

# Building and Flying INSTRUCTIONS

**AEROFlyTE**

# APOLLO

**KIT No. 195**

## GENERAL BUILDING NOTES

BEFORE YOU BEGIN BUILDING IT IS IMPORTANT TO STUDY THE PLAN CAREFULLY AND THOROUGHLY. A GOOD FLAT BUILDING SURFACE WILL ENABLE YOU TO BUILD QUICKLY AND SQUARELY. THIS SHOULD ENSURE THAT YOUR MODEL WILL HAVE NO TWISTS OR WARPS.

AERO FLYTE C23 Balsa CEMENT, C30 SANDMASTER WOOD GLUE AND C66 INSTANT GLUE FOR TACK JOINTS ARE SUPPLIED WITH THE KIT. YOU WILL ALSO NEED A 2 PART 5 MINUTE EPOXY SUCH AS ARALDITE. THE RECOMMENDED ADHESIVE FOR EACH STAGE OF CONSTRUCTION IS MARKED ON THE PLANS AS FOLLOWS:

C23=C23, C30=C30, C66=C66, 5 MINUTE EPOXY=E.

## FUSELAGE ASSEMBLY

- STAGE 1. Cut out from the plan drilling template A1 & A2 and fix temporarily to formers A1 & A2. Drill as per plan then epoxy A1 to A2. When dry, nose-gear, radial mount and engine can be fitted and left in place. (Note: Radial mount nuts may be epoxy glued in place. The radial mount must be drilled and tapped to suit your engine.)
- STAGE 2. Make a right and left fuselage side as follows: Lay fuselage side front right 60R and 60 down making sure of a good glue joint. Then lay right fuselage side doubler 61R on top and glue. Clamp or weight till dry then lightly sand to ensure edges are clean and square. Then lay fuselage side front left 60L and 60 down and glue. When dry remove from plan and **turn over** then lay left fuselage doubler 61L on top and glue, **making sure you have a complete left and right fuselage side.**
- C30
- STAGE 3. Glue servo tray doublers 3 & 4 to the servo tray. Cut out servo tray and fit your servos and switch. The installation of the R/C equipment will depend on the type or brand that you are using. The plan shown is a guide only, however the servo tray is a structural part and **cannot** be replaced by a plastic servo tray. Drill 2 - 4mm holes in servo doublers (where pre-drilled in servo tray) to allow for undercarriage mounting.
- E

- STAGE E 4. Lay RH side flat on plan, locate position of former B from the plan and epoxy glue in place, noting that the top of former B lines up with the top of the fuselage side — the bottom of this former will protrude by 3mm.
- STAGE E 5. The cabin floor 2 can now be epoxy glued in place butting up to the back of former B and so that the floor edge is flush with the building board surface (refer drawing). Note drilled.
- STAGE E 6. Line up former C so that it sits on top of the cabin floor and lines up with the rear of 60R.
- STAGE E 7. Place assembled servo tray on fuselage side butting up to former C making sure of undercarriage alignment. Epoxy in place.
- STAGE E 8. The canopy floor top 1 can now be epoxy glued in place butting up to the front of former B and flush with the fuselage side. Make sure that the canopy floor is right way up to give the correct side thrust. (Check top view for correct angle of floor.)
- STAGE E 9. Former A1/A2 is placed on fuselage side butting up to canopy floor, finishing flush with fuselage front and epoxy glued in place.
- STAGE E 10. The lower cabin floors can now be epoxy glued in place. Start with balsa part 6 making sure it is flush with the **front** of former B and flush with the cabin floor 2. The lower ply floor 7 is butted straight behind part 6. When glueing the lower ply floor 8, locate from the rear of part 60R, and finish flush with the back of former C and flush with the cabin floor 2.
- STAGE C23 11. Cement two fuselage braces 9 to the fuselage side **as shown** on the plan, from the 3mm x 8mm balsa strip provided. The Elevator seat 10 is placed to the rear edge of the back fuselage brace 9 and running along the bottom of the tail plane slot is glued in place. Note that the elevator seat is at 90° to fuselage side. Glue the tail post 11 in place and leave to dry. Cement the two remaining fuselage braces to the left hand fuselage side.
- STAGE E 12. Lay the left hand fuselage side onto the assembled ply parts on the right hand side, noting that the fuselage side is a flush fit with formers A1/A2 and former C. Epoxy all joints, **making sure the assembly is square.**
- STAGE E 13. Shape tail post 11 to allow L/H fuselage side to finish flush with elevator seat 10. Glue L/H fuselage side to elevator seat and tail post making sure the elevator seat lines up with the bottom tail plane slot. When dry glue the two wing saddles 12 in place followed by former D which lines up with fuselage side edges and the back of the wing triplers.
- STAGE E 14. Drill four 6mm diameter wing dowel holes as indicated on plan. Slide dowels through the fuselage and centre, then epoxy in position. (Pin marked on fuselage side.)
- STAGE C30 15. Construct the tail plane from parts 13, 14 & 15 as per scale drawing. Using template bend 2mm wire elevator joiner, insert and epoxy to left and right elevators 16 as shown. Cement fin parts 17, 18 & 19 together. Sand paper all of the leading and trailing edges to a smooth finish with rounded corners as shown in fuselage side view. Cement tail plane to elevator seat and fuselage sides making sure the tailplane is square with the fuselage.
- STAGE 15A. Place a pin in the top centre of former B. Mark the top centre of former D. Place a pin in the rear centre tail post. Run a cotton line tight between these pins and ensure the line passes directly over the centre of former D. Check this alignment as the top sheeting is drying.
- STAGE C30 16. Top sheeting is now fitted. Start with Part 20 and working from the rear edge of the tail plane glue part 20 in place. Work forward using cross grain 3mm sheeting provided. When dry trim to shape. Note: fuselage sides should be symmetrical to the centre line of the model. When dry glue bottom sheeting starting with part 21, work from the back edge of the model working forward as before. Trim to shape as before.
- STAGE C30 17. Cement the fin 17, 18 & 19 and tail skid 22 firmly in place making sure that the fin is vertical and straight. Shape rear curve block 23 and glue in place as per plan.
- STAGE C30 18. The nose section is now ready to block up. Start by shaping top nose block 24 to give clearance around your engine, refer to the plan side and top views for block positioning. Before glueing bottom block 25 in place cut out shaded area for nose gear as per plan. Glue the top and bottom nose blocks 24 and 25 in position followed by the side cowl block 26. When dry fit balsa fill-in block 27 and use scrap balsa to gusset nose.

STAGE 19. Glue the removable hatch 28 and tab 29 together as shown on plan. When dry locate and glue the hardwood hatch mount 30 in place. When fitted shape blocks from former B as shown in section A-A in a fair curve to line up with a 52mm spinner, glue and shape canopy block 31. Fill in the two small gaps in the fuselage sides with scrap balsa, and sand smooth. Sand the entire fuselage smooth at this stage, having removed the engine and mount before sanding.

C30

STAGE 20. The rudder 32 and elevators 16 can now be temporarily fitted to the fin and tailplane with the nylon hinges provided. Cut thin slots in the rudder 32, fin, elevators 16, and tailplane, push hinges into slots and check for free movement. Do not cement the hinges until after the model has been covered or painted.

Fit the nyrod outer sleeves for elevator and rudder in place. Work a 5mm drill through fuselage side to achieve the correct exit angle as shown on the plan. Allow sufficient sleeve at the rear and servo end for later trimming. Fit control horns and linkages making sure linkages move freely. Roughly cut out the canopy then trim for an exact fit. At the same time the top block 24 and canopy block 31 can be sanded to match. Do not epoxy the canopy finally in place until after the inside area has been painted, etc.

Retain the main undercarriages with the nylon clamps supplied and fit the main wheels with the washers supplied (epoxy or solder a washer either side of wheel). Note main wheels larger dia.

Note: When glueing hinges in place, use white glue and when drying carefully wash out any excess glue from the hinge pins.

## LEFT HAND SIDE WING

STAGE 21. Break out and identify all wing parts, and building on a level board start with the left hand wing. Assemble and glue left hand leading edge to ply doubler 33, L/H top and bottom mainspar balsa braces, and ply doublers 35, 34 onto the mainspars before building left wing. (Refer mainspar assembly drawing.)

C23

Shape wash-out wedge from scrap balsa and locate where dotted on plan. This wedge builds in a small amount of washout and must not be removed until after the wing has been built and dries fully still pinned to the plan.

STAGE 22. Pin in place on the plan one bottom trailing edge sheet and the bottom cap strips. Chamfer a 30° taper along the front edge of bottom leading edge sheeting as per plan. Place 70mm long tabs of masking tape at rib intervals to assist bending up and glueing sheeting at a later stage, then place on plan followed by the bottom centre sheeting and bottom wing tip braces.

C30

Glue each joint with white glue. (Note: Cap strips are cut from the 2mm x 6mm strip supplied. The leading edge sheeting is cut over size.) **Do not trim yet.**

STAGE 23. At this stage break out all ribs marked 40, clamp together and lightly sand evenly. Lay down and cement lower main spar together with ribs 41, 42, 43, 44 & 45. The centre rib 46 must be angled using centre rib template provided. Then position and glue top mainspar then trailing edge ply doubler 36.

C23

The leading edge may now be fitted and glued in place. Bend bottom sheeting up and glue to leading edge using masking tape already laid down. Fit the rib webs supplied behind the mainspar and glue in place in all rib bays shown.

NOTE: This assembly controls the strength and accuracy of your wings and should be built carefully and neatly, all cement joints should be strong.

STAGE 24. Fit the top trailing edge sheeting, leading edge sheeting chamfered as before, centre sheeting, and cap strips for ribs **41, 42 & 43 only**. Cement in place. When dry remove from building board, and remove washout wedge.

C23

## RIGHT HAND SIDE WING

STAGE 25. Assemble and glue right hand mainspar and brace. Pin in place on the right hand plan one bottom trailing edge sheet, cap strips, leading edge sheeting (using masking tape as before) centre sheeting and wing tip brace glueing each piece with white glue. Now lay the assembled left hand wing next to the right hand wing plan using centre rib 46 as the centre line.

C30

Block up the left hand wing tip 75mm. Continue building the right hand wing in the same sequence as the left hand wing, making sure of good glue joints between leading edge, doubler, spars and doublers.

When dry remove from building board and trim trailing edge sheeting, sanding the leading edge sheeting to correspond to the leading edge side view. Fit left and right wing tip blocks in position and shape as per plan. Glue optional scrap tips.

STAGE 26. Fibre glass the centre section of the wing top and bottom with a 100mm wide strip of fibre glass cloth (not supplied). Scrap lightweight 1.5mm mill ply rubber band braces may now be glued on trailing edges if desired, where rubber bands would cut into wood.

C23

Sand the wing all over and cover with AEROKOTE or similar.

## FINISHING

Remove all radio equipment, undercarriage, engine, engine mount and sand all surfaces to a smooth finish. The rear edges of the fuselage need only light sanding to remove edges.

Apply one coat of dope to the fuselage only and paint the area inside the canopy and fit a pilot if desired. It is advisable to paint the inside of the fuel tank and engine compartments with epoxy resin to prevent fuel soaking into the balsa structure.

The method of applying the final finish depends on your own choice. One method is to cover fuselage and tail areas with AEROKOTE or a similar film following the manufacturer's instructions. If you wish to paint the model, cover the fuselage, tailplane, etc., with light weight tissue which is doped to the balsa surfaces and finally apply two coats of fuel proof enamel. (We recommend **AERO GLOSS**). Re-assemble the model and re-check all working parts.

Set the main undercarriage wheels with a small amount of toe-in, and check that the model tracks straight along the ground.

Check List:—

### Flying Your Model.

- 1) Check all plugs properly plugged in and secure.
- 2) Insure full battery charge.
- 3) Check all control surfaces for security and freedom from binding.
- 4) Check all surfaces for proper alignment and freedom from warps. Make sure there are enough rubber bands holding on surfaces.
- 5) Check CG for proper position.
- 6) Obtain authorization to use your frequency.
- 7) Check radio range and proper functioning of all controls including **DIRECTION**.
- 8) Check fuel system and fill fuel tank.
- 9) Check engine, throttle and propeller for proper security and operation.
- 10) Check engine at high throttle holding the nose high to make sure the engine isn't too lean. Check control operation with the engine running at high throttle.
- 11) Taxi test the airplane if the field is suitable and steering is provided.
- 12) Check transmitter antenna fully extended and properly seated; check out meter.
- 13) Check the wind and traffic pattern, then apply power smoothly, taking off into the wind.

Allow the plane to climb gently straight ahead until well above all obstructions and make a gentle left turn to get it pointed back toward the field. Level the airplane and trim it using the trim levers on the transmitter. If the plane was built accurately and the CG and thrustline are correct, very little trim should be required. If electronic trim is insufficient and you have to hold some stick in to maintain level flight, bring the plane around, reduce power and land into the wind as quickly and safely as possible.

Note the position of the trim levers and re-set the clevises on the pushrods to put the same amount of trim into the control surfaces as you put in with electronic trim. Neutralize transmitter trim levers and try another flight. Keep retrimming mechanically until the plane will fly straight and level with all transmitter trim levers centered. Now you're ready to learn to fly.