

Assembly instructions for the MANHATTAN 74 model boat, Order No. 2099

The model

Sunseeker is a renowned designer and manufacturer of high-performance racing boats, and the company has exploited its experience to build some of the world's largest and most luxurious yachts. Our model of the MANHATTAN 74 is an accurate miniature to a scale of around 1 : 18, based on original Sunseeker drawings, and is intended for the demanding and experienced marine modeller. In contrast to the full-size vessel the model is powered by two Jet Propulsion Units which provide excellent turning characteristics plus a reverse capability without reversing the motors. At around half motor speed the reversing mechanism can be deployed to bring the boat to a halt, at which point it can be turned on the spot using the rudder. If you switch on the bow thruster, the boat can even traverse (move bodily sideways). The motors are controlled using two separate speed controllers.

Specification

	Full-size	Model
Overall length approx.	23.05 m	approx. 1280 mm
Length of hull and platform	22.26 m	approx. 1230 mm
Beam approx.	5.43 m	approx. 300 mm
Draught approx.	0.95 m	approx. 55 mm
Overall height approx.	5.97 m	approx. 400 mm
Overall displacement	37,100 kg	7 kg
Speed	max. 33 kn.	approx. 20 km / hr
Scale approx.		1 : 18

Replacement parts

Description	Order No.
Hull and deck	2099.2
Superstructure	2099.4
Vacuum-moulded parts (mast, ship's boat etc.)	2099.5

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 model boats 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.
- This is a high-speed model, which means that you must **NEVER** operate it when there are persons or animals in the water, otherwise there is a serious risk of causing injury.
- 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.
- 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.
- 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 motors are disconnected from the drive battery.
- When the drive battery is connected, keep well clear of the area around the power units, 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 motors 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 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.
- 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 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 boat is completely watertight, as it may sink if too much water enters the hull. Check the boat for damage before every run.

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 department 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 run for a considerable time it is important to dismantle all the moving parts (propeller shafts, rudder system 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.
- These instructions do not cover every single procedure in assembling the parts. Instead they concentrate on important areas of construction, where explanatory notes are needed to

complement the plan.

- Bear in mind that tools can be dangerous; always be careful when handling them.
- The vacuum-moulded parts can be cut out using a pair of scissors (we particularly recommend our Lexan shears, Order No. 26), although a sharp knife (e.g. Order No. 982) can be used for many cuts. Simply cut along the marked lines, but note that it is always better to cut slightly outside the line and sand back to final size.
- Don't throw away scrap ABS immediately as the material may be required for making other small parts.
- All wooden parts should be sanded before being installed, and given several coats of GLATTFIX sanding sealer (Order No. 207). The printed wooden parts, e.g. the planked deck, must not be brush-painted, as the sealer might cause the printing to smear. These wooden surfaces should be sprayed with clear sealing lacquer.
- The electric motors must be suppressed. The minimum is one 470 nF capacitor (Order No. 3588) for each motor, soldered between the terminals as 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.
- 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

Wood - wood
Wood - metal
Wood - ABS
Metal - metal
ABS - ABS
ABS - metal
Rubber - metal

Suitable adhesives

UHU hart, white glue
Stabilit express, UHU plus
Cyano-acrylate, Stabilit express
Cyano-acrylate, UHU plus
Cyano-acrylate, Stabilit express, UHU plast
Cyano-acrylate, Stabilit express
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. Assemble the boatstand from the two end-supports (1), two rear supports (part 2) and two connecting pieces (3). The parts must first be glued together in pairs, then fitted together and glued.
The stand can be painted if you wish.
2. The hull (4) should be prepared as follows:
 - a.) Use a coarse flat file to rub down the inside of the bottom of the hull in the area of the Jet Propulsion Unit openings, with the aim of leaving the moulding about 1 mm thick overall.
 - b.) Cut a 4 mm wide slot in the bow of the boat to accept the anchor guide (35).
 - c.) File shallow recesses at the points where the fairleads (37) and cleats (38) are to be fitted, so that these parts can be fitted flush with the top edge of the hull.
 - d.) Sand the hull joint lines smooth all round, and use filler paste to make good any irregularities.
3. **The numbers with asterisks (*) indicate the numbers of the components included in the Jet Propulsion Unit 6 Booster sets.**
4. Glue the intake tubes 1* of the Jet units to the electric motor mounts, working on a perfectly flat surface, and check that these assemblies fit in the openings in the hull. When you are confident of this, glue the Jet units in place permanently, taking care to make the joints completely watertight. It is best to tack them in place using cyano initially, then apply a generous amount of Stabilit express or epoxy resin round the joints on the inside of the hull.

5. The next step is to fix the servo mounts (6) to the servo plate (5), then glue the plate in the hull as shown in the drawing.
6. Attach the electric motors to the motor mounts, and fit the shaft couplings on the motor output shafts.
7. Assemble the Jet Propulsion Units and the reversing mechanisms as described in the instructions supplied with the Jet Propulsion Unit 6 Booster sets.
Caution: it is important to observe the correct position of the eight mounting openings for the outlet nozzles 8*.
8. At this point the servo for the steering nozzles 12* can be installed on the servo mount, together with the two servos which operate the reversing mechanisms 13*.
9. Slip the rubber bellows (7) onto the sealing tubes (8) and secure them with a drop of cyano each. The sealing tubes can now be fixed to the transom by applying cyano from the inside.
10. Mount the pushrod connectors (10) on the servo output arms as shown in the drawing, and fit the connectors (9) on the steering nozzles 12*.
11. Make up the control rods (11) for actuating the steering nozzles and fit them through the rubber bellows, working from the inside of the hull. Clamp the rod ends in the appropriate pushrod connectors (9), (10).
12. Two outer sleeves (13) now have to be fixed to the stern bulkhead with cyano; they are used to actuate the reversing mechanisms. Slip the steel wire inners (15) in the two inner sleeves (14), and attach them to the threaded couplers (12) by crimping. Screw the couplers into the ball-links 23* for the reversing mechanisms. Connect the front ends to the pushrod connectors (10) on the servo output arms as shown in the drawing. Seal the outer sleeves with grease before fitting the inner sleeves into them.
13. The next step is the final assembly and installation of the Jet units (reverse the procedure to remove them again). This is the procedure:
 - a.) Install the stern tube 2*, the impeller tube 3*, the shaft 4* and the impeller 5*, followed by the sealing tubes (8), the rubber bellows (7) and the outer sleeves (13). Run the two steering rods (11) through the bellows (7) and clamp the ends in the pushrod connectors (10) mounted on the servo output arm.
 - b.) Attach the prepared steering nozzle 12* (with reversing mechanism) to the outlet nozzle 8* and the inner sleeve (14), (15) and connect the threaded coupler (12) to the ball-link 23*.
 - c.) Fix the outlet nozzle 8* to the impeller tube 3* using eight self-tapping screws 10*, sliding the inner sleeve (14) into the outer sleeve (13). At the same time clamp the steering rods (11) in the pushrod connectors 22* (9), and fix the inner sleeves (14), (15) to the pushrod connectors (10) on the servo output arms.
14. **Important: check that the servos are not obstructed mechanically at any point in their travel.**
15. The bow thruster can now be installed in the hull: fit the two tube ends in the hull from the outside and glue them in place using Stabilit express. Check that the joints are watertight.
16. We recommend that you place the hull in water at this stage to check that the various joints are completely watertight. Don't forget to fill the stern tubes with high-performance grease, Order No. 570, before you do this.
17. Complete the wiring of the drive motors as shown in the wiring diagram, and solder the suppressor capacitors to the motor terminals as shown. We recommend that you install a separate speed controller for each motor, and connect both controllers to the same receiver socket using a Y-lead. Each motor is powered by 2 x 10 cells, wired in parallel. Run the motors on a low voltage for a while, at the same injecting grease into the stern tubes via the grease nipples 10*.
18. The stern platform (16) is assembled from two vacuum-moulded shells. We recommend that you cut a strip of scrap ABS sheet and glue it over the inside of the joint line; this makes it easier to produce a watertight unit.
19. Remove the anchor winch base (17) from the scrap material, leaving it about 3 mm high, and glue it to the deck.
20. Make up the railing (18) and the handrails (19) from 2 mm Ø brass rod. You will find a template drawn on the plan showing the shape of the railing. All the dimensions can be taken directly from the drawing, including those for the handrails.
21. The deck planking (20) is supplied as twelve ready-made laser-cut panels, as is the stern platform planking (21). Finish the panels by spraying with clear waterproof lacquer, then glue them to the model.
22. The portholes (22) and hawser guide (23) are supplied as ready-made items; glue them to the model as shown in the drawing.
23. Assemble the stern bench (24), the bench (25) and the inflatable boat (26) from the vacuum-moulded parts supplied (2 and 4 parts respectively).

24. Make parts (27) to (30) as shown in the drawing.
25. Parts (31) to (38) are ready-made components; paint them as shown in the drawing before gluing them to the model.
26. Prepare the anchor guide (35) as shown in the drawing and glue it in the slot in the bow.
27. Cut out the two stern doors (39) along the marked lines and trim them to fit in the stern area. The doors can either be glued in place permanently or - if you wish - hinged. In this case seal the side and bottom edges with scrap ABS.

Superstructure

28. The first step in this stage is to sand off the cut edges from the superstructure (40) and make good any gaps using filler paste.
29. Trim the front panel (41) to fit and glue it in place using Stabilit express. Fill the joint line gaps and sand smooth.
30. Trial-fit the upper deck planking (47), mark the position of the companionway (staircase) opening and cut it out using a knife or rotary cutter. The opening also has to continue down for about 35 mm through the curved rear face of the superstructure; the cut line is marked by a dotted line in the stern view. This area also has to be sawn or machined away so that the companionway (43) can be fitted.
31. Trim the control stand (42) to fit on the front panel (41) and glue it in place.
32. Installing the companionway (43) is a little more complicated: we recommend that you first cut the companionway moulding from its scrap material, working slightly outside the marked lines, then gradually sand it back to final size.
33. When the companionway has been glued in place, trim the companionway insert (44) to fit by cutting it to the required height. The companionway insert can now be glued in place permanently, together with the upper deck planking (47).
34. Bend the companionway handrail (48) to shape and solder the parts together as shown in the drawing.
35. The next step is to assemble the four vacuum-moulded parts to form the equipment bar (45). First cut out the top section and the two side parts. Start by trimming the top section and attaching it to the equipment bar, then add the two side parts in the arrangement shown in the drawing. The prepared components can now be glued together using Stabilit express. When the resin has set hard, cut off the projecting parts of the equipment bar. The equipment bar, completed to this stage, can now be filled and sanded smooth. Glue the finished item on the superstructure using Stabilit express.
36. Bend the parts of the handrails (46) and the stern balustrade (49) to the shape shown, solder them together and install them as shown in the drawing.
37. The balustrade glazing (50), the front screen (51), the windscreen (52), the stern window (53) and the stern door (54) are supplied as vacuum-moulded items in smoked-tint plastic; these parts should now be cut out from the waste material. Attach the balustrade glazing (50) to the stern balustrade and the equipment bar using cyano. Secure the windscreen (52) using 16 countersunk screws.
38. The side windows (55), the bow hatch (56) and the companionway door (57) are die-cut from smoked-tint plastic. We recommend that you spray the inside of all these parts black, including the windscreen (52) and the stern window (53), and fix them to the model using double-sided adhesive tape.
39. The easiest method of simulating the window frames is to apply self-adhesive trim stripe tape. A rather more complex - but more durable - solution is to cut out a template and paint the frames on the windows.
40. The skipper's seat (59) and upper deck bar (60) are supplied as vacuum-moulded parts. Cut them out along the marked lines, trim them to fit and glue them together.
41. Bend the bar handrail (62) and the control stand handrail (63) to shape, and solder the parts together as shown in the drawing.
42. A slightly more complicated task is to assemble the corner bench (63) and backrests (64), as the legs (65) have to be positioned truly vertically.
TIP: the corner bench is assembled from three parts. Mark the position of the holes for the legs in the corner bench, and drill the holes vertically through all three layers. The backrests are assembled from six parts. Tape them to the corner bench, then drill the holes for the legs in the backrests through the already existing holes, working from the underside.
43. Make up the folding backrest (67), the folding bar (66) and the table components (68), (69) and (70) as shown in the drawing, and fix them to the superstructure.
44. The ship's wheel (71), the engine telegraph (72), the searchlight (74) and the screen wipers (76) are supplied as ready-made items.

45. The aerial mast (77) is assembled from seven parts which have to be bent to shape and soldered together.
TIP: to obtain a neat radius, bend the parts round a former consisting of a piece of round hardwood dowel or some other circular object with a diameter of about 18 to 20 mm.
46. Parts (79) to (83) are ready-made items.
47. Assemble each of the satellite aerials (84) from two vacuum-moulded shells and attach them to the equipment bar using the supports (85) and spacer sleeves (86).
48. The TV aerial (87) is assembled from two parts and fixed to the equipment bar together with the support (88).
49. Parts (89) to (93) are also ready-made parts which are simply attached as shown in the drawing.
50. Modify the lifebelts (94) slightly by removing the retaining ropes. The lifebelt holders (95) are vacuum-moulded items.
51. Make the two VHF aerials (96) from 1.5 mm Ø ABS rod and glue them to both sides of the equipment bar.

Painting the model

General notes

- Please use high-quality modelling paints exclusively, especially if you wish to apply a brushed finish. We suggest that you ask your model shop or local paint supplier for recommendations regarding paint types, although we basically recommend Graupner colour paints which have been tested on a very wide range of surfaces.
- We strongly recommend that you use ONLY paints of a single type made by the same manufacturer, otherwise the colours may interact, and dissolve each other or produce bubbles. Be particularly careful when combining spray cans with brushing paints; always carry out a test on a piece of scrap material to ensure that they are compatible with each other.
- To ensure that the paint adheres well, sand the boat overall with fine wet-and-dry paper (600- to 800-grit) beforehand, then de-grease the surfaces using a non-greasy liquid detergent. Try not to touch the cleaned surfaces after this, as your skin contains grease which will then be deposited on the model.
- A good method of painting small parts is to stick them to a piece of wood using double-sided adhesive tape. Paint the parts and allow the paint to dry. They can then be removed easily from the tape prior to fixing them to the model.
- When spraying, carefully mask off all areas which are not to be painted. Seal all openings too, as the fine mist of paint will penetrate into any opening, no matter how small.
- Read and observe the instructions supplied with the paints you intend to use.

Colour scheme

You can copy the colour scheme shown in the kit box illustrations if you wish, or alternatively you can create your own scheme. Apply the self-adhesive name placards etc. as shown in the pictures.

Notes on the RC system

We recommend that you use the right-hand transmitter stick to control the steering nozzles (left / right) and the reversing mechanisms (forward = open, back = closed). The two motors (wired in parallel) and the bow thruster should be controlled from the left-hand transmitter stick. The stick axis for controlling the motors, and the axis for the reversing mechanisms, should be set to non self-neutralising (remove the neutralising spring in the transmitter and fit the stick ratchet - see RC system instructions). The radio control system components, i.e. receiver, speed controllers and batteries, can be secured in the model using self-adhesive Velcro (hook-and-loop) tape, Order No. 3368.

Running the model

Take your time initially, and run the boat slowly and cautiously while you become familiar with the model's control response, its handling on the water, and its duration. The running time is around 10 to 15 minutes, although this can be extended by careful use of the throttle. **Please note:** the model cannot be steered when the motors are switched off.

Be sure to read and observe the instructions supplied with your radio control system and accessories.

We wish you lots of luck and many hours of pleasure building and running your MANHATTAN 74.

Part No.	Description	No. off	Material	Size in mm
1	Front boatstand support	2	Plywood	4, die-cut
2	Rear boatstand support	2	Plywood	4, die-cut
3	Boatstand connecting piece	4	Plywood	4, die-cut
4	Hull	1	GRP	Ready made
5	Servo mounting plate	1	Birch ply	200 x 50 x 3, oversize
6	Servo mount	3	Plastic	Ready made
7	Bellows	2	Rubber	Ready made
8	Sealing tube	2	Aluminium	10 x 6 / 5 Ø
9	Pushrod connector	2	Plated brass	Ready made
10	Pushrod connector	4	Plated brass	Ready made
11	Control rod	2	Plated steel	230 x 2 Ø, overlength
12	Threaded coupler	2	Plated brass	Ready made, 2
13	Outer sleeve	2	ABS	190 x 3.2/2.2 Ø, overlength
14	Inner sleeve	2	Plastic	240 x 1.85 / 0.9 Ø, overlength
15	Wire stiffener	2	Steel	240 x 0.8 Ø, overlength
16	Stern platform, 2-part	1	ABS	Vac. moulded, to be cut out
17	Anchor winch base	1	ABS	Vac. moulded, to be cut out
18	Railing	1	Brass rod	4000 x 2 Ø, overall
19	Handrails	8	Brass rod	1000 x 2 Ø, overall
20	Deck planking, 13-part	1	Beech ply	1, laser-cut
21	Stern platform planking	1	Beech ply	1, laser-cut
22	Porthole	10	ABS	1, laser-cut
23	Hawser guide	2	ABS	1, laser-cut
24	Stern bench, 3-part	1	ABS	Vac. moulded, to be cut out
25	Bench, 4-part	1	ABS	Vac. moulded, to be cut out
26	Inflatable boat, 2-part	1	ABS	Vac. moulded, to be cut out
27	Steering nozzle	1	Aluminium	5 x 4 / 3.2 Ø, overlength
28	Handle	9	Brass rod	15 x 1 Ø, overlength
29	Front support	1	ABS	1, as plan, make from scrap
30	Rear support	1	ABS	1, as plan, make from scrap
31	Steering yoke	1	Plastic	Ready made
32	Retaining cord	2	Thread	250 x 0.7 Ø
33	Anchor winch	1	Plastic	Ready made
34	Anchor	1	Plastic	Ready made
35	Anchor guide	1	ABS	Vac. moulded, to be cut out
36	Anchor chain	1	Brass rod	100
37	Fairlead	2	Plastic	Ready made
38	Cleat	10	Plastic	Ready made
39	Stern door	2	ABS	Vac. moulded, to be cut out
40	Superstructure	1	GRP	Ready made
41	Front superstructure panel	1	ABS	Vac. moulded, to be cut out
42	Control stand	1	ABS	Vac. moulded, to be cut out
43	Companionway	1	ABS	Vac. moulded, to be cut out
44	Companionway insert	1	ABS	Vac. moulded, to be cut out
45	Equipment bar, 4-part	1	ABS	Vac. moulded, to be cut out
46	Handrail	6	Brass rod	500 x 2 Ø, overall
47	Upper deck planking	1	Beech ply	1, laser-cut
48	Companionway handrail	1	Brass rod	300 x 2 Ø, overall
49	Stern balustrade	1	Brass rod	400 x 2 Ø, overall
50	Balustrade glazing	1	Smoked plastic	Vac. moulded, to be cut out
51	Front screen	1	Smoked plastic	Vac. moulded, to be cut out
52	Windscreen	1	Smoked plastic	Vac. moulded, to be cut out
53	Stern window	1	Smoked plastic	Vac. moulded, to be cut out
54	Stern door	1	Smoked plastic	Vac. moulded, to be cut out
55	Side window	4	Smoked plastic	1, die-cut
56	Bow hatch	1	Smoked plastic	1, die-cut
57	Companionway door	1	Smoked plastic	1, die-cut
58	Companionway hatch	1	ABS	Vac. moulded, to be cut out
59	Skipper's seat, 4-part	1	ABS	Vac. moulded, to be cut out
60	Upper deck bar	1	ABS	Vac. moulded, to be cut out
61	Bar handrail	1	Brass rod	150 x 1 Ø, bend and solder

62	Control stand handrail	1	Brass	100 x 1 Ø, bend and solder
63	Corner bench, 3-part	1	ABS	Vac. moulded, to be cut out
64	Backrests, 6-part	1	ABS	Vac. moulded, to be cut out
65	Bench leg	7	Brass rod	40 x 2 Ø
66	Folding bar	1	Brass rod	200 x 2 Ø
67	Folding backrest, 2-part	1	ABS	Vac. moulded, to be cut out
68	Table top	1	ABS	Vac. moulded, to be cut out
69	Table base	2	ABS	Vac. moulded, to be cut out
70	Tube	1	Aluminium	30 x 4 / 3.2 Ø, overlength
71	Ship's wheel	1	Plastic	Ready made
72	Engine telegraph	1	Plastic	Ready made
73	Compass	1	Smoked plastic	Vac. moulded, to be cut out
74	Searchlight, 2-part	1	Plastic	Ready made
75	Lens	1	Smoked plastic	1, make from scrap
76	Screen wiper	3	Plastic	Ready made
77	Aerial mast	1	Brass rod	500 x 2 Ø, overall
78	Mounting plate	2	ABS	12 x 20 x 2, make from scrap
79	Lamp bracket	1	Plastic	Ready made
80	Mast lantern	1	Plastic	Ready made
81	Masthead lantern	1	Plastic	Ready made
82	Radar aerial, 3-part	1	Plastic	Ready made
83	Double typhoon, 4-part	1	Plastic	Ready made
84	Satellite aerial, 2-part	2	ABS	Vac. moulded, to be cut out
85	Satellite aerial support	2	Brass rod	20 x 2 Ø
86	Spacer sleeve	2	ABS	4 Ø x 3.2 Ø x 2.2, overlength
87	TV aerial, 2-part	1	ABS	Vac. moulded, to be cut out
88	TV aerial support	1	Brass rod	15 x 2 Ø, overlength
89	Flagstock	1	Plastic	Ready made
90	Flagstock holder	1	Plastic	Ready made
91	Navigation lamp	2	Plastic	Ready made
92	Lamp bracket	2	Plastic	Ready made
93	Support	2	Plastic	Ready made
94	Lifebelt	2	Plastic	Ready made, modify as plan
95	Lifebelt holder	2	ABS	Vac. moulded, to be cut out
96	VHF aerial	2	ABS	200 x 1.5 Ø
97	Upper deck support column	2	ABS	80 x 3.3 Ø x 2.2 Ø
98	Companionway tread	6	Beech ply	1, laser-cut

You will also need the following items (included in the kit)

6	M3 grub screws (pushrod connectors)
4	M2 nuts (pushrod connectors)
4	8 x M4 socket-head grub screws (motor mounting)
4	Washers (motor mounting)
1	Velcro tape (500 mm) (mounting battery, speed controllers, receiver)
16	6 x M2 countersunk screws (retaining windscreen)
1	Decal sheet