# CATALINA PBY 6/6A

RC model to 1 : 17.5 scale
**Order No. 1359/00**


| **Specification:** | Model | Full-size |
|---|---|---|
| Overall wingspan | approx. 1810 mm | 31,720 mm |
| Length | approx. 1125 mm | 19,465 mm |
| Wing area | approx. 43.1 $dm^2$ | |
| Tailplane area | approx. 7.45 $dm^2$ | |
| Total surface area | approx. 50.55 $dm^2$ | |
| All-up weight | | |
| (PBY 6A with 10 SANYO 2400RC cells, Mega 16/15/4 motors with 2.64 : 1 gearbox) | approx. 2850 g | 16.500 kp |
| With actro C8 | approx. 2950 G | |
| Wing loading at 2850 g | approx. 66.1 g/$dm^2$ | |
| Wing section - root | Aeronaut, 14.5 % | |
| - tip | Aeronaut, 12 % | |
| Tailplane section | E 168 | |

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**Replacement parts:**

| | | |
|---|---|---|
| GRP fuselage | Order No. | 1359/02 |
| GRP engine nacelle, complete, 1 set | | 1359/03 |
| Canopy | | 1359/04 |
| Observer's dome, L + R | | 1359/06 |
| Wing – 3-part | | 1359/05 |
| Tailplane set | | 1359/09 |

Power system: the size of the model was determined by our choice of a 10-cell flight battery. This, combined with today's electric motor technology, guarantees more than adequate power and very good flight times. Li-Po batteries can also be used at the builder's discretion.

Power system 1: Mega 16/15/4 with 2.64:1 gearboxes

| | | |
|---|---|---|
| Motor mount and housing | Order No. | 7120/91 |
| Gearbox set, 2.64:1 | | 7121/78 |
| Ballrace | | 7821/40 + 7822/40 |
| Propeller driver | | 7124/14 |
| E Prop propeller, 9.5 x 6“ | | 7229/42 |

*This system provides more than adequate power!*

Power system 2:

| | | |
|---|---|---|
| actro C8 | Order No. | 7002/38 |
| GRP firewall | | 7002/87 |
| actro hub | | 7002/62 |
| Propeller driver | | 7124/14 |
| E Prop propeller, 9.5 x 6” | | 7229/87 |

*Virtually endless power!*

As speed controllers we recommend the actronic 45. If you are using one central battery you will need one actronic 45 and one actronic 45 BEC. The actronic 45 BEC provides sufficient power to operate four standard servos (but not digital servos). The RC system cables to the actronic 45 and the aileron servos must be fitted with ferrite rings or ready-made filter cables to prevent interference. The two actronic 45 controllers can be inter-connected using a Y-lead.

**Suggested alternative power systems:** (data per motor at 15 m/s unless otherwise stated)

10 cells: actro C6, 9.5 x 7", 23 A (32 A static), output 190 W, climb rate approx. 6.3 m/s, static thrust approx. 10.2N
12 cells: actro C8, 9.5 x 7", 18 A (25 A static), output 195 W, climb rate approx. 6.5 m/s, static thrust approx. 10.3N
14 cells: actro C8, 9.5 x 6", 20 A (27 A static), output 248 W, climb rate approx. 7.7 m/s, static thrust approx. 12.2N

The performance figures stated above are only possible if good cells are used. Ten NiCd / NiMH cells are roughly equivalent to three Li-Po cells. If you intend using Li-Po batteries it is essential to check their current delivery capacity. To select the appropriate battery capacity please refer to the current drain at the stated airspeed. For safety's sake we recommend that you reduce the current drain rate by a factor of 1.3 to 2, in order to extend the useful life of the battery. Example: manufacturer's stated current capacity 10C for a 1.5 Ah battery; this means a maximum current of 15 A according to the manufacturer's specification. With a reduction factor of 1.3 this is 11.5 A. This requires four parallel-wired cells (see above example: C6 with 10 cells). If you only intend to fly the model at full power for brief periods, it may be possible to use only three parallel-wired cells.

If a separate (smaller) battery is used for each motor, then two actronic BEC controllers can be used, wired as described above. This alternative system provides more current to power the servos, and also makes it possible to obtain greater power output.

(Data per motor at 15 m/s unless otherwise stated)

8 cells: actro C5, 9.5 x 6", 31 A (27 A static), output 200 W, climb rate approx. 6.7 m/s, static thrust approx. 10.4N
8 cells: actro C5, 9.5 x 7", 33 A (40 A static), output 209 W, climb rate approx. 7.0 m/s, static thrust approx. 10.4N
10 cells: actro C6, 9.5 x 7", 26 A (35 A static), output 220 W, climb rate approx. 7.1 m/s, static thrust approx. 11.3N
10 cells: actro C6, 9.5 x 7", 28 A (39 A static), output 231 W, climb rate approx. 7.3 m/s, static thrust approx. 10.9N

**IMPORTANT NOTE - BEFORE YOU START CONSTRUCTION:**

- The position of the wing on the pylon has been changed compared to that shown on the plan: the distance from the trailing edge of the wing to the rear end of the pylon is now **65 mm**. In consequence of this the rear hole in the wing should now be located at a point **30 mm** forward of the trailing edge of the pylon.

- The motor thrust line has been changed to **2 mm** off-centre (measured at the motor bulkhead) compared to that shown on the plan. This ensures that the propeller shaft is located in the centre of the cowl when the correct sidethrust of 2° is used.

The building instructions provide a detailed explanation of these points at the appropriate stage. The term “cyano” is an abbreviation for cyano-acrylate, sometimes known as “CA”.

**Preparation:** the die-cut sheets are shown at reduced scale in these building instructions. Write the part numbers on the components using a soft pencil, referring to the drawing. Use a balsa knife to separate the parts from their parent sheets. Trial-fit all parts before installing them.

You may wish to deviate from the sequence of operations described in these instructions, but please think ahead before you do so! The building instructions, photos, parts list, motors and servos should be used constantly as aids to building.

Before starting construction, sand the surfaces of all the GRP parts using 400-grit abrasive paper. Any minor faults can be made good using polyester filler paste. Trim the edges of the cockpit area as shown in the photos.

**Important:** the overall layout of the full-size machine combined with the method of construction used in the kit (GRP fuselage) tend to produce a tail-heavy model. It is therefore essential to minimise weight at the tail end of the model during construction.

**Adhesives:** since the components in the kit are very highly pre-fabricated, just a few tips at this point on the use of laminating resin. Compared to fast-setting epoxy this material offers the advantage that it can be applied more accurately to the actual joint. It penetrates into the narrowest of gaps, ensuring that joints are really strong. For some processes the resin should be thickened with a thixotropic agent, so that it can be applied exactly where required, and does not run out of the joint. Use coarse abrasive paper to roughen all areas of the fuselage which are to be glued, to ensure that all joints are really strong and capable of bearing the loads involved.

**Finishing the wooden surfaces, tissue covering:** sand the surfaces using a sanding block around 250 x 50 mm in size, with 180-grit or 220-grit abrasive paper stuck to it. Apply a coat of thinned sanding sealer to the prepared surfaces and sand lightly when dry. We recommend lightweight tissue for covering. Apply several coats of well-thinned clear shrinking dope until the surface is semi-matt overall. Allow to dry thoroughly, then sand lightly with 320-grit or 400-grit abrasive paper. Stick the abrasive paper to self-adhesive foam sheet around 5 mm thick for sanding. We recommend Universal primer thinned with about 30% thinners for the primer coat. Apply the primer thinly and evenly using a soft brush about 15 - 20 mm wide. Sand down again using 320 - 400-grit paper when completely dry; use the paper wet or dry as preferred. Apply a second, even thinner coat, and sand again. This should produce a sealed, homogeneous surface which is an ideal base for the colour finish. It does not need to be perfectly white overall - see Stage photos.

The kit can be completed as either of two variants of the type: the PBY-6 as a pure seaplane, or the amphibious PBY-6A, which is fitted with a wheeled undercarriage. These building instructions cover the latter version; for the PBY-6 certain parts are simply omitted; this is mentioned at the appropriate point.

The first step is to cut the various openings required in the fuselage. There are several tools which make this operation quick to complete accurately, such as: our Polycap sander, a diamond needle file, a diamond cut-off disc and a high-speed sanding machine. Trial-fit the former 26 and trim it accurately **before** cutting out the opening for the nosewheel unit. Only then cut out the opening for the noseleg unit using a thin diamond disc cutter, and cut the part removed exactly in half.

PBY-6: we recommend that you do not cut out the opening for the gunner’s dome 60, as water will tend to enter the fuselage through it. It is better to cut away the dome to provide clearance, and simply glue it in place later. The openings for the nosewheel unit and main undercarriage are not required.

Trim the edge of the cabin and the wing saddle as shown in the photos; the remaining flange should be about 4 - 5 mm wide. Cut away the periphery of the wing saddle (pylon) using a coarse Perma-Grit cut-off disc to accept parts 23 and 25.

Drill 1.5 mm Ø holes at the slot positions to accept parts 88, and file them out to final size using a needle file. The tongues must be a smooth sliding fit in the slots.

Cut the 3, 4 and 8 mm Ø holes in the fin as required; parts. 41, 42 and 69 must be an accurate sliding fit in the holes.

Mark the position of the exit slots for the elevator pushrods as shown in section F-F on the plan. The centreline of the slot should be in line with the upper linkage hole in the elevator bellcrank, part 20. The slots should be at least 2.5 mm wide.

Cut the exit slot for the rudder snake as shown in the photo, and slide the outer sleeve into the slot from the inside. Tack it in place with cyano, then apply a fillet of thickened laminating resin over the inside of the joint. Allow the epoxy to cure fully, then slice off the sleeve flush with the surface of the fuselage using a sharp chisel.

Sand back the outside edges of the horizontal pylon former 21 at an angle to follow the approximate shape of the fuselage. Trial-fit the former, and repeat the process until it is a snug fit. When you are satisfied, tack it in place with a few drops of cyano, then reinforce the joint all round using plenty of thickened epoxy.

Sand back the outside edges of the horizontal pylon plates 23 and 25 at an angle, so that they can be slid into place under the flange of the fuselage (don't use force! - they must not distort the moulding). The end of the plate 25 should be located **42 mm** from the front edge of the pylon, while the end of the cut-out in part 23 should be **40 mm** forward of the trailing edge of the pylon. Sand back the inside of the fuselage and / or the formers until this is the case. Glue the ply doubler, part 24, to the underside of part 25; an M5 thread is cut in this later. Apply thickened resin to the inside of the fuselage flange, slide the horizontal plates into place and hold the parts together using small screw clamps - see photo.

Assemble the undercarriage support from parts 3 and 4, and tack them together using cyano. Saw four pieces 70 mm long from the channeled strip 5, and sand them at an angle at one end as shown in section D-D. Glue the strips to the support using laminating resin - see section D-D. Check the spacing of the channels (45 mm) by offering up the main undercarriage 34. The undercarriage units should be a tight push-fit in the channels; adjust the spacing of the channeled strips if necessary. When the glue has set hard, push the undercarriage units into place and fit the saddle clamps 6 to secure them. The inner clamps are not accessible on the finished model, so the screws have to be tightened just to the point where the undercarriage units can be slid into place at any time; the outer clamps are accessible even when the model is completed.

At this stage the undercarriage support assembly (minus undercarriage) can be trial-fitted in the fuselage. Check that it makes good contact with the bottom of the fuselage moulding, and adjust the corner radius of the two formers 3 if necessary; these parts must make sound contact with the bottom. Set the support assembly **central** relative to the openings in the fuselage side, and tack it in place at the corners using cyano. Lay a flat plate (e.g. thick balsa sheet) under the fuselage bottom, press the formers 3 against the bottom, and tack the parts together using cyano. The purpose of the balsa sheet is to prevent the bottom of the fuselage being pushed out of shape when you glue the undercarriage support in place. Allow the cyano to harden, then glue the parts together permanently using thickened laminating resin.

PBY-6: here we recommend that you simply glue the front former, part 3, in place to stiffen the bottom of the fuselage.

Use a small pair of tin-snips to cut out the wheel wells 36 as shown in the photos, and file back the outside edges to the marked lines. Trim back the bottom area little by little until it is an accurate fit inside the undercarriage support. Drill 4 mm Ø holes at the marked points, and glue the three circular doublers, parts 37, on the inside. A good adhesive for this is clear UHU-hart Plastic. Before gluing the wheel wells in the fuselage please check that the joint surfaces of parts 36 make good contact with the fuselage sides. If necessary even up the fuselage sides using a sanding disc. The wheel wells should be glued in place using the UHU adhesive mentioned earlier. Remove all rough edges from the ends of the undercarriage wires, and file out the top hole in part 36 at an angle (see section D-D) before trial-fitting the undercarriage. The upper wire will need to be "persuaded" gently into place: press it inward slightly until it slips through the angled section.

The support system for the servos, switch and battery is assembled directly inside the fuselage. First trim the former 7 to fit, and tack it in place on both sides with cyano. The position of the former, part 8, is determined by the two parts 9 and 52. Tack former 8 in place using cyano, supporting the bottom of the fuselage from the underside as described earlier. Tack it in place using cyano, then apply a fillet of slightly thickened resin to the joints. Screw the noseleg bracket 30 to the former 26, position it carefully in the fuselage and glue it in place. Trim parts 27 and 28 to fit, and cyano them in place. Sand the underside of the side parts 29 at the same angle as the bottom of the fuselage before gluing them in place. Apply epoxy to all the joints.

Drill out the holes in the two half-formers, parts 11 and 12, using a 3.2 mm Ø drill, slip them onto the "snake" outer sleeves, and position them as shown on the plan. Check that the parts fit correctly, tack them in place with cyano, then apply a fillet of epoxy along the joints.

Attach two ball-links 17 to the top of the elevator bellcrank 20 using the M2 x 12 screw, part 18. Tighten the retaining nut fully and apply thread-lock fluid if necessary. The wire pushrods 19 are threaded M2 at both ends, with 8 mm and 10 mm threaded shanks. Screw an M2 nut and ball-link 17 on the longer end of each rod, and screw the free end into the ball-links 17, which are already attached to the bellcrank. The distance between the ball centres should be around 65 mm. Unscrew the pushrods 19 together with the rear ball-links 17; the plastic housing of the ball-links must be thinned down to a slight taper, including the nut; the "new" diameter should be around 3 to 3.5 mm. This is quickly accomplished using a sanding disc or band sander. Finally grip the pushrods 19 in a drill chuck and trim parts 17 to final size using a **sharp** file - see photo.

Attach the snake inner 14 to the bottom end of the elevator bellcrank 20 using an M2 nut and clevis 15, and apply a drop of oil to the bearing surface of the pivot and both linkage balls before threading the whole assembly into the fuselage - see photo. Use a needle file or similar tool to push the pivot bush (aluminium tube) into approximate position, and fit a 2 mm Ø steel rod through the fin (and pivot bush). This will serve as guide for the actual pivot shaft, which takes the form of a piece of aluminium tube 41. Slide this into the fin, and gently rotate it to and fro until the shaft slips through the bellcrank, part 20. Seal the fuselage by gluing the tail post 44 in place, and glue the rib 76 in the top of the fin.

Sand the rudder 39 to a smooth, even taper - it should be left full-thickness at the leading edge, and sanded back to about 1 mm at the trailing edge. Cut pieces of tubing, part 41, around 4 - 5 mm long. Press them in the rudder hinge lugs 40, align them carefully using a length of 3 mm Ø steel rod, and glue the parts together using cyano. Fit the hinge lugs in the slots in the tail post, and mark the length of the tubular spacers, which should also be cut from part 41. Cutting the tubing, part 41, to length is very easy using a balsa knife or similar: place the knife blade on the tube, press down lightly, and roll it to and fro. Mark the position of the hinge lugs on the rudder; note that the rudder should project at the top by about 1 mm. Cut the notches for the hinge lugs in the front face of the rudder at the marked points. Thread the hinge lugs and tubular spacers onto the 3 mm Ø steel rod, and press the rod against the rudder so that the lugs engage in the notches (see photo). Set the rod exactly central, and tack the spacers to the rudder using cyano. **Caution: the bottom piece of part 41 should be glued to the tail post, part 44.** Press the whole assembly against the fin, with the hinge lugs 40 engaging in their slots, and clamp scrap pieces of balsa on both sides to align the parts accurately. At the bottom the spacer sleeve 41 should rest against the tail post 44. Set the 100 mm spacing at the top, as shown on the plan. Tack the hinge lugs to the tail post by applying individual drops of cyano on the tip of a pointed stick or rod. Let the glue harden, then withdraw the steel rod and reinforce the glued joints between the hinge lugs and the tail post. Cut pieces from the channeled strip 43, and cut them away at the front to clear the hinge lug bushes where they project beyond the tail post 40 - see photo. Glue the strips to the front face of the rudder, then round off the leading edge of the rudder using a small razor plane. Work gradually here, removing material step by step until full rudder travel is available to both sides of centre. Mark the profile on the top rudder block 45 and trim it back step by step using a razor plane. It is advantageous to carry this out with the rudder attached to the fin, and fixed at the bottom. Glue the block to the rudder when the shape is approximately correct, then carry out the final shaping. At all stages in this procedure, when the rudder is attached to the fuselage temporarily, please be sure to use the **3 mm Ø steel rod** as the pivot shaft - not the aluminium tube 42. The latter should only be used at the final assembly stage as it is easily damaged.

With the rudder attached to the fuselage, lay the 1 mm ply reinforcement on the bottom of the rudder and mark its outline. Saw the part approximately to size and glue it centrally to the bottom fuselage block 45. Cut it away at the front to clear the aluminium tube 41. Tape the block 45 to the fin, and cut a template from scrap balsa or plywood for the side view of the block. Mark the shape on part 45 and plane it to shape. Press the block against the tail post, and mark the cross-section of the fuselage on it. Remove the block and cut it to the correct outline. Plane away the underside to the correct V-shape, offering up the block to the tail post and trimming step by step to ensure that it continues the lines of the fuselage. This may sound difficult, but it’s actually quite easy. Do not glue the bottom block to the fuselage at this stage.

Draw a centreline on the tailplane root fairings on the fuselage, and continue the line on both sides of the rudder. Mark the clearance slot for the tailplane fairing 73 and saw it out as shown in the photo. It can only be trimmed to fit accurately, and the 1.5 mm balsa lining strips fitted, when the tailplane and part 73 are installed.

Mark the position of the front cut-out on part 73; it should be 15 mm long. The tailplane fairing should be a tight fit on the rear of the integral tailplane root fairings. Mark the correct thickness at the front of the fairing (approx. 11 mm), and plane and sand it to an even taper over its full length. Final adjustment is again only possible when the tailplane is in place.

Now screw the two pushrods 19 into the ball-links inside the fuselage as far as they will go. You will find it helpful to file the threaded end of the rods 19 to a slight taper first, as they will then engage more easily into the ball-links. **Important:** both parts 19 must be the same length (measured to the ball centreline). If this is not the case, you will inevitably end up with unequal elevator travel.

Cut out the canopy 65 using tin-snips, but don’t trim the rear end initially. The best method of trimming the edges is to use a razor plane (new blade, please) set for a fine cut. Place the blade on the edge of the moulding **at an angle**, and move the plane **parallel** to the edge; this is a fast, accurate method of trimming plastic. Cut the sides and front edge first, and only then mark, cut and trim the rear edge.

Drill 4 mm Ø holes at the marked points in the half-former 63, mark the hole positions on the fuselage, and drill them 3 mm Ø. File out **one** of the holes to 4 mm Ø using a round needle file. Cut a 10 mm length of 4 mm Ø hardwood dowel 64 and press it into the hole. Insert the half-former, then check the position of the second hole. Open up the second hole to suit, then glue the dowels 64 in the holes. Sand back the outside edge of part 63 so that the canopy fits the fuselage recess, flush with the outside surface. Sand the underside of the front half-former 61 to follow the angle of the fuselage.

Install the canopy latch 62 at the front; you may need to fit a plywood packing piece under it. Note that the axis of the latch bolt should be more or less parallel to the top surface of the fuselage. Tack it in place with cyano, then apply a fillet of thickened epoxy. Press the canopy latch 62 against the half-former 61, and drill a hole (3 - 4 mm Ø) at the marked point at approximately the correct angle. Adjust the hole using a needle file until part 61 makes proper contact with the bottom of the canopy recess. Cut a piece of scrap die-cut plywood 10 x 10 mm in size, drill a 3 mm Ø hole at the same angle, and fit it onto the latch bolt where it projects beyond part 61; glue the doubler to the canopy former as shown in the photo. Relieve the angled front face of part 61 where necessary so that it can be disengaged from the fuselage (swivel the canopy when opening it!). Sand back the outside edge of part 61 at an angle to follow the line of the canopy. Apply thin tape to the front and rear of the canopy recess on the fuselage to act as a release agent, then fit the half-formers 61 and 63. The canopy can now be glued to the formers using the UHU Plastic adhesive mentioned earlier. Press the canopy into place firmly, and tape it to the fuselage while the glue is hardening.

You will find a marked line on the top of the canopy; this indicates the position of the stiffener 66 (and the radar pylon 67). Sand the top of part 66 to a slightly rounded section, apply the UHU adhesive and glue it in the canopy. Allow the glue to set hard, and only then cut out the slot for part 67, starting with a 1.5 mm Ø drill. Carefully trim the opening to final size using a balsa knife and a needle file.

Cut the radar pylon 67 to final profile using a razor plane; note that the grain must be vertical. Use a sanding block to finish the job. Cut out the two-part radar fairing 68, and check that the shells can be fitted together neatly and accurately. Trim the plate 75 to fit in the shells 68: sand it to the correct taper at the rear, then glue it in place using UHU Plastic adhesive. Note that half the thickness of the plate 75 must project. Carefully cut a curved recess to clear the pylon 67, working step by step. Set part 67 central and glue it in place. Cut away the second shell 68 to clear the pylon 67, and glue it in place. Allow the glue to set hard, then sand the joint line and apply polyester filler paste to make good any gaps. Note that the radar pylon 67 must be tissue-covered and primed before it is glued in the canopy.

Install the sleeve for the receiver aerial 56 as shown in the plan view and side elevation of the fuselage. Drill a 3 mm Ø hole at the tail end, file it out at an angle, and thread part 56 in place from the rear. It must run to the **right** of the elevator bellcrank 20.

Cut out the two observer's domes 50, leaving a flange about 1.5 - 2 mm wide all round. Use a sanding block to cut back the integral flanges in the fuselage to a height of around 2 mm. If the domes are to fit accurately on the fuselage, the edges must be sanded at an angle, especially towards the rear of the mouldings; this is best done using a file or a narrow sanding block. Mask off the edge of the dome recesses to protect the fuselage surface when sanding. We recommend that you glue the domes to the fuselage only after it has been painted (the frames on both domes 50 should also be painted beforehand).

Cut out the step console 38, and glue it to the pylon using thin cyano. Cut out the step treads 74 with a fine-blade fretsaw, using the template on the plan as a guide, trim them to fit on the fuselage and glue them in place, again using thin cyano.

**Tailplane, L + R:** fit the CFRP tube 69 through the fin and slide both tailplane panels onto it to check the fit against the root fairings on the fuselage. Drill a 3 mm Ø hole in the tailplane, working through the fin, and glue a 35 mm length of aluminium tube 42 in the fin to act as an incidence peg. Use a sanding block to make fine adjustments until the tailplane is a perfect fit. The next step is to sand the tailplane / elevator panels to the final profile: we suggest that you lay the tailplane panel on a sanding block about 25 - 30 mm thick, and hold the panel still with your left hand. This makes it relatively easy to work on the attached control surface. Sand down the trailing edge to a thickness of around 1 mm, but leave the leading edge full thickness. Use a sanding block to reduce the length of the tailplane at the tip by about 1 mm = clearance gap to tip block. Set the control surface exactly central using two pieces of scrap balsa about 5 x 10 mm in size and a screw clamp - Fig. 36. Hold the elevator tip blocks 71 in place, mark the profile, then cut them to approximate shape using a razor plane. Glue the tips to the elevators. **Important:** the elevator tips must only be sanded with the elevators fixed at centre, otherwise either the control surface or the leading edge of the tip will end up out of line. Figs. 38 and 39 show how the tailplane and elevators have to be recessed to accept the torque rod horns 72 (L + R). Note that the pivot axis of parts 72 must line up with the plane of the factory-fitted flex-hinge, otherwise the system will tend to bind. This means that the flex-hinge must be cut away using a balsa knife as far as the right-angled section of parts 72. The balsa sheeting is 1.5 mm thick (= position of the flex-hinge), i.e. parts 72 must be recessed 1 mm lower than the hinge plane; see also the plan, section F-F and detail "Z". Cut away the root of the tailplane panels to allow parts 72 to move forward (down-elevator). The tail surfaces can now be covered as described earlier. The tailplane panels should not be installed permanently until all surface finishing is complete.

Seal both ends of the carbon fibre tube 69 with scrap balsa, and sand the ends to a slight taper. Fit both tailplane panels on the tube 69 "dry" (no glue), and check that the gap between them is 25 mm wide (= width of tailplane root fairing). Mix up about 3 cc of laminating resin, thicken it well, and apply about 2.5 cc of it in the socket in one tailplane panel, feeding the resin in gradually using a steel rod or similar tool. Distribute it all over the inside of the tube socket. Now slowly slide the carbon tube 69 into the socket, rotating it constantly to and fro. Wipe away any resin which is forced out of the hole. Lay the tailplane panel in its styrofoam shell, and set the projecting tube exactly horizontal and at right-angles to the tailplane root. Leave the resin to harden for 4 to 5 hours - depending on temperature - after which the epoxy will still be relatively soft; it should still be possible to rotate the tube slightly using "gentle force". This is the time to install the tailplane in the fin: apply a little fresh, thickened resin to the root of the panel, slide the carbon tube through the fin, and glue the tube in the fin using cyano. Carefully align the tailplane relative to the root fairing on the fin. Wipe away any excess epoxy at the root, and clean the GRP surface using meths or similar solvent.

Now fresh resin can be applied to the second panel, although this time a single procedure is used (resin in socket and on root simultaneously). Fit the tailplane panel, and clamp two strips of balsa over the elevators as shown in Fig. 40. Tape the tips to the tailplane for this procedure. Check the position of the tailplane: right-angles to the fin, trailing edge in one line; allow the epoxy to cure thoroughly.

You have already partially prepared the tailplane fairing 73, and you can now offer it up, check the width and trim the front face so that the part fits accurately. Sand back the trailing edge to conform with the elevator section, and sand it to the correct final taper. Cut it away at the top to clear the elevator torque rods 72, and relieve the sides to allow for the angular travel of parts 72 - see Fig. 43 and section F-F. Hold the torque rods 72 in place and check their freedom of movement. The plain shank of parts 72 (= end of elevator to tailplane fairing) will form the bearing area. Check that the two ball-links are exactly the same length, and adjust them if not. Screw the top M2 nuts on the torque rods 72; they act as a stop for the linkage balls. Both parts 72 must be in exactly the same position! Now apply a thin coating of Vaseline to the bearing shanks, and slip parts 72 through the linkage balls using a pair of tweezers. Refer to Fig. 42 here, as it shows the arrangement clearly. With the elevator trailing edges clamped together again using two strips of wood, tape the elevators at neutral. Hold the linkage balls against the M2 nuts, secure them with a drop of cyano, then fit the bottom nut - see section F-F. Raise the elevator torque rods 72 from their recesses in the elevators using tweezers, and apply well thickened resin to the joint area. Apply a little epoxy also to the recess in the tailplane (= bearing area), then press parts 72 into place. **Important:** take care not to glue the torque rod to the tailplane outside the bearing area, and keep the right-angled section of parts 72 free of resin. Apply a small fillet of epoxy to the front of parts 72 to form a bush, and allow the resin to cure. When the epoxy is hard the rods should revolve smoothly in the epoxy bush.

Trim the front face of the tailplane fairing 73 once more to clear any excess resin, and glue it in place using thickened epoxy. **Caution:** keep the elevator linkage free of resin on both sides, as explained above. Align the trailing edge of the elevators once again and tape it in place - see Fig. 45. Check the epoxy ‘bush’ round parts 72, and trim it / enlarge it as required. Figs. 44 and 46 show how the gap between the tailplane and the elevator can be filled and smoothed. Place a piece of thin ABS sheet in the gap, support it with scrap pieces of balsa, and fill the gap with resin. Caution: the resin ‘bush’ forms the bearing for the torque rods 72, and this should be lubricated on each side with a tiny drop of oil applied using a pointed stick. Fig. 47 shows the final result, with the gaps made good using fast-setting filler paste and then primed.

The next step is to enlarge the tapered clearance slot in the rudder, and line it with balsa cap strips. We strongly recommend that you fit a length of 3 mm Ø steel rod as the rudder pivot prior to any further work on this area (covering, etc.). Fit the finished rudder, tape it at neutral, and glue the fuselage bottom block 45 in place. Tissue-cover all the wooden surfaces. Figs. 49 - 51 show the result.

The flight-testing programme has shown that the distance from the CG to the main undercarriage (at the rear end of the CG range) is insufficient, and we have countered this by re-positioning the wing 5 mm further forward. The result is greatly improved stability on the ground. **Caution:** this modification means that the 70 mm dimension between the trailing edge of the wing and the trailing edge of the pylon, as stated on the plan, is no longer correct. **The correct dimension is now 65 mm.** A further consequence is that the rear hole in the wing is now located **30 mm** forward of the trailing edge of the pylon.

**Important:** please check that the rear hole in the wing is exactly central. A discrepancy of just 1 mm can have a significant effect on the alignment of the wing relative to the fuselage. If the hole is not exactly central, the marked point for the hole in the fuselage plate must also be offset by the same amount. Drill a 2 mm Ø pilot-hole about 2 mm deep. The kit includes a 50 mm length of 5 / 4.1 mm Ø aluminium tube which forms a drilling sleeve. Fit this in the rear hole in the wing to act as a guide for a 4 mm Ø drill bit. Align the wing on the pylon carefully, and drill the hole. Cut a thread in the hole using an M5 tap to accept the wing retaining screw. Check the plan view carefully (= right-angle to fuselage centreline). We recommend that you mark a point on the fin and measure the distance to the trailing edge of the wing at both tips. When you are satisfied, tighten the screw fully. The front hole can now be drilled, and threaded M5 as described earlier. We recommend that you soak the threaded area with thin cyano to harden the material. Allow the adhesive to harden fully, then run the tap through again to clean the threads.

The next step is to install the battery support and the servos. Fit the ply guides 10 on the snake outer sleeves. Set the servos to neutral (centre) from the transmitter, determine the correct length of the snakes, taking the threaded couplers and clevises into account, and cut them to length. Check the length, then crimp the threaded couplers securely to the snake inners using combination pliers (crimp at several points). Glue the guides 10 to the fuselage to prevent the snakes flexing; they also hold the snakes in the correct position.

To complete the main undercarriage units you just need to fit the aluminium bushes 41 (length 22 mm) - see section D-D. They are secured on the shaft by soldering washers 55 on either side. The internal diameter of the washers (2.8 mm) is deliberately undersize, as this makes it much easier to solder them to the undercarriage wires. File them out to a tight fit on the wire using a needle file and push them onto the shaft. Sand the joint areas thoroughly until you see bright metal, and use good solder flux for the joints.

The nosewheel is secured on the shaft using only two washers, i.e. no bush is used. Installation is self-explanatory; set it to the correct height, then tighten the ball-end bolt 31. The nosewheel is steered by the threaded rod 49, fitted with a ball-link 17 at the front end. Connect the clevis 15 to the servo (inner hole), and mark the correct length of the pushrod 49 with the nosewheel at the neutral position. Cut the rod 49 to length, slide it into the threaded section of the clevis and solder the parts together.

One of the photos shows a suggested method of securing the battery: Velcro (hook-and-loop) tape, with a piece of 3 mm plywood in the centre (glue it between the two lateral rails 53); two rails are quite sufficient.

**Wing:** the first step is to epoxy the CFRP tubes 69 in the outboard wing panels. We recommend that you carry out this procedure in two stages:

Lightly sand the tubes over half their length, and check that they are an easy sliding fit in their sleeves. In the first phase mix up thickened epoxy and apply about 2 cc of the mix to each socket before pushing the tubes fully into place. Take care to remove all traces of resin which are squeezed out, and clean the tubes with acetone. After around 2 - 3 hours (depending on temperature) you can fit the outer panels to the centre section, leaving a gap of about 5 mm. The top surface of the wing is flat (no dihedral), so it can be laid down inverted on a flat building board. At this stage you can check whether the leading and trailing edges line up properly, and correct the alignment if necessary by applying slight pressure (while the epoxy is still soft). The trailing edge will later be sanded down to a thickness of 1 mm, i.e. the trailing edge alignment does not need to be 100% perfect at this stage. Check that there are no traces of epoxy on the projecting carbon tubes, then slide all three panels together so that you can check that the airfoils line up accurately. If not, use a sanding block carefully until the surfaces meet snugly. The second phase is now to apply thin laminating resin to the tube joints in order to fill any voids; apply the resin on a stick or rod, and warm it with a heat-gun if necessary to help it flow into the gaps.

The next step is to sand the wing overall; we recommend that you make up a sanding block about 250 - 300 x 50 mm, and attach a new sheet of 180-grit abrasive paper to it. Work on the centre section first, using one of the engine nacelles 80 as a template for the leading edge profile (sand the nacelle recess to final shape first). Don’t use excessive pressure; the coarse grit works very quickly. When sanding the trailing edge remember to take the outboard panels into account, and take care not to form a stepped joint.

The trailing edge of the outboard panels should first be sanded back at the joint area, i.e. where the centre section meets them. Place a sanding block under the ailerons to prevent them moving before sanding them to final profile. Remove about 1 mm from the aileron tips to form a clearance gap to the tip floats. Mount the servos, with the clevises 15 already fitted, on the servo plates 90, and install them in the wings “dry”. Mark the line of the aileron pushrods 49. The slots in the sheeting should be 20 mm long, and positioned 20 mm forward of the aileron on each side. Cut the slots in the ailerons for the horns 91 (don’t glue them yet), as shown in Fig. 56, and cut away sufficient foam to provide clearance for the pushrods. Fit an M2 nut and clevis 15 on each aileron pushrod, and bend the rods to the shape shown in Fig. 56. Mark the correct length and cut the pushrod. When the linkage is finally installed the pushrod is simply slid into the clevis attached to the servo; you can then solder the joint easily.

Everything should now be removed and dismantled as far as possible, and thinned sanding sealer applied to the wing. Allow the sealer to dry thoroughly before sanding the wing overall using fine abrasive paper.

The outboard panels can be secured against the centre section using any method you fancy. One very simple means is to make a pocket from 2.5 mm plywood and glue it in the centre section; a plywood tongue in the outboard panel fits in the pocket, and an M3 screw can be fitted through the pocket and tongue from the underside. Caution: this assembly must be installed parallel to the joiner tubes!

The purpose of the wing struts is not to prevent the wing flexing upwards (tensile load); it is to brace the wing to the fuselage, as it is mounted on a narrow pylon. The struts therefore have to absorb compressive loads!

First cut the tongues from the aluminium strip material 88 supplied - see view “E” on the plan. A sanding disc makes short work of shaping them. Roughen the joint surfaces and drill a further two or three holes if necessary. Fit the tongues in their slots in the fuselage and drill right through using a 1.8 - 1.9 mm Ø bit. Before screwing the tongues in place we recommend that you remove them and enlarge the holes to 2 mm Ø. Fix the tongues to the fuselage using the self-tapping screws 35, using a screwdriver of the correct size. Cut two pairs of struts 186 mm and 183 mm long from the profiled hardwood strip 87.

The angled end of the strut (where it fits against the wing) is prepared first; the taper is again best cut using a sanding disc. Fit the wing on the fuselage and check that it is square to the vertical central plane. If it is at an angle on the pylon, start the strut fitting procedure with the side where the wing alignment can be corrected **by pressure**! Lay the model inverted on the building board (with the rudder removed). Fit the first strut **under** the installed aluminium tongue 88, mark the outline of part 88 on the strut, and saw it out using a fretsaw. Now comes the “fine-tuning”: carefully trim both ends of the strut where it meets the fuselage fairing and the underside of the wing, and pin the strut in place. Repeat the procedure with the remaining three wing struts, as shown in photos 57 - 59. When everything fits correctly, remove the struts and apply clear plastic film over the joint positions on the wing. Apply a little thickened resin to the prepared angled end, fit the strut on the aluminium tongue, and then fold it down onto the wing and secure it with pins again. Apply a drop of cyano to fix the strut to the aluminium tongue, and apply a little more epoxy to the outboard end of the strut if necessary. Allow the resin to cure, then drill 1.6 mm Ø holes for the self-tapping screws which hold the struts to the wing. Remove the self-tapping screws from the fuselage, remove the wing, take the struts out and enlarge the 1.6 mm Ø holes in them to 2.2 mm Ø. Apply thin cyano to the wood to harden the material. Sand off excess resin - and you can be confident of a perfect fit! Glue the tongues to the struts using plenty of thickened epoxy, and make good any gaps using fast-setting filler paste. The wing struts can now be treated with sanding sealer, sanded, and primed. Use fast-setting filler paste to fill any gaps.

Fig. 60 shows the nosewheel well doors with the door supports 54 already glued in place; section A-A on the plan also shows this. Bend the brass wire supports to shape using combination pliers, tack them in place using cyano, and apply a fillet of thickened resin. We recommend that you only install these assemblies in the fuselage when the whole model has been painted. Again: tack in place with cyano, then apply epoxy afterwards to reinforce the joints.

The wing can now be covered; we recommend tissue, as already mentioned. Apply several coats of thinned clear dope, sanding between coats, then open up the wells for the servos using a sharp balsa knife. Apply a coat of primer, as described for the tailplane. Thread the aileron servo leads through the wings, then glue the servo plates 90 (with the servos attached and the clevises fitted) in the wells using thickened epoxy. Glue the aileron horns 91 in place. With the servos at neutral (set from the transmitter), slip the prepared pushrods into the front clevises and solder the joints. Cover the openings again; you may wish to apply self-adhesive film over the servo wells when painting is complete.

Trim and assemble the two-part floats in the usual way. We recommend that you fill the outline (joint line) with fast-setting filler paste, and sand to a rounded section. Brushing primer over this area will help to show up and correct any defects in the filler. Once again we recommend that the floats be attached using the specified UHU Plastic adhesive - see view “D”.

PBY-6: for this version we recommend that you make the floats removable; the plan shows one suggested method. Important: the length of the struts should be determined by measuring the clearance with the model floating in water; the bottom of **both** floats should be 25 - 30 mm above the surface. Since the floats on the full-size machine are retractable, the length of the struts dictates their location on the underside of the wing. Fit 1 mm ply braces in the space between the struts, positioned diagonally.

Test-flights showed the necessity for increased motor sidethrust, so the two-part motor bulkheads 81 + 82 have been modified compared to the arrangement shown on the plan. The motor thrustline (measured at the bulkhead) is now 2 mm off-centre, which brings the output shaft to the centre of the cowl when the motors are set at the correct sidethrust of 2°.

Glue parts 81 and 82 together using slightly thickened epoxy, and sand the outside edges to a taper of 20° as shown on the plan; check that they are a snug fit in the nacelles. A disc sander with an adjustable table (e.g. Proxxon) is very useful for this task. Drill the mounting holes to suit the motors you intend to install, and apply thin cyano to the holes to harden the wood. Fig. 61 shows how the motors look when set at the correct angle. Apply wax release agent to the motor mount surface, fit an M2.5 nut on the left-hand screw (as seen from the tail) from the rear, and insert the other two screws. Apply a fillet of thickened resin to the front face of the double bulkhead as shown in the photo, and lay a strip of 1 mm thick aluminium over one corner of the centre hole of the three. Place the motor mount in position, press it against the bulkhead, and fit the nut on the rear; do not tighten the nut fully. Remove excess epoxy, and apply a fillet of resin round the nut. When the glue has set hard, position the bulkhead upright in the nacelle (the front face of the nacelle is flat), tack it in place using cyano, then apply a little thickened epoxy to secure it permanently. Sand the nacelles with 400-grit abrasive paper before gluing the dummy radiators 85 in place using cyano - see section L-L.

The already prepared cowls 83 can now be fitted with their mounting lugs 84. The cowls are circular in section, but they still have a “top” - see the marked lines. The line indicates the position of the first 2 mm Ø hole in part 83, 18 mm forward of the rear edge. Fix the lug to the cowl using an M2 screw and nut, then lay it face-down on the building board to check that it is positioned at the correct angle to fit on the nacelle. File the screw-hole to an oval shape if necessary. Centre the cowl 83 on the nacelle, and check that the gap is of even width as seen from the rear. Mark the position of the hole on the motor bulkhead, drill it 1.6 mm Ø and secure the cowl with one 2.2 x 6.5 mm Ø self-tapping screw. The lower mounting lugs 84 should be positioned 86 mm from the first, measured at the periphery of the cowl. Determine the position of the lower holes using a strip of paper, and install the lugs. If the lugs foul the motor mount, file them back to provide clearance.

Cut the power supply cables in half, twist them together, and bundle them together using 10 mm lengths of heat-shrink sleeving. To draw them through the wing we recommend that you make a tool from a length of 0.6 mm Ø steel wire, with a loop formed in one end. Shorten the end of the leads by steps of around 8 - 10 mm. Hold the end of the steel tool against the cable ends and wrap with tape. The stepped leads make the end of the bundle narrower where it has to be drawn through the wing, and makes it easier to thread it through the hole. Mark the position of the nacelles on the wing with the greatest accuracy, following the dimensions stated on the plan. Align them carefully, check again, then tack them in place with cyano. Allow the glue to harden, then apply slightly thickened epoxy to the inside of the joints to make them permanent.

Cut two pieces about 340 mm long from the profiled plastic strip 95, heat them gently in the centre with a heat-gun and bend them over a tube of around 8 mm Ø. Heat them again, then bend them in your fingers to approximately the same shape as the leading edge of the wing. Continue to adjust the shape of parts 95 until they make contact with the trailing edge of the centre section without requiring undue pressure. Round off the ends and glue them to the wing centre section using thin cyano.

This completes the basic construction of the model. The motors should not be installed until the model has been painted overall. For painting we strongly recommend the use of automotive base paints. Advantages: very high covering power (= weight saving), fast drying (after about 20 minutes it is perfectly safe to apply masking tape), one-pack materials. Base paints are the colour pigment components of all two-pack acrylic paints, and should be available from any supplier of car finishing materials. On our model we used BMW 176 (dark blue), while the yellow / orange areas are RAL 1003.

Carefully remove all traces of dust from the whole model. De-grease the surfaces using water with a little liquid detergent mixed in, then rinse with clean water and allow to dry. Use a soft cloth for this procedure, which is quick, effective and produces no unpleasant smells. Parts such as the gunner’s dome, observer’s domes and canopy must be painted separately. For the final coat we recommend clear acrylic lacquer with some matt lacquer mixed in; these are also available from car paint suppliers. The degree of gloss can be adjusted by varying the quantity of matt lacquer: a 1 : 1 ratio corresponds approximately to a silk (semi-matt) finish. Please test the degree of thinning required; we used +100% thinners, and it could well have been even thinner. An extremely thin coat is all that is required.

Now it's time to install the motors. We assume that you have already checked and marked the "address" of the individual cables (direction of motor rotation). Solder the cables directly to the existing motor cables, and protect each soldered joint individually with a heat-shrink sleeve to avoid short-circuits. Leave a short length of cable loose in the nacelles in case you need to remove the motors at any time. The battery cables attached to both speed controllers should be soldered to a set of connectors. The controllers can be left hanging freely under the wing, so that they are in mid-air in the lower area of the pylon when the model is assembled. All you have to do now is fit extension leads for the aileron servos. We recommend that you simply remove the outboard wing panels when you dismantle the model for storage at home and for transport.

Before test-flying the Catalina please note the following points:
- The propellers are located high above the Centre of Gravity, and produce enormous thrust. This is countered to some extent by the upthrust built into the shafts, but there is still a significant "nose-down" pitching moment when you open the throttle, especially if you are abrupt with the throttle stick (fuselage inertia).
- The unusually short fuselage, the proximity of the two motors and the very large vertical fin combine to produce quite pronounced asymmetry of the airflow over the fin. The result is that the Catalina always tends to "veer to the left"; although this is more pronounced than with a conventional layout, it is still easy to control.

Before the first flight we recommend that you set the CG to the forwardmost position (75 mm), and take the 'bite' out of the rudder response by setting exponential at the transmitter. A flat, closely mown grass strip, or - even better - a tarmac runway, is advantageous for the first few flights, as this enables the pilot to perceive the model's response to control commands more readily. Once all the checks have been made, increase the throttle setting gradually so that the aircraft picks up speed relatively slowly; this again gives you more time to correct any tendency to swing on the take-off run. A ground roll of about 3 to 4 seconds is a good starting point. Once in the air the machine is completely straightforward to handle, and presents no problems in general flying. We recommend trying a stall test during the very first flight - at a safe altitude, needless to say - followed by a series of simulated landing approaches. Keep the airspeed up during the approach, and don't close the throttle completely until the model is very close to the ground, so that airspeed is maintained to the last moment. Please bear in mind that the airflow over the wing of your "Caty" is already at +5.5° when the fuselage is horizontal! A nose-down attitude is typical, and attempts at correcting the attitude with up-elevator may prove to be fatal!

During the next few flights we suggest that you experiment with minor changes to the CG position and control surface travels until you feel completely "at home" with the model's handling and control response.

In both full-size and model form the "Caty" is more stately lady than racer, and deserves and demands to be flown in a realistic scale manner.

Naturally we would also like to pass on our experience of flying the model from water:

The "weathercocking" effect is much more pronounced on water than on land, so it is of fundamental importance to take off and land exactly into wind. This effect makes it almost impossible to taxi on water unless you are lucky enough to encounter flat calm conditions or a very gentle breeze. The ideal wind strength is around 1 - 2 m/s.

Do check the lateral balance of the model, and set it either neutral or slightly "right wing down". When taxiing on the water the lower float has a braking effect if it contacts the water, i.e. a "right-hand dip" can help to correct the "veering left" tendency to a slight extent (see PBY-6A). At take-off time open the throttle slowly, otherwise the high thrustline will push the nose down into the water. The elevators have no noticeable effect until the aeroplane is moving quite fast. Maintain heading carefully, and keep the wings exactly level (floats out of the water) as soon as the ailerons "bite". The "Caty" can be brought up "on the step" (planing) relatively quickly, and will lift off at this point with only slight up-elevator. We recommend that you always place a piece of absorbent material (kitchen towel or similar) in the lowest point of the fuselage to collect any water.

Applying a 10 mm wide strip of material about 0.5 mm thick (e.g. thick self-adhesive tape) in front of the step in the bottom of the fuselage may make take-off a little brisker. The strip generates turbulence which makes it easier for the 'hull' to separate from the water.

Carry out the landing approach with plenty of speed (well above idle). The fuselage should not make contact with the water until the model is at minimum sinking speed and the keel is horizontal; this can be corrected with the throttle setting. Only in this attitude will the hull make an immediate transition to planing. The water has a very severe braking effect, but you can counteract this by increasing the throttle slightly immediately after touch-down. The worst possible approach is to plop the model into the water at minimum airspeed and a high angle of attack!

We all hope you have many hours of pleasure building and flying your model, and wish you many happy landings.

aero-naut Modellbau GmbH & Co. KG

**Parts List**

| Part | Description | No. off | Material | Dimensions in mm |
|---|---|---|---|---|
| 1 | Fuselage | 1 | GRP | Ready made |
| 2 | No part | - | - | - |
| 3 | Former | 2 | Plywood | Die-cut, 3 mm |
| 4 | Plate | 1 | Plywood | Die-cut, 3 mm |
| 5 | Channeled strip | | Lime / obechi | 15 x 8 mm |
| 6 | Saddle clamp | 8 | Aluminium | Ready made |
| 7 | Former | 1 | Plywood | Die-cut, 3 mm |
| 8 | Former | 1 | Plywood | Die-cut, 3 mm |
| 9 | Servo mount | 2 | Plywood | Die-cut, 3 mm |
| 10 | Guide | 2 | Plywood | Die-cut, 3 mm |
| 11 | Half-former, elevator snake | 1 | Plywood | Die-cut, 3 mm |
| 12 | Half-former, rudder snake | 1 | Plywood | Die-cut, 3 mm |
| 13 | “Snake” inner sleeve | 2 | Plastic + steel | Ready made |
| 14 | Nut, M2 | 18 | Brass | Ready made, M2 |
| 15 | Clevis | 9 | Plated steel | Ready made, M2 |
| 16 | Threaded coupler | 2 | Mild steel | Ready made, M2 |
| 17 | Ball-link | 5 | Plastic + brass | Ready made, M2 |
| 18 | Screw, M2 | 7 | Brass | Ready made, M2 x 12 mm |
| 19 | Threaded rod, M2 | 2 | Mild steel | Ready made, M2 x 45 mm |
| 20 | Elevator bellcrank | 1 | GRP + aluminium | Ready made |
| 21 | Horizontal pylon former | 1 | Plywood | Die-cut, 3 mm |
| 22 | Strip | | Balsa | 5 x 5 mm |
| 23 | Pylon plate | 1 | Plywood | Die-cut, 3 mm |
| 24 | Reinforcement | | Plywood | 5 mm |
| 25 | Pylon plate | 1 | Plywood | Ready made, 4 mm |
| 26 | Former | 1 | Plywood | Ready made, 6 mm |
| 27 | Half-former | 1 | Plywood | Die-cut, 3 mm |
| 28 | Plate | 1 | Plywood | Ready made, 3 mm |
| 29 | Side panel, nosewheel box | 2 | Plywood | Ready made, 3 mm |
| 30 | Bracket | 1 | Plastic | Ready made |
| 31 | Ball-end bolt, 22 mm long | 1 | Chrome-plated mild steel | Ready made |
| 32 | Screw, M2.5 | 4 | Steel | Ready made, M2.5 x 12 mm |
| 33 | Nut, M2.5 | 4 | Brass | Ready made, M2.5 |
| 34 | Main undercarriage unit | 2 | Steel rod, soldered | Ready made |
| 35 | Self-tapping screw | 24 | Chrome-plated steel | Ready made, 2.2 Ø x 13 mm |
| 36 | Wheel well | 2 | Plastic | Ready made |
| 37 | Wheel well doubler | 6 | Plywood | Die-cut, 3 mm |
| 38 | Step console | 1 | Plastic | Ready made |
| 39 | Rudder | 1 | Styrofoam + balsa | Ready made |
| 40 | Hinge lug | 3 | GRP | Ready made |
| 41 | Tube | | Aluminium | Ready made, 4 / 3 mm Ø |
| 42 | Tube | | Aluminium | Ready made, 3 / 2 mm Ø |
| 43 | Channeled strip | 1 | Balsa | 15 x 6 x 210 mm |
| 44 | Former | 1 | Plywood | Die-cut, 3 mm |
| 45 | Bottom fuselage block | 1 | Balsa | 30 x 25 x 80 mm |
| 46 | Rudder tip block | 1 | Balsa | Ready made |
| 47 | Noseleg unit | 1 | Steel | Ready made |
| 48 | Collet | 1 | Chrome-plated steel | Ready made |
| 49 | Threaded rod, M2 | 3 | Mild steel | Ready made |
| 50 | Observer’s dome | 1L+1R | Plastic | Ready made |
| 51 | Keel skid | 1 | GRP | Ready made |
| 52 | On-Off switch plate | 2 | Plywood | Die-cut, 3 mm |
| 53 | Battery support | | Spruce | 5 x 5 mm |
| 54 | Nosewheel door support | | Brass rod | 1.5 mm Ø |
| 55 | Washer | 6 | Brass | 7 / 2.8 mm Ø |
| 56 | “Snake” outer sleeve | 1 | Plastic | 3 / 2 mm Ø |
| 57 | Main wheel | 2 | Plastic | 76 mm Ø |
| 58 | Nosewheel | 1 | Plastic | 45 mm Ø |
| 59 | Rudder horn | 1 | GRP | Ready made |
| 60 | Gunner’s dome | 1 | Plastic | Ready made |
| 61 | Half-former | 1 | Plywood | Die-cut, 3 mm |
| 62 | Latch | 1 | Steel | Ready made |
| 63 | Half-former | 1 | Plywood | Die-cut, 3 mm |
| 64 | Dowel | | Beech | 4 mm Ø |
| 65 | Canopy | 1 | Plastic | Ready made |

| | | | | |
|---|---|---|---|---|
| 66 | Stiffener | 1 | Plywood | Die-cut, 3 mm |
| 67 | Radar pylon | 1 | Balsa | 8 x 50 x 40 mm |
| 68 | Radar fairing | 2 | Plastic | Ready made |
| 69 | Tube | 5 | CFRP | 8 / 6 Ø x 150 mm |
| 70 | Tailplane | 2 | Styrofoam + balsa | Ready made |
| 71 | Elevator tip block | 2 | Balsa | Ready made |
| 72 | Elevator torque rod | 1L+1R | Mild steel rod | Ready made |
| 73 | Tailplane fairing | 1 | Balsa | 12 x 55 x 60 mm |
| 74 | Step tread | | ABS sheet | 1 mm |
| 75 | Plate | 1 | Plywood | Die-cut, 3 mm |
| 76 | Rib | 1 | Plywood | Die-cut, 3 mm |
| 77 | Wing centre section | 1 | Styrofoam + balsa | Ready made |
| 78 | Outboard wing panel | 1L+1R | Styrofoam + balsa | Ready made |
| 79 | Motor cable | 3 colours | Copper + silicone | Ready made |
| 80 | Engine nacelle | 2 | GRP | Ready made |
| 81 | Bulkhead | 2 | Plywood | Die-cut, 3 mm |
| 82 | Bulkhead | 2 | Plywood | Die-cut, 3 mm |
| 83 | Cowl | 2 | GRP | Ready made |
| 84 | Cowl mounting lug | 6 | Aluminium | Ready made |
| 85 | Dummy radiator | 2 | Plastic | Ready made |
| 86 | Screw | 2 | Plastic | M5 x 50 mm |
| 87 | Wing strut (tear-drop section) | | Lime | 12 x 5 mm |
| 88 | Wing strut tongue (root) | | Aluminium | 1.5 x 8 mm |
| 89 | Spinner | 2 | Aluminium | Ready made |
| 90 | Servo plate | 2 | Plywood | Die-cut, 3 mm |
| 91 | Horn | 2 | GRP | Ready made |
| 92 | Float bottom section | 2 | Plastic | Ready made |
| 93 | Float top section | 2 | Plastic | Ready made |
| 94 | Self-tapping screw | 6 | Steel, chrome-plated | Ready made, 2.2 x 6.5 mm Ø |
| 95 | Profiled plastic strip | 1 | Plastic | Ready made |

***Building plan text***

(1) Section C-C
(2) Part 2 not required; this area now reinforced with CFRP
(3) See building instructions
(4) Section D-D
(5) Section A-A
(6) Section F-F
(7) Trailing edge of fin
(8) Detail “Z”
(9) View “A”
(10) Detail “Z”
(11) Rudder
(12) Section G-G
(13) Section H-H
(14) Edge of opening in fuselage
(15) View “B”
(16) On-Off switch / speed controller switch L / R
(17) Section B-B
(18) Installation of ACTRO C-8, Order No. 7002/38
(19) Section L-L - see building instructions
(20) Section J-J
(21) View “D”
(22) Section E-E (not to scale) 12. Rudder 11. Elevator
(23) View “D” - floats - see building instructions
(24) Surface of water
(25) Up: 15 mm / down 7 - 8 mm
(26) View “C” - suggestion
(27) Section K-K
(28) View “E”
(29) Section M-M
(30) Roughen
(31) Aluminium tube, Order No. 7735/03
(32) Aileron servo lead
(33) We reserve the right to modify any feature in order to improve our products
(34) Balsa cap strips
(35) Motor sidethrust - see building instructions
(36) Order No. 7002/87
(37) Order No. 7002/62