



Build your own

KON-TIKI



Complete instructions for building a scale model of the world-famous raft

This home-construction kit will enable you to build your own authentic model of the Kon-Tiki raft, to a scale of one-fiftieth of the original, using the same kinds of wood - balsa, hardwood etc. All the enclosed working drawings are full scale, so that any part can be instantly recognized and fitted into its proper place, and the instruction are so detailed that fans of all ages will find it a simple matter to construct their own Kon-Tiki raft.

Hardly any tools are needed: in fact, provided you have a sharp knife, or a razor-blade, a large and a small needle, in addition to a little sand-paper, you are ready to set to work.

Remember: the Kon-Tiki was a crudely constructed craft, like its pre-historic antecedents.

Before you start take a look at the photos of the finished model and the working drawings. The numbers indicate the various parts, and the same numbers are to be found in the list below showing you the various parts which have to be made from your kit.

Parts made of balsa

No. of part.

- | | |
|---|---|
| 1 | 9 main logs |
| 2 | 9 cross logs |
| 3 | 2 long side logs |
| 4 | 4 short cross logs supporting the cabin |

Special parts

27, 28, 29	bamboo matting
31	banana leaf roof cover
34	canvas sail
35	rope ladder
36	radio antenna

Knots used throughout: *either* a reef knot, *or*: a bowline.



The Main Logs (1)

The 9 main logs are supplied with grooves ready for lashing. Bind logs one and two together, two and three, three and four, etc., using a separate lashing in each case (see drawing II a), leaving the last grooves unlashd, as this will have to be done when the bow is shaped. Threading the lashing is most easily done with a large needle or bodkin.

If you find this takes too long, you can of course use one lashing for each set of grooves. Your lashing will then run over one log and under the next, and should be secured with a reef knot back at its starting point, see II b.



The Cross Logs (2)

First place a cross log in position on top of the lashed main logs, and cut it to the requisite length. Next mark off with a pencil the position of the grooves for the lashings, or cut them straight away with a knife or razor. (For position of grooves see drawing I.) In lashing cross logs to main logs *either* use separate lashings round each of the 9 main logs, as was done on the actual Kon-Tiki raft, *or* use one continuous lashing. Starting from the stern lash 8 cross logs in position, leaving the 9th until later (see below).

Next, with a razor, or sharp knife, cut the main logs to a point in the bows (see drawing I and photo).

This should be done carefully, as you will need some of the pieces later on for making your steering block (6) and bow log (16).

You should now lash along the grooves which were left un-lashed when the main logs were bound together, and then secure the last log in position.



The Bow Log (16)

Cut a bow log (16) from one of the pieces left over when the main logs were cut to a point, and attach it athwart the front of the central main log, using a cross lashing, for which the necessary grooves must be made (see drawing I).



Balsa Steering Block (with thole-pins) (6 & 11, drawing IV a)

Cut a steering block from a piece left over from one of the main logs. Scoop oblong hole out of the top (see drawing I) and into this hole place a block of hardwood into which four thole-pins have been inserted.

Secure the hardwood with a lashing either side of the thole-pins to the block. The steering block should then be lashed to the three central main logs after the necessary grooves have been cut.



The 4 short Cross Logs Supporting the Cabin (4)

Drawing I and II indicate the size of these logs, each of which should be secured with 4 lashings to the cross logs on which they stand.



The 2 Long Side Logs (3)

The long side should be placed, one on each side, on top of the cross logs, and cut to the right length. After pairs of grooves have been cut above the cross logs the side logs should be lashed in position (see drawing I).



14 Short Pieces to fill gaps between Cross Logs and Side Logs (7)

To fill the gaps (7) between the cross logs and the side logs either side of the raft small blocks of balsa should be inserted, each being lashed to the side log with two thin pieces of twine. Place the twine in position before inserting the balsa blocks.



The Bow (Drawing IV.)

This consists of 6 pine planks, placed three on each side, supported by 10 hardwood plank supporters, and kept in position by 9 bamboo struts and rope braces.

Owing to the small scale of the model, you may at first find the bow section rather complicated, but if you follow the

instructions closely it will prove quite simple. Study the photos carefully, and then turn to the working drawings, IV b, c, f, g, h.

First cut a hardwood supporter, starting for convenience' sake with the first supporter on the port (left) side (g). Near the top of the supporter, on the inside, cut an oblique groove to take the end of the corresponding strut (f). (Drawing IV shows full details of this construction.)

Sharpen the end of a strut cut to the requisite length. Press the sharp end of the strut into the appropriate cross log and the other end into the oblique groove of the hardwood supporter, which should be standing in a groove cut in the end of one of the main logs (h). The strut and supporter should then be lashed together. Proceed in the same way until all supporters and struts are in position.

N.B. Cut your bow planks to fit your own bows, and do not necessarily take the measurements from the working drawing.

Drill holes in the bow planks for the ropes which help to brace them. Then cut the requisite number of lengths of string, and make a small loop in the end of each. Each length should then be threaded through the appropriate hole in the bow plank, round the nearest cross log, and then tied securely. Complete one half of the bow section at a time. Three lengths of string, each passing through one set of planks, should then be used to lash the port and starboard bow sections to the two central supporters.



The Cabin. (See drawing III b)

The cabin consists of a framework, with walls of bamboo matting and a roof of bamboo covered with banana leaves (see photo and drawing III b). The framework is made of thin wooden supports, which are cut to the requisite length with the aid of drawing III b. All vertical units should be sharpened

and pressed a little into the balsa cross logs, and the framework should then be lashed into position as shown. The simplest method of constructing the cabin is to spread out the matting, attach the framework onto it, and then place it in position. Next secure the roof poles, and fasten lengths of string from each corner of the cabin to the cross logs.

Cut a piece of matting to act as flooring for the cabin (28). In the actual Kon-Tiki raft boxes of equipment, etc., placed under the bamboo matting, provided a natural floor.

The cabin contained the radio station in one corner, with the wireless-operator's table (marked x, drawing I). When the cabin has been fitted out the roof should be placed in position. First the banana leaves should be sewn onto the roof matting, and this should then be fastened to the roof poles.



The Main Mast (5)

The two spars forming the mast should be cut out of hardwood, and then sandpapered. The two spars should be securely lashed together on top (see drawing II). The topmast (8) is also cut out of hardwood.



The Topmast Section (12, Drawing II and IV c, d)

The topmast platform should be cut out of pine. The holes should be drilled, or made with a red-hot needle. If you find that the wood is liable to split, the platform can just as conveniently be made in two sections, which must then be lashed together.

The Cross-tree (17)

The cross-tree is most conveniently placed in position as soon as the mast has been made. Use twine to fasten the cross-tree to the top-mast platform.



Sockets for Mast Spars (9, Drawing II)

As the balsa logs were too soft to take the thrust of the mast spars, two hardwood sockets were constructed. Cut out two mast spar sockets of hardwood (9), and lash them to the main logs.



Stepping the Mast

First place the base of each spar firmly in its socket, secure the mast in position with the aid of one fore-stay, running forward from the junction of the two spars to the bow log, and two stays running aft to each corner of the raft.



The Deck (28)

The deck should cover the entire section forward of the mast, as well as the section in front of the cabin door.

First place a thin layer of bamboo slats (33), and on top a layer of matting (28). In drawing I only one part of the section forward of the mast is shown in position.

Flag and Radio Mast (see photo)

Place the radio mast as shown in the photo, and sling your radio antenna (36) from it to the top-mast.



Steering Oar (III d)

The steering shaft is of hardwood, and should be cut out and sandpapered. The steering handle, lashed to the end of the shaft, should be at right-angles to the plane of the actual blade.

Drill holes in the oar blade (14), which is of pine, and lash the steering shaft to it.



The Centreboards (13)

The five centreboards are of pine, and care should be taken in drilling the holes, as the wood is liable to split. Four are wedged between the main logs, and the fifth is placed in reserve behind the cabin where the man on watch used it as a platform (see photos).



The Sail (34)

See drawing III, which clearly shows how a continuous rope is sewn round the edge of the sail, with a loop in each corner, enabling the sail to be fixed to the yard (21). Allow plenty of "rope" for the sheets.

The Yard (21)

This consists simply of two pieces of wood lashed together, see drawing II.

The yard, with the sail attached, is at the middle fixed to the mast by a loop of string.



The Rope-ladder (Drawing III e)

The rope-ladder has 13 rungs, which should be made of hardwood. Drawing III e shows the rungs are fixed to the rope. See also photo.

The Kon-Tiki Expedition

On the 28th of April, 1947 the Kon-Tiki raft was towed out of the harbour of Callao in Peru, and left adrift in the Humboldt Current. A hundred and one days later, after crossing 4300 miles of the Pacific, the raft was washed up on the Raroia reef well inside Polynesia.

The six men who made up the crew were: Thor Heyerdahl, leader of the expedition; Herman Watzinger, in charge of meteorological and technical research; Knut Haugland and Torstein Raaby, both wireless operators, who maintained contact with radio amateurs; Erik Hesselberg, navigator, who plotted the drift of the raft; and the Swedish sociologist Bengt Danielsson, who acted as steward.

The object of the expedition was to test the sea-going abilities of the South American balsa raft, and to investigate whether it would have been practically possible for the original native population of Peru, the Incas and their remarkably cultured predecessors, to have reached the islands out in the open Pacific. For more than a century scientists had debated as to whether balsa rafts were seaworthy, and to what extent it might have been possible for the aboriginal inhabitants of South America to have contributed to the peopling of the Pacific islands. The experts had finally concluded that a balsa raft was water absorbent and therefore compelled to hug the home coasts where it could be beached at intervals and dried out in the sun. It was also argued that the low deck of an open raft would be unprotected in the high sea, and furthermore, that the balsa raft would dissolve as soon as the big logs started chafing on the rope lashings that held the craft together. Due to the general disregard for this former means of navigations in ancient South America, it had already been agreed that, for practical reasons, Polynesia could only have been reached from the direction of Asia, until the arrival of European ships.

This generally accepted theory ran counter to the Pacific

migration theory of which Thor Heyerdahl had tried to obtain a hearing over a number of years. The Kon-Tiki expedition which he organized was an attempt to throw light on these practical problems.

With co-operation of the Peruvian authorities the members of the expedition built a balsa raft in the Callao naval yard. The raft was a copy of those used by the Indians on the coast of Peru and Ecuador at the time when the first Europeans arrived. Large sailing rafts of this kind, with a capacity of up to 35 tons, were seen and described in detail from 1526 and on by the pioneering Spaniards who first discovered and colonized the Pacific coast of South America. Small raft models, and exquisitely carved paddles and raft centreboards, have also been excavated in large numbers in desert graves along the coast of Peru and North Chile, some dating back, to the very first centuries A. D.

The expedition test raft was built of medium size, consisting of nine 2-foot-thick balsa logs, ranging in length from thirty to forty-five feet, the longest in the middle, and lashed to balsa cross beams supporting a plaited bamboo deck and an open bamboo hut. A bipod mast with a bamboo yard carrying a square sail; five centreboards thrust down in cracks between the logs; and a stout block of balsa supporting a long steering-oar completed the construction. The raft was christened "Kon-Tiki", after a legendary Sun-King who according to Inca history is supposed to have ruled their land before the coming of the Incas, after which he is claimed to have migrated into the Pacific, in company with certain white-skinned and bearded followers. In the ocean the Kon-Tiki proved to be eminently seaworthy, with an amazing carrying capacity. Every day the raft was driven steadily westward and away from South America by the strong tradewind and the Humboldt Current, both of which maintained a steady course towards Polynesia. Ample new supplies of food were also available in the Humboldt Current, every day edible flying fish and small squids would even come aboard uninvited. Beneath the raft there was a constant procession of dolphins, pilot fish, sharks, bonitos, and occasionally tuna fish, as well as edible plankton. It was possible to collect limited supplies of rainwater, and to squeeze a thirst-quenching lymph liquid from the ever present raw fish.

The raft was also at various occasions visited by whales, and two specimens of the *Gempylus* or snake-mackerel, a fish which had never previously been seen alive by man, jumped aboard from out of the deep. On one occasion the six men on the raft made the acquaintance, at uncomfortably close range, with the whale-shark, the world's largest fish, which kept on swimming right under the raft until it was finally driven off with the aid of a hand-harpoon. The raft was caught in two storms, one of which lasted for five days, but the balsa logs rode the waves with incredible ease, and as the mass of water crashed down on the stern of the raft, it ran out through the gaps between the logs. The greatest danger that threatened was falling overboard in strong wind, and at one such event a man was almost lost.

After 93 days at sea the expedition sighted land for the first time as the raft drifted helplessly past Puka-puka on the eastern fringe of the Tuamotu group. Four days later the Kon-Tiki passed so close to the island of Angatau that the naivites ashore paddled out to the raft in their canoes, but once again it was swept past. When Raroia was reached after 101 days, the raft was caught in the surf and wrecked on the windward side of a coral reef just off the island. The crew made their way ashore, and after a week they were found by native Polynesians who lived on the other side of the wide lagoon. The shallow raft was eventually washed right over the reef and into the calm lagoon, whence it was rescued, towed to Tahiti, and shipped back to Norway with the assistance of the French authorities and Norwegian shipowners.

In 1949 a number of Norwegians, anxious to provide a future home for this unique vessel, had a suitable building erected on the Bygdøy peninsula, on the outskirts of Oslo.