

# **KNARR**

**SCALE: 1/35**  
**length: 440mm**  
**width: 300mm**  
**height: 400mm**

## **HISTORY:**

The Knarr is a type of Viking ship which serves for long trade naval business. The Knarrs were very robust and very well resist against unfavorable conditions in open sea. This model represents the similar Knarr which was found near the village of Skuldelev at Denmark and which is known as Skuldelev 1. The original was built in Norway between years 1030 and 1050 mainly from oak and pine. Length of the ship was about 16.3m and displacement about 24 tones.

## **Recommended tool list:**

- 1) Modeler's knife or scalpel
- 2) Mini drilling machine
- 3) Drill bits
- 4) Selection of abrasive paper
- 5) Scissors
- 6) Pliers
- 7) Clothes pegs or crocodile clips
- 8) Pencil
- 9) Rule
- 10) Set of needle files
- 11) Sewing machine

## **Before you begin:**

Before you begin to build the model it is necessary with a vengeance read building instructions and plans. Also chronology of assembly steps is necessary to keep. You check if the parts go together before you glue it respectively you make any corrections with sandpaper. During the gluing, painting, lacquering and at work with another chemical materials is necessary well ventilated in your working room. You cut the parts from sheet until actually required for fitting. You cut by knife only in direction off ward your body so that you head to injury risk.

## **Coloring:**

Medieval ships were protected against influence of salt water and woodworms by a mixture of tar and thanks to it the hull of ships was a reddish-brown or brownish-black color. This effect it is possible to get by staining of the wood by dark wood stain. It is recommended to use the wood stain before gluing of the parts. Decks of the ships were probably in naturally color of wood. Anchors and other metal parts were a black color.

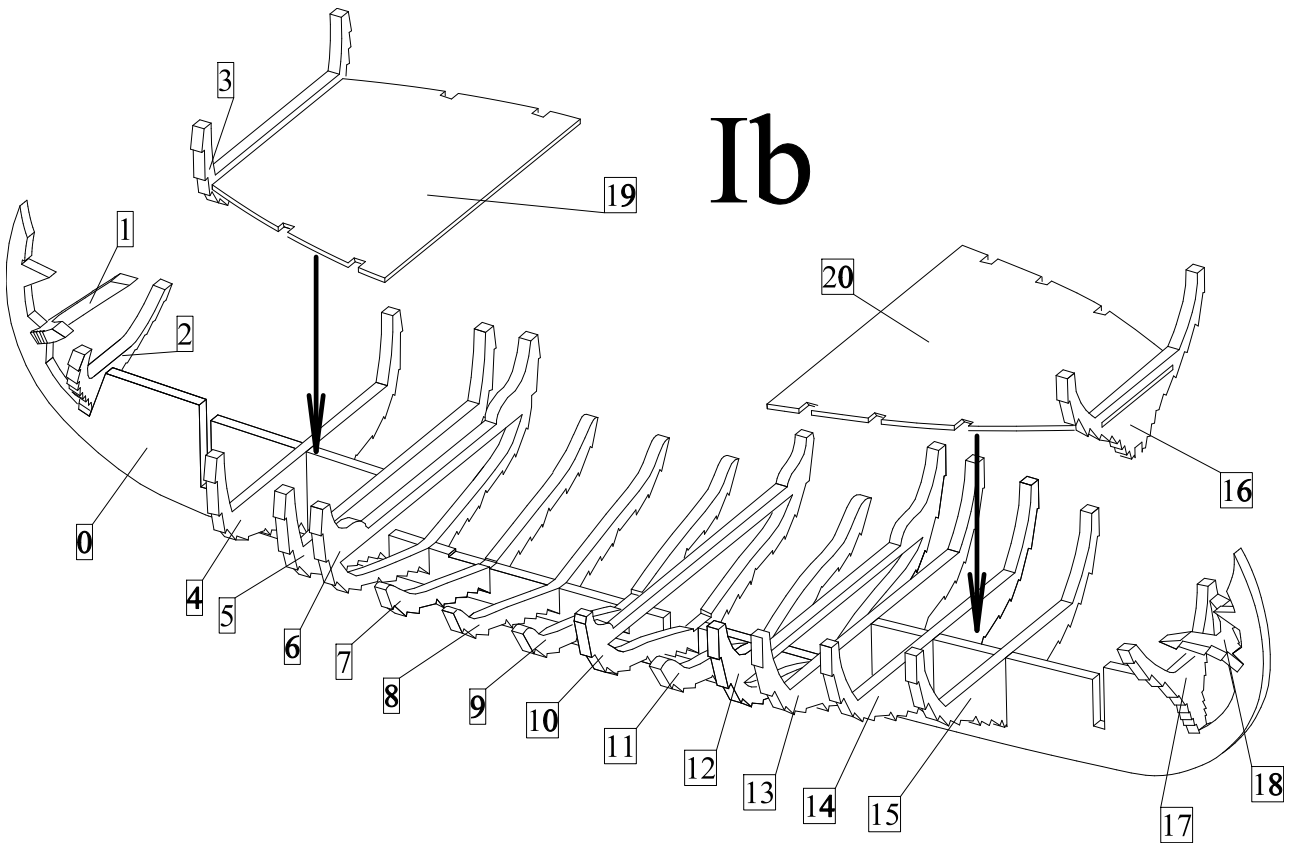
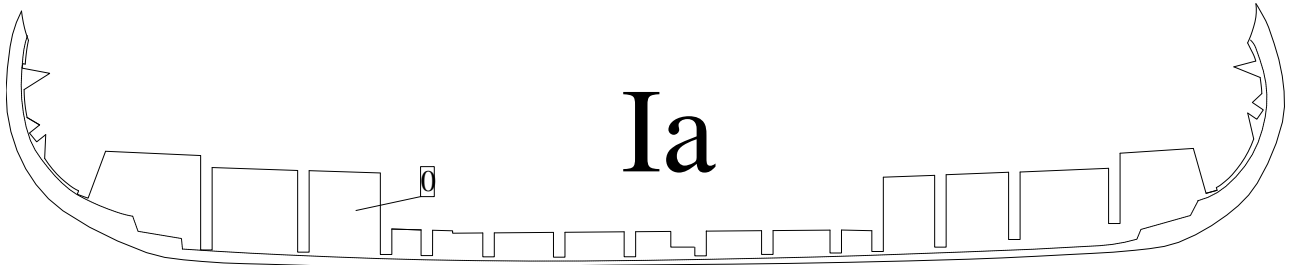
## **Bending of wooden strips:**

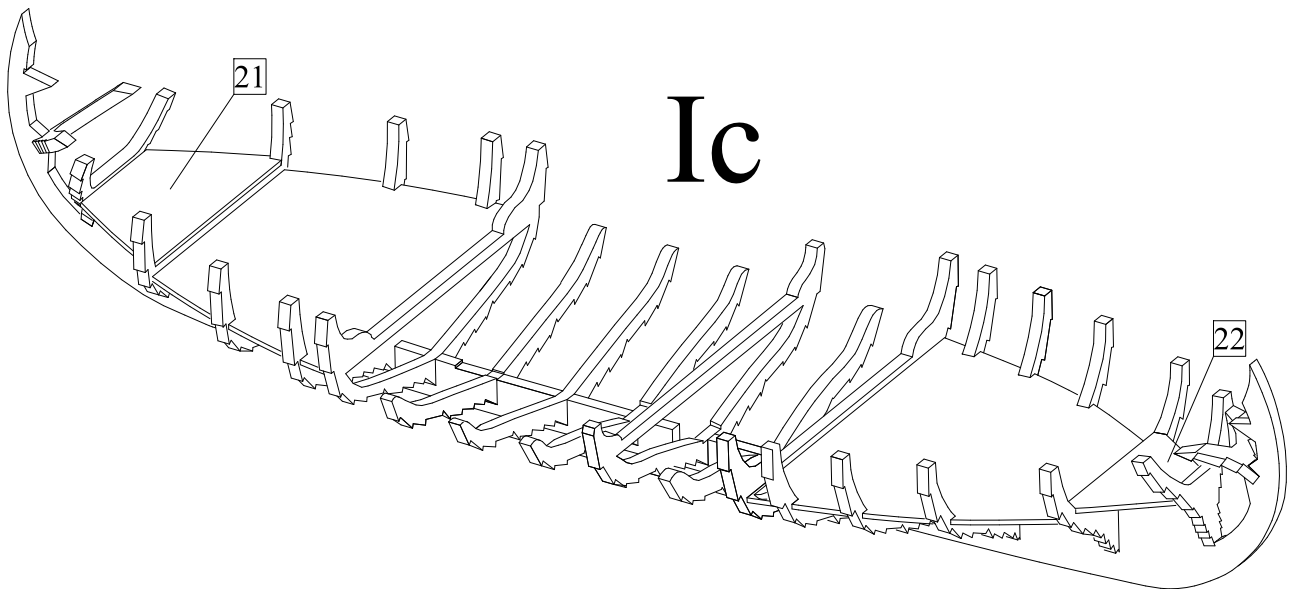
The Wooden strips will be more flexible if you will boil it in hot water about 10-15 minutes. You can bend the strips along any cylindrical area but ideal is using of special plank bender (it would be best to use electric plank bender). If you need to do very small radius so you must bend it in more steps.

**Model building process:**

**I) Framing of a hull I:**

- a) First draw on both sides of the keel 0 contours of planking. The contours draw after the plan 1.
- b) Run frames 4, 5, 6, 12, 13, 14, 15 into the keel 0. Then run also frames 3 and 16 together with decks 19 and 20 into the keel 0. Then glue all frames and to the decks and to the keel.
- c) Glue decks 21 and 22 to a bow and stern o the ship.

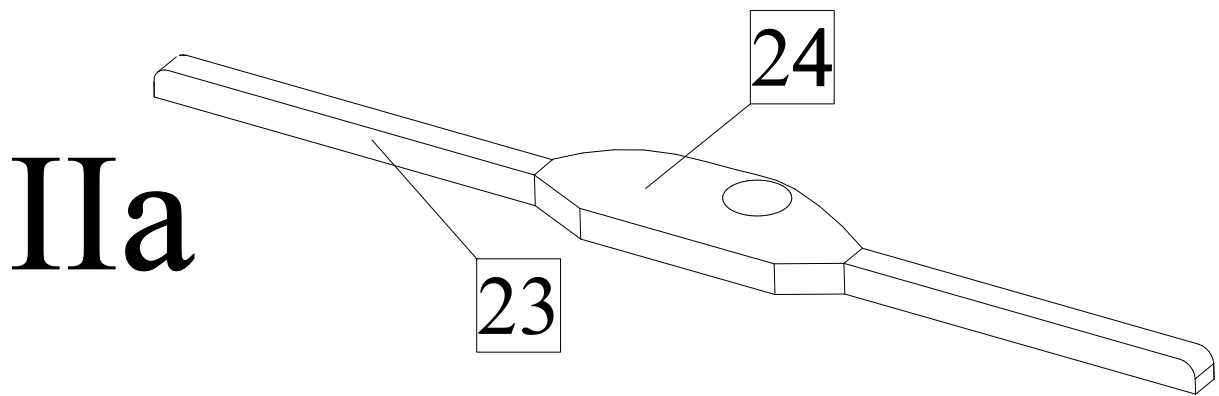




Ic

**II) Mast foot:**

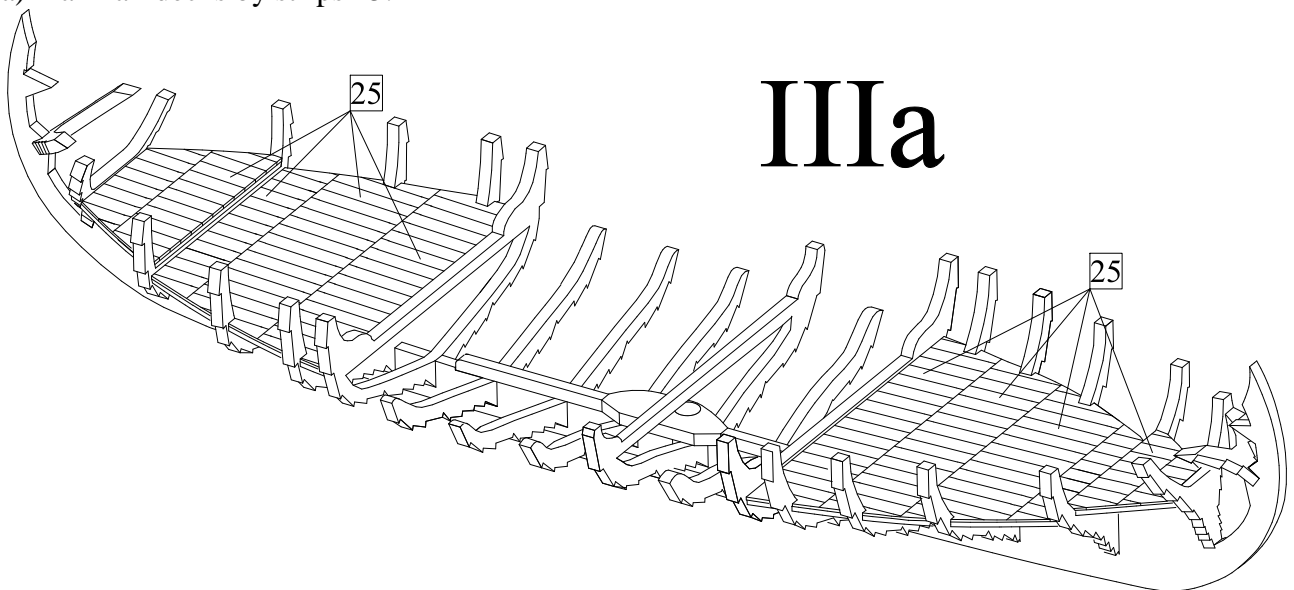
a) Make a mast foot from parts 23 and 24. First glue the part 23 to the part 24 and then sharpen them by a sand paper into rounded shape. Finally glue the mast foot to the keel 0.



IIa

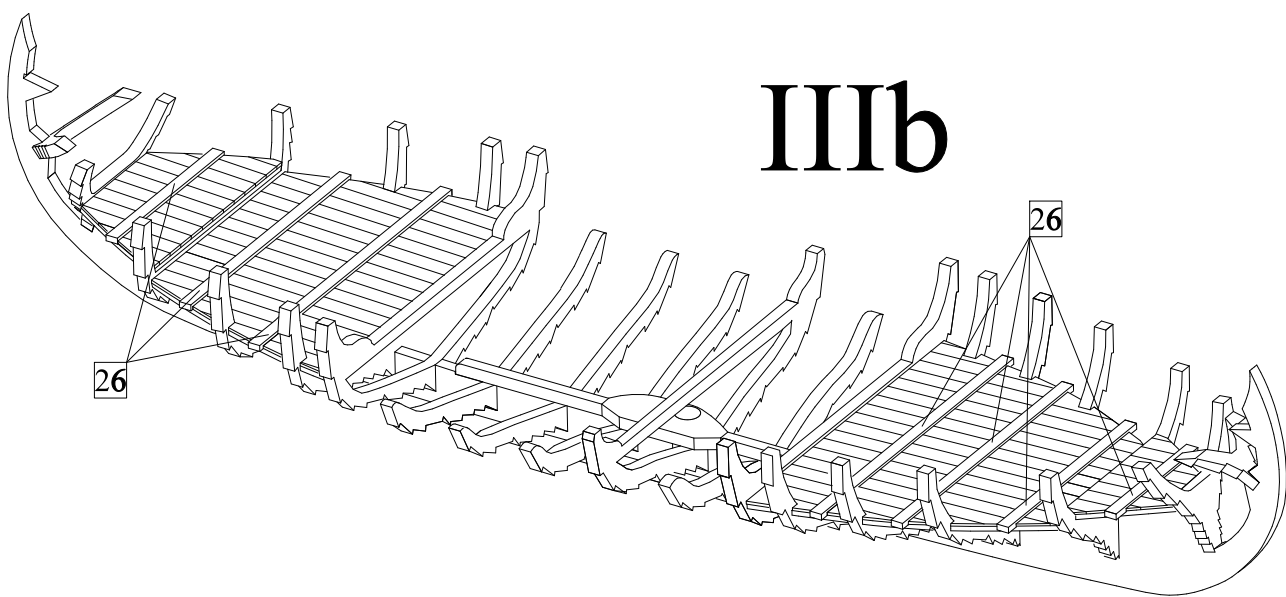
**III) Deck planking:**

a) Plank all decks by strips 25.



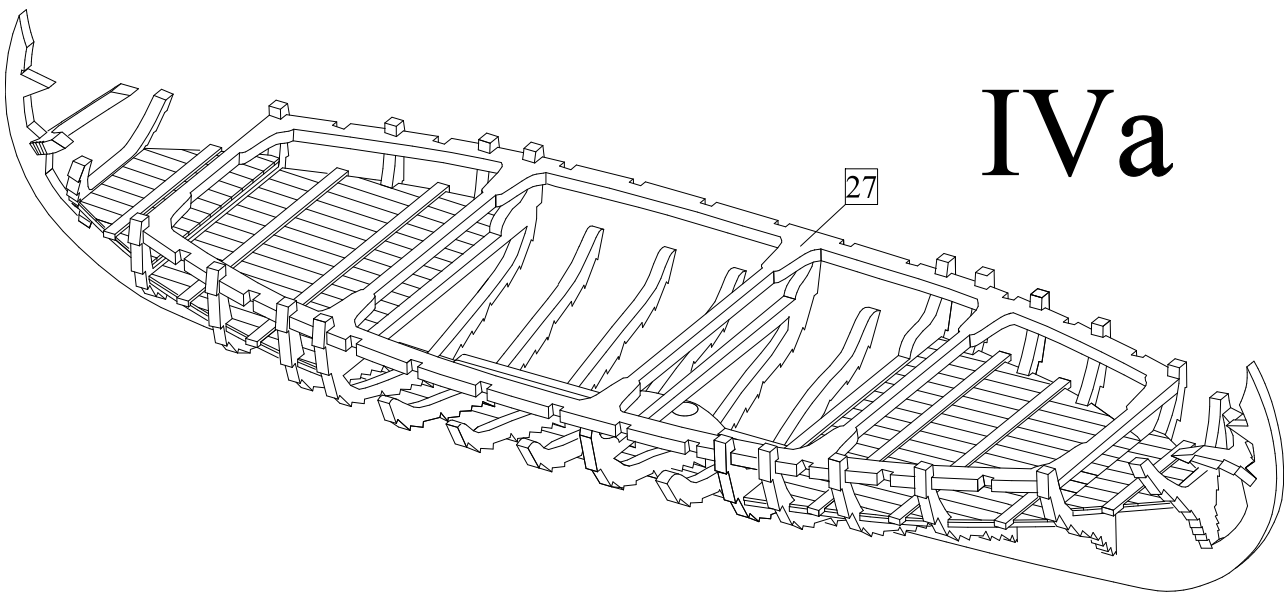
IIIa

b) Glue transverse strips 26 to the decks.

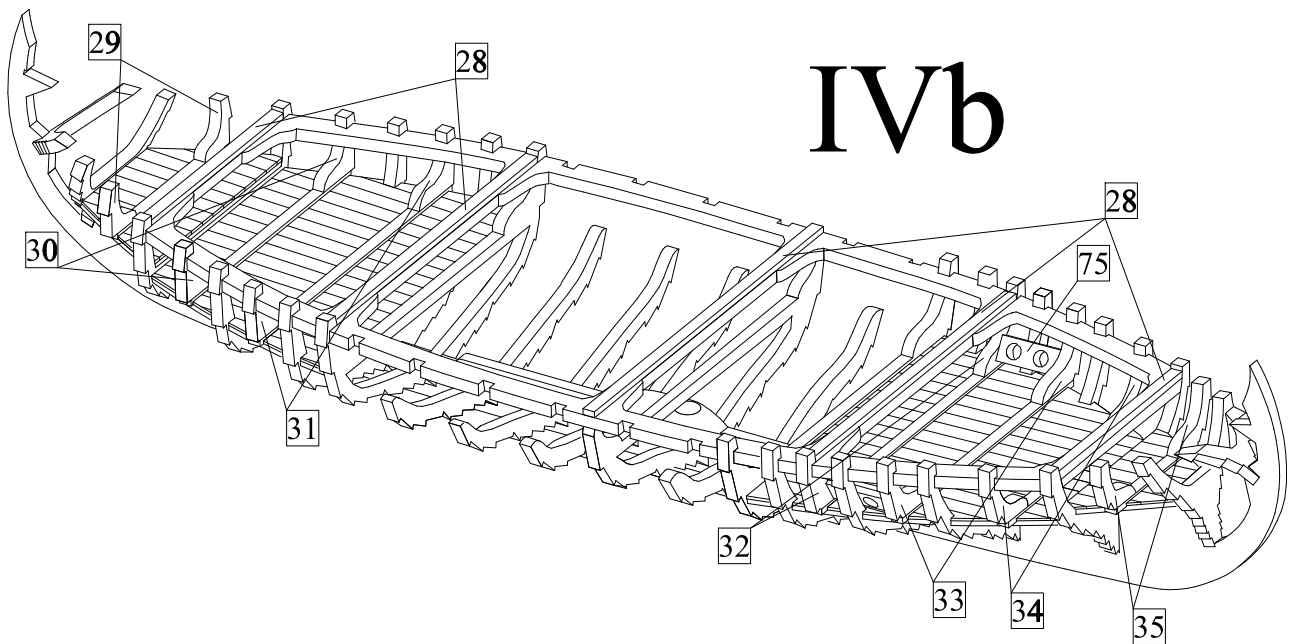


**IV) Framing of a hull II:**

a) Glue an inner frame 27 to the frames 3-16.

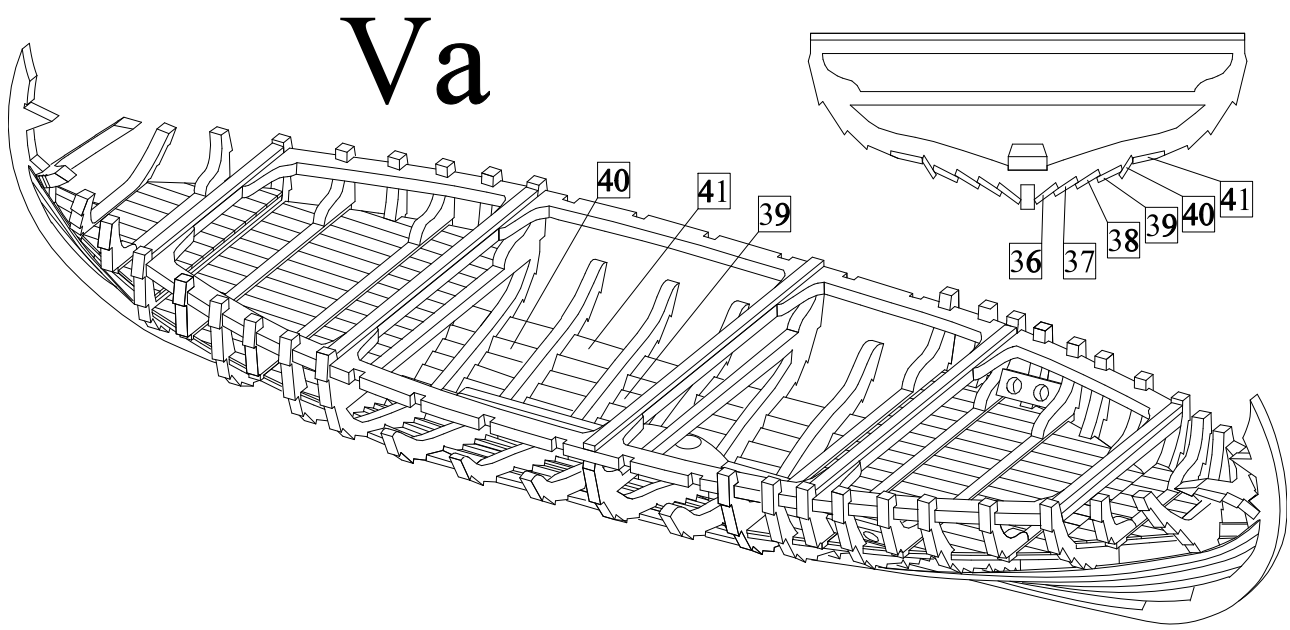


b) First glue transverse beams 28 to the frame 27. Then glue frames 29-35 to the transverse strips 26 and to the frame 27. Finally glue to the frames 14 a board with holes 75.

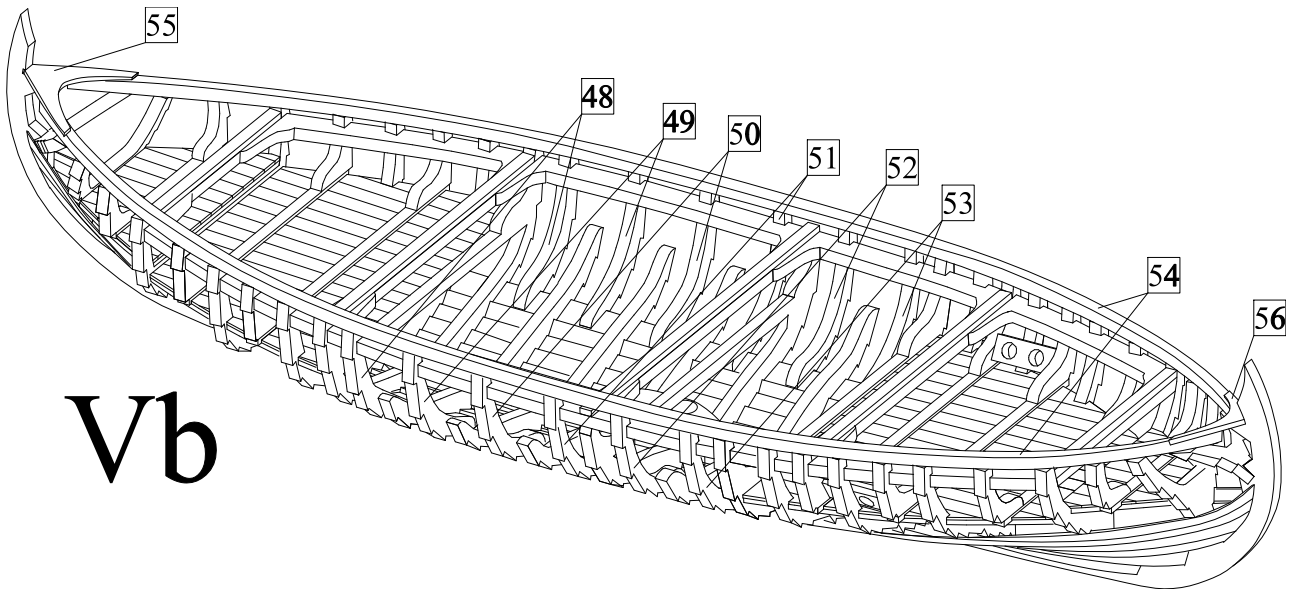


**V) Hull planking:**

a) The hulls of Viking ships were built by clinker planking method. It means that neighbor planks are overlapped. For this reason it is very important to keep exact order of gluing of the planks! First glue lowest planks 36 to the frame of the hull. Start to glue the planks to a middle part of the ship and subsequently glue it to bow to stern. Then glue also other planks in sequence from 37 to 41. After gluing the planks to the hull grind by a sand paper the frames so that following planks tightly joined to the already glued planks. An arrow in the plan shows an orientation of the planks.

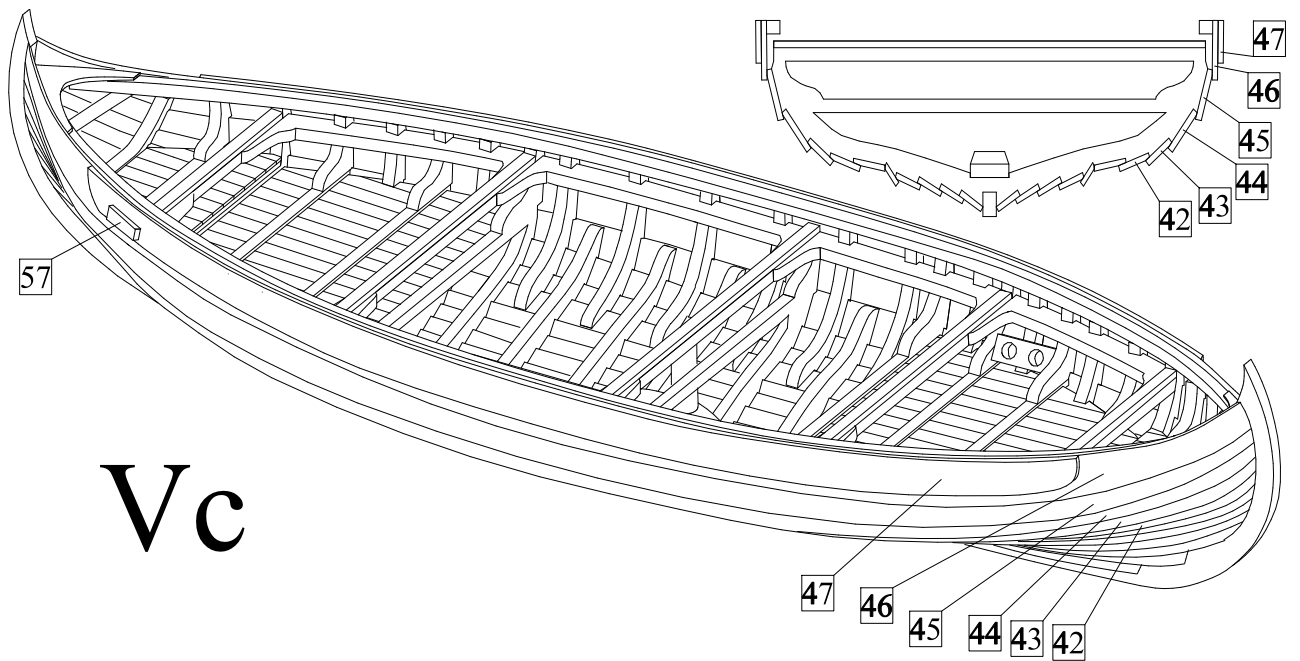


b) First glue frames 48-53 to the planks 41 and frame 27. Then bend beams 54 into needed shape and then glue them to the hull. Finally glue to the bow and stern parts 55 and 56.



Vb

c) Plank the hull also by rest planks 42-47. Then glue a part 57 to the plank 47 on starboard.

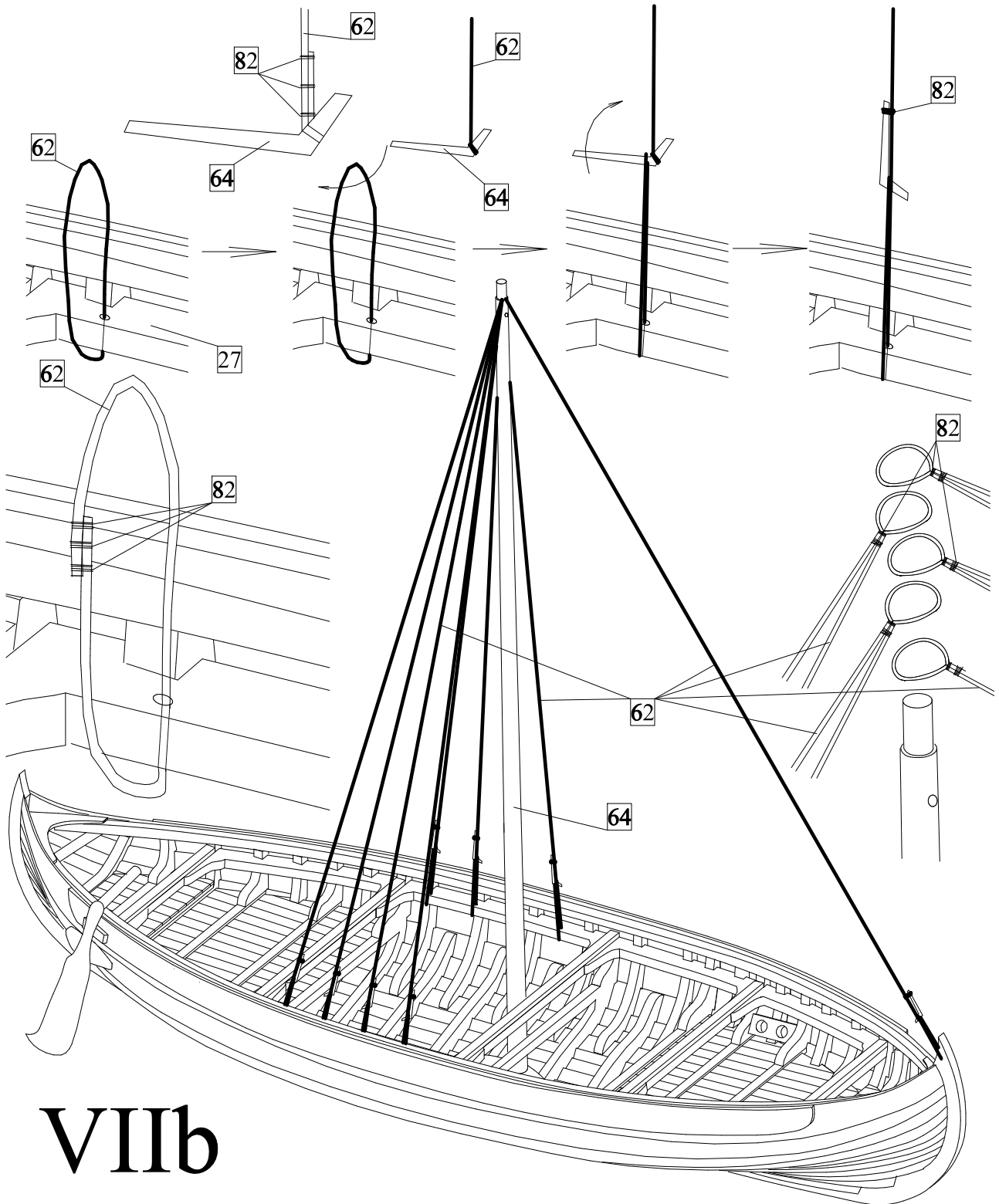


Vc



## VII) Mast:

- a) Make a mast 64. First sharpen the mast by a sand paper into conical shape from a dowel 8mm. Then drill a 1,5mm hole for control of yard into the top of the mast.
- b) Tie the mast by shrouds to the hull. First drill holes for the shrouds in the frame 27. Then tie the rigging 62 with shroud pins 64. The tying of the shrouds is shown below.



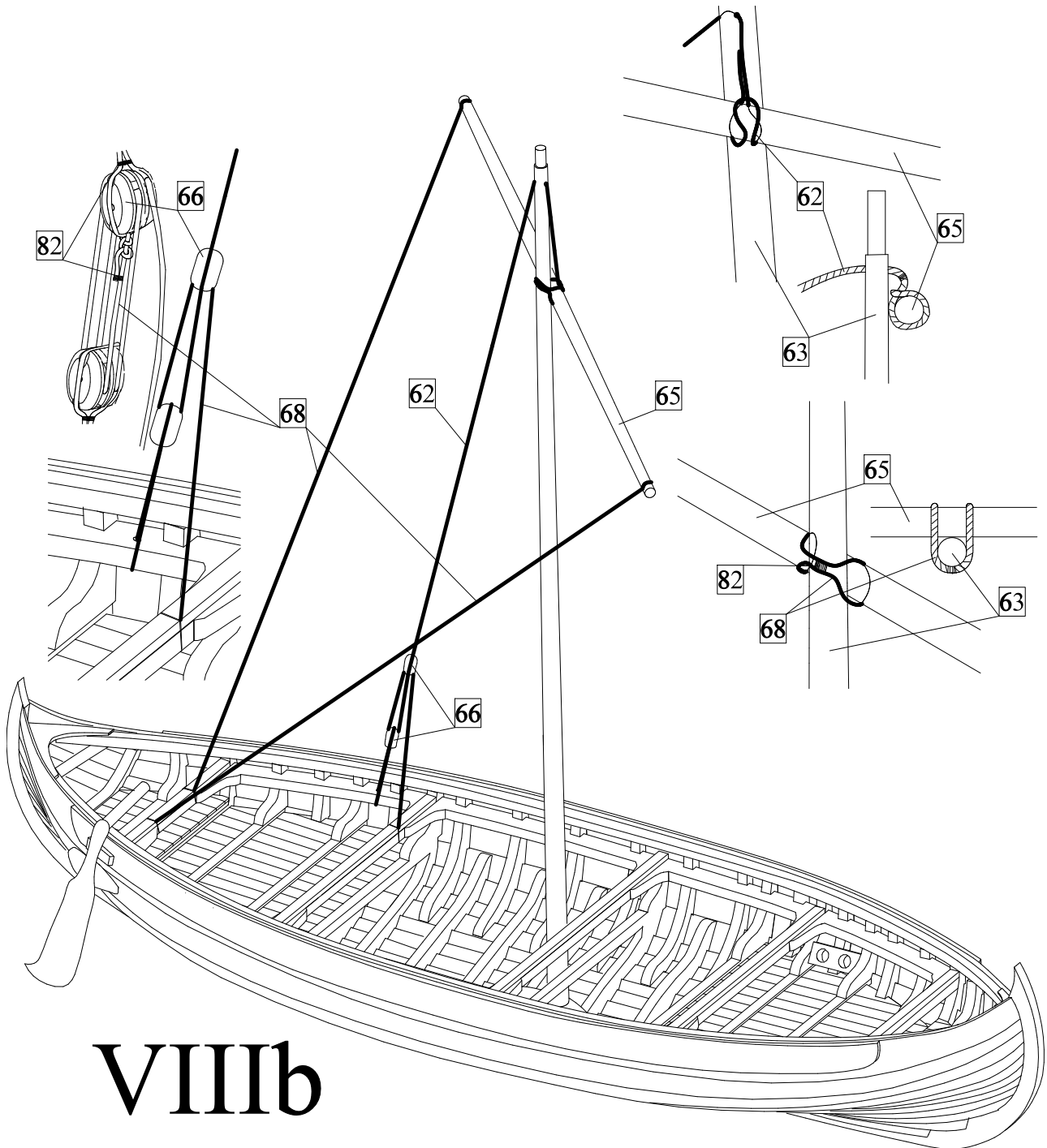
# VIIb



### VIII) Yard:

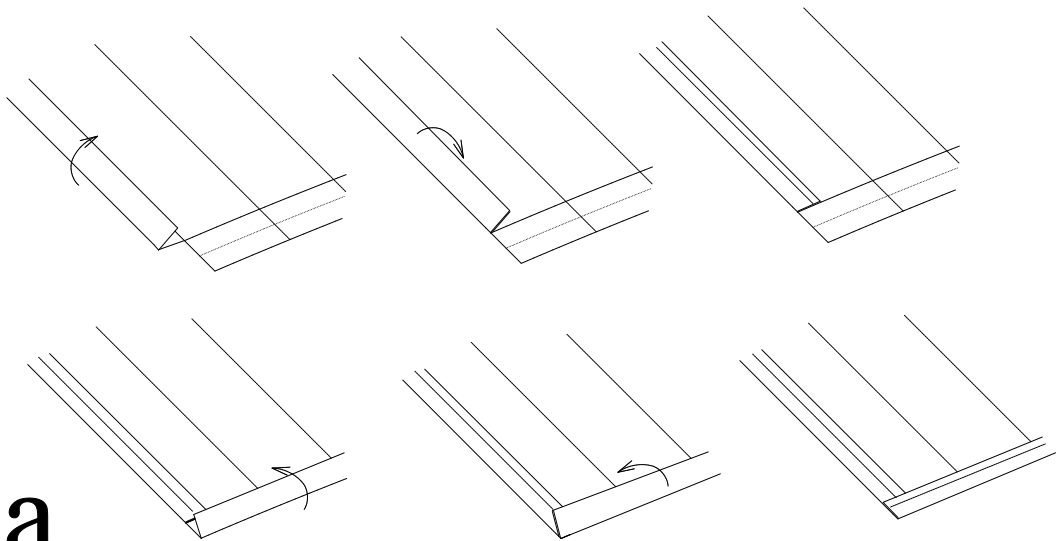
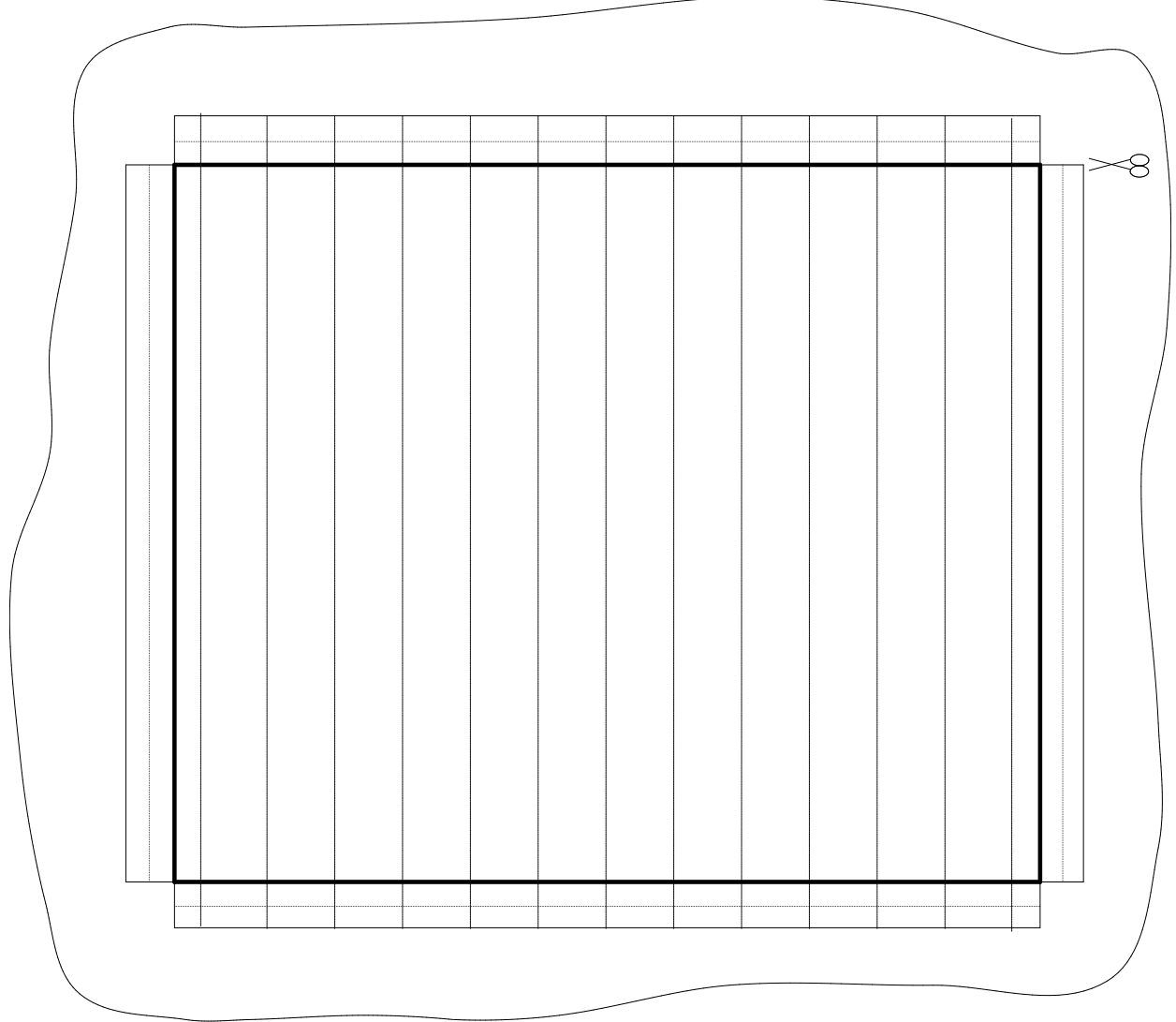
a) Sharpen by a sand paper a yard 65 from a dowel 3mm.

b) First tie a rope for raising and lowering to the yard. The second end of the rope tie through block 66 to the hull. Then tie the yard to the mast. Finally tie ropes for control to the ends of the yard and then tie them to the hull. The tying of the yard is shown below.

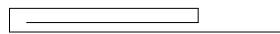


**IX) Sail:**

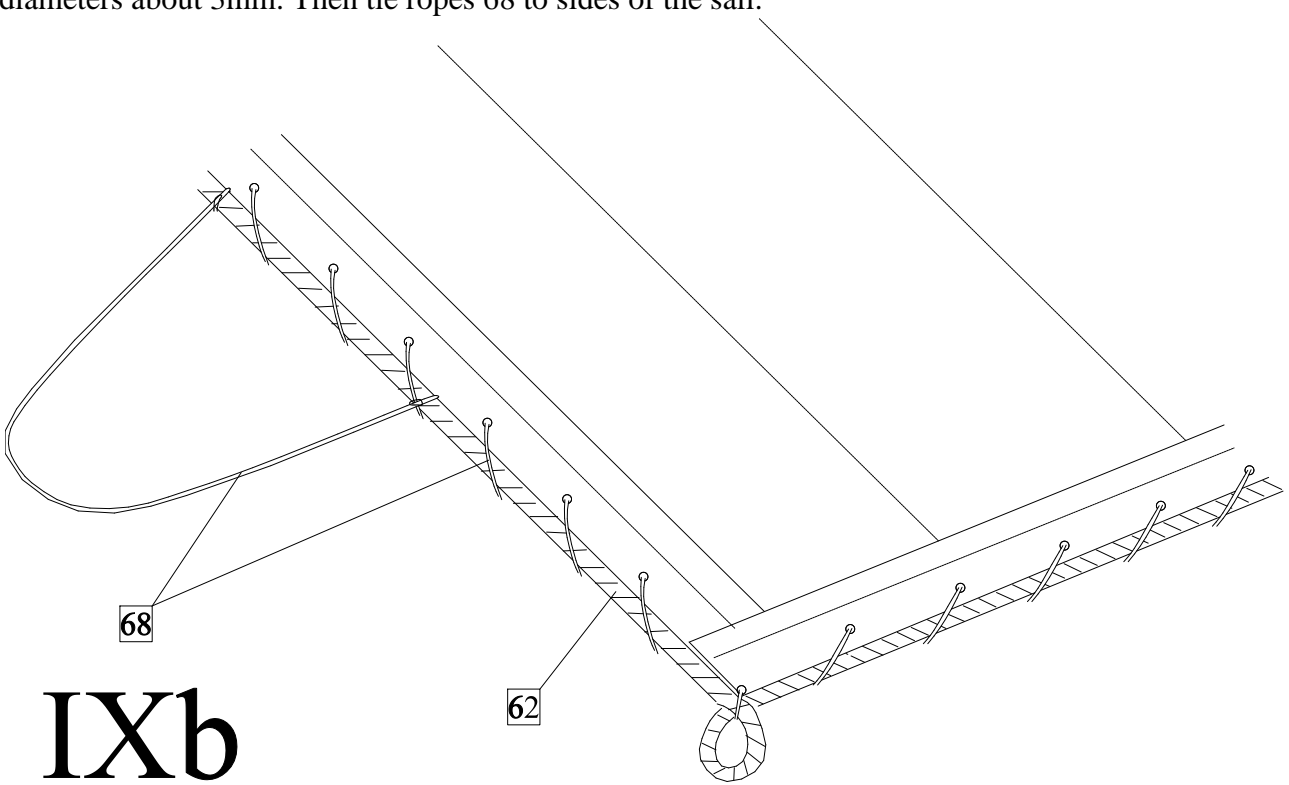
a) Make a sail 67. First draw by pencil contours of the sail on the. To the border of the sails add about 10mm for fell. By the pencil draw on the cloth also seams which divided the sail into simple segments. Then scissor the sail with fells and sewn it like it is shown below.



**IXa**

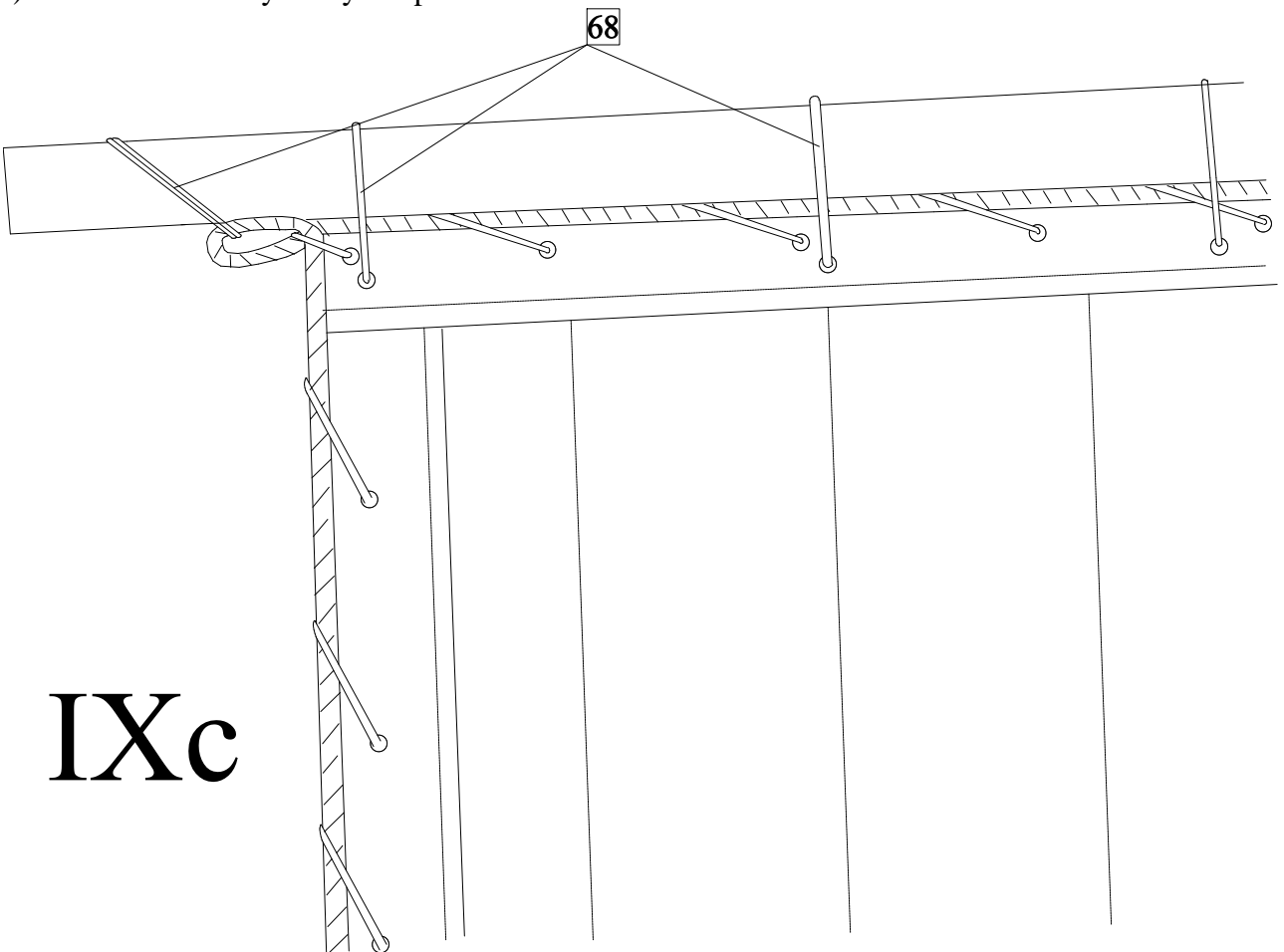


b) To the circumference of the sail sew on a rope 62 so that in the corner of the sail will eyes with diameters about 3mm. Then tie ropes 68 to sides of the sail.



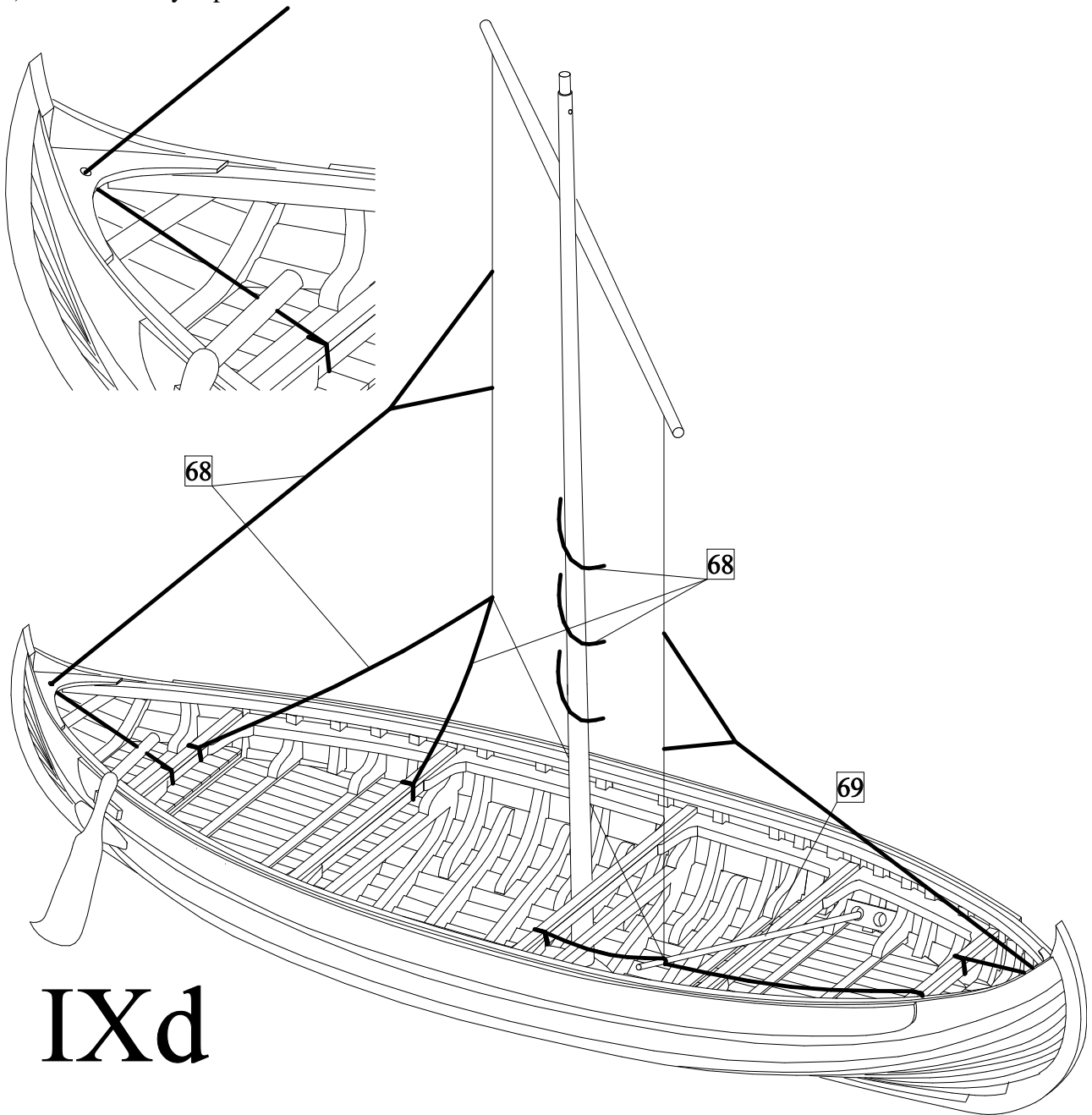
**IXb**

c) Tie the sail to the yard by a rope 68.



**IXc**

d) Tie the sail by ropes 68 to the hull and to the bar 69.

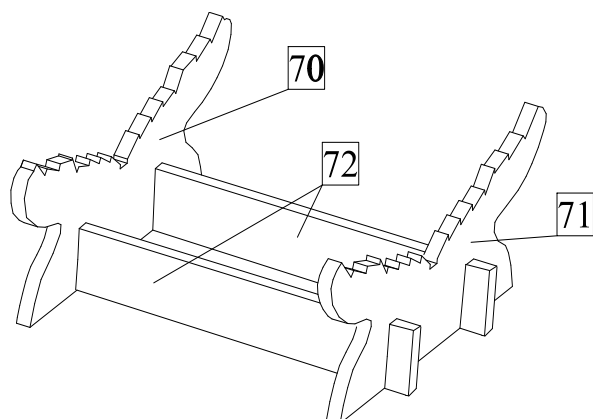


## IXd

### X) Stand

a) Make a stand from parts 70-72.

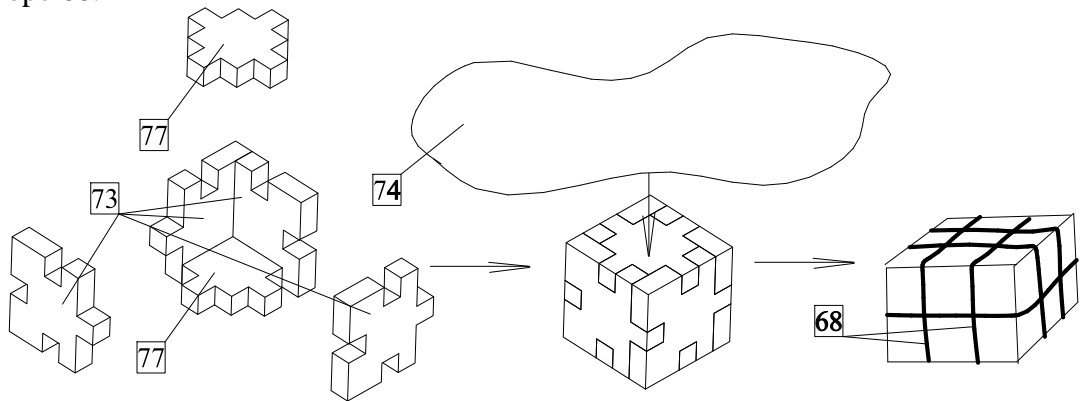
## Xa



### XI) Ship load:

a) Make a ship load. First glue together parts 73 and 77 and then pack them by a cloth 74. Finally tie the bales by rope 68.

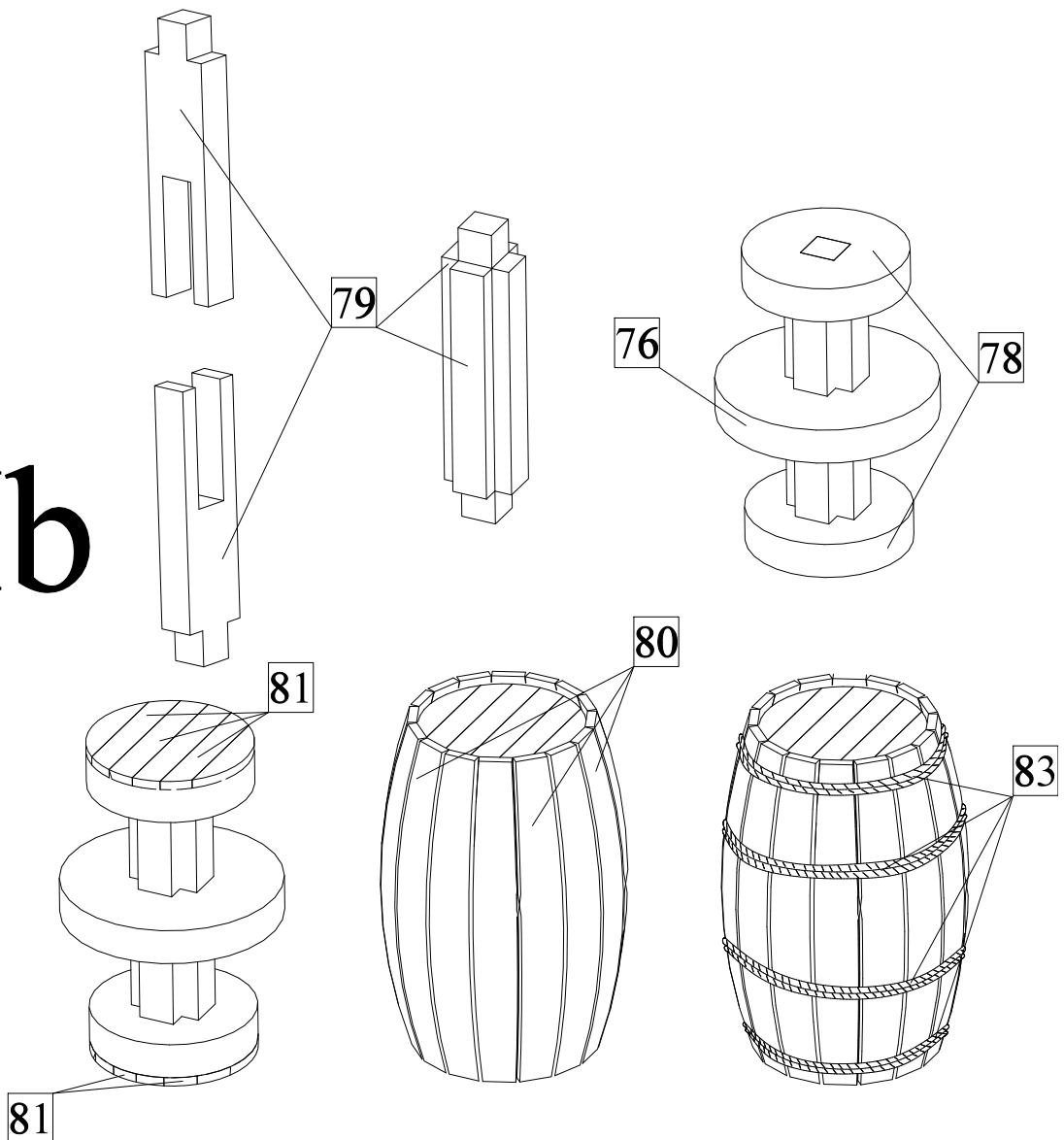
# XIa



b) Make barrels. First glue frames of the barrels from parts 76, 78 and 79. Then glue to the frames a covers 81. Then glue to the frames also planks 80. Finally tie the barrels by ropes 83

c) Install the ship load into the ship.

# XIb



**Part list:**

0	Keel	plywood 4mm	1pcs
1-18	Frames	plywood 4mm	1pcs
19,20	Deck	plywood 1mm	1pcs
21,22	Deck	plywood 1mm	1pcs
23,24	Mast foot	plywood 4mm	1pcs
25	Deck	veneer 0,6mm	6pcs
26	Deck	strip 2x4mm	2pcs
27	Frame	plywood 4mm	1pcs
28	Beams	strip 2x4mm	2pcs
29-35	Beams	plywood 4mm	2pcs
36-47	Planking	plywood 1mm	2pcs
48-53	Frames	plywood 4mm	2pcs
54	Beam	strip 3x3mm	2pcs
55,56	Reinforcements	plywood 1mm	1pcs
57	Rudder oar bed	strip 2x4mm	2pcs
58-60	Rudder oar	plywood 4mm	1pcs
61	Rudder oar	dowel 4mm	1pcs
62	Rigging	rope 1,25mm	5m
63	Mast	dowel 8mm	1pcs
64	Shroud pins	plywood 1,5mm	9pcs
65	Yard	dowel 6mm	1pcs
66	Block	block 5mm	2pcs
67	Sail	cloth	1pcs
68	Rigging	rope 0,75mm	20m
69	Bar	dowel 4mm	1pcs
70,71	Stand	plywood 3mm	1pcs
72	Stand	plywood 3mm	2pcs
73	Bales	plywood 3mm	60pcs
74	Cover cloth	cloth	1pcs
75	Boards with holes	plywood 4mm	2pcs
76	Barrels	plywood 3mm	7pcs
77	Barrels	plywood 3mm	30pcs
78	Barrels	plywood 3mm	14pcs
79	Barrels	plywood 3mm	14pcs
80	Barrels	veneer 0,6mm	112pcs
81	Barrels	veneer 0,6mm	14pcs
82	-----	-----	-----
83	Barrels	rope 0,75mm	20m