Graupner

Assembly instructions for the SYDNEY STAR container ship, Order No. 2071

The full-size vessel

Container ships such as the SYDNEY STAR are an increasingly common sight on the world's oceans, as the use of standardised containers - they are identical the world over - makes it simple and fast to load and unload goods. For this reason virtually all merchandise is transported by container nowadays. For long-distance journeys (Asia - Europe - America) large container ships with vast transport capacity are employed, which can only be accommodated in particular ports. These ports are specially equipped for handling containers, and for this reason the vessels require no loading bridge. The containers are then carried on the remainder of their journey by smaller container ships (coastal vessels), or by road and rail.

The model

The SYDNEY STAR is a semi-scale model of a long-range container ship. It includes all the characteristic features and details of these vessels, as we wanted the ship to have as realistic an appearance as possible. Construction of the model is greatly simplified by the high level of pre-fabrication of the kit's components, many of them CNC-machined or laser-cut, plus the many fittings included in the kit as standard, including winches, companionways and injection-moulded handrails. Nevertheless, the model is only recommended for the experienced marine modeller. The two transverse thrusters at bow and stern allow the model to traverse (move sideways) and turn on the spot without difficulty, without the need for tugs.

Specification

	Model	**Full-size**
Length approx.	1135 mm	227 m
Beam approx.	140 mm	28 m
Displacement max. approx. (model incl. RC system)	6 kg	
Scale approx.	1 : 200	

Important safety notes

You have purchased a kit which can be assembled to produce a fully working RC model when fitted out with the appropriate accessories. As manufacturers, we at GRAUPNER are not in a position to influence the way you install, operate and maintain the model, nor the other components used in connection with the model. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect use and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of the GRAUPNER company to pay compensation, regardless of the legal argument employed, is excluded. This includes personal injury, death, damage to buildings, loss of trade or turnover, interruption of business or other indirect or direct damages which are caused by the operation of the model. Under all circumstances and in all cases the company's overall liability is limited to the amount which you actually paid for this model.

The model is operated at the sole risk of the operator. To avoid injury to persons and damage to property please handle your model boat carefully and operate it conscientiously at all times.

Before you run the boat for the first time it is important to check that your private third party insurance policy provides cover when you are operating model boats of this kind. If you are not sure, take out a special insurance policy designed to cover the risks of RC modelling.
These safety notes are important, and must be kept in a safe place. If you ever dispose of the model, be sure to pass them on to the new owner.

Guarantee conditions

The guarantee covers replacement of any parts which can be shown to exhibit manufacturing faults or material defects within the guarantee period of 24 months from the initial date of purchase; no other claims will be considered. Cost of transport, packing and freight are payable by the purchaser. We accept no liability for damage in transit. When you send the product to GRAUPNER, or to the approved Service Centre for your country, you must include a clear and concise description of the fault together with the invoice showing the date of purchase. The guarantee is invalid if the component or model fails due to an accident, incompetent handling or incorrect usage.

The following points are important and must be observed at all times:

- This model is not suitable for young persons under 14 years of age.
- ***NEVER*** operate this boat when there are persons or animals close by in the water, otherwise there is a serious risk of injury.
- Never run your boat in a protected site, an animal or plant sanctuary or a site of special scientific interest (SSSI). Check with your local authority that the stretch of water you wish to use is suitable for model boats.
- Do not run the model in salt water. Even the salt-laden sea air can attack your model's technical components, causing oxidation and eventually ruining them.
- Never run your boat in adverse conditions, e.g. rain, storm, strong wind, choppy water or strong currents.
- Before you run the model check that the radio control system is working reliably, and that all connections are secure.
- If you are using dry cells as a power source, please note that these must never be recharged. Only batteries marked specifically as "rechargeable" can safely be recharged.
- It is important to charge the batteries before each session, and to check the range of the radio control system. The transmitter and receiver batteries in particular must be fully charged at the start of each run.
- Ensure that the channel you intend to use is not already in use by other modellers. Never run the boat if you are not certain that your channel is free.
- Read and observe the recommendations and instructions supplied with your radio control system and accessories.
- Do not work on the power system unless the motor is disconnected from the drive battery.
- When the drive battery is connected, keep well clear of the area around the propeller, as this represents the greatest risk of accident and injury. Make sure any spectators do the same.
- Do not exceed the recommended voltage of the drive battery. Increasing the voltage may cause the motor and / or the speed controller to overheat, and the electrical leads can even melt. In the worst case this may cause the model to go up in flames and be completely ruined.
- Check that all the drive train components work smoothly and freely. This applies in particular when you are running the model, as leaves and other detritus can get caught up in the power train. If this happens and you do not remove the obstruction, the motor, speed controller or rudder servo may be ruined due to overloading.
- Ensure that the servos are not mechanically obstructed at any point in their travel.
- Dry cells and rechargeable batteries must never be short-circuited. Do not allow them to come into direct contact with water.
- Allow the drive motor and speed controller to cool down after each run. Don't touch the hot surfaces!
- Remove all batteries from the model prior to transporting and storing it.
- Do not subject the model to high levels of humidity, heat, cold, vibration or dirt.
- Secure the model, batteries and RC equipment carefully when transporting them. They may be seriously damaged if they are free to slide about.
- If you wish to operate the model on moving water (e.g. a river), remember that it could be washed away downstream if the battery fails or a malfunction occurs.
- If you have to ***salvage*** the model, take care ***not to risk your own life or that of others***.
- Check regularly that the hull is completely watertight, as the model may sink if too much water enters the hull. Check the boat for damage before every run, and ensure that water cannot penetrate the hull through the shaft or rudder openings.
- Take care to seal the model before every run, so that water cannot enter. Check that the superstructure cannot slip out of position while the boat is running. Take care also that any water which does find its way into the hull cannot make contact with the RC components. Damage caused by water will not be repaired under guarantee.
- The parallel-wired drive batteries should only be connected together for the period of the run, as interference effects may occur between the two packs under no-load conditions, and this may result in battery damage. This means: keep the batteries separate, and plug them together only when you are about to run the boat; disconnect them again at the end of each run. It is important not to store the batteries with the parallel cable connected.

Care and maintenance

- Clean the model carefully after every run, and remove any water which penetrates the hull. If water gets into any of the RC components, dry them out and send them to your nearest GRAUPNER Service Centre for checking.
- Clean the model and RC components using suitable cleaning agents only. Ask your model shop for information.
- Lubricate the propeller shafts at regular intervals.

- If the model is not to be operated for a considerable time, it is important to dismantle all the moving parts (propeller shaft etc.), and clean and re-lubricate them.

Notes on building the model

- This boat is not suitable for beginners to modelling, and for this reason the instructions do not cover every single step, as we assume that, as an experienced model builder, you will be familiar with common procedures.
- Before you start building the model it is important to study the plan and read right through the instructions, referring constantly to the parts list. In general terms the instructions and parts list reflect the sequence of assembly.
- The laser-cut wooden parts are retained in their sheets by small lugs; to avoid splitting the wood, cut into the lugs on both sides using a sharp knife before cutting right through. The connecting lugs of the ABS parts can simply be cut straight through.
- The laser-cutting process leaves a black cut-line on the wooden parts, but this can easily be sanded off.
- The wooden bulkheads are accurately pre-cut, but it is still necessary to offer them up to the hull and trim them to fit perfectly where necessary. If these parts are a tight fit they will distort the hull and spoil the smooth external contours. The trimming process is therefore important, and should be carried out with great care.
- Please take the time to compare the laser-cut parts with the drawings at the end of the building instructions, and write the part numbers on them.
- The wooden parts have to be sealed with GLATTFIX sanding sealer to prevent them absorbing water. However, the treated surfaces cannot be glued using UHU acrylit or STABILIT express, so take care to leave joint areas free of sealer. Try to avoid excess adhesive being squeezed out of joints, as many paints will not adhere properly to areas coated with dried glue. This applies in particular to the vacuum-moulded parts.
- Don't throw away the scrap wood, ABS and wire, as many small parts are made from these materials.
- If you intend to fit auxiliary working systems in the boat, it is essential to plan the installation before you start construction. There is a section at the end of the building instructions which includes hints and tips on this.
- It is very important with this model to keep the Centre of Gravity as low as possible. Whenever you are working above the waterline, this means that you should use no more adhesive than necessary, and use the lightest materials possible.
- Please bear in mind that many tools can be dangerous if misused or handled carelessly.
- Each electric motor must be suppressed by fitting a 470 nF capacitor (Order No. 3588): solder the capacitor across the motor terminals to form a bridge (as shown in a sketch on the plan).
- Deploy all electrical cables neatly, without crossing them over. Take great care to avoid any bare positive wire touching any negative wire.
- Be sure to use cable which is capable of carrying the high currents which flow when the boat is operating.
- Deploy the receiver aerial as far away as possible from any high-current cables (at least 3 cm).
- The propeller shaft system must be lubricated; be sure to use only a type of grease or oil which does not soil or contaminate water (e.g. Order No. 570).
- Before gluing parts together it is important to clean the joint surfaces carefully. This is best done by sanding lightly, followed by wiping with a non-greasy liquid detergent. The same applies to all surfaces which are to be painted, as this improves the paint's adhesion considerably. Before gluing the power system components to the hull it is essential to roughen the surfaces by rubbing with fine abrasive paper, and to remove all traces of grease with white spirit. There is little chance of obtaining durable glued joints if you ignore this advice.
- Recommended adhesives for joining particular materials:

Material - material	**Suitable adhesives**
Metal - metal	Cyano-acrylate, UHU plus
ABS - wood	Cyano-acrylate, UHU acrylit
ABS - ABS	Cyano-acrylate, UHU acrylit, UHU plast spezial
ABS - metal	Cyano-acrylate, UHU acrylit
Wood - wood	Cyano-acrylate, UHU hart, white glue
Wood - metal	Cyano-acrylate
Metal - paper	UHU alleskleber

Read the instructions supplied with the adhesives. Be sure to observe any special notes in the instructions regarding particular types of glue. If you are using acetone, white spirit or any other solvent as a cleaning agent, special safety measures are necessary. Read the instructions supplied with these materials.

Assembly instructions

1. Assemble the boatstand from the two end supports (part 1) and the connecting pieces (part 2), and trim the support surfaces so that the hull is a snug fit in the stand. **TIP**: the support surfaces for the hull can be lined with soft felt or foam rubber to avoid scratching the hull surface. This is particularly important once you have painted the hull.
2. Cut out the two halves of the bow bulge (part 3). Sand the joint areas perfectly flat, then glue the shells together. Apply plenty of UHU acrylit over the inside of the glued joint for extra strength. Glue the bow bulge to the hull (part 4). If the bulge is not quite wide enough to fit the hull, use pieces of scrap ABS material to spread the moulding. Ensure that the bow bulge is aligned correctly with the hull centreline, and take care to make the joints as neat as possible. Allow the glue to set hard, then apply two-pack filler paste (e.g. Order No. 924) to the transitional area and sand it smooth.
3. Cut out the half-shells of the rudder blade (part 5) and sand the joint areas perfectly flat. Cut the shaft supports (part 6) from scrap ABS and glue them inside one rudder shell. Cut the rudder shaft (part 7) to length, sand it over the joint area, and glue it in one rudder blade shell. Ensure that the shaft is aligned exactly straight; you may need to sand slight flats into both sides of it to allow the rudder shells to fit together. When you are satisfied, glue the second rudder shell to the first.
4. Insert the shaft bush (part 8) in the shaft support (part 9); the bush should project by about 2 mm on the underside. Fit the rudder in the bush, adjust its position carefully, then tack the bush to the support with a drop of cyano. Trim the reinforcement (part 10) so that it is a snug fit, then glue it in place permanently. The pivot bush assembly can now be glued in the hull. Use plenty of UHU acrylit to ensure that all the joints are sound, and that there is no possibility of leaks. Slip the rudder in the bush and fit the tiller (part 11) on the top end to hold it in position.
5. The next step is to assemble the power system. Open up the slots in the long sides of the motor mount (part 12), which also forms the stern tube support, and fit the two M2 screws and nuts which are used later to hold the stern tube in place. Attach the shaft coupling (part 14) to the motor (part 13), then fix the motor to the motor mount using the retaining screws (part 15). Place the stern tube (part 16) on the motor mount, and position it so that only the threaded part of the shaft is exposed at the rear end. Chamfer the motor mount in the area of the two sleeves so that it rests snugly against the hull sides. Solder the suppressor capacitor (part 17) and the power cables (part 18) to the main drive motor. The motor train assembly can now be glued in the hull using cyano; apply plenty of UHU acrylit to the inside of the area where the stern tube exits the hull, forming a watertight seal.
6. The central bulkhead framework can now be assembled. It consists of the main bulkheads (part 19), the short fairing strips (part 20), the medium fairing strip (part 21) and the long fairing strips (part 22). Please refer to the plan at this point, as it clearly shows the correct position of the fairing strips relative to the bulkheads. Note that the fairing strips should fit fully in the notches, so that they are flush with the outside of the bulkheads. Glue the joints, allow the glue to set hard, then sand back the fairing strips flush with the bulkheads. **IMPORTANT**: the completed bulkhead framework must now be trimmed to follow the internal shape of the hull exactly; it must not press against the hull. When you are satisfied, glue the assembly in the hull using cyano. Check that all the fairing strips make contact with the hull without forcing it out of shape.
7. The main bulkhead framework can now be assembled. This consists of the front bulkhead (part 23), the rear bulkhead (part 24) and the inner fairing strips (part 25). Please refer to the plan at this point, as it clearly shows the correct position of the fairing strips relative to the bulkheads. The completed bulkhead framework must now be trimmed to follow the internal shape of the hull exactly; it must not press against the hull. The fairing strips must again lie flush with the bulkheads. Glue this assembly in the hull.
8. The rear bulkhead framework can now be assembled. This consists of the servo former (part 26), the two servo mounting plates (part 27), the rear bulkhead (part 28) and the rear fairing strips (part 29). Insert the servo mounting plates in the servo former and glue the joints with cyano. Place the two bulkheads in the hull and sand them to match the curvature of the hull sides. **IMPORTANT**: ensure that the position and height of the bulkheads relative to each other is exactly as shown on the plan, otherwise the deck will not rest evenly on top of them. Tack the bulkheads in the correct position with a drop of cyano; they must not be fixed permanently at this stage. Now lay the rear fairing strips on the bulkheads; trim them carefully to fit, so that they rest in place without tension, and do not exert pressure on the hull. Lay the strips on a flat surface and then glue the bulkheads to them in the correct position. This process ensures that the support surface for the deck is perfectly straight; you may now find that you need to trim the bulkheads slightly so that they fit in the hull without pushing it out of shape. When you are satisfied, the whole assembly can be glued permanently to the hull. **IMPORTANT**: take care to avoid distorting the moulding during this procedure, and to maintain the overall width (beam) of the hull.
9. The front bulkhead framework can now be assembled. This consists of the bow bulkhead (part 30), the upper fairing strips (part 31) and the lower fairing strip (part 32). Place the bow bulkhead in the hull and sand the edges to follow the taper of the hull sides. **IMPORTANT**: ensure that the position and height of the bulkheads relative to each other is exactly as shown on the plan, otherwise the deck will not rest evenly on top of them. Tack the bulkhead in the correct position with a drop of cyano; it must not be fixed permanently at this stage. Lay the front fairing strips on the bulkheads; you may need to make minor adjustments here. In-

sert the lower fairing strip in the bulkheads, and check that everything fits together properly, and is correctly positioned. The fairing strips and the bulkhead can now be glued permanently.

10. The transverse bow and stern thrusters (part 33) can now be installed in the hull. **IMPORTANT**: they must be an easy fit, without placing stress on the hull; you may need to trim the openings in the hull sides to obtain a good fit. Be sure to suppress the transverse thrusters as described for the main drive motor; fit the power cables in the usual way.
11. Screw the rudder servo (part 34) to the servo plate. Make up the rudder linkage from the pushrod (part 35), the plastic retaining clip (part 36) and the pushrod connector (part 37). Bend one end of the wire pushrod at right-angles, fit the angled end in the hole in the tiller, and secure it with the plastic clip. Screw the pushrod connector to the servo output arm. Cut the pushrod to length: it must pass right through the pushrod connector. Set the rudder and servo to centre, and lock the screw in the connector.
12. Glue the coamings 1 to 7 (parts 39 to 45) to the main deck (part 38) using cyano; the correct position is defined by the tabs and slots.
13. Glue together the bow partitions 1 to 3 (parts 46 to 48), and glue the completed assembly to the deck.
14. Glue together the stern partitions 1 to 3 (parts 49 to 51), and glue the completed assembly to the deck. **NOTE**: gently bend the projecting ends of the coaming sections (part 40) beforehand.
15. Glue the coamings 1 to 5 (parts 53 to 57) to the forecastle deck (part 52) using cyano; the correct position is defined by the tabs and slots.
16. Glue the coamings 1 to 4 (parts 59 to 62) to the after deck (part 58) using cyano; the correct position is defined by the tabs and slots.
17. The three decks can now be trimmed to follow the shape of the hull. It is important that the decks fit properly; they should be in the correct position relative to the hull, and must also rest on the fairing strips. When you are satisfied, the decks can be glued in place permanently.
18. Cut out the hatch cover (part 63), and trim it so that it rests snugly on the forecastle deck coaming. The hatch cover should be attached using double-sided tape - after the model has been painted - so that it can be removed at any time for maintenance purposes.
19. Cut out the windshield (part 64) and the swimming pool (part 65). Glue the baseplate (part 66) in the windshield. Cut the water surface (part 67) from the clear blue plastic; the “water” must be trimmed accurately, so that it fits in the swimming pool without gaps. Once the pool has been painted, it is fixed in place using clear lacquer. The swimming pool assembly should be fixed in place on the painted model using double-sided tape, so that it can be removed at any time for maintenance purposes.
20. Cut out the three small stowage boxes (part 68) and the large stowage box (part 69) and glue them on the forecastle deck and after deck at the marked positions.
21. Cut out the breakwater (part 70) and glue it on the forecastle deck at the marked point.
22. Cut out the companionway housings (part 71) and glue them on the forecastle deck at the marked points; the entrances must face the stern.
23. Cut the scupper openings in the bulwarks, and the triangular openings under the forward edge of the after deck, as shown on the plan. Cut the handrails (part 72) to length, and glue them to the deck. **TIP**: it is not easy to attach the handrails at the bow; it is easier if you sand off one rail, starting at the edge of the hatch cover. It looks best if the transition is at an angle, as shown on the plan.
24. Make the pulley baseplates (part 73) from scrap ABS, and cut the return pulleys (part 74) from the white injection-moulded sprue. Glue the baseplates to the forecastle deck and the after deck just inside the elongated openings in the bulwark, and glue the return pulleys on them (three each side at the bow, two each side at the stern).
25. Glue the companionways (part 75) to the hull as shown on the plan; they should stand at an angle of around 60°. Note that the companionway on the main deck should be glued to the bow partition (part 48) in such a way that one segment of the railing fits between the hull and the companionway.
26. The railings (part 76) can now be glued to the hull as shown on the plan; they are fitted in individual units, or segments. The dividing points of the railing are clearly shown on the plan.
27. Glue the four doors (part 77) to the hull as shown on the plan, and glue two more to the companionway housings.
28. Glue together the bottom sections (part 78) of the control bridges in stacks of four. Attach the narrow control bridges (part 79) and the wide control bridge (part 80) in place centrally. Glue the companionways (part 75) to the angled areas. Cut railing segments (part 76) to length and fix them to the control bridges.
29. Glue together the bottom sections of the control bridge 2 (part 82) in stacks of three, then attach these assemblies to the ends of the control bridge bottom section 1. Glue the stern control bridge (part 83) centrally to the bottom section. Glue the companionways (part 75) to the side walls, and sand them back slightly so that they project like ladders. Cut segments of railing (part 76) to length and glue them to the control bridge. Glue one door (part 78) to each of the bottom sections 2. All the control bridges are eventually glued in place, but only after the model has been painted.
30. Container block 1 is assembled from parts 1 - 1 to 1 - 11 (parts 84 to 94). First glue part of the outer wall (parts 85 and 88) to the baseplate (part 84), then add the side panels (part 86). Tape the joints to prevent them springing apart. Glue the inside walls (parts 87 and 89) in place, then fit the roof panels (parts 90 and

91). When the glue has set hard, the lower walls (parts 92 to 94) can be added. **NOTE**: take care not to apply too much glue on the inside of the joints, as this would obstruct the coamings.

31. The two container blocks 2 are assembled from parts 2 - 1 to 2 - 6 (parts 95 to 100). First glue part of the outer wall (parts 96) to the baseplate (part 95), then add the side panels (part 97). Tape the joints to prevent them springing apart. Glue the inside walls (parts 98) in place, then fit the roof panels (parts 99). When the glue has set hard, the lower walls (parts 100) can be added. **NOTE**: take care not to apply too much glue on the inside of the joints, as this would obstruct the coamings.
32. Container block 3 is assembled from parts 3 - 1 to 3 - 5 (parts 101 to 105). First glue part of the outer wall (part 102) to the baseplate (part 101), then add the side panels (part 103). Tape the joints to prevent them springing apart. Fit the roof panel (parts 104). When the glue has set hard, the lower walls (parts 105) can be added. **NOTE**: take care not to apply too much glue on the inside of the joints, as this would obstruct the coamings.
33. Container block 4 is assembled from parts 4 - 1 to 4 - 3 (parts 106 to 108). First glue part of the outer wall (parts 107) to the roof plate (part 106), then add the side panels (part 108). Tape the joints together to prevent them springing apart. **NOTE**: take care not to apply too much glue on the inside of the joints, as this would obstruct the coamings.
34. The container blocks can now be clad using the corrugated vacuum-moulded sheets (part 109). Container blocks 1 and 4 should be clad with the textured sheets for the 20-foot containers, while blocks 2 and 3 are clad with those for the 40-foot containers. **TIP**: carefully sand the rounded corrugations of the textured sheets to obtain a flat outer surface; this simulates the square-section sheets of the full-size containers.
35. The profiled frame strips (part 110) can now be glued to the container blocks. Cut the strips to the required length and glue them to the underside of the blocks.
36. Cut out the container supports (part 111). They should be glued to the deck in such a way that the ends support the projecting containers. The supports should be inclined at a slight angle inwards.
37. **NOTE**: if you intend to illuminate the bridge from the inside, you should paint the inside of the walls and decks black before starting construction, otherwise the light will shine through the ABS panels.
38. The superstructure can now be assembled. Glue the wide superstructure walls (part 112), the front superstructure wall (part 113) and the rear superstructure wall (part 114) to the superstructure baseplate (part 115). Ensure that everything is at right-angles. Bend the glazed bridge panel forward slightly. **NOTE**: this must be carried out with extreme care, as the window frames can easily break. Cracked frames can be repaired with a little cyano.
39. Glue together the two companionway walls 1 and 2 (parts 116 and 117) and the companionway floors (part 118). Note that these two assemblies must form a mirror-image pair. Glue one door (part 77) to the wall at each floor level. These assemblies can now be glued in the superstructure.
40. Glue the deck baseplate (part 119) in the superstructure, resting on the companionway walls; ensure that the plate is not distorted or curved. Glue one companionway (part 75) on each deck level.
41. Glue together the back superstructure wall 1 (part 120), the deck panel (part 121) and the back superstructure wall 2 (part 122); this assembly can then be glued to the deck baseplate. Glue two doors (part 77) to each back wall.
42. Glue the side decks (part 123) to the superstructure, then glue the railings 1 - 1 to 1 - 3 (parts 124 to 126) to the side decks. Cut segments of railing (part 76) to fit in the open area, and glue railing segments to the top of the deck baseplate (part 119) in the area of the companionway.
43. Glue the railing 2 - 1 (part 128) to the bridge deck (part 127), then glue the deck to the superstructure. Glue the railings 2 - 2 and 2 - 3 (parts 129 and 130) to the bridge deck outriggers.
44. Glue the side bridge walls (part 131) and the back bridge wall (part 132) to the bridge deck. Ensure that the bridge glazing panel is bent in a straight line over its full length. Glue the three doors (part 77) to the bridge.
45. The whole superstructure should now be filled and sanded smooth, as this is much more difficult to do later.
46. Glue the braces 1 (part 133) to the bottom of the wide area of the side deck (part 123), as shown on the plan.
47. Glue the braces 2 (part 134) to the bottom of the bridge outriggers as shown on the plan.
48. Glue the twelve doors (part 77) to the superstructure as shown on the plan.
49. Glue two companionways (part 75) between the bridge deck (part 127) and the deck panel (part 121). Glue two companionways (part 75) between the deck panel (part 121) and the deck baseplate (part 119).
50. Assemble the davits (part 135), modify them as shown on the plan, and glue them to the side decks (part 123). Cut two pieces of scrap ABS sheet 6 x 4 mm in size, and glue them to the angled davit arms to form supports for the liferafts (part 136). Glue the two liferafts (part 137) to the supports.
51. Cut out the two ventilator caps (parts 138) and sand them flat. Cut the two ventilator shafts (part 139) to length from the 8 mm Ø aluminium tube supplied. Glue the tubes centrally to the caps, then fix the two ventilators to the deck baseplate (part 119) as shown on the plan.
52. Glue the railings 3 - 1 to 3 - 3 (parts 141 to 143) to the navigation deck (part 140). Place the completed navigation deck on the bridge, set it straight and tape it in place; glue two companionways (part 75) to the back bridge wall (part 132). **NOTE**: the navigation deck should be glued in place, but only after the super-

structure has been painted and the bridge glazing fixed. For the same reason do not glue the companionways to the navigation deck at this stage.

53. Glue the funnel side panels (part 145), the back panel (part 146), the front panel (part 147) and the pipe plate (part 148) to the funnel baseplate (part 144). **NOTE**: two versions of the pipe plate are supplied: the one with the 8 mm Ø hole is for the normal version, while that with the 9 mm Ø hole is for the version with smoke generator (Order No. 2324), which is an optional extra. Allow the glued joints to set hard, then sand the top face of the funnel at a slight angle. Glue the large exhaust pipe (part 149) and the two small pipes (part 150) in the pipe plate. Glue four companionways (part 75) to the funnel back panel, and two more to the top of the side panel. Sand these away slightly to simulate ventilation grilles. The funnel can be glued to the superstructure once painting is complete.
54. Cut out the bridge mast (part 151) and the transverse support (part 153), and sand them flat. Glue a piece of scrap ABS to the mast to form the back panel (part 152). Allow the glue to set hard, then cut off the projecting edges of the back panel and sand them back flush. Glue the transverse support to the mast, taking care to keep it straight. The platform (part 154) can now be glued in place. Cut railing segments (part 76) to size, and glue them to the platform. **NOTE**: for the short pieces of railing between the front and rear sections it is best to cut out a segment with a strut left in the centre. The radar antennas (part 155) can now be glued to the antenna bases (part 156); the antenna assemblies can then be fixed to the roof plate, setting them at different heights. Glue a door (part 77) to the bottom of the back wall. Drill 1.5 mm Ø holes in the sides of the mast, as shown on the plan. Glue a lamp (part 158) to one end of each lamp support (part 157), and glue the completed lamp assemblies in the holes in the mast. Drill a 0.8 mm Ø hole in the rear of the transverse support to take the flag mast (part 159) and glue the mast in place. The completed mast should be glued to the navigation deck, but only after painting is complete.
55. Cut out the bow mast (part 160) and sand it flat. Cut a piece of scrap ABS sheet to form the back panel (part 161), as for the bridge mast, and glue the parts together. Now use a fine saw (e.g. a junior hacksaw blade) to cut a straight transverse slot in the mast to accept the lower platform (part 162), and glue the platform in the slot. Glue the upper platform (part 163) at the top of the mast, taking care to align it correctly. Attach two doors (part 77) to the mast: one at the top and the other at the centre platform. Cut railing segments (part 76) to fit, and glue them to both platforms. Glue three lamps (part 165) to the lamp support (part 164). Drill a 1.5 mm Ø hole in the upper platform on the bow mast, and glue the lamp assembly in it. The mast is eventually glued to the forecastle deck, but only after painting is complete.
56. Cut out the lifeboats (part 166) and the boat covers (part 167), and glue the two parts together. Note that the boats must fit inside the covers; sand back the outside edges of the boats slightly if necessary. Rudder blades can also be made from scrap ABS and glued to the lifeboats if you wish. Fix the boats to the davits when painting is complete.
57. Assemble the right and left anchor winches (parts 168 and 169) and glue the joints. Assemble four right-hand deck winches (part 170) and two left-hand deck winches (part 171); these are glued to the decks in the positions shown on the plan, but only after painting is complete. Cut two pieces of anchor chain (part 172) about 10 cm long, and glue them on the deck in the positions shown. They look best if painted or chemically browned beforehand.
58. Glue the 18 double bollards (part 173) to the decks as shown on the plan.
59. Cut five pulleys from the anchor winches to form the cable return pulleys (part 174), and glue them to the decks at the marked points.
60. Glue three lamps (part 176) to the stern lamp mast (part 175), drill a 1.5 mm Ø hole in the after deck and glue the lamp mast in it.
61. Cut the two position lamp plates (part 177) from scrap ABS, and glue the position lamps (part 178) to them. After painting, these should be glued to the bridge outriggers.
62. Cut the flag mast (part 179) from the 0.8 mm Ø brass rod supplied, drill a matching hole in the deck baseplate (part 119) and glue the mast in it. **TIP**: make the flag from paper and colour it using felt-tip pens. The relatively weak colours represent the typical bleached and washed-out colours of ship flags very effectively. The colours of the Bahamian flag are as follows: black triangle, blue outer stripes, yellow inner stripes. Glue the flag in place, then curve it carefully into the typical wavy pattern of a wind-blown flag before applying a coat of clear lacquer to protect it.
63. The navigation compass (part 180) is simulated by a short piece of 1.5 mm Ø ABS rod glued in a 2 mm Ø aluminium tube. Sand it to a rounded shape as shown, cut the tube to length and glue it to the navigation deck.
64. Cut the two winch bases (part 181) from scrap ABS. Cut two pulleys from the injection-moulded sprue to form the lifebelt winches (part 182), and glue them on the bases. The completed winches should be glued adjacent to the lifeboats.
65. Paint the lifebelts (part 183), and glue them to the inside of the railing and the bulwarks in suitable positions. They should be located at points where a crew member could throw a lifebelt overboard without difficulty.
66. Drill a hole in the underside of each anchor hawse to accept the anchors (part 184), and trim the holes carefully so that the anchor shafts are a snug fit in them. Glue the anchors in place using cyano, taking care to seal the holes completely.

67. Screw the propeller (part 185) to the shaft. Alternatively you could install the 5-bladed screw (Order No. 2298.40); however, this propeller provides greatly increased thrust, and in this case you should operate the motor on no more than 6 or 7.2 Volts.
68. Cut the glazing panels (part 186) from the translucent grey plastic as shown on the plan, and glue them in the superstructure using UHU Alleskleber. **TIP**: a good method of positioning the glazing panels accurately is to apply a patch of double-sided tape to your fingertip, and then stick the glazing panel to the tape; this allows you to get the panel into a tight corner without any problem. At this stage the navigation deck can be glued to the glazed bridge, and both masts can be fitted.
69. If you wish, you can now make additional detail fittings from the remaining scrap material, and fit them to the model; for example, companionway railings can be simulated using spare 0.8 mm Ø brass wire. However, this is very delicate work, and is only likely to be successful if you are an experienced model builder.
70. With all the RC system components installed, place the boat in water (e.g. the bathtub), and check the level at which it floats. You will probably need to fit additional lead ballast to persuade the model to float at the marked waterline. Good ballast weights are Order No. 536 or metal profiles such as Order No. 717.14 (220 g/m) or 519.80 (400 g/m); these can easily be cut down to the required size. You should also carry out a capsize test while the boat is in the water: tilt the completed model at an angle of heel of around 30°, then release it. From this attitude it should right itself easily, without rocking for too long.

Painting

- We recommend that you ask your local model shop (or specialist paint supplier) for advice on the best types of paint to use.
- Use ONLY paints of the same type, made by the same manufacturer, otherwise they may react with each other; dissolving the earlier coats or producing unsightly bubbles. Be particularly careful when combining spray cans and brushing paints; if in any doubt, always establish whether the paints are compatible beforehand by carrying out a check on some scrap material.
- To ensure that the paint adheres well, it is essential to sand the surfaces with fine wet-and-dry paper (600-grit or 800-grit), then de-grease them using a non-greasy cleaning agent or white spirit. Try not to touch the cleaned surfaces again before painting, as your skin will just apply new grease to the surface.
- It makes sense to paint the small parts separately, and only then to glue them to the model. Wherever possible, the larger parts should also be painted before continuing with the next stage, as this can save you hours of work with masking tape later on.
- The bridge superstructure must be sprayed before the glazing panels are fitted; the panels can then be glued in place when the paint is dry.
- Do bear in mind that parts glued to painted surfaces can only adhere as well as the paint sticks to the model, i.e. such parts are often knocked off, tearing the paint from the model at the same time. Parts which are exposed and vulnerable should be glued directly to the sub-surface, i.e. the paint should be scratched off beforehand.
- Apply several coats of sanding sealer (e.g. GLATTFIX, Order No. 207) or clear lacquer (e.g. HYDRO-AEROFIX, Order No. 926.1) to all the wooden parts to prevent them absorbing water.
- When spraying paint, take care to mask off all areas which are not to be coloured. Seal all openings, as the fine mist of paint finds its way into any opening, no matter how small.
- Read and observe the instructions supplied by the paint manufacturer.
- **IMPORTANT**: please take the time to consider how and in what sequence you ought to paint the model - and do this before starting construction. There are areas on the model which can only be painted with great difficulty, or even not at all, at a later stage.

Colour scheme

The recommended colours are stated below with their RAL numbers, to help ensure that you can select the correct hues. Armed with this information, any paint supplier will be able to produce the right colours for you. Let your specialist paint supplier or advisor know what you intend to use the paints for, as this will help him select the correct type. We always recommend synthetic enamels. The RAL colours listed below are our recommendation, but you can, of course, finish the boat in any colour scheme you like. Container ships generally differ only in the colour of the exposed hull and the funnel scheme. The submerged hull is always the same colour, and the decks are usually grey, dark green or dark red. For the deck and submerged hull the paint should have a dead matt finish, while semi-matt (silk) paints are ideal for the other colours.

Exposed hull:	RAL 5012, light blue
Submerged hull:	RAL 3009, red oxide
Deck:	RAL 7030, stone grey
Superstructure, masts, control bridges, small items, funnel ring:	RAL 9010, pure white
Funnel, mast peaks, bollards:	RAL 9005, solid black
Winches:	RAL 7005, mouse grey
Pool:	RAL 6027, light green
Lifeboats:	RAL 1018, zinc yellow
Lifebelts:	RAL 3026, fluorescent red
Containers:	RAL 9006, white aluminium, or other colours at the builder's discretion (they are usually grey, red, green, blue or white)

Applying the decals

Cut out the individual decals neatly using a pair of sharp scissors, leaving as little margin round them as possible. They should be applied to the model's surface once painting is complete; all traces of dust must be removed beforehand. The decals can be persuaded to take up the corrugated pattern of the containers by temporarily fixing one end and then pressing it into place furrow by furrow using a scrap piece of ABS (the rubbing surface must be rounded). This procedure does require care and a delicate hand.

Instructions for installing the RC components

The actual RC plan is an integral part of the main drawing, and describes the installation of the RC components for the basic running functions, as well as the accessories for the SYDNEY STAR's auxiliary working systems. The parts required for the running functions are included in the kit, as are other small items, some of which need to be cut out and prepared before fitting. The remaining parts can either be purchased separately or made from scrap material. Details of installing the RC components and making the other parts are not supplied in full, since we assume that the procedures will be familiar to the experienced modeller for whom the boat is intended.

- The RC plan should only be considered as a starting point for the selection and location of the RC components. At the builder's discretion, different components can be used to control the basic running functions and the auxiliary working systems.
- The rudder servo should be mounted using the retaining screws supplied with it.
- The other RC components, including the receiver, speed controller and batteries, should be secured in the model using Velcro (hook-and-loop) tape. Secure retention is particularly important in the case of the heavy drive batteries, as the model could capsize if the batteries were to move and alter its Centre of Gravity.
- It is important to make every effort not to exceed the all-up weight of 6 kg, and the model's Centre of Gravity should always be as low as possible. This means that no heavy components should be installed above the waterline unless there is absolutely no other alternative.
- If you intend to install a working lighting system, it is important to plan the arrangement before you start building the model, as these systems are extremely difficult, if not impossible, to install at a later stage.
- To control the lighting system we recommend the use of RC switches (e.g. Order No. 3294) or servo-operated micro-switches (e.g. Order No. 3757).

Possible auxiliary working systems

Auxiliary function	Extra items required	Installation and operation
Sound module	Tug sound module (Order No. 2465), loudspeaker (Order No. 2355), 12 V power supply from the main drive battery.	The loudspeaker must be arranged in such a way that the outside of the cone has no direct air-connection to the inside of the cone (acoustic short-circuit), i.e. it should be fitted in a similar way to a loudspeaker cabinet. We recommend that you install the loudspeaker below the deck in the bow area. Use double-sided adhesive tape to fix the vacuum-moulded loudspeaker box to the underside of the main deck in the area of the first container block.
Interior lighting for the bridge superstructure	Interior lighting set (Order No. 351 or Order No. 635), 2 V power supply from a lead-acid battery (e.g. Order No. 793).	Make supports from scrap ABS material for the interior lighting, and attach the lamps to these using double-sided adhesive tape. **IMPORTANT**: if you wish to illuminate the bridge superstructure, it is essential to paint the inside of the entire superstructure black, otherwise the light will shine through the ABS panels.

Funnel smoke	Smoke generator (Order No. 2324), 6 V power supply from the main drive battery.	Glue the smoke generator in the 9 mm Ø hole in the alternative funnel pipe plate, and connect it to an On / Off switch.

Optional accessories for the auxiliary working systems
The parts listed in the table are not included in the kit and have to be acquired separately. Other necessary accessories such as connectors, cable etc., are not listed separately here; experienced model builders will have their own stocks of such materials.

Maiden run

Give the batteries a full charge, and check that the model's working systems operate correctly, and that adequate effective radio range is available. Trim the model by adjusting the position of the drive batteries until the boat floats exactly level in the water. Now you can start the motors and head out on the maiden run. Take your time to get used to the model's running characteristics and handling; run it slowly and cautiously at first until you feel familiar and confident with your new boat.
All of us hope you have many hours of pleasure building and running your SYDNEY STAR.

Parts List

No.	Description	No. off	Material	Size and thickness in mm
1	End support, boatstand	2	Plywood	4 mm, laser-cut
2	Connecting piece, boatstand	2	Plywood	4 mm, laser-cut
3	Bow bulge shell	2	ABS	Vac. moulded
4	Hull	1	ABS	Vac. moulded
5	Rudder blade shell	2	ABS	Vac. moulded
6	Support piece	2	ABS	Approx. 30 x 10 mm, make from scrap
7	Rudder shaft	1	Brass	Round section, 3 Ø x 80 mm
8	Shaft bush	1	Brass	Tube, 4 / 3 Ø x 32 mm
9	Shaft support	1	ABS	Laser-cut
10	Reinforcement	1	Beech plywood	Laser-cut
11	Tiller	1	Plastic	Ready made
12	Motor mount	1	Plastic	Ready made
13	Motor	1	Accessory	Order No. 1788
14	Shaft coupling	1	Aluminium	Ready made
15	Retaining screw	2	Metal	M3 x 8 mm
16	Stern tube	1	Metal	Ready made
17	Suppressor capacitor	1	Accessory	Order No. 3588
18	Motor power cable	2	Accessory	Order No. 3389
19	Main bulkhead	3	Beech plywood	Laser-cut
20	Short fairing strip	4	Spruce	4 x 12 x 340 mm
21	Medium fairing strip	2	Spruce	4 x 12 x 430 mm
22	Long fairing strip	1	Spruce	4 x 12 x 500 mm
23	Front bulkhead	1	Beech plywood	Laser-cut
24	Rear bulkhead	1	Beech plywood	Laser-cut
25	Inner fairing strip	2	Spruce	4 x 12 x 640 mm
26	Servo former	1	Beech plywood	Laser-cut
27	Servo mounting plate	2	Beech plywood	Laser-cut
28	Stern bulkhead	1	Beech plywood	Laser-cut
29	Rear fairing strip	2	Spruce	4 x 12 x 270 mm
30	Bow bulkhead	1	Beech plywood	Laser-cut
31	Front fairing strip	2	Spruce	4 x 12 x 220 mm
32	Bottom fairing strip	1	Spruce	4 x 12 x 150 mm
33	Transverse thruster, bow / stern	2	Accessory	Order No. 1785

34	Rudder servo	1	Accessory	In RC set, or Order No. 4101
35	Rudder pushrod	1	Steel rod	1.5 Ø x approx. 100 mm
36	Retaining clip	1	Plastic	Ready made
37	Pushrod connector	1	Metal	Ready made
38	Main deck	1	ABS	Laser-cut
39	Coaming 1 (main deck)	7	ABS	Laser-cut
40	Coaming 2 (main deck)	1	ABS	Laser-cut
41	Coaming 3 (main deck)	2	ABS	Laser-cut
42	Coaming 4 (main deck)	2	ABS	Laser-cut
43	Coaming 5 (main deck)	2	ABS	Laser-cut
44	Coaming 6 (main deck)	4	ABS	Laser-cut
45	Coaming 7 (main deck)	2	ABS	Laser-cut
46	Bow partition 1	1	ABS	Laser-cut
47	Bow partition 2	1	ABS	Laser-cut
48	Bow partition 3	1	ABS	Laser-cut
49	Stern partition 1	1	ABS	Laser-cut
50	Stern partition 2	2	ABS	Laser-cut
51	Stern partition 3	1	ABS	Laser-cut
52	Forecastle deck	1	ABS	Laser-cut
53	Coaming 1 (forecastle deck)	1	ABS	Laser-cut
54	Coaming 2 (forecastle deck)	1	ABS	Laser-cut
55	Coaming 3 (forecastle deck)	1	ABS	Laser-cut
56	Coaming 4 (forecastle deck)	1	ABS	Laser-cut
57	Coaming 5 (forecastle deck)	1	ABS	Laser-cut
58	After deck	1	ABS	Laser-cut
59	Coaming 1 (after deck)	1	ABS	Laser-cut
60	Coaming 2 (after deck)	1	ABS	Laser-cut
61	Coaming 3 (after deck)	1	ABS	Laser-cut
62	Coaming 4 (after deck)	1	ABS	Laser-cut
63	Hatch cover	1	ABS	Vac. moulded
64	Windshield	1	ABS	Vac. moulded
65	Swimming pool	1	ABS	Vac. moulded
66	Base plate	1	ABS	Laser-cut
67	Dummy water surface	1	Plastic	Vac. moulded
68	Small stowage box	3	ABS	Vac. moulded
69	Large stowage box	1	ABS	Vac. moulded
70	Breakwater	1	ABS	Vac. moulded
71	Companionway housing	2	ABS	Vac. moulded
72	Handrail	8	ABS	Angle section, 1.5 x 1.5 mm, actual lengths vary
73	Return pulley baseplate	4	ABS	4 x 13 mm, make from scrap
74	Return pulley	10	Plastic	3 Ø x 4 mm, inj. moulded
75	Companionway	18	Plastic	3.5 x 60 mm, actual lengths vary
76	Railing	24	Plastic	4 x 150 mm, actual lengths vary
77	Door	40	ABS	Laser-cut
78	Control bridge, bottom	12	ABS	Laser-cut
79	Control bridge, narrow	2	ABS	Laser-cut
80	Control bridge, wide	1	ABS	Laser-cut
81	Control bridge, bottom 1	1	ABS	Laser-cut
82	Control bridge, bottom 2	6	ABS	Laser-cut
83	Stern control bridge	1	ABS	Laser-cut
84	Container block 1 – 1	1	ABS	Laser-cut
85	Container block 1 – 2	1	ABS	Laser-cut
86	Container block 1 – 3	4	ABS	Laser-cut
87	Container block 1 – 4	1	ABS	Laser-cut
88	Container block 1 – 5	1	ABS	Laser-cut
89	Container block 1 – 6	1	ABS	Laser-cut
90	Container block 1 – 7	1	ABS	Laser-cut
91	Container block 1 – 8	1	ABS	Laser-cut
92	Container block 1 – 9	2	ABS	Laser-cut

93	Container block 1 – 10	2	ABS	Laser-cut
94	Container block 1 – 11	2	ABS	Laser-cut
95	Container block 2 – 1	2	ABS	Laser-cut
96	Container block 2 – 2	4	ABS	Laser-cut
97	Container block 2 – 3	8	ABS	Laser-cut
98	Container block 2 – 4	4	ABS	Laser-cut
99	Container block 2 – 5	4	ABS	Laser-cut
100	Container block 2 – 6	4	ABS	Laser-cut
101	Container block 3 – 1	1	ABS	Laser-cut
102	Container block 3 – 2	2	ABS	Laser-cut
103	Container block 3 – 3	4	ABS	Laser-cut
104	Container block 3 – 4	1	ABS	Laser-cut
105	Container block 3 – 5	2	ABS	Laser-cut
106	Container block 4 – 1	1	ABS	Laser-cut
107	Container block 4 – 2	2	ABS	Laser-cut
108	Container block 4 – 3	2	ABS	Laser-cut
109	Corrugated sheet, container	8	ABS	Vac. moulded
110	Profiled frame strip	6	ABS	Laser-cut, actual lengths vary
111	Container support	14	ABS	Vac. moulded
112	Superstructure side wall	2	ABS	Laser-cut
113	Superstructure front wall	1	ABS	Laser-cut
114	Superstructure rear wall	1	ABS	Laser-cut
115	Superstructure baseplate	1	ABS	Laser-cut
116	Companionway wall 1	2	ABS	Laser-cut
117	Companionway wall 2	2	ABS	Laser-cut
118	Companionway floor	4	ABS	Laser-cut
119	Deck baseplate	1	ABS	Laser-cut
120	Superstructure back wall 1	1	ABS	Laser-cut
121	Deck panel	1	ABS	Laser-cut
122	Superstructure back wall 2	1	ABS	Laser-cut
123	Side deck	2	ABS	Laser-cut
124	Railing 1– 1	2	ABS	Laser-cut
125	Railing 1– 2	2	ABS	Laser-cut
126	Railing 1 – 3	2	ABS	Laser-cut
127	Bridge deck	1	ABS	Laser-cut
128	Railing 2 – 1	1	ABS	Laser-cut
129	Railing 2 – 2	2	ABS	Laser-cut
130	Railing 2 – 3	2	ABS	Laser-cut
131	Bridge side wall	2	ABS	Laser-cut
132	Bridge side wall	1	ABS	Laser-cut
133	Brace 1	6	ABS	Laser-cut
134	Brace 2	4	ABS	Laser-cut
135	Davit	4	Plastic	Ready made
136	Liferaft support	2	ABS	6 x 4 mm, make from scrap
137	Liferaft	4	Plastic	3 Ø x 4 mm, inj. moulded
138	Ventilator cap	2	ABS	Vac. moulded
139	Ventilator shaft	2	Aluminium	Tube, 8 / 7 Ø x 10 mm
140	Navigation deck	1	ABS	Laser-cut
141	Railing 3 – 1	1	ABS	Laser-cut
142	Railing 3 – 2	2	ABS	Laser-cut
143	Railing 3 – 3	2	ABS	Laser-cut
144	Funnel baseplate	1	ABS	Laser-cut
145	Funnel side panel	2	ABS	Laser-cut
146	Funnel back panel	1	ABS	Laser-cut
147	Funnel front panel	1	ABS	Laser-cut
148	Funnel pipe plate	2	ABS	Laser-cut
149	Exhaust pipe, large	1	Aluminium	Tube, 8 / 7 Ø x 20 mm
150	Exhaust pipe, small	2	Aluminium	Tube, 3 / 2 Ø x 20 mm
151	Bridge mast	1	ABS	Vac. moulded
152	Back panel	1	ABS	Make from scrap

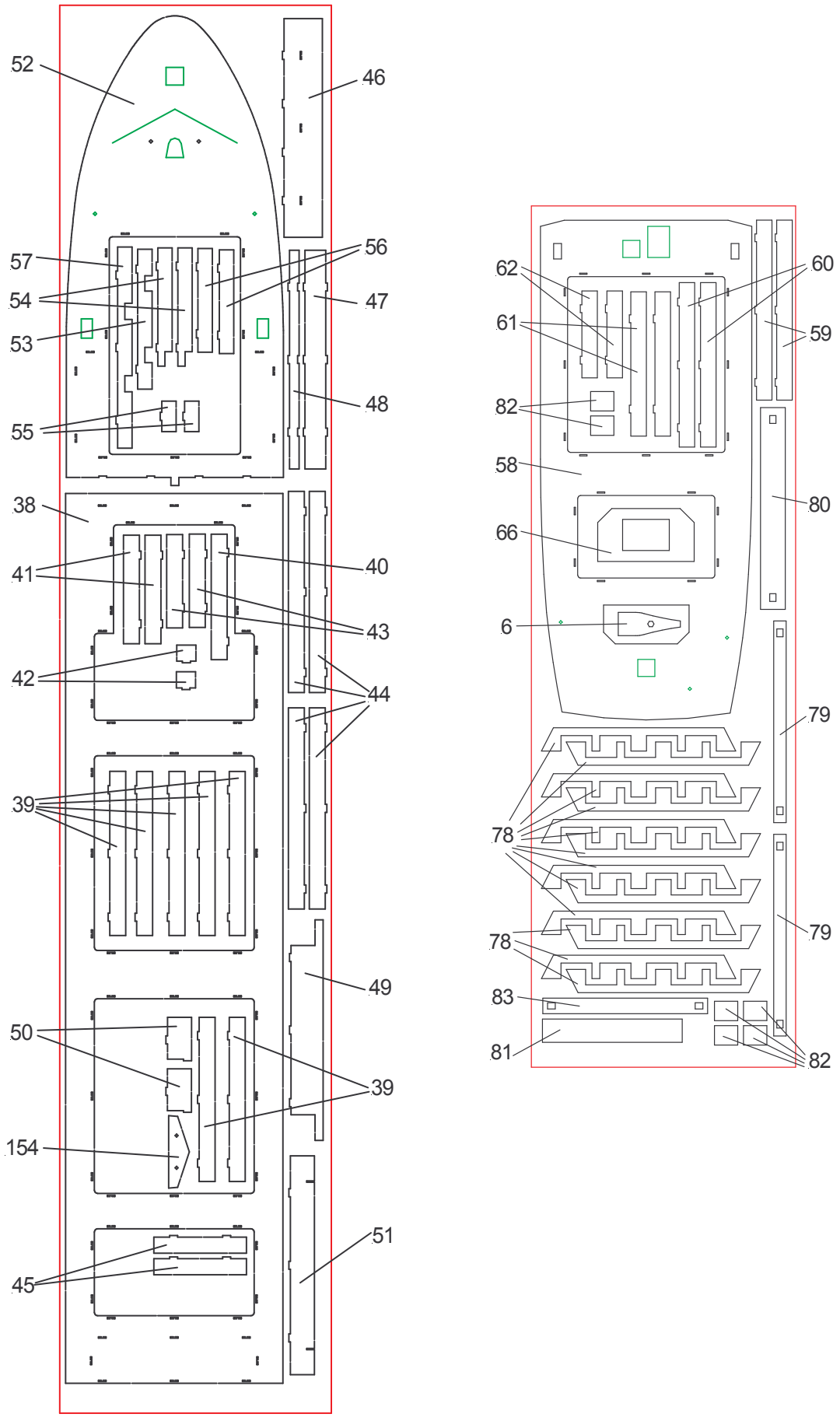
153	Transverse support	1	ABS	Vac. moulded
154	Platform	1	ABS	Laser-cut
155	Radar antenna	2	Plastic	On injection-moulded sprue
156	Radar antenna base	2	Aluminium	Tube, 2 / 1.6 Ø x 12 mm
157	Lamp support	4	ABS	Round rod, 1.5 Ø x 20 mm
158	Lamp	4	ABS	Round rod, 1.5 Ø x 2 mm
159	Flag mast	1	Brass	Wire, 0.8 Ø x 20 mm
160	Bow mast	1	ABS	Vac. moulded
161	Back panel	1	ABS	Make from scrap
162	Bow mast platform	1	ABS	Laser-cut
163	Top platform	1	ABS	Laser-cut
164	Lamp support	1	ABS	Round rod, 1.5 Ø x 30 mm
165	Lamp	3	ABS	Round rod, 1.5 Ø x 2 mm
166	Lifeboat	2	ABS	Vac. moulded
167	Lifeboat cover	2	ABS	Vac. moulded
168	Anchor winch, right	1	Plastic	inj. moulded
169	Anchor winch, left	1	Plastic	inj. moulded
170	Deck winch, right	4	Plastic	inj. moulded
171	Deck winch, left	2	Plastic	inj. moulded
172	Anchor chain	2	Brass	Ready made
173	Double bollard	18	Plastic	Ready made
174	Cable return pulley	5	Plastic	Ready made
175	Stern lamp mast	1	ABS	Round rod, 1.5 Ø x 30 mm
176	Lamp	3	ABS	Round rod, 1.5 Ø x 2 mm
177	Position lamp plate	2	ABS	3 x 6 mm, make from scrap
178	Position lamp	2	ABS	Round rod, 1.5 Ø x 3 mm
179	Flag mast	1	Brass	Wire, 0,8 Ø x 30 mm
180	Navigation compass	1	Aluminium	Tube, 2 / 1.6 Ø x 10 mm
181	Winch base	2	ABS	3 x 6 mm, make from scrap
182	Lifeboat winch	2	Plastic	3 Ø x 4 mm, inj. moulded
183	Lifebelt	42	ABS	Laser-cut
184	Anchor	2	Plastic	Ready made
185	Propeller	1	Plastic	Ready made
186	Glazing	15	Plastic	Cut as plan

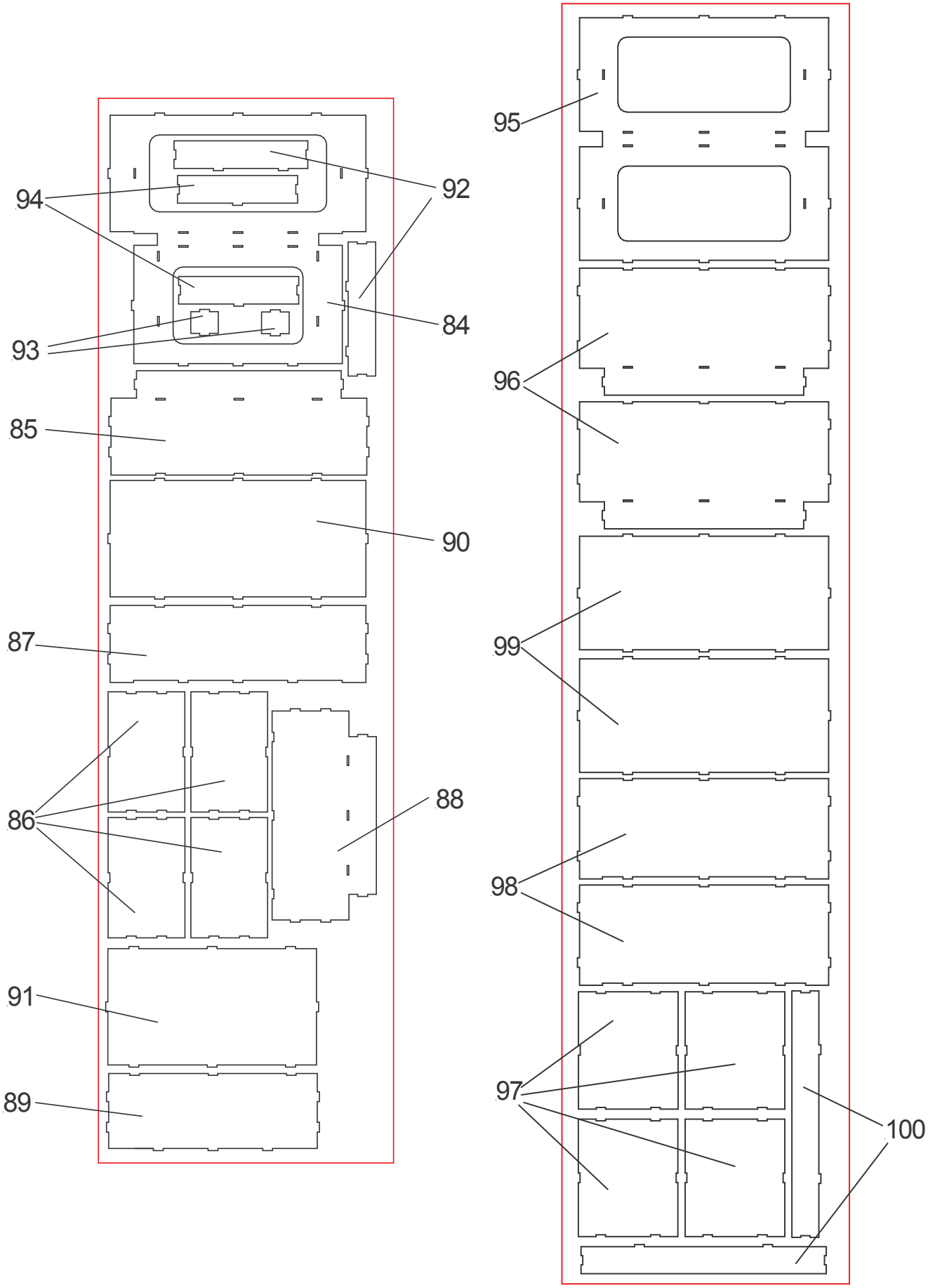
The Parts List also shows certain components which are not included in the kit; these have to be purchased separately.
Cut as plan: take the dimensions from the plan

The following items are also required (not included in the kit)
1 x SPEED 500 E electric motor, Order No. 1788
2 x Bow thrusters, Order No. 1785
3 x Suppressor capacitors, Order No. 3588 (pack of 2)
1 x NAVY V 40R speed controller, Order No. 2875
2 x MICRO SPEED 10 speed controllers, Order No. 2736
2 x Graupner 6 V / 10 Ah lead-acid drive batteries, Order No. 768
1 x G2 parallel cable, Order No. 3061
1 x Stranded copper cable, 2 m, Order No. 3389
1 x G2 connector system, Order No. 2989
Other essential accessories, including switch harness, servo extension lead, connectors etc., are not listed here separately, and have to be selected and acquired by the builder.

Radio control system
1 x mx-12 radio control system, Order No. 4723
or
1 x mc-12 radio control system, Order No. 4725
Other Graupner / JR 40 MHz FM computer radio control systems can also be used.

Pos.-Nr. der Laserteile/Part Numbers of the laser-cut components/Numéros des pièces découpées au Laser

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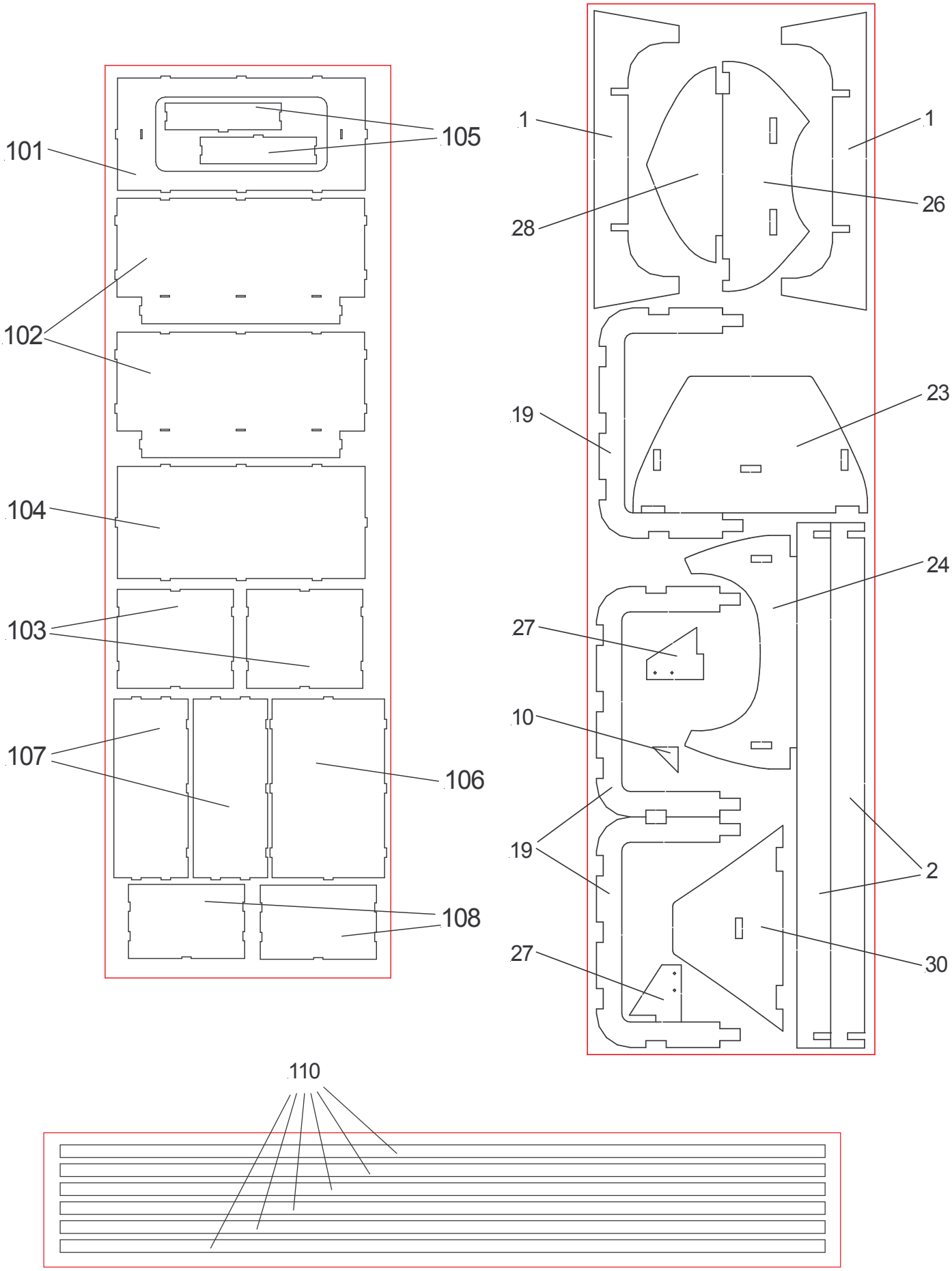
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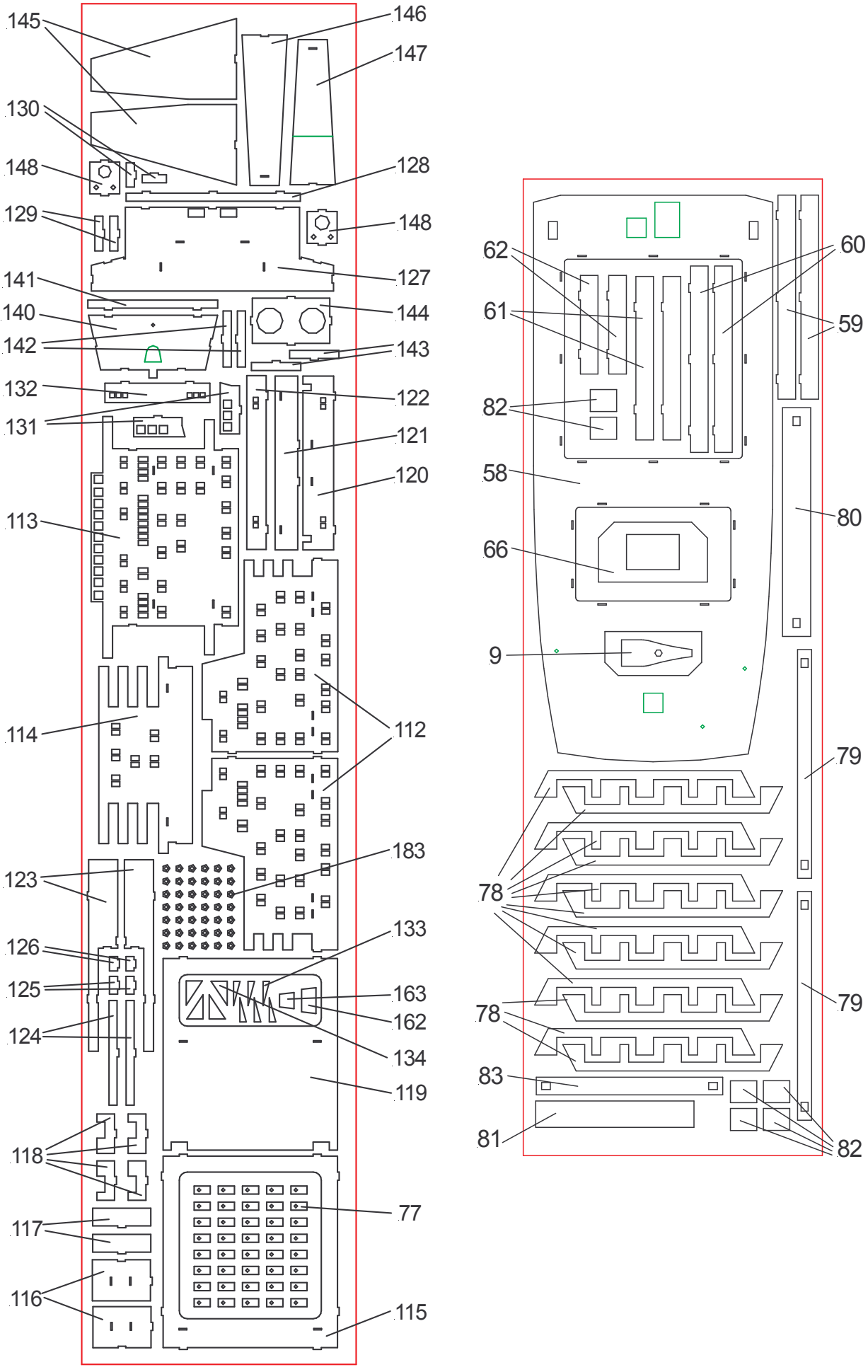
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