Graupner

Building instructions for the “RANZOW” model boat, Order No. 2023

The full-size vessel
The “Ranzow” is a multi-purpose ship designed for operations in shallow, confined waters. It can cope with many tasks including transport of personnel, equipment and materials, the maintenance of navigation buoys, ice-breaking missions and other tasks.
The vessel is fitted with a remotely controlled hydraulic crane for work on deck.
The mast can be folded down, and the searchlight on the bridge swung forward and down, to enable the ship to pass under low bridges. Powerful rudders and a bow thruster provide excellent manoeuvring capability, while extra electronic equipment allows the crew to operate and monitor all systems from two control towers.

The model
Our model of the RANZOW has been developed from documents supplied by the Fassmer dockyard, and is drawn up to a scale of 1 : 32. The boat is powered by two SPEED 500 motors, and is steered using two Becker rudders and one bow thruster - just as on the full-size vessel.
The deck-mounted crane is included in the kit, and can be made to work in scale fashion. Additional working systems can be installed at the builder’s discretion, including the derrick for lowering the ship’s boat, a radio control system in the ship’s boat itself, and systems for folding the mast and lowering the searchlight.
Most of the parts which are difficult to make, including the hull, deck, bulwark, superstructure and bridge, are supplied in pre-fabricated form, while the many injection-moulded parts in the kit shorten the building time considerably. However, the model is not intended for the beginner, and technical modelling experience and manual skill are required to assemble it and apply a realistic scale colour finish.

Specification	Model	Full-size
Overall length approx.	1000 mm	32 m
Overall beam approx.	270 mm	8.90 m
Draught approx.	55 mm	1.75 m
Dry weight approx.	2.0 kg	–
Total displacement max. approx.	7.4 kg	250 t
Scale approx.	1 : 32	–

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.
- You must ***NEVER*** operate this boat when there are persons or animals in the water, otherwise there is a serious risk of causing injury.
- Check whether there are any persons on the bank. If you make a mistake controlling your model, or if a fault occurs, the boat could strike the bank, slide up onto the ground and cause injury. Please make sure any onlookers are aware of the danger, and ask them to leave the hazard zone.
- 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 vessel in salt water.
- 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 supply, 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 propellers, 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 may even melt. In the worst case this could 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 motors, 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 motors 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.
- The lead-acid battery which is the boat’s main energy source must not be stored in the discharged state. Always charge it up before storing it, and recharge it at regular intervals if it is not to be used for a protracted period.
- 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. Before running the boat, seal the hatch cover completely by applying tape all round.

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

- Before you start building the boat, please take the time to study the plan and read right through the instructions, referring to the Parts List constantly. In general terms the instructions and parts list reflect the sequence of assembly.
- Plan the installation of the RC components and the accessories for the auxiliary working systems before you start building the model, as it will be more difficult or even impossible to install certain parts when the model is complete.
- Please bear in mind that many tools can be dangerous if misused or handled carelessly.
- The vacuum-moulded parts are best cut out using scissors (our Lexan shears, Order No. 26, are excellent for this). In many areas a sharp knife (e.g. Order No. 982) also works; simply cut along the marked lines. It is always best to leave a little excess material, so that you can sand the parts back to final size. Run a soft pencil along the marked lines to make them easier to see.
- It is important to compare all the wooden parts with the drawings on the plan before gluing them in place. This is necessary because some parts have to be prepared in some way beforehand, such as chamfering particular edges.
- The die-cut wooden parts can be separated from their sheets using a sharp balsa knife. If the cutter has not penetrated right through the wood, use a fretsaw to cut along the stamped line. Sand all cut edges to remove any rough areas.
- The surfaces shown hatched-in are joint areas, i.e. other parts are glued at this point.
- Before installing any wooden part, sand the surfaces smooth overall and apply several coats of GLATTFIX sanding sealer (Order No. 207) to prevent the material absorbing water.
- The electric motors must be suppressed by fitting a 470 nF capacitor (Order No. 3588): solder the capacitor across the motor terminals to form a bridge. Fit two additional 47 nF capacitors (Order No. 3584) between the terminals and the motor case (see the wiring diagram 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 shaft systems must be lubricated; be sure to use 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 or methylated spirit (“meths”). The same applies to all surfaces which are to be painted, as this improves the paint’s adhesion considerably. Before gluing any part to the hull it is essential to roughen the surface carefully using fine abrasive paper, and de-grease it thoroughly using a solvent such as acetone. If you neglect this, you cannot expect the glued joints to “hold” in the long-term.
- The part numbers of the laser-cut components are listed at the end of the building instructions. The instructions themselves state the letters E, F, G, which indicate the ABS sheets containing particular laser-cut parts.

- Recommended adhesives for joining particular materials:

Material - material	Suitable adhesives
Wood - wood	UHU hart, white glue
Wood - metal	Stabilit express, UHU plus
Metal - metal	Cyano-acrylate, UHU plus
ABS - ABS	Cyano-acrylate, Stabilit express, UHU plast
ABS - GRP	Cyano-acrylate
ABS - metal	Cyano-acrylate, Stabilit express
GRP - wood	Cyano-acrylate, UHU plus
GRP - metal	Cyano-acrylate, UHU plus
Rubber - metal	Cyano-acrylate

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

Assembly instructions

1. The hull (part 1) should first be prepared as follows:
   a) Drill 6 mm Ø holes in the shaft fairings for the stern shaft tubes (part 24).
   b) Drill 8 mm Ø and 3 mm Ø holes at the marked points for the Becker rudders.
   c) Cut slots about 14 x 2 mm in size at the marked points for the stern tube braces (part 25).
   d) Drill 6 mm Ø holes for the anchor hawse tubes (part 31).
2. Make the boatstand by connecting the front support (part 2) to the rear support (part 3) using two connecting pieces (part 4); glue the joints soundly. You may wish to paint the finished stand.
3. The next step is to assemble the transverse bulkheads (parts 5, 6, 7 and 8) and the fore-and-aft bulkheads (part 9), and glue them together on a flat surface using “cyano” (cyano-acrylate adhesive) or Ponal express. The bow former (part 10), the stern former (part 11) and the support (part 12) are fitted next, along with the two hull side rails (part 13) and the rudder brace (part 16).
4. Working from the underside, fit the stern tube braces (part 25), the Becker rudders (part 22), the tillers (part 23) and the stern tubes and shafts (part 24). **Note that these parts should not be glued to the hull** until the assembled framework has been installed, the four-part motor bracket (part 28), the mounting plate (part 29) and the couplings have been temporarily connected to the propeller shafts and the motor shafts, and you are confident that everything fits accurately, i.e. not before the motors, couplings and shafts are aligned correctly. Install the reducer sleeves (part 27) between the propeller shafts and the couplings.
5. The motor bracket (part 28) is attached to the mounting plate (part 29) using two M4 x 15 plastic screws and two M4 nuts, so that the motors can easily be installed and removed again. Glue the mounting plate permanently to the hull using Stabilit express, after fitting the screws from the underside. Open up the holes on the underside to accept the countersunk screws. In this way the motor mount can easily be removed from the model when the motors need to be serviced or replaced.
6. Place the bow thruster unit in the hull, and fit the extension tubes on both sides. Glue the parts together and to the hull, taking care to make the joints watertight. Allow the glue to set hard, then cut off the excess tube length and sand the ends back flush with the hull. Solder the suppressor capacitor to the bow thruster motor, and complete the wiring as shown in the wiring diagram.
7. Glue the bulkheads, the bow former, the stern former and the hull side rails to the hull using cyano or Stabilit express, then sand off any excess material from the hull edge so that the foredeck (part 31) and the main deck (part 32) can be glued in place.
   Please note that you must leave 1 mm clearance at the bow and stern for the bow bulwark (part 37) and the stern bulwark (part 40), otherwise these parts will not fit properly.
8. **Before the decks are glued in place,** install the RC plate (part 14) and console (part 15), the rudder servo and servo mount (part 18), the connecting rod (part 19) and the steering pushrod (part 20). Glue the ABS sealing frame (part 36), the 1 mm plywood central sealing frame (part 34) and the stern sealing frame (part 35) to the underside of the deck, as shown on the plan. Trim the companionways (part 43) to fit and glue them in place. Cut away the two hull side rails (part 13) at the companionway positions, so that these parts can be glued in place together with the main deck. Take care to make all these joints watertight.

9. The next stage is to glue the four sealing strips (part 33) to the bulkheads (5) and (6), and to the sides of the bow former (10), so that the superstructure frame (part 143) can be fitted on top later. Note that the front sealing strip should be glued in place at a slight angle - approximately matching the inclination of the edge of the bow bulwark (part 37) - to allow the superstructure to be lifted off.
10. Insert the anchor hawse tubes (part 30) as shown in the drawing; glue them in place carefully (watertight joints), and cut off the projecting ends when the glue has set hard.
    The bow bulwark and the stern bulwark can now also be glued to the hull.
11. The bow railing (part 38) is assembled from five lengths of 1.5 mm Ø brass wire. Solder the joints as shown, and fit the railing in the bow bulwark as shown in the drawing.
12. The two-part cable hawses (part 39), the buffers (part 42), the toolboxes (part 45) and lids (46) and the two-part buoys (part 55) are supplied as vacuum-moulded parts; cut them out along the marked lines and join them where necessary. Glue these parts to the model in the positions shown on the plan.
13. The bulwark stanchions (part 41 “G”) are laser-cut parts which have to be trimmed individually to fit.
14. Glue four portholes (part 44) in the machine-cut openings in the hull sides.
15. Fit two hinges (part 47) and one handle (part 48) to each of the toolbox lids (part 46). These parts are made from 1 mm Ø brass wire.
16. The anchor winch (part 49) is assembled from several injection-moulded parts as shown on the plan.
17. The horizontal return drum (part 50 “E”) and the vertical return drum (part 51 “E”) consist of sixteen laser-cut parts each, which should be assembled as shown on the plan. Attach the chain pulleys (part 51.1) to the return drums using the shafts (part 51.2), which are 5 mm lengths of 2 mm Ø brass rod.
18. Attach the two Hall anchors (part 52) to the anchor chain (part 53) using short pieces of soft binding wire, and run the chain through the return drums and into the hull via the anchor winch.
19. Glue the double bollards (part 54) to the boat deck.
20. The buoy stand (part 57 “G”) consists of two laser-cut parts which are held together by three connecting pieces (part 58). Attach a brass wire hoop (part 56) to each buoy.
21. Drill 1.5 mm Ø holes in the deck in the positions shown on the plan, keeping the drill as close to vertical as possible, and glue the railing stanchions (part 59) in place. Thread the top rail (part 60) and the lower rails (part 61) through the stanchions.
22. Make up the left and right hawser guides from parts 62 to 67. These are laser-cut parts from ABS sheet “E”, which are assembled as shown on the plan. The hawser guides are able to swing out on hinges (part 68), which are glued to the base plate (part 65) and the floor plate (part 66), are and connected by a hinge shaft (part 69) and a loop (part 70).
23. The ship’s boat (part 71) and the outboard motor (part 72) each consist of two vacuum-moulded shells. Cut out the parts along the marked lines and glue them together. Attach the propeller (part 74) to the outboard motor using a shaft (part 73). The outboard motor itself is attached to the ship’s boat using a bracket (part 75). Cut out the operator’s stand (part 76), glue it to the boat and install the steering wheel (part 77), the throttle lever (part 78) and the frame (part 79). Glue the cleats (part 80) to the deck of the ship’s boat in the position shown in the drawing.
24. The ship’s boat stand (part 81 “G”) consists of four laser-cut parts; fit them together and glue the joints.
25. The derrick (part 82) is assembled from several injection-moulded parts which can now be glued together. Bend the hook (part 84) to the shape shown on the plan from 1.5 mm Ø brass wire.
26. Cut off the waste material from the crane house (part 85) by cutting along the marked lines, and trim it to fit on the sealing frame (part 36).
27. Glue the funnel (part 86) on the crane house as shown on the plan, and seal the top of the funnel with a plate (part 87) from laser-cut sheet “G”. Apply filler paste to the area between the crane house and the funnel, as the transition needs to be rounded off. The two exhaust pipes (part 88) are supplied as vacuum-moulded parts; glue them together and fix them to the funnel as shown on the plan; they are supported by two exhaust braces (part 120).
28. Attach the two-part base plate (part 90) to the crane column (part 89). If you intend to fit a working crane, it will be necessary to glue two mounting lugs to the base plate, by means of which the crane column can be attached using two screws; this allows access to the interior when necessary. If you are fitting a static crane, the base plate can be glued permanently to the crane column. Glue the swivel platform (part 91) to the base plate, with the open side facing the base.

29. The outrigger (part 92) consists of one vacuum-moulded part and five laser-cut components: the base plate (part 93 “E”), which seals the underside of the outrigger, a top plate (part 94 “F”) and three sealing plates (part 95 “E”). The exact position of the sealing plates is shown on the plan. Cut out the vacuum-moulded outrigger component along the marked lines, as shown in the exploded drawing.

Glue an ABS pin (part 98) in the pulley holder (part 96), and glue the pin in the front sealing plate (part 95). Fix the cable pulley (part 97) in the pulley holder using an M2 x 6 cheesehead screw and M2 nut.

30. Bend the cable guides (part 99) to shape from 1 mm Ø brass wire.
31. Assemble the pulley box (part 100 “E”) from the four laser-cut parts, then glue it to the outrigger. Fix the cable drum (part 101) in the pulley box using a shaft (part 102).
32. Assemble the two-part actuator arm (part 105) from scrap ABS material, and glue it to the outrigger; this part is **only** required if you are installing a working crane.
33. Attach the hinge lugs (parts 107 “G”) to the outrigger hinge lugs using one M2 x 6 cheesehead screw and M2 nut; glue the hinge lugs to the crane column in the position shown on the plan.
34. Attach the edge guard (part 109 “F”) and the balustrade (part 110) to the operator’s platform (part 108 “E”); glue this assembly to the side of the crane.
35. The hydraulic cylinder (part 115) consists of two brass tubes which slide inside each other. Cut a 5.4 Ø / 4.6 Ø x 10 mm reducer sleeve (part 117) from the 5.4 Ø / 4.6 Ø x 50 mm inner tube (part 116), and glue it in the 6.4 Ø / 5.6 Ø x 60 outer tube; Now glue the two connectors (part 118) in the reducer sleeve and the inner tube.
36. The hydraulic cylinder can now be attached to the mounting lugs (part 114 “G”) using one M2 x 8 cheesehead screw and one M2 nut each; the lugs in turn are fixed to the underside of the crane outrigger and the crane column.
37. Parts 119 to 138 are ready-made parts (laser-cut, tube and wire) which do not require any special explanation to complete; they are shown clearly on the plan.
38. The superstructure (part 139) is supplied as a machine-trimmed vacuum-moulded component; the first stage in completing it is to glue the front and rear vacuum-moulded door recesses (part 140, 141) in place. Glue the square-section ABS reinforcements (part 142) in the corners of the superstructure.
39. The superstructure frame (part 143) can now be trimmed to fit. Position the frame and the superstructure on the deck, and check that the superstructure rests squarely on the deck all round, without any gaps, before you glue the frame in place.
40. The next step is to glue the machine-trimmed vacuum-moulded bridge (part 144) on the superstructure, in the position shown in the drawing.
41. Cut out the door in-fill piece (part 145), trim it to fit against the side of the bridge, and glue it in place.
42. Trim the bridge frame (part 146) to fit in the bridge by sanding the outside edges at an angle, producing a flat surface.
43. Cut the scrap material away from the vacuum-moulded bridge roof (part 147), and sand the cantilever edges smooth.
44. The next step is to glue the bridge roof in place, but not until the bridge glazing has been fitted; this involves cutting strips of the smoked-tint plastic sheet supplied, and gluing them on the inside of the bridge.
45. The front and rear windscreen wiper holders (parts 149, 150) take the form of square-section ABS strip parts which are cut to the lengths stated in the Parts List. Attach the two-part screen wipers (part 151) to the wiper holders. The wipers should now be fitted with front and rear covers (parts 152, 153); these are cut from ABS angle-section strip and are glued to the top edge of the windscreen wiper holders.
46. Glue two brackets - the ladder holders (part 154) - to the front face of the bridge.
47. Bend the components of the bridge railing (part 155) to shape as shown in the drawing, bend the ends at right-angles and solder three stanchions to the rails.
48. Fit the superstructure glazing (part 156) as described for the bridge: cut strips of smoked-tint plastic sheet to suit, and glue them to the inside of the superstructure moulding.
49. The wall extensions (part 157 “E”) are laser-cut parts which have to be fitted with square-section ABS reinforcements (part 158) on the inside. The extensions can then be glued to the superstructure and the joints made good with filler paste, but please check their length first: they should reach as far as the deck railing.
50. Cut two ventilator grilles (part 159) from the fly netting supplied, attach a frame (part 160 “G”) to each, and glue them to the rear wall of the superstructure as shown in the drawing.
51. Parts 161 to 173 are all laser-cut parts, ready-made components or wire parts which are simply prepared and fitted to the superstructure in the positions shown on the plan. The only parts which have to be cut to length are the brass wire hinges and the door handles; the latter also have to be bent to shape.
52. Prepare the small ventilator (part 174) and its frame (part 175 G), and glue them to the right-hand (starboard) side of the superstructure.

53. Parts 176 to 190 are also ready-made parts, laser-cut components and wire parts which simply have to be attached to the superstructure.
54. Make the fire extinguisher box (part 184) from scrap material; glue two pieces together to obtain the correct thickness.
55. The gooseneck (part 187) is bent to shape from a length of 3 mm Ø ABS rod; warm it gently with a heat-gun to soften it.
56. Cut the waste material away from the outrigger rest (part 191) and the mast rest (part 192), trim them to fit on the bridge deck and glue them in place permanently.
57. The mast (parts 192 - 200 “E”) is assembled from several tubes, equipment brackets and lamp holders; their relative positions are shown clearly on the plan.
58. The mast mounting consists of parts 201 - 208; these are all laser-cut parts which allow the mast to fold down when joined. For a working mast you would need to replace the mounting lug (part 209 E) and the hydraulic cylinder (part 210) with a servo output arm; the details of the actuating system are left up to the builder.
59. Parts 211 to 228 are lamps, aerials, loudhailers, typhoon and small items which are supplied as ready-made components . The only parts which need to be modified are the aerial housings (225, 227), which are vacuum-moulded ABS parts which have to be trimmed to final size.
60. Slightly more complicated is the swivel mechanism on which the radar antenna (part 229) and the searchlight (part 232) are mounted. The radar antenna is a ready-made component, and is simply attached to the vacuum-moulded antenna housing; the latter is glued to the base plate (part 231 “E”). Fix the searchlight on the top plate (part 233 “E”). The spacer plates (parts 234 “E”) are fitted between the plates 233. The two side panels (part 235 “E”) are used to connect the plates 233 to the base plate 231.
61. Attach the three-part mast base (part 236 “E”) to the bridge roof (part 147) as shown on the plan. If you wish to install a fully operating mast mechanism, the two frames (parts 237 and 238) must be assembled very accurately as shown in the drawing. Some experience is required to make and solder together the individual tubes with sufficient accuracy; the dimensions of the components are stated in the Parts List.

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 beforehand whether the paints are compatible 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 scraped 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 holes, as the fine mist of paint will find 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 work out the best sequence for painting the model - and do this before starting construction. Some areas of the model can only be painted at a later stage with great difficulty, or even not at all.

Colour scheme

We suggest that you use the kit box illustration as the basis for your colour scheme. Use dead matt paints for the deck and the underwater hull, but semi-matt (silk finish) types for the other colours. Always test the paint on scrap material before applying it. 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.

Underwater hull - red oxide, RAL 3009 matt
Exposed hull, funnel, exhaust pipes - black, RAL 9005, matt
Superstructure, wheelhouse, crane house and other parts - white, RAL 9016
Crane, mast, boat derrick - yellow, RAL 1003
Rubbing strakes, ship's boat and other parts - fluorescent red, RAL 3001
Anchor winch, return pulleys and other parts - light grey, RAL 7035

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.

Installing the RC components
- The plan shows the arrangement of the individual RC system components required for the vessel's basic running functions, i.e. steering and speed control.
- The plan also includes a wiring diagram which shows how the various components are connected.
- The drive battery should be installed between the two central bulkheads (parts 6 and 7) and fixed in such a way that it cannot shift.
- Install the rudder servo in the servo mount (part 18) 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.
- If you intend to install working auxiliary systems, it is important to plan the arrangement before you start building the model.

Auxiliary working systems

1. If you wish to install a radio-controlled crane on the boat, you should start by ensuring that your radio control system provides the relevant channels and controls. For this reason we are unable to provide a wiring diagram, but simply recommend that you use the crane expansion set, Order No. 2023.10. This contains all the parts required, together with wiring diagrams for the following functions: rotation of the crane column, rise and fall of the crane outrigger and the crane hook. You will also need three geared micro-motors, Order No. 1753, for this function.
2. Installation of an optional "Tug" module, Order No. 2465, and the associated loudspeaker, Order No. 2355.
   The 12 V power supply for the sound module is drawn from the main drive battery. We recommend that you install the loudspeaker under the superstructure between the bow bulkhead and the central bulkhead.
3. Internal lighting system for the superstructure and bridge.
   You can also install one of the internal lighting sets, Order No. 351 or Order No. 635.
   The power supply for the lighting system is drawn from a separate 2 V lead-acid battery, Order No. 793. You can switch the system on and off using either a manual toggle switch, or by radio using a Mini-Switch 40.
4. It is also possible to install a working boat derrick and a radio control system in the ship's boat; this additional work is left up to the builder.

Maiden run
Give the batteries a full charge, 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 hull floats exactly level in the water. You may need to add ballast in the form of lead sheet to achieve the correct waterline. Take your time to get used to the model's running characteristics and handling.

All of us at GRAUPNER hope you have many hours of pleasure building and running your RANZOW.

Parts List

No.	Description	No. off	Material	Size in mm
1	Hull	1	ABS	Vac.-moulded
2	Front boatstand support	1	Plywood	4.0, laser-cut
3	Rear boatstand support	1	Plywood	4.0, laser-cut
4	Connecting piece	2	Plywood	4.0, laser-cut
5	Bow bulkhead	1	Plywood	4.0, laser-cut
6	Central bulkhead	1	Plywood	4.0, laser-cut
7	Central bulkhead	1	Plywood	4.0, laser-cut
8	Stern bulkhead	1	Plywood	4.0, laser-cut
9	Fore-and-aft bulkhead	1	Plywood	4.0, laser-cut
10	Bow former	1	Plywood	4.0, laser-cut
11	Stern former	1	Plywood	4.0, laser-cut
12	Support	1	Plywood	4.0, laser-cut
13	Hull side rail	2	Spruce	490 x 6 x 6
14	RC plate	1	Plywood	4.0, laser-cut
15	Console	1	Plywood	4.0, laser-cut
16	Rudder brace	1	Plywood	4.0, laser-cut
17	Swivel pushrod connector	1	Plated brass	Ready made
18	Servo mount	1	Plastic	Ready made
19	Connecting rod	1	Stainless steel	1.5 Ø x 100
20	Steering pushrod	1	Stainless steel	1.5 Ø x 160
21	Retaining clip	3	Plastic	Ready made
22	Becker rudder unit	2	Plastic	Ready made
23	Tiller	2	Plastic	Ready made
24	Stern tube and shaft	2	Metal	Ready made
25	Stern tube brace	2	Plastic	Ready made
26	Propeller, R / L	2	Plastic	Ready made
27	Reducer sleeve	2	Brass	Ready made, 4 Ø / 3 Ø
28	Motor bracket, four-part	1	Plywood	4.0, laser-cut
29	Mounting plate	1	Plywood	4.0, laser-cut
30	Anchor hawse tube	2	Aluminium tube	6 / 5.1 Ø x 30, overlength
31	Foredeck	1	Plywood	1.0, laser-cut
32	Main deck	1	Plywood	1.0, laser-cut
33	Sealing strip	4	Plywood	1.0, laser-cut
34	Central sealing frame	1	Plywood	1.0, laser-cut
35	Stern sealing frame	1	Plywood	1.0, laser-cut
36	Sealing frame	1	ABS	Vac.-moulded
37	Bow bulwark	1	ABS	Vac.-moulded
38	Bow railing	2	Brass wire	1.5 Ø x 800 overall
39	Cable hawse, two-part	8	ABS	Vac.-moulded
40	Stern bulwark	1	ABS	Vac.-moulded
41	Bulwark stanchion	12	ABS	1.5, laser-cut
42	Buffer	6	ABS	Vac.-moulded
43	Companionway, L / R	2	ABS	Vac.-moulded
44	Porthole	8	Plastic	Ready made
45	Toolbox	2	ABS	Vac.-moulded
46	Toolbox lid	2	ABS	Vac.-moulded
47	Hinge	4	Brass wire	0.1 Ø x 3
48	Handle	2	Brass wire	1.0 Ø x 10, as plan
49	Anchor winch	1	Plastic	Inj.-moulded
50	Horizontal return drum	2	ABS	1.0, 16 laser-cut parts
51	Vertical return drum	2	ABS	1.0, 16 laser-cut parts
51.1	Chain pulley	4	Plastic	Ready made, 9 Ø x 3
51.2	Shaft	4	Brass wire	2 Ø x 5, overlength
52	Hall anchor	2	Plastic	Ready made
53	Anchor chain	2	Plated brass	Ready made, 250 links
54	Double bollard	8	Plastic	Ready made
55	Buoy, two-part	2	ABS	Vac. moulded

56	Buoy hoop	2	Brass wire	1.0 Ø x 50
57	Buoy stand, two-part	1	ABS	1.5, laser-cut
58	Buoy stand connecting piece	4	Square ABS strip	55 x 3 x 3
59	Railing stanchion	32	Plastic	Ready made
60	Top rail	1	Brass wire	1.5 Ø x 1000 overall
61	Lower rail	2	Brass wire	1.0 Ø x 2000 overall
62	Hawser guide, L / R	2	ABS	1.0, laser-cut
63	Rib	4	ABS	1.0, laser-cut
64	Rib	4	ABS	1.0, laser-cut
65	Base plate	2	ABS	1.0, laser-cut
66	Floor plate	2	ABS	1.0, laser-cut
67	Bridge section, three-part	2	ABS	1.0, laser-cut
68	Hinge	12	ABS	Inj.-moulded
69	Hinge shaft	2	Brass wire	1.0 Ø x 30
70	Loop	2	Brass wire	Ready made
71	Ship's boat, two-part	1	ABS	Vac.-moulded
72	Outboard motor, two-part	1	ABS	Vac.-moulded
73	Outboard motor propeller shaft	1	Brass wire	1.0 Ø x 30
74	Propeller	1	Plastic	Ready made
75	Outboard motor bracket	1	Brass wire	1.5 Ø x 15, as plan
76	Ship's boat operator's stand	1	ABS	Vac.-moulded
77	Ship's boat steering wheel	1	Plastic	Ready made
78	Throttle lever	1	Brass wire	1.0 Ø x 10
79	Frame	1	ABS	0.5, laser-cut
80	Cleat	3	Plastic	Ready made
81	Ship's boat stand, four-part	1	ABS	1.5, laser-cut
82	Boat crane	1	Plastic	Inj.-moulded
83	Cable	1	Thread	0.7 Ø x 300 overall
84	Hook	1	Brass wire	1.5 Ø x 15, as plan
85	Crane house	1	ABS	Vac.-moulded
86	Funnel	1	ABS	Vac.-moulded
87	Funnel plate	1	ABS	1.5, laser-cut
88	Exhaust pipe, two-part	1	ABS	Vac.-moulded
89	Crane column	1	ABS	Vac.-moulded
90	Crane base plate, two-part	1	ABS	1.0, laser-cut
91	Swivel platform	1	ABS	Vac.-moulded
92	Crane outrigger	1	ABS	Vac.-moulded
93	Crane outrigger base plate	1	ABS	1.0, laser-cut
94	Crane outrigger top plate	1	ABS	0.5, laser-cut
95	Sealing plate, three-part	1	ABS	1.0, laser-cut
96	Pulley holder	1	ABS	1.0, laser-cut
97	Cable pulley	1	Plastic	Ready made, 12 Ø x 2
98	Pin	1	ABS	3 Ø x 20
99	Cable guide	4	Brass wire	1 Ø x 40
100	Pulley box, four-part	1	ABS	1.0, laser-cut
101	Cable drum	1	Plastic	Ready made
102	Shaft	1	Brass wire	2 Ø x 20
103	Electric motor	1	Plastic	Ready made (with anchor winch)
104	Cable	1	Thread	0.7 Ø x 700
105	Actuator arm, two-part	1	ABS	2.0, as plan (from scrap)
106	Pushrod connector	1	Metal	Ready made
107	Hinge lug	2	ABS	1.5, laser-cut
108	Crane operator's platform	1	ABS	1.0, laser-cut
109	Edge guard	1	ABS	0.5, laser-cut
110	Balustrade	1	Brass wire	1.0 Ø x 200 overall
111	Handrail	2	Brass wire	1.0 Ø x 90
112	Ladder	1	ABS	Ready made
113	Ladder	1	ABS	Ready made
114	Mounting lug	4	ABS	1.5, laser-cut

115	Hydraulic cylinder	1	Brass tube	6.4 Ø x 5.6 Ø x 60
116	Inner tube	1	Brass tube	5.4 Ø x 4.6 Ø x 50
117	Reducer sleeve	1	Brass tube	5.4 Ø x 4.6 Ø x 10
118	Connector	2	Plastic	Ready made
119	Cover	1	ABS	1.0, laser-cut
120	Exhaust brace	2	Brass tube	3 Ø x 2.1 Ø x 25
121	Door	1	ABS	1.0, laser-cut
122	Door	2	ABS	1.0, laser-cut
123	Door	1	ABS	1.0, laser-cut
124	Door hinge	8	Brass wire	1 Ø x 4
125	Hinge lug	8	ABS	0.5, laser-cut
126	Door plate	4	ABS	0.5, laser-cut
127	Door handle	18	Brass wire	1.0 Ø x 8, as plan
128	Porthole	2	Plastic	Ready made
129	Suspension lamp	4	Plastic	Ready made
130	Console	4	Brass wire	1.0 Ø x 10, as plan
131	Lifebelt	2	Plastic	Ready made
132	Lifebelt bracket	2	ABS	0.5, laser-cut
133	Ventilator grille	2	Fly netting	50 x 17
134	Frame	1	ABS	0.5, laser-cut
135	Crane hook	1	Brass wire	1.0 Ø x 40
136	Ballast ball	2	Lead shot	9 Ø, ready made
137	Vent pipe	2	Aluminium tube	6 Ø x 5.1 Ø x 200 overall
138	Vent outlet, four-part	2	ABS	1.0, laser-cut
139	Superstructure	1	ABS	Vac.-moulded
140	Front door recess	1	ABS	Vac.-moulded
141	Rear door recess	1	ABS	Vac.-moulded
142	Reinforcement	5	Square ABS strip	60 x 3 x 3
143	Superstructure frame	1	Plywood	4.0, laser-cut
144	Bridge	1	ABS	Vac.-moulded
145	Door in-fill piece	1	ABS	Vac.-moulded
146	Bridge frame	1	Plywood	4.0, laser-cut
147	Bridge roof	1	ABS	Vac.-moulded
148	Bridge glazing	1	Smoked-tint plastic	220 x 140 x 1.0, oversize
149	Front windscreen wiper holder	2 + 2	Square ABS strip	50 x 2 x 2 + 40 x 2 x 2
150	Rear windscreen wiper holder	3	Square ABS strip	55 x 2 x 2
151	Windscreen wiper, two-part	5	Plastic	Ready made
152	Front wiper cover	2 + 2	ABS angle strip	50 x 3.5 x 3.5 + 40 x 3.5 x 3.5
153	Rear wiper cover	3	ABS angle strip	55 x 3.5 x 3.5
154	Ladder holder	2	ABS angle strip	6 x 3.5 x 3.5
155	Bridge railing	1	Brass wire	1 Ø x 250 overall
156	Superstructure glazing	2	Smoked-tint plastic	170 x 30 x 1.0, oversize

157	Wall extension	2	ABS	1.0, laser-cut
158	Reinforcement, 4 + 2	6	ABS angle strip	35 x 3.5 x 25 + 45 x 3.5 x 35
159	Ventilator grille	2	Fly netting	30 x 20
160	Ventilator frame	2	ABS	0.5, laser-cut
161	Cover	2	ABS	1.0, laser-cut
162	Hinge	4	Brass wire	1.0 Ø x 3
163	Door	2	ABS	1.0, laser-cut
164	Door	2	ABS	1.0, laser-cut
165	Door	1	ABS	1.0, laser-cut
166	Door	1	ABS	1.0, laser-cut
167	Door hinge	12	Brass wire	1 Ø x 4.0
168	Hinge lug	12	ABS	0.5, laser-cut
169	Door plate	6	ABS	0.5, laser-cut
170	Door handle	24	Brass wire	1 Ø x 5, as plan
171	Rotary closure	1	Plastic	Ready made
172	Porthole	1	Plastic	Ready made
173	Porthole	2	Plastic	Ready made

174	Ventilator	1	Fly netting	17 x 13
175	Frame	1	ABS	0.5, laser-cut
176	Railing stanchion	14	Plastic	Ready made
177	Top rail	1	Brass wire	1.5 Ø x 600 overall
178	Lower rail	1	Brass wire	1.0 Ø x 1200 overall
179	Lifebelt, two-part	2	Plastic	Ready made
180	Stand	4	ABS	1.0, laser-cut
181	Chain	2	Plated brass	80
182	Handrail	1	Brass wire	1.5 Ø x 70
183	Steps, two-part	1	Plastic	Ready made
184	Fire extinguisher box	1	ABS	From scrap
185	Suspension lamp	10	Plastic	Ready made
186	Console	10	ABS	1.0, laser cut
187	Gooseneck	1	ABS	3 Ø x 40, as plan
188	Navigation lamp	4	Plastic	Ready made
189	Double lamp console	2	Plastic	Ready made
190	Lamp bracket, two-part	2	ABS	1.0, laser-cut
191	Outrigger rest	1	ABS	Vac.-moulded
192	Mast rest	1	ABS	Vac.-moulded
193	Mast	1	Aluminium tube	6 Ø x 5.1 Ø x 170
194	Equipment bracket	1	ABS	1.5, laser-cut
195	Equipment bracket	1	ABS	1.5, laser-cut
196	Lamp support	1	ABS	1.5, laser-cut
197	Mast extension	1	Brass tube	3 Ø x 2.1 Ø x 55
198	Flag mast	1	Brass rod	2 Ø x 75
199	Door	1	ABS	1.0, laser-cut
200	Lamp bracket	1	ABS	1.5, laser-cut
201	Mast box, four-part	1	ABS	1.0, laser-cut
202	Upper hinge plate, three-part	1	ABS	1.0, laser-cut
203	Lower hinge plate	1	ABS	1.0, laser-cut
204	Base plate	1	ABS	1.0, laser-cut
205	Side panel	2	ABS	1.0, laser-cut
206	Transverse rib	4	ABS	1.0, laser-cut
207	Mast rib	4	ABS	1.0, laser-cut
208	Hinge pin	3	Brass wire	1.5 Ø x 14 + 1.5 Ø x 5 (x 2)
209	Mounting lug, three-part	1	ABS	1.0, laser-cut
210	Hydraulic cylinder	1	Brass	Ready made, 572.1
211	Fault alert lamp	3	Plastic	Ready made
212	Console	4	ABS	1.0, laser-cut
213	Bracket	3	Brass wire	1.5 Ø x 22
214	Masthead light	2	Plastic	Ready made
215	Lamp bracket	1	Plastic	Ready made
216	Console	1	ABS	1.0, laser-cut
217	Bracket	1	Brass rod	2.0 Ø x 25
218	Hazardous materials lamp, red	1	Plastic	Ready made
219	Radio light, blue	1	Plastic	Ready made
220	Bracket	2	Brass wire	1.5 Ø x 10
221	Anchor light	1	Plastic	Ready made
222	Bracket	1	Brass wire	1.5 Ø x 25
223	Radio aerial	2	Brass wire	1.0 Ø x 120
224	Typhoon	1	Plastic	Ready made
225	Typhoon housing	1	ABS	Vac.-moulded
226	GPS aerial	1	ABS	1.0, laser-cut
227	GPS aerial housing	1	ABS	Vac.-moulded
228	Loudhailer	1	Plastic	Ready made
229	Radar antenna	1	Plastic	Ready made
230	Antenna housing	1	ABS	Vac.-moulded
231	Base plate	1	ABS	Laser-cut
232	Searchlight	1	Plastic	Ready made
233	Plate	2	ABS	1.0, laser-cut

234	Spacer plate	2	ABS	1.0, laser-cut
235	Side panel	2	ABS	1.0, laser-cut
236	Mast base, three-part	1	ABS	1.0, laser-cut
237	Front mast frame	1	Brass tube	2 x 3.2 Ø / 2.1 Ø x 16 + 2 x 2 Ø / 1.2 Ø x 23
238	Rear mast frame	1	Brass tube	2 x 3.2 Ø / 2.1 Ø x 16 + 2 x 2 Ø / 1.2 Ø x 28

As plan = refer to the plan for the exact size and shape.

The following items are also required (included in the kit):

1 Grubscrew M3 (pushrod connector)
2 Self-tapping screws, 2.2 Ø x 9.5 (servo mount fixing)

2	Plastic screws, M4 x 15	)	
2	Washers, 4.3 Ø / 9.0 Ø	)	Motor bracket attachment
2	Nuts, M4	)	
4	Cheesehead screws, M2 x 20	)	Searchlight / radar frame attachment
4	Nuts, M2		
2	Cheesehead screws, M2 x 8.0	)	Hydraulic cylinder attachment
2	Nuts, M2	)	
3	Cheesehead screws, M2 x 6.0	)	Crane outrigger / cable pulley attachment
3	Nuts, M2	)	

The following items are also required (not included in the kit):

2 SPEED 500 E electric motors, Order No. 1788
1 Bow thruster, Order No. 1785
3 Suppressor capacitors, Order No. 3588 (pack of 2)
1 NAVY V40R speed controller, Order No. 2875
1 Micro Speed 10 speed controller, Order No. 2736
2 Shaft couplings, Order No. 354
2 Brackets, Order No. 2997.6
1 Lead-acid drive battery, 12 V / 7 Ah, Order No. 2591
1 Battery for bow thruster: ECO-POWER 4N-4000 RC 4.8 V / 3.0 Ah, Order No. 2596.4
1 Copper cable, 2 m, Order No. 3389
1 G2 connector system, Order No. 2989
1 Spade connector, female, Order No. 3597
1 Extension lead, Order No. 3935.50

Radio control system

1 mc-12 radio control set, Order No. 4725
or
1 mc-19 radio control set, Order No. 4827

Auxiliary working systems

Crane

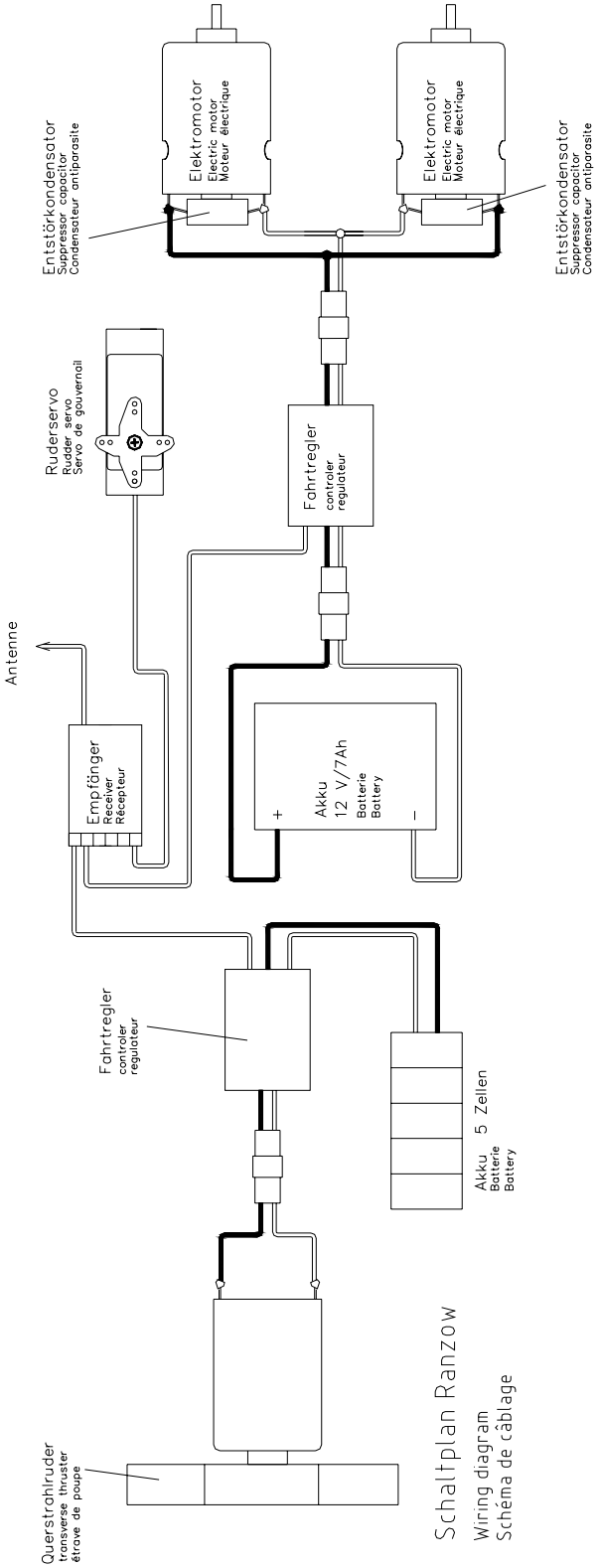
1 Expansion set, Order No. 2023.10
3 Geared micro motors, Order No. 1753
3 Micro Speed 4 speed controllers, Order No. 2735
or
3 Reversing modules, Order No. 37554.2 and
1 NAUTIC-Expert switch module, Order No. 4159

Sound

1 “Tug” sound module, Order No. 2465
1 Loudspeaker, Order No. *2465*

Lighting

1 Interior lighting set, Order No. 351 or 635
1 2V lead-acid battery, Order No. 793
1 Mini-Switch, Order No. 3294
or
1 Toggle switch (for manual switching)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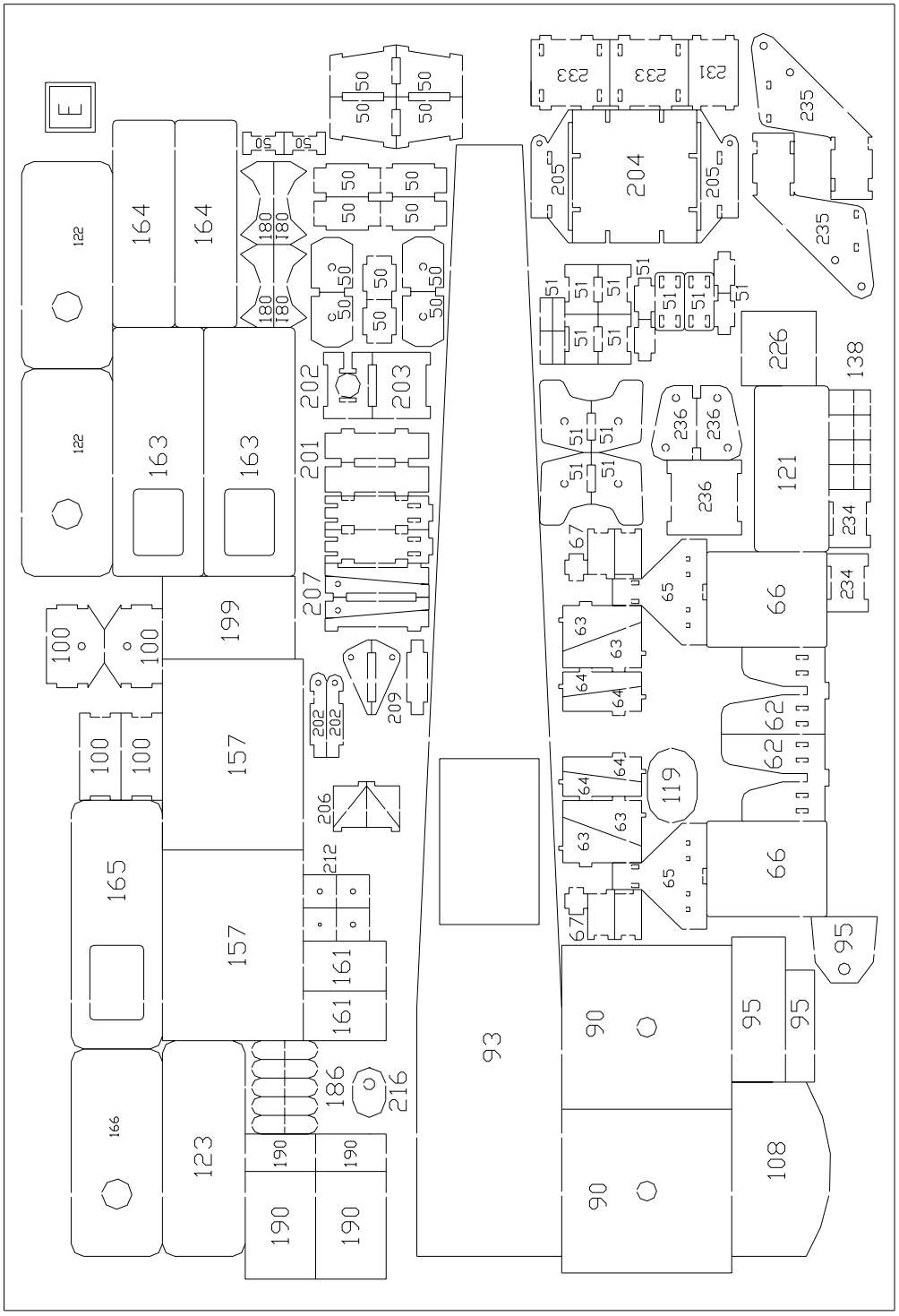
Schaltplan Ranzow
Wiring diagram
Schéma de câblage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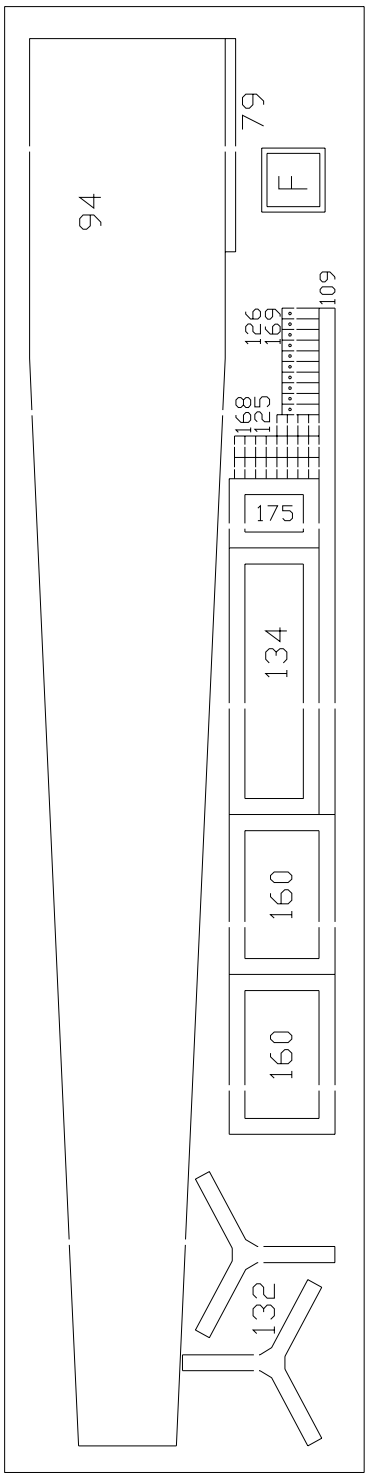
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