should extend 6" and 10" respectively beyond the spreader. They must be staggered so connections will not entangle each other. Small turnbuckles are used to attach these lines to the main control lines. At this time, the turnbuckles are used for fine adjustment of the length of the control lines.

PROPELLER

33. No propeller is included with this kit, because of the large variation in engines which may be used. For true scale effect, notch two-2 blade propellers together to form 4-blade prop. A high pitch propeller, designed specially for control line flying is recommended.

Republic P-47 Thunderbolt

40-¾" span Control Line Scale
designed by Larry Eisinger, August 1942 "Air Trails"
as kitted by Berkeley Models