



The full-size vessel

The KRABBE TÖN 12 SHRIMPING CUTTER is a small vessel whose primary fishing region is the North Sea. It is specially built for catching shrimps, and the rig is designed specifically for this application. The cutter is 12.1 m long and displaces around 20 tonnes. These shrimping boats steam to their fishing grounds with their nets half-lowered, suspended from the outrigger booms. When fishing, the boat anchors over the shrimp grounds in the current of a river estuary or a narrow water channel running between sandbanks, or steams over the fishing grounds amongst the sandbanks, with its two nets held close to the bottom by means of weights. During fishing operations the outrigger booms are set almost horizontal. After catching fish, the net is raised again on the trawl boom and swung in over the deck on the outrigger booms. The shutter line, or net opener halyard, is then released, and the catch falls onto the deck where the shrimps are sorted from the unwanted material; the coarser mesh is at the top, with a finer one at the bottom to collect the shrimps.

The model

The model is based on original drawings and is designed to a scale of 1 : 25. It features many detail features, and the completed boat looks very convincing. As a result, the vessel is intended for the experienced marine modeller, and its construction calls for wide-ranging manual skill and experience. However, the kit now includes many laser-cut wooden parts, making construction of the model very much simpler. The kit also includes the power system components (excluding motor), so that the model can be completed relatively quickly without the builder having to obtain extra parts. The rig of the cutter as drawn on the plan is functionally correct. The kit box illustration does not show the full working system; the primary purpose of this picture is to provide a suggested colour scheme for the finished boat.

Specification

	Full-size	Model
Length approx.	12.10 m	484 mm
Beam approx.	4.25 m	170 mm
Draught approx.	1.25 m	50 mm
Max. displacement approx. (= all-up weight incl. RC)	20 tonnes	1.27 kg
Scale	1 : 1	1 : 25

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 assemble, operate and maintain the model, nor the way you operate 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, defective handling or 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 covers you for operating models of this kind. If you are not sure, take out a special insurance policy designed to cover the risks of RC modelling.

If you ever dispose of the model, be sure to pass on these safety notes to the new owner.

Guarantee conditions

The guarantee provides for free repair or replacement of any part which exhibits proven manufacturing or material faults within the guarantee period of 24 months from the date of purchase. We will not consider any claims beyond these conditions. The cost of transport, packing and carriage are payable by the purchaser. We accept no liability for transit damage. If you send goods to GRAUPNER or to the approved Graupner Service Centre for your country, be sure to enclose an accurate description of the fault together with the dated purchase receipt. 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 always operate the boat **with great care** when there are persons or animals in the water, otherwise there is a risk of causing injury. Keep the boat well away from people and animals.
- Never run your model 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 boat in salt water. Even the salty sea air can attack, oxidise and even wreck the technical components in your model.
- Never run your model in adverse conditions, e.g. rain, storm, strong wind, choppy water or strong currents.
- Before you run the boat check that the radio control system is working reliably, and that all connections are secure.
- If you are using dry batteries as an energy source, note that they must never be recharged. Only batteries marked specifically as "rechargeable" may be recharged safely.
- Ensure that all batteries are fully charged before every run. Check the range of your radio control system. It is particularly important that the transmitter and receiver batteries are fully charged before each session.
- Ensure that the channel you intend to use is not already in use by other modellers. Never run your boat if you are not certain that your channel is free.
- Read and observe the instructions and recommendations provided by the manufacturer of your radio control system and accessory components.
- 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 speed controller or rudder servo may be ruined due to overloading.
- Ensure that the servo is not mechanically obstructed at any point in its 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 surfaces which could be hot!
- Remove all batteries from the boat prior to transporting and storing it.
- Do not subject the model to severe humidity, heat, cold or dirt.
- Secure the model and your RC equipment carefully when transporting them. They may be seriously damaged if they are free to slide about.
- If you intend to operate the boat on moving water (e.g. a river), remember that it could be washed away downstream if the battery fails or a malfunction occurs, especially as its running speed is fairly low.
- The shrimping cutter's tall rig includes fishing nets which can easily catch the wind, and this increases the risk of the model capsizing, especially if there is any appreciable air movement. **NEVER** operate the boat if there is any perceptible wind.
- If you have to **salvage** the model, take care **not to risk your own life or that of others**.
- Check regularly that the boat is completely watertight, as it may sink if too much water enters the hull. Check the boat for damage before every run, and ensure that water cannot penetrate through the propeller shaft bush or rudder system.
- Protect the boat as far as possible from water penetration. Ensure that the removable superstructure cannot slip off the model when it is running. You should also make sure that any water which gets inside the boat cannot reach the RC components. Any claim under guarantee for damage caused by water will be rejected!
- If you connect drive batteries in parallel, note that they should not be connected until just before you run the boat, as the two batteries may interact under no-load conditions, and could suffer damage. For this reason only connect the batteries just before a run, and disconnect them again immediately afterwards. On no account 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 inside any RC component, dry the unit out and send it 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 shaft at regular intervals. Take care to prevent grease or oil getting inside the silicone hose which forms the shaft coupling, as this would compromise the system's ability to transmit power.
- If the model is not to be run 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 be sure to study the plan and read right through the instructions. We recommend that you refer constantly to the parts list as an aid to construction. The instructions and parts list reflect the sequence of assembly.
- Please note: although the laser-cut parts are very accurate, they will still need trimming in certain cases, especially where gaps naturally occur, or where edges have to be bevelled to fit angled joints.
- The laser-cut parts are retained in their sheets by small lugs. Cut through the lugs from both sides using a sharp knife, and only then cut right through the material.
- Small, delicate laser-cut wooden parts are easily broken. We recommend that you apply thin cyano to the edges, or to the whole part, as this strengthens them significantly, and avoids many breakages. This should only be done to parts which will later be painted.
- The laser-cutting process inevitably produces a black cut-line all round the wooden parts. This can easily be sanded off.
- You will need to assign part numbers to the laser-cut components. This is done by comparing the parts with the drawings at the end of the building instructions. The numbers are deliberately not engraved on

the wooden parts, as the numbers would have to be filled and sanded smooth before painting, and the black areas might show through the paint.

- Compare all the wooden parts to the drawings on the plan before gluing them in place. This is important, as it tells you where particular edges have to be bevelled, or the parts have to be trimmed in any other way. Areas shown in the drawings with a double-hatched pattern indicate where other parts are to be glued.
- Remember that wooden parts waterproofed with a coat of GLATTFIX sanding sealer cannot be glued using UHU acrylit or STABILIT express. You should also take care to avoid smearing excess adhesive outside the joint area, as the dried glue may prevent paint adhering during the finishing process. This applies in particular when you are gluing the vacuum-moulded plastic parts.
- Before you start building the model it is important to consider the finish you wish to apply, i.e. how and when you intend to paint the boat. We recommend that you paint small parts separately and allow the paint to dry before gluing them to the model. Some of the larger parts should also be painted before you continue with construction, as this can avoid a lot of work with masking tape. Bear in mind that parts glued to painted areas of the model will only stick as firmly as the paint, i.e. such parts often break off because the paint on the model tears away. Some parts are much more vulnerable to such damage than others; in this case scrape off the paint at the joint position beforehand.
- Don't throw away scrap wood, ABS and wire immediately, as the materials may be required for making other small parts.
- With this model it is important to ensure that its Centre of Gravity is as low as possible. This means: at all locations above the waterline use only as much adhesive as is necessary, and use the lightest materials you can find.
- Bear in mind that tools can be dangerous; always be careful when handling them.
- The electric motor must be suppressed. The minimum is one 470 nF capacitor (Order No. 3588) soldered between the terminals to form a bridge.
- Deploy all electrical cables in an orderly fashion, without crossing them over. Never allow a positive (+) contact to touch a negative (-) contact.
- Use cable of adequate cross-section, capable of carrying the high currents which will flow when the boat is running.
- Deploy the receiver aerial as far from high-current cables as possible (at least 3 cm).
- Lubricate the shaft system using a type of grease or oil which does not soil or contaminate water, e.g. Order No. 570. Take care to prevent grease or oil getting inside the silicone hose which forms the shaft coupling, as this would compromise the system's ability to transmit power.
- Before gluing parts together clean the joint surfaces carefully, i.e. remove all traces of grease. This is best done by sanding, followed by wiping with a non-greasy liquid detergent. The same applies to all surfaces which are to be painted, otherwise the paint will not adhere well. Before gluing parts to the hull sand the surfaces with fine abrasive paper and de-grease them using a solvent such as acetone. If you neglect to do this, the joints will be weak and may fail at any time.
- Recommended adhesives for various types of joint:

Material - material

Metal - metal

ABS - wood

ABS - ABS

ABS - metal

Wood - wood

Wood - metal

Suitable adhesives

Cyano-acrylate, UHU plus

Cyano-acrylate, UHU acrylit

Cyano-acrylate, UHU acrylit, UHU plast spezial

Cyano-acrylate, UHU acrylit

Cyano-acrylate, UHU hart, white glue

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

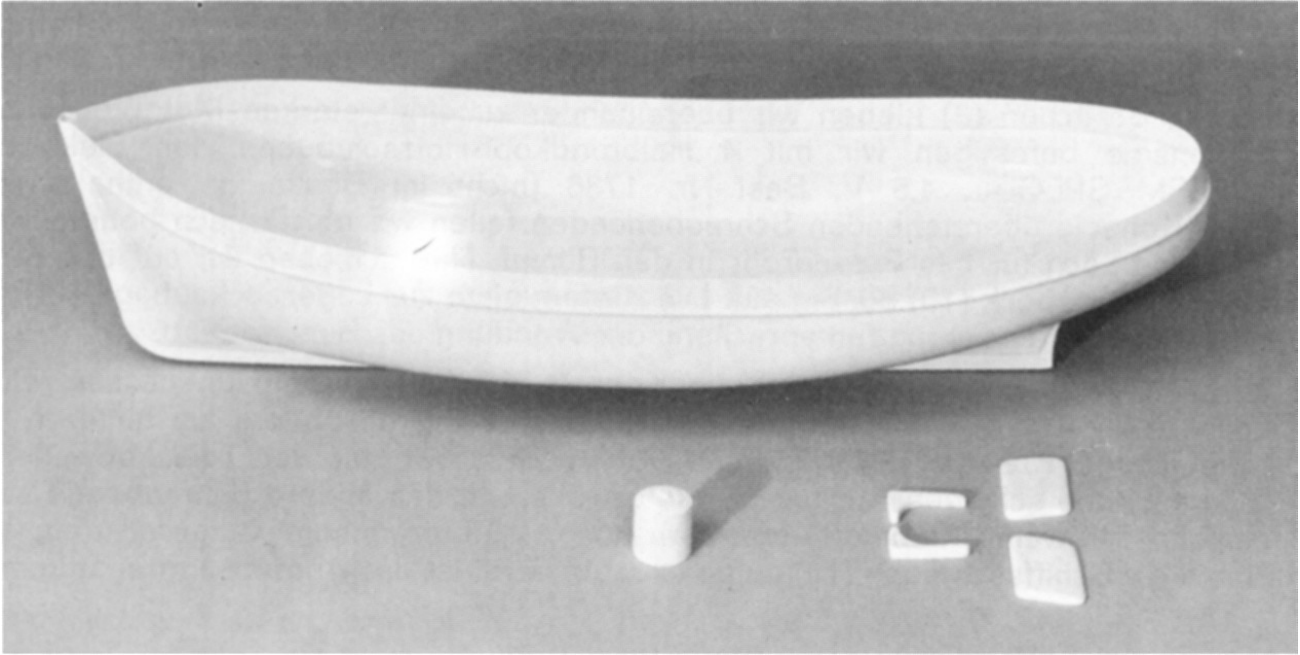


Fig. 1: The CNC-trimmed hull, the rudder shells cut out and trimmed to size, the keel shells and the boiler.

The hull

The hull is supplied in the kit as a moulded, CNC-trimmed plastic shell (1). Cut the two stern shells (2) and the rudder shells (3) to final size and file the cut edges smooth; the parts must fit together well. Glue together the two stern shells, holding the parts together with spring clamps until the glue has set hard. Glue the stern shell assembly to the rear face of the hull, with the underside flush; the position is shown clearly on the plan. A new feature of the fuselage is two scuppers on each side; water which gets onto the deck can now escape through these, and this change goes a long way to preventing water from the deck running inside the hull.

The rudder shaft (4) is made from 3 mm Ø brass rod. Sand the area of the shaft where it is to be glued in the rudder to provide a “key” for the glue. Cut the rudder bush (5) from the 4 / 3.05 mm Ø brass tube supplied. Glue the bush in the hull, taking care to set it vertical. Ensure that the rudder is free to swivel to both sides, and can be withdrawn from the bush by pulling it downwards. When the adhesive has set hard, glue the two gussets (7) inside the hull, resting against the bush. Assemble the tiller (5) from the plastic lever, the collet (5a) and the M3 socket-head screw (5b). Fit the tiller on the rudder shaft and tighten the retaining screw. The method of connecting the rudder servo is described in the section covering installation of the RC system at the end of these instructions.

Cut a piece of heat-shrink sleeve (8) to length, i.e. about 2 mm longer than the motor. Solder the connecting wires and the suppressor capacitor to the motor terminals. Shrink the sleeve over the motor so that it is firmly held. Insert the stern tube (9) in the hull, but don't glue it at this stage. Cut a piece of silicone sleeve about 30 mm long to form the shaft coupling (12). **NOTE:** we recommend that you fit the bracket (10) on the stern tube, as this makes it easier to lubricate the propeller shaft inside the tube. Fix the bracket components together using two 2.2 Ø x 6.5 mm self-tapping screws. With the bracket installed, drill a 2 mm Ø hole in the stern tube through the hole in the bracket, taking care not to drill right through the tube.

Fit the motor, coupling and shaft together, and screw the propeller (13) on the end of the shaft. Place the power assembly in the hull in the position shown on the plan; the assembly must be positioned in such a way that the motor shaft lines up exactly with the stern tube; this is easy to check by observing the silicone coupling sleeve; if it is curved or kinked you must pack up the motor using pieces of scrap wood until the coupling sleeve is perfectly straight. When you are confident that everything fits correctly, fix the motor in place by tacking the heat-shrink sleeve to the hull using cyano. Take care that no glue runs between the motor and the coupling sleeve. The stern tube can now be glued to the hull using cyano, after which a generous fillet of UHU acrylit should be added to ensure that the joint is watertight.

Cut the shaft support (11) from the rectangular-section spruce strip; its purpose is to avoid the stern tube vibrating or oscillating. Trim the support so that it does not distort the stern tube or place it under stress when fitted in the hull. Any gaps can easily be filled with UHU acrylit. **NOTE:** the silicone sleeve forms an excellent shaft coupling, as this model requires little power and the system is virtually silent when operating. If you

prefer, you can glue the coupling sleeve permanently to the motor shaft and the propeller shaft with a drop of cyano, but do be careful to avoid glue running into the bearings, as this would wreck the stern tube and / or the motor.

Glue the RC console (14) in the hull; the position is shown on the plan and in the photo. The picture also shows strips of Velcro (hook-and-loop) tape, Order No. 3368. These strips are used to secure the speed controller and receiver at a later stage. As an alternative the double-sided foam tape supplied in the kit can also be used.



Fig. 2: The interior of the hull with the electric motor installed. The stern tube and coupling sleeve are also in place, as are the rudder and the rudder servo. The shaft support (11) is not shown in this picture.

Turning to the deck: glue the recess rails (17) round the opening in the deck (14). These strips hold the centre deck securely on the sealing tape. Glue two short recess rails (28 mm long) on both sides of the deck opening to fill the gaps. The four transverse rails (18) can now be glued to the deck together with the in-fill piece; their position is shown on plan sheet 2. There is a second, smaller opening in the deck (for access to the tiller); glue four frame rails (19) around this to support the hatch cover. Trim the centre deck (20) to fit in the main deck opening (you may have to trim it slightly), and reinforce it with three transverse rails (21), which are glued in place on edge. Glue the two connecting plates (16) over the joint line; they prevent the deck sagging when it is fitted in the hull. The next step is to glue the deck in place, but not before applying several coats of GLATTFIX sanding sealer, Order No. 207, to all the wooden parts to waterproof the surfaces.

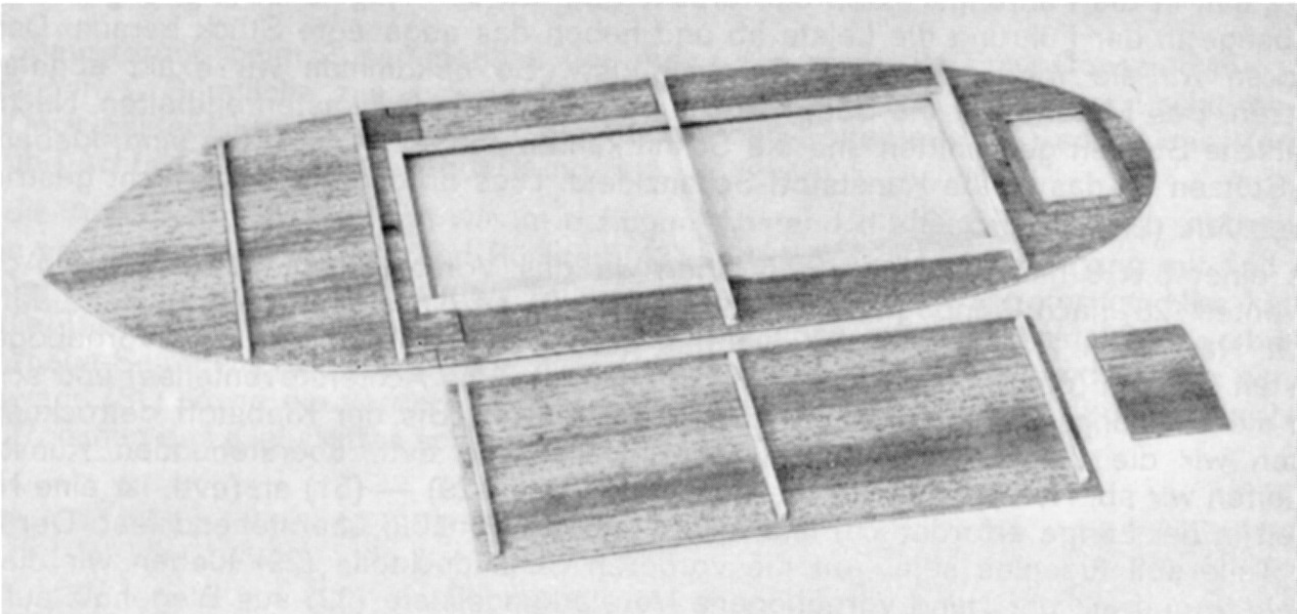


Fig. 3: View of the underside of the assembled deck components, showing the recess rails, the transverse rails and the frame rails.

Round off the outside edge (the joint edge) of the deck using glasspaper and trim it to fit snugly in the hull recess. It should be possible to fit the deck into the recess all round by applying gentle pressure; it may be necessary to trim the outer edge to achieve this. Now apply glue sparingly along the hull recess and fit the deck immediately. To achieve a sound glued joint it is necessary to press the hull against the deck at its widest point; this is done by laying the hull on its side and placing a weight on the wide side. **TIP:** the simplest method of joining the hull to the deck is to place the finished, painted deck in position and then allow thin cyano to run along the joint. If you fit a disposable syringe needle on the cyano bottle, you can apply small amounts of the adhesive exactly where you want them. **IMPORTANT:** the deck should not be glued in place until it is finished and lacquered, otherwise the cyano will penetrate into the wood and cause ugly discoloured patches.

Apply strips of sealing tape (22) under the outside edge of the centre deck, butting the strips accurately to each other (no gaps). The tape should first be slit down the centre to produce strips about 5 mm wide. This seal is designed to prevent spray entering the interior of the hull when the centre deck is in place.

Now mark the position of the holes for the twelve turnbuckles (23). Drill 1.5 mm Ø pilot-holes at the marked points and attach the turnbuckles using the countersunk woodscrews (24); tighten the screws to the point where they can still just be swivelled. The centre deck is held securely in the deck frame when the turnbuckles are rotated. The latches can be painted the same colour as the wood to make them less obvious.

The bulwark stanchions (25) can now be cut to length and glued in place. However, the stanchions on the finished model must be white, and it is important that the dividing line between stanchion and clear lacquered deck is as neat as possible, so it is much simpler to finish the stanchions beforehand: apply GLATTFIX sanding sealer, Order No. 207, to the 400 mm length of spruce strip, then sand the sealer and paint the strip white. Now a set of pieces 12 mm long can be cut off to form the bulwark stanchions (25). The forward eight stanchions should be cut at a slight angle to allow for the rake, but the others should be cut at right-angles. All the stanchions should be exactly the same length, otherwise the rail (flex-wood strip) (26) will not make contact with all of them. We suggest that you prepare a cutting jig as follows: take a wooden strip or board about 100 x 20 mm in size, and pin two strips of wood about 50 x 3 x 2 mm to it, parallel and 3 mm apart (width of the bulwark stanchions). Now use a fretsaw or razor saw to cut through both guide rails, approximately in the centre of the strips, down as far as the base board. Make one cut at right-angles, and a second at a slight angle for the forward stanchions. This saw-cut acts as a guide for the fretsaw blade. Now all you have to do is hammer in a small nail between the guide rails at a distance of 12 mm from the saw-cut to form a "stop" for all the stanchions. Place the white-painted 3 x 2 mm spruce strip in the guide rails, hold it against the stop, saw it off with a fretsaw held in the guide slot, and lift out the sawn-out piece. Push the strip up against the stop again, and repeat the procedure until you have prepared all the stanchions.

This method produces a set of stanchions cut accurately to length. The materials for the saw jig are not included in the kit. When you have cut all the stanchions and sanded all the cut edges, they can be glued to the white plastic bulwark; since this is already the correct colour, it does not need to be painted.

Cut the stem section (27) and the stern section (28) from a strip of 8 x 8 mm spruce strip as shown on plan sheet 2, and glue them to the deck in the appropriate position. When the glue is dry, bend the flex-wood strips (26) to shape by hand to form the handrails, and trim them to fit - the joint in the handrail should be at the centre of the stem section. Cut the strips to length and glue them in place, holding the strips against the hull using spring clamps while the glue hardens. Any excess plastic can be sanded back flush when the glue has cured fully. Trim the bulwark deck sections (29) - (31) (they may need to be trimmed to length), and glue them in place, projecting evenly on both sides. There should be no gap between these parts. Prepare the reinforcing rail (32) by bending the flex-wood in your hands and trimming to length. Glue the rail on the forward bulwark deck sections (29). Carefully cut the posts (33) - (35) from spruce strip and glue them to the deck at the marked points, taking care to keep them exactly vertical. Cut a piece of 8 x 8 mm square spruce strip 27 mm long to make the cleat post (36) and place it on the foredeck. Cut the brace (37) to length and glue it between the posts and the stem section.

The final work on the model's hull is to trim the centre deck (20) to fit in the deck opening. The fit should be as close as possible so that the joint line is not too obvious.

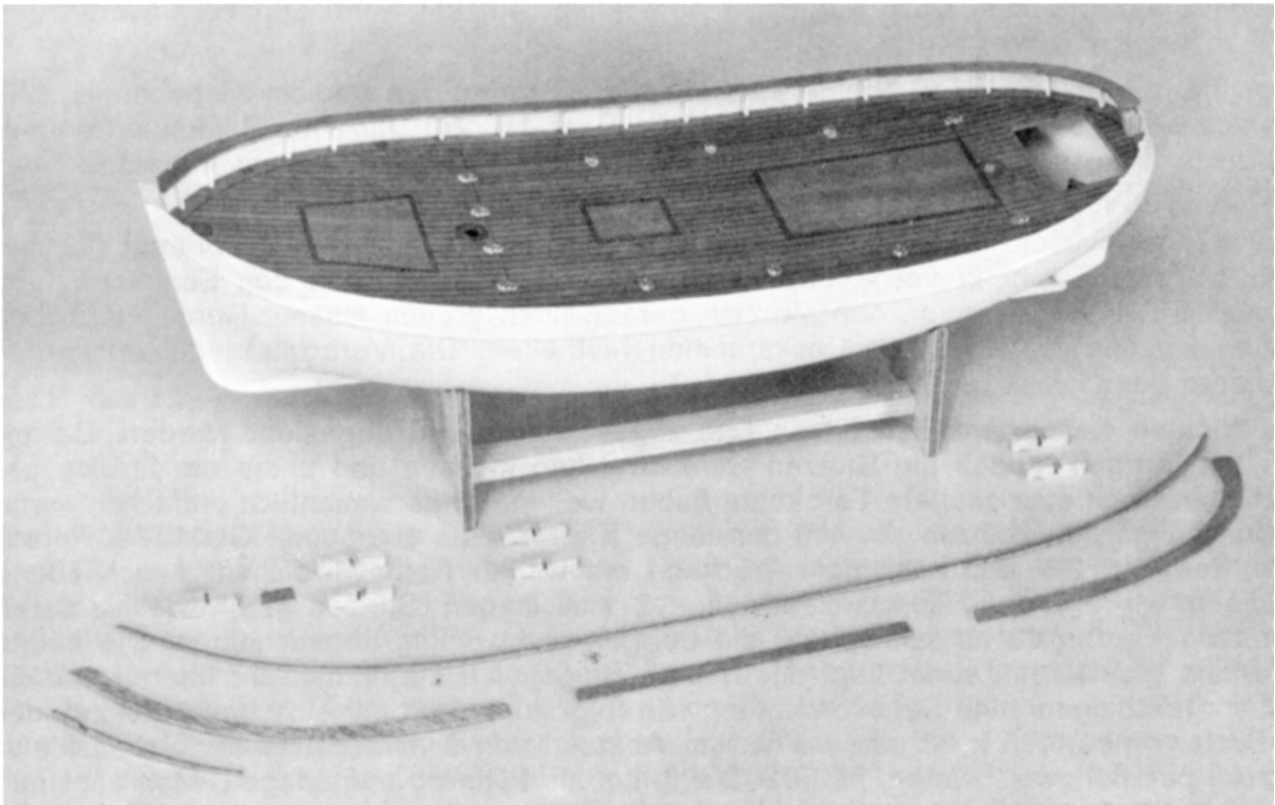


Fig. 4: The deck fitted to the hull, with the bulwark stanchions in place. The bulwark deck sections have been glued to the bulwark on the starboard side. The port bulwark deck components are laid out in front of the boat, together with the mooring posts, ready to install.

The superstructure

You will find an exploded drawing of the superstructure on plan sheet 1; this makes assembly of these parts much easier. All the components should be assembled and painted completely before being glued to the deck. The first step is to glue the forecastle superstructure side panels (38) to the hatch (41), together with the forward part (39) and the aft part (40).

Glue the side panels (42) to the hatch (41), spaced the correct distance apart, and fit the front and rear parts (43) between them. Cover the companionway with part (44). The aft superstructure is assembled in a similar way from parts (45) - (48). The components of the wheelhouse can now be assembled: start by gluing the two wheelhouse side walls (49) to the spacer plates (50), then fit the back panel (51), the front centre wall (52) and the side walls (53), with their edges flush. Allow the glued joints to set hard, then sand all the corners smooth and flush.

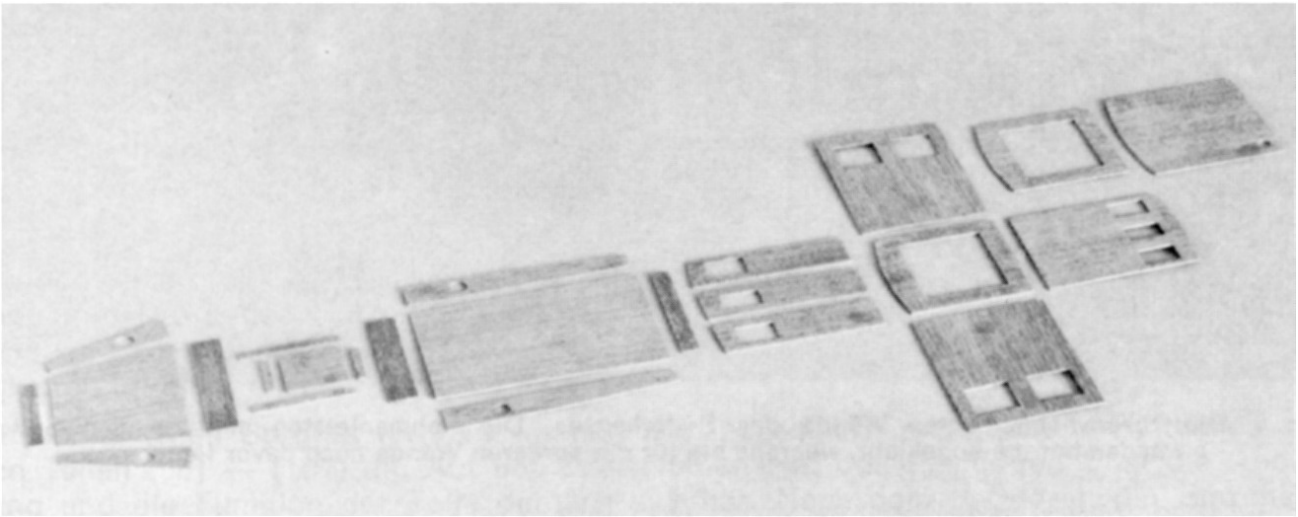


Fig. 5: The main components of the forecastle superstructure, the wheelhouse and the companionway hatch

The frame strips (54) can now be attached to the wheelhouse: first use a pencil to mark the position of the fore-and-aft and transverse strips on the outside of the wheelhouse, referring to the detail drawings of these parts. Now use a sharp knife to cut the corresponding frame strips to the correct width from the 1 mm thick veneer supplied in the kit. Use a steel ruler to guide the knife. Cut the individual strips to exact length (the cuts must be at right-angles) and glue them to the wheelhouse along the marked lines. When the glue has set hard, apply several coats of GLATTFIX sanding seal to the wheelhouse and the deck (55) (it is not glued in place until later). When the sealer has dried, cut the glazing panels (56) to shape as shown on plan sheet 2. Glue the glazing panels in the wheelhouse on the inside, working through the opening in the spacer plate. Be very sparing with the adhesive, as it tends to be squeezed out when the panels are pressed in place, causing unsightly smears on the clear surfaces. The deck (55) can now be glued to the wheelhouse; it should project by an equal amount on all three sides (not at the front). Make the exhaust pipe (57) from a piece of 6 mm Ø beech dowel. Saw out a wedge-shaped piece at the "elbow", and glue it back together at an angle of 30°. When the glue is hard, bevel the top end as shown. The exhaust pipe is glued in the hole in the roof, but not until it has been painted.

Prepare the two mast plinths (58) and (59) and glue them to the deck in the positions shown. Cut the mainmast (60) and the two outrigger booms (61) from the appropriate sizes of beech dowel, and use glasspaper to taper the top ends to the thickness shown.

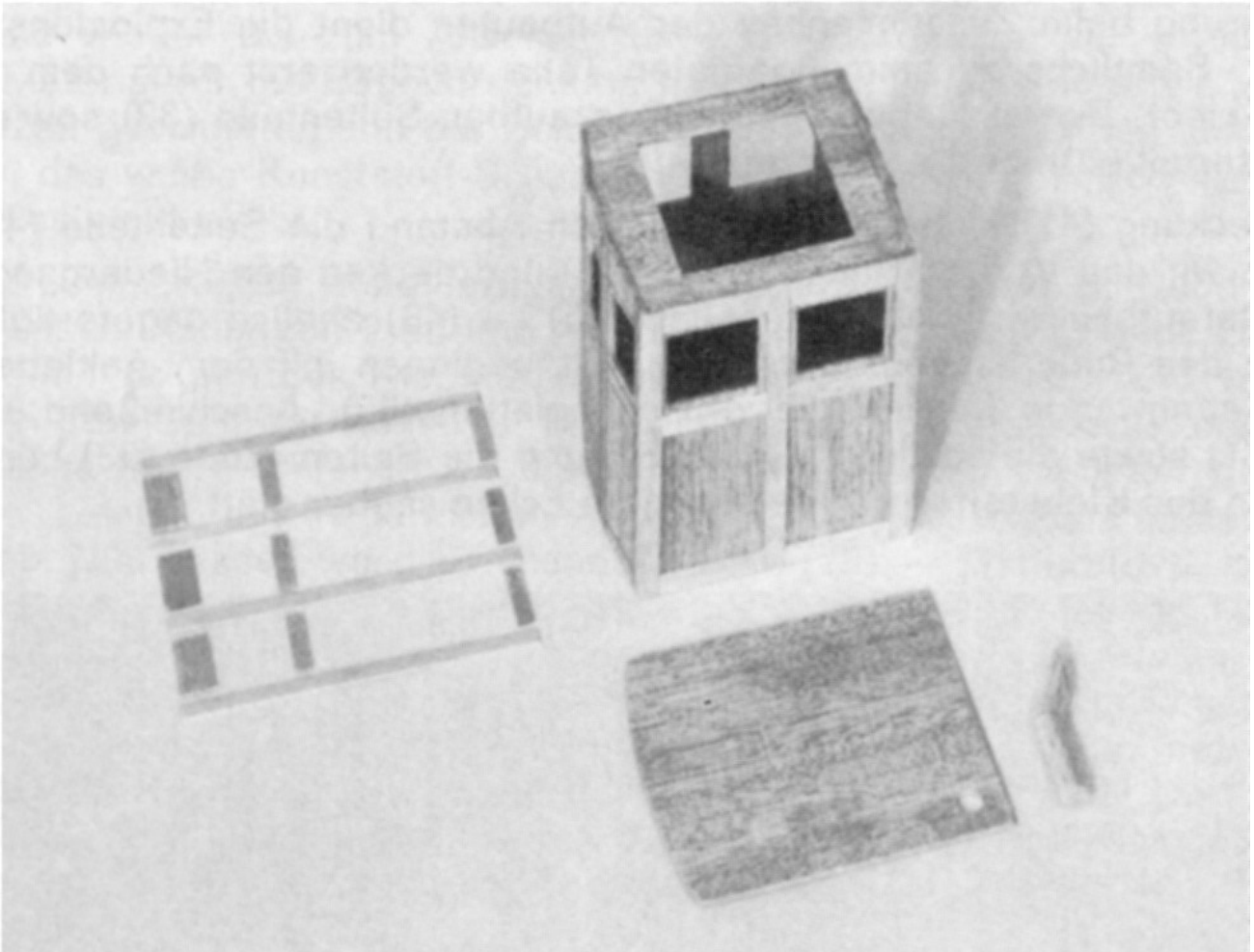


Fig. 6: The assembled basic wheelhouse structure. The frame strips have already been glued to the side walls, while those for the front walls are shown separately.

Prepare the mizzen mast (62) and the boom (63) in the same manner. Drill the holes for the wire rings etc., using 1 and 1.5 mm Ø drill bits as stated on the plan. Make the outrigger fittings (64) from two strips of metal (this material is supplied in the kit; it is also used to make the net bars). Bend four rings (65) from 1 mm Ø brass rod. **Note:** instead of bending wire rings to shape from 1 mm Ø brass rod, 1 mm Ø split pins can be used; an adequate quantity of these is included in the fittings set. When assembling the outrigger fittings solder or glue two rings in place at the same time. The other two rings should be glued in the holes in the top of the mainmast using STABILIT-express or UHU plus. Use the same adhesive to attach the outrigger fitting to the mainmast in the position shown. It is important to observe the position of the rings relative to the holes in the mast. The yard (66), the two lamp platforms (67) and the mast sheave (68) can also be glued to the mast at this stage. Note the correct position of the lamp platforms.

Glue the rings (69) and (70) in the holes in the two outrigger booms. The ring at the bottom must be opened up to the point where it can be connected to the rings of the outrigger fitting when the outrigger booms are mounted on the mainmast. The ring can then be squeezed closed using flat-nose pliers. Glue the ring (71), the mast sheave (72) with the RT rod (73), the yard (74) and the flag gaff (75) to the mizzen mast in the same way. As already described, open up the ring (76) slightly so that it can be connected to the ring on the mizzen mast, and glue it in the 1 mm Ø hole which you have already drilled in the front face of the boom.

The outside of the net is held open by means of a trawl boom (77), at the ends of which the net bars (78) are pivoted in the boom mounting (79). The struts (80) hold the net bars in their curved shape, while the ring (81) is connected to the trawl boom in the centre. Trim the parts carefully as shown on plan sheet 1 and solder or glue them together. The next procedure is to assemble the net winch from parts (82) - (95).

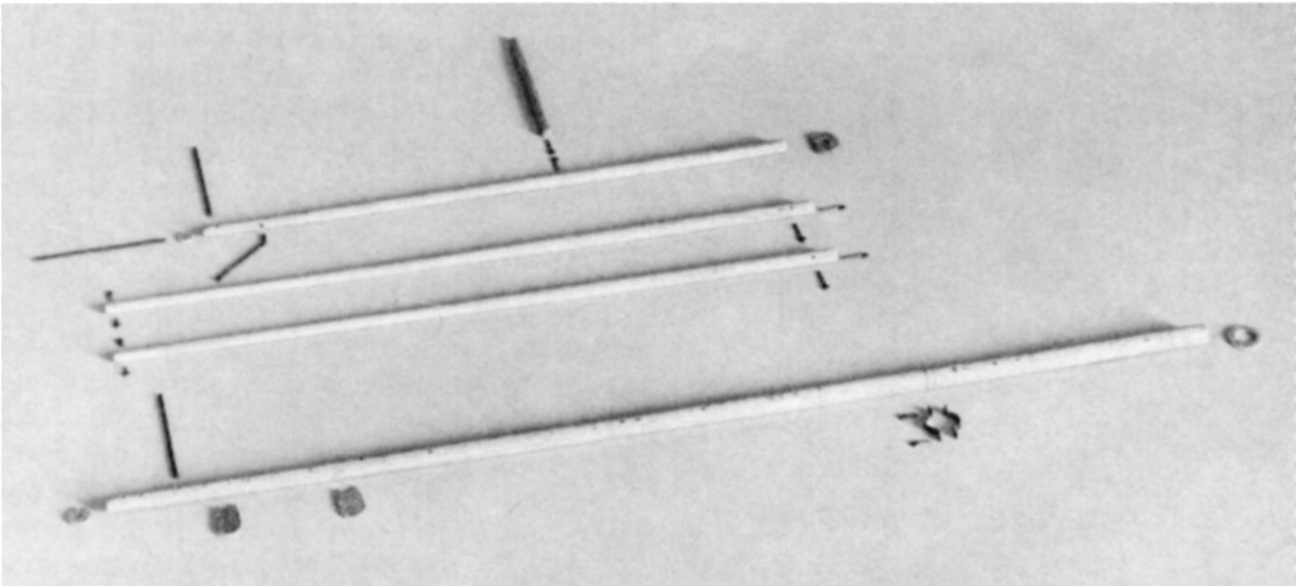


Fig. 7: The dowels and small fittings required for assembling the main mast, the outrigger booms, and the mizzen mast

Some wooden winch components have to be glued together with their edges flush to form a double thickness, but all the “difficult” parts are supplied injection-moulded in plastic, so you should have no major problems in assembling the net winch.

The mechanically powered vibrating strainer can now also be assembled from parts (96) - (107); this also calls for a certain degree of care. The three-view drawing on plan sheet 1 shows the arrangement and the function of the parts clearly. When the components have been prepared and painted, glue pieces of net (supplied in the kit) to the underside of the strainer frames using UHU hart. The toplight is assembled from parts (108) - (111). Paint a grey area on each side of the hatch before fitting the guard components (111) in the pre-drilled holes; they represent the glazed section of the toplight. Glue the sides (112) and the transverse parts (113) of the hatch box to the hatch cover (114). Leave the glue to set hard, then sand the top surfaces smooth using glasspaper. The hatch box is eventually glued permanently to the centre deck, but only after the model has been painted.

The full-size vessel carries a boiler which is used to scald the shrimps after they have been caught, and our model also features just such a boiler. The boiler container (115) is supplied as a vacuum-moulded plastic part. Use a pair of scissors to cut off the outer ring and the bottom flange at the height stated on the plan, and file the cut edges straight. Glue the wooden bottom (116) in the boiler container. Cut the boiler chimney (117) from a piece of beech dowel, and saw two channels at the top end in the form of a cross, leaving four narrow lugs. Now cut the cover to shape from paper, using the template shown on the plan, and glue the edges together to form a cone. Place the conical cover on the lugs of the boiler chimney. Drill holes in the boiler container for the chimney and for the handles (118); the latter are bent to shape from brass wire and glued in the holes. The boiler has to stand vertically on the deck, and this is achieved by gluing angled plinths (119) to the bottom of it. The shrimps are shaken in the strainer frames, which are mounted in a stand, in order to cool them. This stand can now be made for our model. Drill four 1 mm Ø holes in each of the stand supports (120).

Glue the former (121) between two stand supports at the top end, and fit the supports (122) in the holes; the supports are made from brass rod, and should end flush with the outside. Cut the fore-and-aft strips (123) to a length of 30 mm, and glue them between the stand supports. The stand is covered by the plate (124). Cut four strainer frames (125) from 2 x 2 mm spruce strip, bevel the outside edge slightly, apply a coat of GLATTFIX sanding sealer to them and glue a piece of shrimp netting to the underside of each when the sanding sealer has dried.

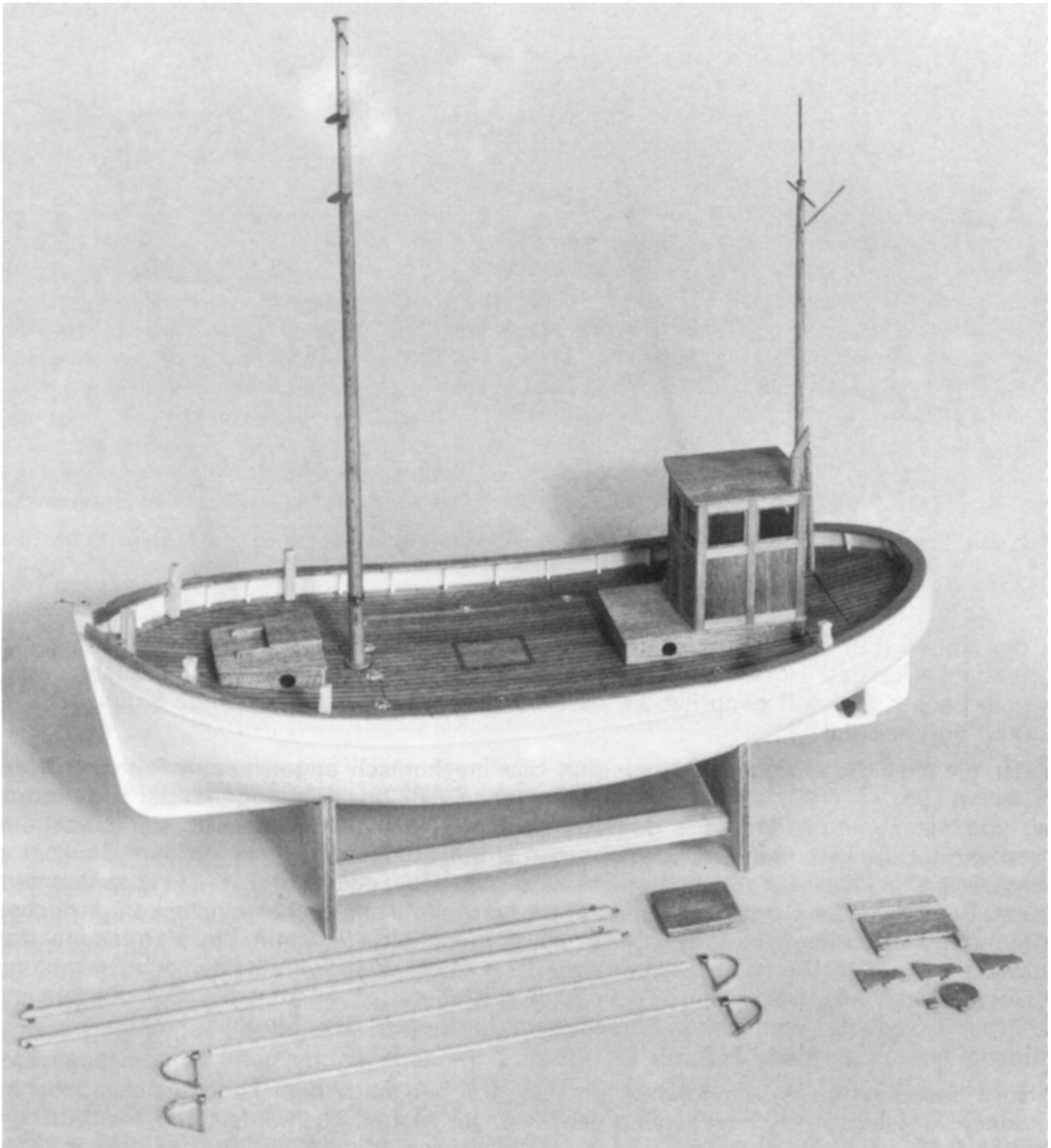


Fig. 8: View of the model showing the completed superstructure assemblies. The components of the trawl booms and the net winch are laid out in front of the boat.

The boatstand

The wood required to make the stand is included in the kit. Simply fit the four parts (1a + 1b + 2 x 1c) together and glue the joints. When the glue has set hard, sand the boatstand overall using 120-grit abrasive paper and apply several coats of GLATTFIX sanding sealer. When the sealer is dry sand all the surfaces again using 320-grit abrasive paper. Now the stand can be painted in the colour scheme of your choice (**NOTE**: check first that the paints are compatible). Glue a thin strip of felt or foam on the inside of the hull supports, i.e. the contact surfaces; these strips should stop short of the keel, otherwise the hull will not fit in the stand.

Painting

- We suggest that you ask your model shop or local paint supplier for advice on choice of paints.
- Use **ONLY** paints of the same **type**, made by the same **manufacturer**, otherwise they might react and attack each other or cause bubbles. Be particularly careful if you intend to combine spray-can paints with

brushing types; always carry out an experiment on a scrap piece of material to ensure that the paints are compatible with each other.

- To ensure that the paint adheres strongly it is essential to rub down the surfaces beforehand using fine-grit wet-and-dry paper (600 to 800-grit). Remove all traces of grease from the surfaces using methylated spirit ("meths") or a non-greasy cleaning agent. **NOTE:** an already painted surface which is to be over-painted must not be cleaned with meths, as this would attack the existing paint. Try not to touch the surfaces again before painting, as the sweat on your skin contains grease which could again prevent paint adhesion.
- The wooden surfaces which are not stained or exposed should be given several coats of sanding sealer (e.g. GLATTFIX, Order No. 207) or clear lacquer (e.g. HYDRO-AEROFIX, Order No. 926.1) to prevent them absorbing water.
- If you are spraying the paint, it is essential to mask out all areas which are not to be coated using masking tape or paper. Seal all openings at the same time, as the fine paint mist will penetrate into any opening, no matter how small.
- Read and observe the instructions supplied with the paints.
- Before you start construction please consider how and in what order you will paint the model, as some areas and components will be difficult or even impossible to paint once installed permanently on the model.

Staining the wooden parts

- The wooden parts of the superstructure can be coloured using teak stain. One suitable product is CLOU 2528 Teak, which is available from builders' merchants. Apply the stain as directed, but do check first that it is compatible with the clear lacquer you are using (**TIP:** check the stain on some scrap wood beforehand).
- Avoid sanding stained wooden parts wherever possible, as there is a danger that you will sand through the coloured surface. Re-applying the stain alters the depth of colour locally, and tends to produce patchy results.
- Please note that wooden parts already soaked with glue or paint cannot be stained! The wooden parts must be stained before gluing them in place or together.
- For example, where frame strips are to be glued to wooden walls, we recommend that you cut and prepare all the strips, stain them, finish them with clear lacquer, and only then glue them in place.
- We recommend that you finish the stained wooden parts using semi-matt clear lacquer, as this looks more realistic on the completed model than a glossy finish.

Colour scheme

To help you select the correct hues the table below states the colours using standardised RAL names and numbers. You can take this information to any specialist paint supplier, who will then be able to supply the correct colours. We recommend matt or semi-matt synthetic enamels. The colours listed below are our recommendation for a realistic model, as they are typical of the shrimping cutters in regular use today. Of course, you can also use any other colours you like, or adopt the classic scheme shown in the kit box illustration. **TIP:** the lamp housings should be painted on the outside, the clear parts of the lamps on the inside; this preserves the apparent depth of the glazed sections.

Suggested colour scheme

Exposed hull:	Brown ochre RAL 8001, light blue RAL 5012 or graphite black RAL 9011
Submerged hull:	Red oxide RAL 3009
Bridge and superstructure, bulwark handrail:	Soil brown RAL 8003 or teak stain
Masts:	Sand yellow RAL 1002
Winches, shrimp boiler, dry strainer, vibrating strainer, weight pulleys, bridge roof, toplight forward of bridge:	Agate grey RAL 7038
Mast peaks:	White RAL 9016
Navigation lamp housings:	Fire red RAL 3000 (port), signal green RAL 6032 (starboard)
Lens of upper panoramic lamp (132):	Signal green RAL 6032
Lamp housings generally, navigation lamp brackets, exhaust:	Slate grey RAL 7015
Lifebelt:	Fluorescent orange RAL 2005

Fitting the remaining parts

Install the portholes (126) in the positions shown, using the glue very sparingly. The searchlight (127) and the two navigation lamps with their brackets (128) are fitted on the roof of the wheelhouse. A working lighting system can be fitted, but the details of the installation are left up to the builder. The lifebelt (129) should be glued to the front wall of the wheelhouse. Glue the masthead lantern (130) to the top of the mainmast (use the glue sparingly), and the stern lantern (131) to the mizzen mast below the boom. The panoramic lamps should be attached to the appropriate platforms on the top section of the mainmast. Use UHU hart to glue the ten cleats (133) in place as follows: two on the cleat post (36), two on the mainmast (60) approximately 25 mm above the deck, two on the front wall of the aft superstructure (46), two on the side of the wheelhouse (49), one on the stern section (28) and one on the mizzen mast (62), approximately 35 mm above the deck. Bend the rings (134) from the brass wire supplied (or use the split pins included in the Fittings Set). Drill 1 mm Ø holes for them and glue them in place using STABILIT-express. The exact position of the rings is shown in the plan view on plan sheet 1.

Applying the waterslide transfers

Cut out the individual name placards from the decal sheet and place them one at a time in water for about thirty seconds. The transfer can then be lifted from the water and slid over the edge of the paper and onto the boat. The waterslide transfers should not be left in the water for too long, as this would dissolve the adhesive on their rear face, and prevent them adhering properly.

The TÖN 12 name placards are applied to the bow of the cutter on both sides, and the name placard KRABBE to the stern.

The rigging

Start by attaching the blocks (135) to the appropriate rings on the mizzen mast and the end of the boom. They can be tied in place using sewing thread (not included in the kit); the alternative is to form small rings with an I.D. of about 2.5 mm from 1 mm Ø brass wire, and use them to attach the blocks. Cut the chain (136) to the length shown in the drawing, and attach it to the trawl boom and the towing bars. Attach a length of 1 mm Ø thread to the stock anchor (137) to represent the anchor rope (138). Coil up the loose end of the anchor rope and glue it to the deck. The anchor itself fits in the recess in the reinforcing rail (32). Bend six chain plates (139) to shape from 1 mm Ø brass wire, and attach the shrouds (140) using the bottle screw (141). Drill holes in the bulwark deck and the main deck, then open up the loop of the chain plate slightly, connect a bottle screw to it and close the ring again. The chain plates can then be glued in place using STABILIT-express. Slip the shroud ropes through the holes in the masts with half their length on each side, wrap one end round the mast and back through the hole again, so that it passes through the hole twice (four times on the mainmast, because there are two shrouds). Now run the ends down to the bottle screws and thread the rope through the ring. Wrap the loose end of the tensioned shroud rope through the ring about three times, and secure it by smearing with a little glue. Attach two bottle screws to the rings at the stem, run a length of 0.7 mm Ø thread (142) through one bottle screw, then up to the transverse hole in the mainmast and down again on the other side to the ring of the second bottle screw. The ends are again wrapped round and held with glue, as described for the shrouds.

The next step is to bend six hooks (144) from brass wire, as they are required for the following stages. Attach a mizzen stay (143) to one hook, connect the hook to the ring which is fitted to the wheelhouse roof, run the thread through the transverse hole in the mizzen mast and twist the end. The mizzen stay and other ropes are disconnected by means of these hooks when the centre deck and superstructure have to be removed. Attach a length of 0.5 mm Ø thread to the rear end of the mizzen boom, run it through the block on the mizzen mast and belay (secure) the mizzen lift (145) to the cleat. The boom should be approximately horizontal. Run the mizzen boom sheet (146) from the ring on the aft bulwark deck through the block on the mizzen boom and back down to the cleat, where it is belayed. The ring is also the starting point for the flag halyard (147), which runs up to the flag gaff and on to the RT rod at the masthead. Glue the Federal German flag in the position shown.

Run a length of thread from the two ends of the mainmast yard to the mizzen mast to represent the RT aerial, and tie two pieces of thread approximately to the centre of the aerial to form the downleads (149). Tie a hook to the bottom end of both downleads, and connect it to the ring on the wheelhouse roof. Cut a piece of thread about 900 mm long and thread it through the upper transverse hole in the mainmast with half its length on each side. Wrap each end separately round the mast and thread it through the same hole again. Run one end to the port outrigger boom and the other end to the starboard outrigger boom, then through the upper block and back to the block on the mast. Tie a hook to each end of the rope (outrigger boom lift) (150). The two tackles (151) run from the ring on the hatch cover through a block (the hook is connected to the ring on the block) and down to the cleat, where the rope end is belayed.

The next stage is to prepare the two shrimping nets. Each net is sewn up from two pieces to form a funnel shape. Start by cutting card templates for the inner and outer net panels as shown on plan sheet 1. Lay out the whole net fabric, as supplied in the kit, on the workbench, tension it evenly and pin it to the building board. Place the templates on the net and mark the panel outlines using a soft pencil. Take care to arrange the templates so that all four panels can be cut out of the one piece. Cut out the net panels using a pair of scissors. The full-size nets look well-used and weathered, and a similar appearance can be achieved by staining them. The stain is prepared by pouring about 25 ml of UNIVERSAL thinners, Order No. 922, into a small container, adding about 10 drops of waterproof black ink to the thinners, and mixing well. Press the individual net panels into this liquid, pull them out again and lightly dab them to remove excess fluid before leaving them to dry thoroughly in the air. The sketch shows how the net panels are sewn together using thin thread. During the sewing process a 0.7 mm Ø reinforcing rope should be incorporated into the seam and the open edges of the net. Fit a small loop about 3 mm long at the marked corners of the net (I) and (III). The net is left open at the narrow end (of III). When the sewing is complete, the pulley chain can be prepared: first cut the chain to the correct length (from point II to II) and thread the pulleys (wooden beads) onto it. The hole in the pulleys should be the same as the diameter of the chain, which is 1.5 mm; you may need to open up the holes slightly in some of the pulleys. A length of thread is used to pull the chain through the pulleys: slip the thread through the first link of the chain, hold both ends of the thread and fit them through the hole in a pulley. Now pull on the thread to draw the chain through the hole. Each pair of pulleys should be spaced about one chain link's length apart. With all the pulleys on the chain, the chain can be attached to the bottom edge of the net. The pulleys of the full-size vessel are made of metal with a wood cladding, and their purpose is to keep the bottom of the net open when fishing. There are two possible methods of attaching the pulley chain to the edge of the net, and the sketch shows both of them: the first version uses chain links connected to the reinforcing rope on the edge of the net; this is similar to the method used on the full-size vessel, but it represents a lot of work. The alternative is to sew the pulley chain in place using thread. With both nets completed, they can be fixed to the holes in the net bars attached to the trawl boom using thin thread. The net edges should be under tension, while the edge with the pulleys should hang loosely. The net can now be attached to the trawl boom by the topmost link of the chain. The net halyard (152) runs through the upper block on the outrigger boom, then to the bottom block, where it is fitted to the lateral ring (69), and on to the block on the deck. From that point route the net halyard to the cleat glued to the mainmast and belay the end there.

The two forehauls (153) can now be tied to the topmost end of the outrigger booms. Thread the ends through blocks attached to the rings on the deck. At the bow belay the forehaul to the cleat which is mounted on the cleat post; at the stern belay it to the rear post. As you would expect, the forehauls are fitted to both sides of the boat. The top end of the trawl boom forehauls (154) are attached to the hole in the net bar. Fix the forward forehaul to the forward net bar, run the bottom end through the block on the deck and belay it to the forward post. The rear forehaul is attached to the aft net bar, while the bottom end is routed through a block on the deck and belayed to the central post. All the ropes should be under light tension.

Finally the net opener halyard (155) can be tied in place: tie a length of 0.5 mm Ø thread to a loop in the narrow open end of the net, and run it through the other loop on the same end of the net. Run the thread up again to the block attached to the ring on the mainmast. Pull the end of the net up until it is about 150 mm above the deck. At a point about 220 mm from the block tie a small loop in the end of the net opener halyard. Tie approximately 230 mm of thread to a hook (144) and connect the hook to the loop you have just prepared. Wrap the loose end about three times round the small capstan head on the winch. From there the rope runs onward to the cleat on the wheelhouse where it is belayed. All the loose rope ends should be coiled up and glued to the deck. This is a rather difficult task, so we recommend the following procedure: apply glue to a piece of paper, lay the end of the rope on it and coil it round starting from the inside, until you reach the end of the rope, pressing each turn down into the glue. When the glue has set hard cut off the excess paper neatly using a pair of scissors and glue the completed coils to the deck. These little details are important, as they help the SHRIMPING CUTTER to look impressively realistic; they also contribute to the feeling of pleasure when you survey the results of all your labour.

Installing the RC components

The actual RC plan is included in the main plan and shows the positions of the receiving system components for the basic running functions, as well as the accessories for the optional working systems which can be installed on the TÖN 12 shrimping cutter. The procedures for fitting the RC components and producing the parts are only sketched in; this boat is not intended for the beginner to marine modelling, so we assume that the builder is familiar with these processes.

- Please note that the RC plan is just a recommendation for the location of the RC components, and also for the components we suggest you use. There is no reason why you should not install different components to control the boat's basic running functions.

- The motor and the rudder servo should be fitted in heat-shrink sleeves and the sleeves glued in the hull. This is a simple and effective method of servo mounting; see the photo in the instructions. If you prefer, and if you wish to swap servos between models, a servo mount can easily be made from scrap wood. However, please be sure to use a very small servo.
- Make up the rudder pushrod from the 1.5 mm Ø steel rod as shown on the plan and in Fig. 2. Bend one end at 90°, connect the angled end to the tiller and secure it with a retaining clip. The pushrod connector should be mounted on the output arm of the rudder servo: drill out one of the holes in the output arm to 2 mm Ø, push the connector through it and secure it on the underside with an M2 plastic nut. Check that the connector swivels smoothly, then fit the M3 grubscrew in the top of the barrel. Slip the rudder pushrod through the pushrod connector, set the servo and rudder to centre and secure the pushrod in the connector by tightening the grubscrew. If there is a height difference between servo and tiller, compensate for this as shown on the plan.
- For this model we have deliberately selected a motor which provides more thrust than is available to the full-size vessel. This provides a useful reserve of power should the boat get into a critical situation. For a scale running speed we recommend replacing the propeller with Order No. 2307.25.
- The other RC components such as receiver, speed controller and batteries can be fixed in the model using Velcro (hook-and-loop) tape (e.g. Order No. 3368), or the double-sided foam tape supplied in the kit. It is particularly important to secure the heavy drive batteries well, as the boat could capsize if they were to shift and alter the Centre of Gravity. We strongly recommend the use of Velcro tape with the batteries, as this makes it easier to remove them from the model for charging.
- As far as possible the model's all-up weight should not exceed 1.5 kg, and the boat's CG should be as low as possible. This means: no heavy components above the waterline.
- If the model does not "sit" correctly in the water, your first resort should be to re-position the drive batteries until its attitude is more or less correct. If this is not sufficient, or if the boat floats too high in the water, install ballast in the form of lead sheet in the lowest part of the hull. To be on the safe side, you should test the completed model by holding it at an angle of heel of around 30°. When you release it from this attitude, the boat must be capable of righting itself easily, and without oscillating from side to side.
- If you intend to fit a working lighting system it is important to plan the installation at an early stage, and preferably before you start building the model. It is virtually impossible to install such a system in a finished model.
- If you install a working lighting system we recommend that you use RC switches (e.g. Order No. 3294) to switch the system on and off. Select the lightest switches you can find.

Maiden run

Charge the batteries and check that the model's working systems operate correctly. Carry out a range check. Wait for a day with as little air movement as possible, then you can safely launch the boat on its maiden voyage. Allow yourself plenty of time to get used to the boat's handling characteristics; run the model slowly and cautiously until you feel confident and familiar with its control response.

We hope you have many hours of pleasure building and running your model of the TÖN 12.

Parts list - Shrimping Cutter

Part No.	Description	No. off	Material	Size in mm
1	Hull	1	Plastic	Vac. moulded
1a	Front boatstand support	1	Birch plywood	4.0, as plan
1b	Rear boatstand support	1	Birch plywood	4.0, as plan
1c	Boatstand connecting piece	2	Birch plywood	4.0, as plan
2	Stern shell	2	Plastic	Vac. moulded
3	Rudder shell	2	Plastic	Vac. moulded
4	Rudder shaft	1	Brass	3 Ø x 75
5	Rudder bush	1	Brass	4 / 3.05 Ø x 16
6	Tiller	1	Plastic	Ready made
7	Gusset	2	Birch plywood	1.8, as plan
8	Heat-shrink sleeve	1	Ready made	To suit motor length
9	Propeller shaft and bush	1	Ready made	
10	Shaft bracket	1	Ready made	
11	Shaft support	1	Spruce	22 x 6 x 6
12	Shaft coupling		Silicone tube	4.5 / 1.5 Ø
13	Propeller	1	Ready made	Ø
14	RC console	1	Birch plywood	4.0, as plan
15	Deck	1	Birch plywood	1.8, as plan
16	Connecting plate	2	Birch plywood	1.8, as plan
17	Recess rail	6	Lime	750 x 6 x 3 overall
18	Transverse rail	4	Spruce	650 x 5 x 3 overall
19	Frame rail	4	Birch plywood	208 x 6 x 1.6 overall
20	Centre deck	1	Birch plywood	1.8, as plan
21	Transverse rail	3	Spruce	270 x 5 x 3 overall
22	Self-adhesive sealing tape	1	Plastic	340 long
23*	Turnbuckle	12	Plastic	Ready made
24*	Countersunk woodscrew	12	Plated brass	2.7, DIN 97
25	Bulwark stanchion	30	Spruce	400 x 3 x 2 overall
26	Handrail	2	Flex-wood	550 x 2 x 2
27	Stem section	1	Spruce	30 x 8 x 8
28	Stern section	1	Spruce	15 x 8 x 8
29	Forward bulwark deck	2	Birch plywood	1.8, as plan
30	Centre bulwark deck	2	Birch plywood	1.8, as plan
31	Aft bulwark deck	2	Birch plywood	1.8, as plan
32	Reinforcing rail	2	Flex-wood	90 x 5 x 2
33	Forward post	2	Spruce	32 x 6 x 6
34	Centre post	2	Spruce	32 x 6 x 6
35	Aft post	2	Spruce	32 x 6 x 6
36	Cleat post	1	Spruce	27 x 8 x 8
37	Brace	1	Birch plywood	1.8, as plan
38	Forecastle superstructure side panel	2	Birch plywood	1.8, as plan
39	Forecastle superstructure front panel	1	Birch plywood	1.8, as plan
40	Forecastle superstructure rear panel	1	Birch plywood	1.8, as plan
41	Hatch	1	Birch plywood	1.8, as plan
42	Side panel	2	Birch plywood	1.8, as plan
43	Front and rear sections	2	Birch plywood	1.8, as plan
44	Companionway hatch	1	Birch plywood	1.8, as plan
45	Aft superstructure side panel	2	Birch plywood	1.8, as plan
46	Aft superstructure front panel	1	Birch plywood	1.8, as plan
47	Aft superstructure rear panel	1	Birch plywood	1.8, as plan
48	Hatch	1	Birch plywood	1.8, as plan
49	Wheelhouse side panel	2	Birch plywood	1.8, as plan
50	Spacer plate	2	Birch plywood	1.8, as plan
51	Back panel	1	Birch plywood	1.8, as plan
52	Front centre wall	1	Birch plywood	1.8, as plan
53	Front side panel	2	Birch plywood	1.8, as plan
54	Frame strip	44	Birch plywood	1, as plan
55	Wheelhouse roof	1	Birch plywood	1.8, as plan
56	Glazing	6	Celluloid	0.5, as plan

57	Exhaust pipe	1	Beech dowel	40 x 6 Ø
58	Mainmast plinth	1	Birch plywood	1.8, as plan
59	Mizzen mast plinth	1	Birch plywood	1.8, as plan
60	Mainmast	1	Beech dowel	440 x 8 Ø
61	Outrigger boom	2	Beech dowel	300 x 6 Ø
62	Mizzen mast	1	Beech dowel	255 x 6 Ø
63	Boom	1	Beech dowel	70 x 4 Ø
64	Outrigger fitting	2	Brass sheet	20 x 3 x 0.5
65	Ring	4	Brass wire	12 long (1138.1)
66	Yard	1	Plated steel	50 long (1004.1,5)
67	Lamp platform	2	Birch plywood	1.8, as plan
68	Mast sheave	1	Birch plywood	1.8, as plan
69	Ring	4	Brass wire	12 long (1138.1)
70	Ring	4	Brass wire	10 long (1138.1)
71	Ring	1	Brass wire	12 long (1138.1)
72	Mast sheave	1	Birch plywood	1.8, as plan
73	RT rod	1	Plated steel	55 long (1004.1,4)
74	Yard	1	Plated steel	50 long (1004.1,4)
75	Flag gaff	1	Plated steel	37 long (1004.1,4)
76	Ring	1	Brass wire	12 long (1138.1)
77	Trawl boom	2	Beech dowel	240 x 3 Ø
78	Net bar	4	Brass sheet	50 x 3 x 0.5
79	Boom mounting	4	Brass tube	3 long (1004.1,4)
80	Strut	4	Plated steel	21 long (1004.1,4)
81	Ring	2	Brass wire	12 long (1138.1)
82	Baseplate (2-part)	1	Birch plywood	1.8, as plan
83	Side panel	2	Birch plywood	1.8, as plan
85	Support plate	1	Birch plywood	1.8, as plan
86	Gearbox (2-part)	1	Birch plywood	1.8, as plan
87	Drive box (2-part)	1	Birch plywood	1.8, as plan
88	Shaft	1	Brass rod	62 long (1138.2)
89*	Winch drum	2	Plastic	Ready made
90*	Capstan head	2	Plastic	Ready made
91	Shaft	1	Brass rod	62 long (1138.1)
92*	Capstan head	2	Plastic	Ready made
93	Shaft	1	Brass rod	50 long (1138.2)
94	Crank	2	Brass rod	18 long (1138.1)
95	Clutch lever	2	Brass rod	22 long (1138.1)
96	Vibrating strainer baseplate	1	Birch plywood	1.8, as plan
97	Frame	8	Spruce	220 x 3 x 2 overall
98	Corner piece	2	Birch plywood	1.8, as plan
99	Strainer frame	2	Birch plywood	1.8, as plan
100	Frame strip	8	Spruce	324 x 3 x 2 overall
101*	Ring	8	Split pin	Ready made
102	Guide rail	4	Brass rod	60 long (1138.1)
103	Shaft	1	Plated steel	40 long (1004.1,4)
104	Eccentric wheel (2-part)	1	Birch plywood	1.8, as plan
105*	Drive wheel	1	Wood	From 1131
106	Pushrod	2	Brass rod	65 long (1138.1)
107	Pin	1	Brass rod	6 long (1138.1)
108	Toplight side panel	2	Birch plywood	1.8, as plan
109	Former	2	Birch plywood	1.8, as plan
110	Cover	2	Birch plywood	1.8, as plan
111	Guard	10	Brass rod	10 long (1138.1)
112	Side panel	2	Birch plywood	1.8, as plan
113	Transverse panel	2	Birch plywood	1.8, as plan
114	Cover	1	Birch plywood	1.8, as plan
115	Boiler container	1	Plastic	Vac. moulded
116	Base	1	Birch plywood	1.8, as plan
117	Boiler chimney	1	Beech dowel	50 x 4 Ø
118	Handle	2	Brass rod	16 long (1138.1)
119	Plinth	2	Birch plywood	1.8, as plan
120	Stand support	4	Spruce	126 x 2 x 2 overall

121	Former	2	Birch plywood	1.8, as plan
122	Support	8	Brass rod	25 long (1138.2)
123	Fore-and-aft strip	4	Spruce	120 x 2 x 2 overall
124	Cover	4	Birch plywood	1.8, as plan
125	Strainer frame	16	Spruce	410 x 2 x 2 overall
126*	Porthole	4	Plastic	From 305.1
127*	Searchlight	1	Ready made	From 353.2
128*	Navigation lamp and bracket	Pair	Plastic	372
129*	Lifebelt	1	Plastic	From 300.3
130*	Masthead lantern	1	Plastic	From 373
131*	Stern lantern	1	Plastic	From 373
132*	Panoramic lamp	2	Plastic	From 481
133*	Cleat	10	Plastic	From 2502
134	Ring	17	Brass rod	12 long (1138.1)
135*	Block	24	Plastic	From 322
136*	Chain	6	Brass	1500 long (1369)
137*	Stock anchor	1	Plastic	From 336.2
138	Anchor rope	1	Thread	1 Ø
139	Chain plate	6	Brass rod	30 long (1138.1)
140	Shroud	6	Thread	0.7 Ø
141*	Bottle screw	8	Plastic	From 444
142	Forestay	2	Thread	0.7 Ø
143	Mizzen stay	1	Thread	0.5 Ø
144	Hook	6	Brass rod	15 long (1138.1)
145	Mizzen lift	1	Thread	0.5 Ø
146	Sheet	1	Thread	0.5 Ø
147	Flag halyard	1	Thread	0.5 Ø
148	RT aerial	2	Thread	0.5 Ø
149	Downlead	2	Thread	0.5 Ø
150	Outrigger boom lift	2	Thread	0.5 Ø
151	Tackle	2	Thread	0.5 Ø
152	Net halyard	2	Thread	0.5 Ø
153	Outrigger boom forehaul	4	Thread	0.5 Ø
154	Trawl boom forehaul	4	Thread	0.5 Ø
155	Net opener halyard	2	Thread	0.5 Ø

Note: items marked with an asterisk (*) are ready-made parts. They are not included in the kit, but are available in the Fittings Set under Order No. 434.

As plan: please refer to the plan for actual size.

Total thread length:	1 mm Ø	approx. 0.3 m
	0.7 mm Ø	approx. 5 m
	0.5 mm Ø	approx. 5 m

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

- 6 x round-head woodscrews, 2 x 7 mm, plated brass, DIN 96, for mounting the motor and shaft bracket
- 1 x net (net curtain material), approx. 100 x 33 cm
- 80 x weighted pulleys (wooden beads), 6 x 4 mm, bored 1.5 mm
- 1 x waterslide transfer sheet, KRABBENKUTTER
- 1 x Federal German flag, 25 x 15 mm

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

- 1 x SPEED 280 electric motor, Order No. 6328
- 2 x GRAUPNER ECO-POWER 4N-2100 RC drive batteries, Order No. 2478
- 1 x C 261 rudder servo, Order No. 5125.LOSE

At the builder's discretion other small servos can be used. Minimum rated torque approx. 10 Ncm

- 1 x G2 parallel lead, Order No. 3061
- 1 x MICRO SPEED 10 electronic speed controller, Order No. 2736
- 1 x Velcro (hook-and-loop) tape, Order No. 3368
- 1 x copper flex, 2m, Order No. 3071
- 1 x G2 connector system, Order No. 2989

Radio control system

- 1 x X-306 FM radio control set, Order No. 4709

or

- 1 x mc-12 radio control set, Order No. 4725

Other Graupner/JR 40 MHz FM radio control systems may also be used.

Key to stripwood and metal rod - SHRIMPING CUTTER

No. off	Material	Dimensions in mm	Required for part
3	Shaped lime strip	320 x 6 x 6	17
2	Spruce	500 x 2 x 2	120, 123, 125
2	Spruce	500 x 3 x 2	25, 97, 100
2	Spruce	500 x 5 x 3	18, 21
1	Spruce	250 x 6 x 6	11, 33, 34, 35
1	Spruce	100 x 8 x 8	27, 28, 36
2	Flex-wood	550 x 2 x 2	26
1	Flex-wood	200 x 5 x 2	32
1	Beech dowel	500 x 3 Ø	77
1	Beech dowel	150 x 4 Ø	63, 117
3	Beech dowel	300 x 6 Ø	57, 61, 62
1	Beech dowel	500 x 8 Ø	60
4	Brass rod	500 x 1 Ø	65, 69, 70, 71, 76, 81, 91, 93, 94, 95, 102, 103, 106, 107, 111, 118, 122, 134, 139, 144
1	Brass rod	200 x 2 Ø	4, 88
1	Plated steel rod	500 x 1.4 Ø	66, 74, 75, 80, 103

This table indicates the parts for which the strip and rod supplied in the kit are required. All sizes are stated slightly oversize.