Building Aber

Sail and oar dinghy 4.30 m long

Customer name:	
Plan number:	ABR -

François Vivier Architecte Naval – SARL au capital de 8 000 € - Siren : 451 456 669 RCS Saint Nazaire
7, avenue des Courtils, 44380 Pornichet - FRANCE
tel : 33 (0)6 74 54 18 60 or 33 (0)2 28 54 97 86 - e-mail: fr@vivierboats.com – www.vivierboats.com

1. Plan package content

1.1. The present manual

1.2. Appendices

Numb	Rev	Title	Date	Pages
1	5	Timber list	18 June 2011	3
2	6	Plywood panels list (clinker version)	9 March 2012	11
3	3	Plywood panels list (strip planking version)	24 April 2008	1
4	2	Fittings list (standing lug rig)	29 September 06	2

Fitting lists for the new rigs (lug sloop rig and sprit sail) will be provided on demand to the designer, free of charge.

1.3. Manual of “wooden boatbuilding” sheets (mainly in French)

These documents are extracts from my book on wooden boat construction, “Construction bois les techniques modernes” (in French). Though only a few are presently translated, equivalent information in English is available from other sources. For example, the websites of epoxy suppliers give comprehensive information in regard to saturation, gluing, filleting, and sheathing. Sheet 44 is already translated and I intend to translate other ones. If you need some technical advice, please tell me and and I will answer your questions.

Numb	Rev	Title	Date	Pages
05	0	Imprégnation époxy	25 sept. 03	2
06	0	Collages et joints congés	14 octobre 03	2
07	0	Stratification sur bois	15 novembre 03	4
08	0	Imprégnation et collage : solutions par temps froid	12 novembre 03	3
12	1	Rivets à bateaux	15 novembre 03	2
15	1	Scarfs des panneaux de contreplaqué	9 novembre 03	2
16	0	Pièces en lamellé-collé	30 décembre 03	4
22	0	Montage de la structure sur chantier	8 avril 04	8
31	1	Bordé en petites lattes	19 juin 04	5
41	0	Brochetage d’un bordé	30 décembre 03	3
43	0	Tenue provisoire des clins	6 novembre 03	1
44	2	Lapstrake fitting	4 December 2006	3
62	0	Membrures ployées à la vapeur	28 janvier 03	4
63	2	Membrures lamellées-collées in-situ	28 octobre 05	4
71	0	Bancs et planchers	7 octobre 03	1
72	0	Gouvernail à safran relevable	17 octobre 03	1
81	0	Mâts et espars ronds	17 octobre 03	3
82	0	Le gréement au tiers ou de misainier	10 octobre 03	3
91	0	Peintures et vernis	18 novembre 03	3

1.4. Plans (large size)

Numb	Rev	Title	Scale	Date
21	5	Structure	1/10	18 June 2011

1.5. Plans (A3 format booklet)

Numb	Rev	Title	Scale	Date
01	1	Lines plan (outside planking) clinker version	1/12	10 October 2007
02	0	Lines plan (outside planking) strip version	1/12	14 March 2004
03	3	Stations dimensions - clinker version	1/10	25 June 2011
04	1	Transom and stem, clinker version	1/10	10 October 2007

05	**1**	Stations dimensions (strip planking version)	1/10	13 November 2007
06	**0**	Transom and stem, strip version	1/10	14 March 2004
11	**2**	General arrangement plan	1/15	12 October 2007
12	**2**	Building frame (classic)	1/15	12 October 2007
13	**1**	Building frame (advanced for clinker hull built with patterns or kit)	1/15	10 October 2007
25	**1**	Centreboard and centreboard case	1/10	12 October 2007
26	**0**	Rudder	1/10	3 April 2004
27	**0**	Rudder (optional arrangement)	1/10	18 June 2011
31	**0**	Sail plan "misainier" rig or standing lug	1/25	31 March 2004
32	**1**	Sail plan sprit rig	1/25	18 June 2011
33	**0**	Sail plan lug sloop rig	1/25	17 February 2011
34	**0**	Sail mark	1/1	31 March 2004
41	**0**	Mast and spars standing lug rig	1/20	31 March 2004
42	**1**	Mast and spars sprit rig	1/12	18 June 2011
43	**1**	Mast and spars lug sloop rig	1/10	9 March 2012
36	**0**	Oars	1/10	7 April 2004

2. Main characteristics

2.1. Dimensions

Hull length	4.30 m
Waterline length	4.00 m
Breadth	1.48 m
Depth	0.58
Draught (centreboard up)	0.25 m
Draught (centreboard down)	0.85 m
Empty weight (clinker)	180 kg
Full weight (clinker)	220 kg
Empty weight (strip planking)	220 kg
Full weight (strip planking)	270 kg
Sail area standing lug	9.7 m²
Sail area sprit sail	8.8 m²
Sail area sloop lug rig	10 m²

The full weight refers to the boat ready to sail. The empty weight is the weight of the boat without rig, oars, rudder, mooring... This weight varies according to the choice of plywood and timber. Thus, it is recommended to weight the boat prior ordering the trailer.

2.2. Boat presentation

Aber was the first boat created in 1985 as a result of the desire to provide a boat especially designed for the home builder. It is derived from Aven, my first sail & oars design. It is a little smaller, but has more buoyancy in the fore sections for better sea keeping. Aber kept the simple but so efficient lug rig in the Breton style, with a well peaked yard. She has a pivoting centreboard. The rudder is fixed but can slide vertically.

Due to its moderate size, Aber is an excellent rowing boat for one or two persons. It is also a very lively and fast dinghy. In the sail & oars range, Aber is the best choice for small crew, from 1 to 3.

As a result of these qualities, Aber was classified in the “top 150” by the English magazine “Classic Boat” (issue 150).

Aber is strip planked over bent or laminated frames. Since 2004, there is a plywood (6 mm) clinker version which gives a lighter boat.

2.3. Rigs

New rigs have been added in 2011 : sprit sail and lug sloop rig.

2.4. Compliance to regulations

WARNING

Aber is a boat that may capsize. Thus it is important:
to be equipped in order to withstand immersion into water,
to be prepared to right the boat,
to be always vigilant, to carry the sail appropriate for the wind and the sea state,
particularly if no external assistance is available.

Aber is designed in compliance with the requirements of the European Recreative Craft Directive 1994/25/CE amended 2003/44/CE.

It is designed to sail in the following categories:

- ✔ In category C, with a maximum of 3 persons on board (maximum loading 260 kg)
- ✔ In category D, with a maximum of 4 persons on board (maximum loading 330 kg)

The minimum crew is one person, as the boat may be right up by one person only in calm sea conditions. It is recommended to be at least two on board when sailing in poor wind and sea conditions or away from any possible assistance.

Note that if the boat is not fitted with additional side buoyancy bags (see plan 11), the maximum load is 3 persons (260 kg) in both categories C and D.

The definition of these categories is pointed out below:

Category C (Inshore): designed for trips in coastal waters, large bays, estuaries, lakes and rivers where conditions up to, and including, wind force 6 and significant wave heights up to, and including, 2 m may be experienced.

Category D (Sheltered waters): designed for voyages in close coastal waters, small bays, lakes, rivers and canals where conditions up to and including wind force 4 and maximum wave heights up to and including 0,3 m may be experienced.

NOTE: The significant wave height is the mean height of the highest one third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will be double this height.

3. Right of use and general information

3.1. Right of use

The purchase of plans gives the right to build one unit, by an amateur builder. They can be sold only by the naval architect (François Vivier).

Plan package, comprising the present manual and all the attached documents listed on page 2, is the property of the architect. Except for the needs of construction, the documents may not be reproduced, transmitted to a third party, nor published entirely or partly, without written authorization from the architect.

3.2. Plan number

The plan number, registered on the front page of this manual, is specific to the purchaser and must be recalled in any correspondence with the architect or Icarai (builder and kit seller).

Please inform the architect when the boat is first launched, and of change of address or ownership while building.

3.3. Liability of the builder

Aber was designed with care and in full compliance with the European regulations. However, each boat is built under the whole responsibility of its builder, and sails under the whole responsibility of its crew. Both the architect and Icarai (boats from a kit) decline any liability in regard to people, legal entities, and property resulting from construction and/or from use of a boat built from the plans.

3.4. Respect of the weights, scantlings, materials, and buoyancy

Amateur builders should be careful to note the necessity of respecting the plans and specifications, especially scantlings and choice of materials, so that the boat does not become too heavy. Such extra weight would make it less seaworthy, more difficult to launch and retrieve, and would involve a risk of overloading the road trailer. Conversely, it is strongly disadvised to reduce scantlings or to use materials of lower quality. Respecting the specifications concerning volumes of buoyancy is an essential condition for compliance with EC regulations.

3.5. E-mail assistance

If you encounter difficulties during construction, or if you have suggestions to make, please feel free to contact the architect (preferably by e-mail or phone). Specify the number and the date of the plan (see front page). We will answer your questions and, if necessary, update the plans to benefit other builders.

François Vivier Architecte Naval
7, avenue des Courtils – 44380 Pornichet - France
tél : 33 (0)6 74 54 18 60 ou 33 (0)2 28 54 97 86
e-mail : fr@vivierboats.com
www.francois.vivier.info

Note: I am always happy to receive pictures and news about the boats I have drawn !

3.6. Supplies, kit

Materials and fittings needed for construction, in particular those specific to the boat, can be acquired from Icarai (non restrictive list): marine plywood (panels or NC cut parts), sawn timber, centreboard, fittings, sails, outboard motor, trailer.

I have observed that to buy a kit allows the amateur builder to avoid bad surprises, un-compliant purchases, high delivery costs and generally is a cheaper and easier way that to try to source all different materials and equipments.

Icarai sarl
Lieu dit La Lande - 50110 Le Mesnil au Val - France
tél : 33 (0)6 62 83 33 36 ou 33 (0)2 33 41 38 91
e-mail : nvivier@icarai.net
Internet : www.icarai.net

4. Choice of construction method and rigs

4.1. Construction method

Aber may be built either in clinker plywood (6 mm thick ply or possibly 9 mm) or in strip planking (15 mm thick). The following table gives the advantages (as well as drawbacks) of each method:

Clinker plywood	***Strip-planking***
Lighter (about 50 kg), easier to launch and recover. Able to carry more load, for example to take on board camping equipment.	Heavier and more stable and comfortable when sailing with a small crew, in particular single handed.
The material is not sensitive to temperature and moisture variations. A plywood boat is very tolerant to trailering, long and alternate period in water and ashore...	Strip planks are true wood. The hull may be varnished, even over a thin epoxy glass sheathing which improve resistance to abrasion and weather.
Clinker planking gives an aesthetic effects in the spirit of northern Europe tradition as well a large vessels service boats.	Strip planking give a look very close to a traditional carvel built boat.
The clinker boat is easier and quicker to built, with few temperature and moisture content constraints.	With strip planking, you keep the pleasure to work timber.

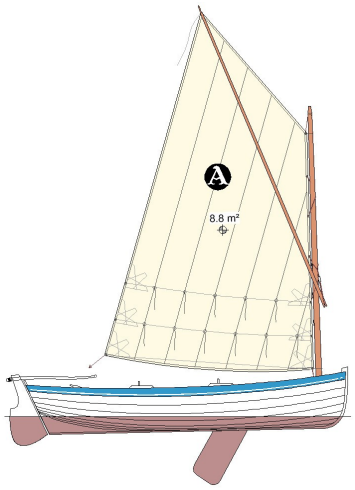
Going into more detail, there is three different solutions concerning frames. We give hereunder some element to make a choice:

Laminated frames fitted first	***Laminated frames fitted after planking***	***Steam bent frames***
Description: frames are laminated at very first stage and laid down on the building frame before planking. Some frames are reinforced by partial plywood bulkheads (crosshatched on the structure plan).	Description: the hull is made first using temporary station moulds. Then frames are laid down into the hull. Station moulds are used as patterns to laminate the frames.	Description: the hull is made first using temporary station moulds. Then frames (acacia or oak) are heated into a steam box and forced into the hull in the traditional way.
Interest: **only for strip planked hull**. It is possible to screw down the strips into frames (no temporary screwing). The hull may be epoxy sheathed on the outside face before turning over. Frames may be laminated into a small room which may be more easily heated in winter. Frame scantling is heavier, giving a more traditional look. The construction is sturdier.	Interest: **mainly suited for clinker construction**. It is a good alternative solution to steam bent frames if you do not have appropriate timber or you want to avoid the use of a heating apparatus. The attachment between frame and planking is made by either screws of rivets.	Interest: Suited for both clinker and strip planking construction. It is a traditional method, fast if you have already the steam box and timber (to be green or with a high moisture content). It is the best way for professional builders. The attachment between frames and planking is to made preferably by rivets.
Precautions: it is recommended to use full size polyester patterns to get a good precision.		Precautions: At least last two fore frames are to be cant frames (not perpendicular to keel) to ease lay down. Attention: In case of clinker planking, it is preferable to use 9 mm plywood. With 6 mm plywood, the hull is too flexible when laying down the frames.

4.2. Rig choice

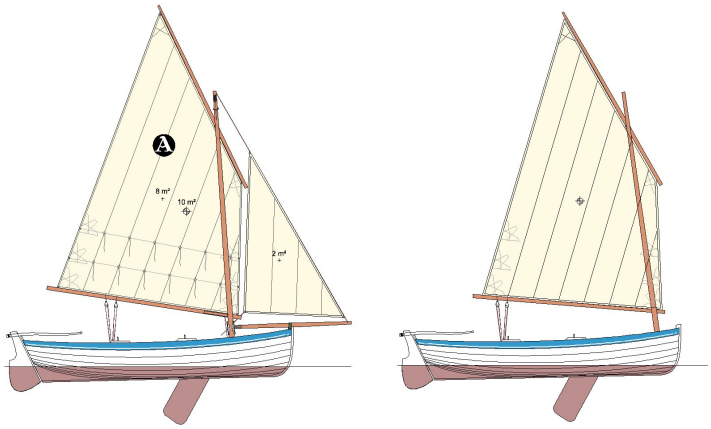
The Aber original rig is the standing lug, said misainier in French Britanny. It is a simple but efficient rig, particularly with a well raked yard as designed. The tack point is just ahead of mast. Therefore it is possible to tack still keeping the yard on the same side of mast. The helmsman has just to take the sheet from one side to the other and put the block grommet into the thumb cleat. The sail is boom-less, which is safe for the crew heads!

The mast is easily un-stepped at sea. It is strongly preferable to row with the mast stowed into the boat, as this reduce dramatically the windage and makes rowing easier with head-wind.



A home builder in Tasmania ask for a sprit rig for my Aber design. This rig is now available. Sprit rig has many benefits on a small boat. It is easy to set as the sail may be wrapped around the mast and both are easily handled. It is also more efficient when running, compared to the lug sail as the sprit unfold the sail. The sprit itself does not distort the sail due to the natural twist, even when the sprit is on the lee side. If designed with a high aspect ratio, as I did on Aber, the sprit sail is also excellent to windward. The only drawback of the spritsail is that it is not possible to reef down as much as on other rigs. Two small reefing lines are the very maximum. However, it is possible to sail without sprit in case of a sudden storm, with the top of the sail folded. And last but not least, the sprit sail gives a very good looking to you boat!

With more sail area, the lug sloop rig is dedicated to those who prefer sail than oars. An interesting feature is that it is possible to step the mast in the fore position and to convert the rig into a simple standing lug with a moderate sail area. Then, you have an easy rig, perfect for singlehandling or to sail in a fresh breeze.



4.3. Building time, tools

It is difficult to give an estimate of the construction time, so much this one varies from one builder to another, according to the experience possibly gained during former constructions. The tools you have at disposal and you are able to master influence the working time. Some boats are true works of art, others are rather of simple and rustic style.

The cutting up of timber takes also time which could be sub-contracted. The purchase of a light combined planer is not justified for the clinker version which largely calls upon plywood. Such a device can economically prove profitable for the strip planked version if you want to cut up timber yourself. For the remainder, only basic portable tools are necessary: drill, screw driver, jigsaw, electric plane (especially for mast and spars), without forgetting a good quantity of screw clamps.

The clinker version is faster to build than the strip planking. Minimum building time is about 400 hours for the clinker version, using a precut kit. Add about 100 hours for the strip planking version. Construction time may be doubled for a first construction project and if you want a high quality finish. These times are complete, including rig, fitting and painting. To build yourself such a boat supposes that you are looking mainly for the satisfaction of a beautiful work, without being to much worried by time constraint.

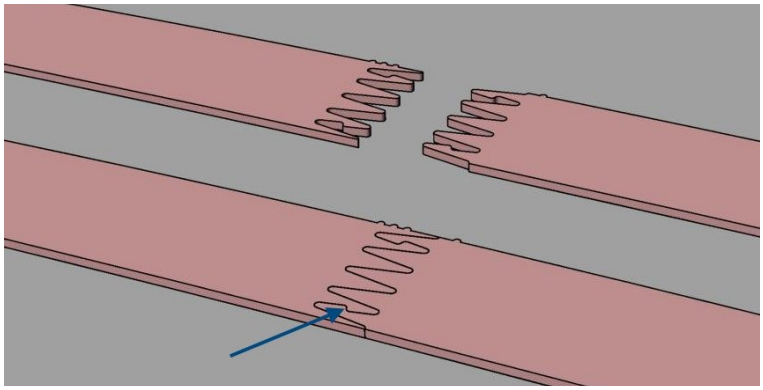
4.4. NC cut plywood kit (clinker version only)

The kit includes all the plywood parts necessary to the construction, as well as station moulds and longitudinal girders for the “advanced” building frame, precut on numerically controlled machine. Most parts are at final dimension or require only little fit. Refer to the appendix 2 which gives the nesting diagrams of the parts in all panels.

The kit offers up the following advantages:

- ✔ Large reduction of the construction time: you will save the time of marking and cutting many parts within many plywood panels.
- ✔ Reduction of the need for space to scarf and cut out the panels.
- ✔ Reduction of the risk of construction error and improvement of the assembly accuracy.
- ✔ Saving in the number of required plywood panels (see appendix 2)

The hull strakes are assembled by zigzag joints as follows:



Kit is to be ordered to boat-builder Icarai (see page 5) or other approved designer representatives. If you buy the kit, you do not have to order the polyester patterns.

4.5. Full size patterns on polyester film (also said mylar)

They are available for both clinker and strip planked versions

For the clinker version, patterns allow to build with the same “advanced” frame that with the kit. You get also a pattern of all strakes allowing to mark the planks shapes on the plywood panel which have been previously scarfed. In that case planks do not need any adjustment.

For the strip planked version, patterns give at full scale the same data as plans “stations dimensions” and “transom and stem”.

The support is a polyester film, very resistant to tearing and not subject to humidity variations. Marking are to be transferred to the plywood sheets.

For that purpose, you may use a screwdriver grinded to form a spike. With a hammer, the wood is marked through the film. You may also use carbon paper spread between film and plywood. An other very efficient method is to use a tracing wheel as used by dressmakers :

The patterns offer up the following advantages:

- ✔ Reduction of the risk of construction error and improvement of the assembly accuracy.
- ✔ Reduction of the construction time: you will save the time of marking many parts from scaled down drawings ; no need to make strakes patterns in the traditional way (for the clinker version).
- ✔ Compared to kit, may be sent easily worldwide.

Polyester patterns are delivered in a resistant tube and are to be ordered from François Vivier Architecte Naval SARL according to current price list.

5. Summary of the construction process

Before starting the construction, the general process of which is presented in the following pages, it is important to read the whole manual and plans for a good overall comprehension. That remains true at all stages. A good preparation will avoid errors, sometimes not easily retrievable, and will save time.

The general process is as follows :

	Clinker over station moulds	Strip planking over station moulds	Strip planking over laminated frames
A Building frame	**AG** ✔ Cut out station moulds. Making out stem and transom. ✔ Setting up of all these elements on the building frame		**AM** ✔ Making out laminated frames, stem and transom ✔ Setting up of these elements on the building frame
B Planking	**BC** ✔ Lapstrake planking with plywood. ✔ External completion of the hull : false-stem, skeg, false keel....	**BL** ✔ Planking with timber strips ✔ External completion of the hull : false-stem, skeg, false keel....	**BL** ✔ Planking with timber strips ✔ External completion of the hull : false-stem, skeg, false keel.... ✔ Epoxy sheathing of the hull
C Interior assembly	**C** ✔ Roll over the hull. ✔ Fit frames into the hull ✔ Completion: thwarts, seats, floorboards, rub-rails...		**C** ✔ Roll over the hull. ✔ Completion: thwarts, seats, floorboards, rub-rails...
D Rig and fittings	**D** ✔ Making rudder and centreboard ✔ Making mast, spars and oars. Lay down fittings and rig. The tasks of chapter **D** are independent of the general building schedule. They may be done at any moment, giving some freedom to organize construction taking in account available space and climate constraints.		

Take note of the letter which are used to number the paragraphs. According to chosen options, the above table points out the applicable paragraphs.

Note that some “secondary options” are also to be chosen and are described only in the following pages, in particular:

Main option	Secondary option
Construction over station moulds	Laminated or steam bent frames
Strip planking	Epoxy sheathing of the outside face of planking or not
Clinker	Glued (with temporary screws) or riveted (with epoxy impregnation afterwards)
All	Construction from drawing only, from polyester patterns or from kit.
All	Rig choice

In order to avoid mistakes, we suggest to cross out non applicable paragraphs as soon as you have made your choice.

6. Chronological description of the construction

The construction of Aber is described in a chronological way. At each paragraph, we show on the left the applicable drawings, appendices, wooden boatbuilding sheets.

The description which follows is based on the assumption of a construction using plans/drawings only. If you have polyester patterns or kit, marking and/or cutting tasks are deleted.

AG – Construction on station moulds: building frame

AG-1 Make station moulds

Plan 03 or 05

Sheet 22

Station moulds are made of ordinary plywood or chipboard panels 12 mm thick. They have to be extended down to the baseline (at 600 mm above waterline). They are marked and cut out according to plans, including notches for the keel (and even keel + stem or keel + transom knee). Draw a line at 375 mm from centreline to ease lateral positioning.

It is also advisable to cut out holes in the moulds (see appendix 2) to facilitate access under the hull (to clean out glue smears or to set down rivets) and to fasten hull planks with clamps.

If you are building a clinker version using full scale patterns, cut out also the longitudinal girders and transom support which are part of the “advanced” building frame.

AG-2 Prefabrication of stem and transom knee/sternpost

Plan 04 or 06
Plan 12
Plan 13

Appendix 1

Sheet 22
Sheet 16

Mark in full size, on a light plywood sheet, the stem profile. Cut-out the plywood to get a stem pattern. Make the stem as shown on plan 21 (3 layers). Note that it is preferable to extend the stem up to the transversal beam shown on plan 12 or 13 (building frame) for proper holding during construction. This extra length will be cut out after hull turning over.

Use the stem as a mould to laminate the false stem which will be screwed down after planking.

Draw on the stem the bevel lines on fore face and on sides. Rough out the bevels. Take care not to bevel above the sheer line.

Plane out the face on which the keel will be glued.

The transom knee (also said sternpost) is made in the same way. It is made of two layers only.

AG-3 Transom prefabrication

Plan 04 or 06

The transom is made of timber battens glue together. Apply the same principle of wood ring alternating as shown on sheet 31 for strip planking.

The inner profiles is given on plans (as well as on patterns). So you may cut directly along the marking line. Wood will be taken off when bevelling. A notch is be cut-out for keel end.

An alternative way is to make the transom in plywood, preferably sapele, mahogany or sipo, gluing together two layers 10 mm thick. Such a plywood transom is included in the plywood kit.

AG-4 Building frame setting

Plan 12
Plan 13
Sheet 22

Set-up the building frame, made of two wooden stocks of any other equivalent solution, as per plan.

There is two versions of the building frame, classic or advanced. Plans 12 and 13 explain which one is applicable according to your building option.

AG-5 Scarf of plywood panel for hull planking (clinker only)

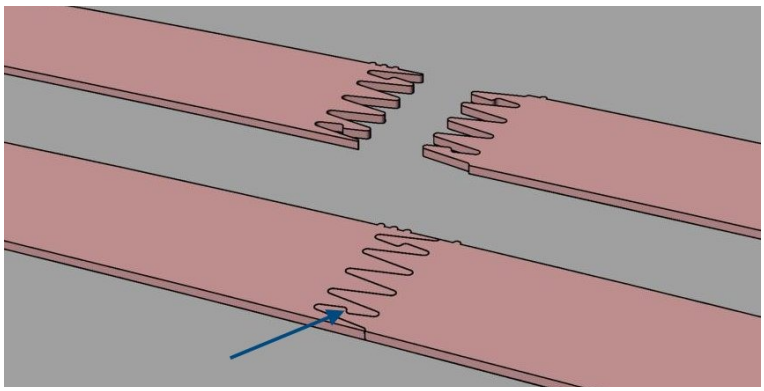
Appendix 2

Sheet 15

It is practical to use the building frame as a support for scarfing panels, especially if you are short is space.

If you use the kit, each strake is made of two parts with a zigzag joint which need only to be glued together. Prior gluing, coat the plywood edges with epoxy and wait until the resin has been soaked up. Then apply glue again and join both parts. It is essential to squeeze the joint to have the planks perfectly flushed. You may use the building frame as support.

To avoid mixing up planks, there is dents close to joints. Dents have to be on the same side (upper side when the boat is upright). The aft part has only one dent, the fore part several. The number of dents give the order of planks (1 to 4 and again 1 to 4 dents for planks 5 to 8). There is also dent at the aft end of planks. The number of dents gives also the order:



If the fit is too tight, you may rasp some wood in the areas marked by an arrow on the sketch.

In other case, scarf full plywood panels two by two, making 4.9 m long about panels. The strakes will be outlined either by traditional spiling or simply from polyester patterns. Patterns take in account a strake overlap of 24 mm about. Add at each end about 20 to 50 mm in length which will be levelled with transom aft face and stem fore face after full planking of the hull.

The recommended scarf length is 50 mm for 6 mm plywood and 70 for 9 mm plywood.

AG-6 Erecting the building frame

Plan 12
Plan 13
Plan 21

Sheet 22

Put on the building frame:

- ✔ The station moulds. They does not require any bevelling. They are located on the fore side of stations marks 1 to 5, and on the aft side of station marks 6 to 10.
- ✔ The stem which is resting into the station 10 notch and on the transverse beam.
- ✔ The transom and transom knee which are to be very precisely positioned. If you use the classic building frame, two set squares (see plans 04 or 06) are to be cut for that purpose and are to placed against the station mould 1, at each sides of transom knee.
- ✔ The keel which is to be made narrower at ends. The slot for the centreboard is also to be cut-out on the work bench. Screw down and glue the keel on the stem and transom knee. Screws must be temporary or located in order not to prevent further bevelling of the keel (mostly forward).

It is preferable to work on a building frame as rigid and precise as possible. So do not hesitate to add as many reinforcing battens and square as you feel satisfied. These are not shown on plan 12. Double check all dimensions and straitness before starting planking process. This is essential for the final quality of the boat.

As shown on drawing 13, longitudinal girders ease the positioning of moulds and transom if you are building the clinker version with patterns or kit.

AM – Construction over laminated frames: building frame

AM-1 Laminating frames

Plan 05
Plan 21

Sheet 16
Sheet 22
Sheet 06

If the boat is built over frames (instead of station moulds), frames are laminated. Frames are made of 8 layers, 3 mm thick and 27 mm wide. Thus, the final width, after gluing and planing is 25 mm about.

Frames are to be bevelled, both outside to receive planking and inside to receive the seat riser. Additional layers are required to bevel,and keep approximately the same frames moulding, as follows:

Station 1	11 layers
Station 2	10 layers
Station 3	9 layers
Station 4	8 layers
Station 5	8 layers
Station 6	9 layers
Station 7	9 layers
Station 8	10 layers
Station 9	11 layers
Couple 10	12 layers

Frames are made in one single part (except station 10), from one side to the other one. They have to be extended down to the base line of the building frame. Both end are linked with a span, maintaining proper opening and allowing to fasten over the building frame girders. Mark these span at 375 mm from centreline to allow longitudinal alignment of frames. Frames 6 and 7 will be cut out only when the centreboard case will be inserted.

Floors and plywood bulkheads are glues and screwed to frames.

AM-2 Prefabrication of stem and transom knee/sternpost

Plan 06
Plan 12

Appendix 1

Sheet 22
Sheet 16

Mark in full size, on a light plywood sheet, the stem profile. Cut-out the plywood to get a stem pattern. Make the stem as shown on plan 21 (3 layers). Note that it is preferable to extend the stem up to the transversal beam shown on plan 12 (building frame) for proper holding during construction. This extra length will be cut out after hull turning over.

Use the stem as a mould to laminate the false stem which will be screwed down after planking.

Draw on the stem the bevel lines on fore face and on sides. Rough out the bevels. Take care not to bevel above the sheer line.

Plane out the face on which the keel will be glued. See picture in § AG-2.

The transom knee (also said sternpost) is made in the same way. It is made of two layers only.

AM-3 Transom prefabrication

Plan 06

The transom is made of timber battens glue together. Apply the same principle of wood ring alternating as shown on sheet 31 for strip planking. See picture in § AG-3.

The inner profiles is given on plans (as well as on patterns). So you may cut directly along the marking line. Wood will be taken off when bevelling. A notch is be cut-out for keel end.

An alternative way is to make the transom in plywood, preferably sapele, mahogany or sipo, gluing together two layers 10 mm thick.

AM-4 Building frame erecting

Plan 12
Plan 21

The building frame is built according to plan or in a similar way according to timber and materials you have.

Sheet 22

Then Lay down:

- ✔ Frames (aft of station marks 1 to 4 and forward of station marks 5 to 9. Station marks are all at 400 mm spacing).
- ✔ Stem, sternpost, transom, keel.

On the picture, the sheerstrake is already fitted and add stiffness to the ensemble

BC – Lapstrake planking with plywood

BC-1 Lapstrake fastening

Sheet 44

Sheet 12

Choose one of the the following methods:

- ✔ Glued lapstrakes with temporary screws (sheet 44)
- ✔ Riveted or clenched lapstrakes (sheet 12) if you prefer the aesthetic traditional aspect of rivets.

BC-2 Lapstrakes lay down (with kit or full scale patterns)

Sheet 12

Sheet 43

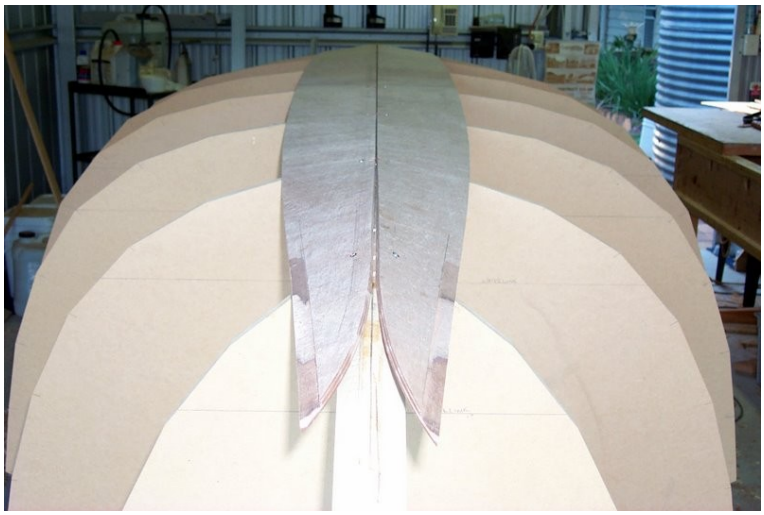
Sheet 44

In both cases (kit or patterns), lapstrakes are cut at final shape and do require adjustment at ends only.

The general process is as follows (see details in sheets 43 and 44):

- ✔ Lay down temporarily the plank according to marks / angles on the station moulds and according to “previous” plank. The normal value of overlap is 24 mm. But to cope with the unavoidable inaccuracy, the actual overlap may vary between minimum 10 mm (locally) and 30 mm.
- ✔ Make end chamfer as per sheet 44 § 4.
- ✔ Mark and plane the chamfer on the “previous” plank full length.
- ✔ Glue the plank
- ✔ Repeat with the opposite plank. It is preferable to plank progressively both sides to avoid any hull distortion.

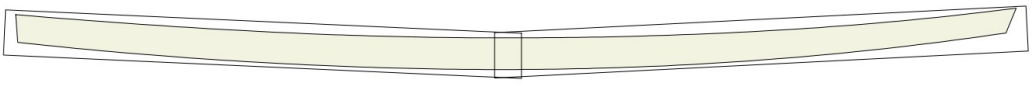
Note that the first plank (garboard) must cover the keel up to centreline. It will be covered afterwards by the false-keel.



The garboard is in place but still needs to be twisted at fore end. This the most touchy job.
With hard plywood, it may be necessary to soften plywood with a towel impregnated with boiling water.

The sheerstrake (last plank to be fitted) is made of timber instead of plywood. This will allows to have it varnished. This has also be chosen to avoid an additional plywood panel (kit or patterns).

Attention: If the sheerstrake is made of 2 scarfed planks, take in account the overall camber before assembly as per sketch:



Tip: when 2 strakes per side are glued, it is preferable to stop planking process and to fit the skeg and plane out the garboard to receive the false keel. The bilge-keels may also be laid down after the fifth plank is glued (see next paragraph).

BC-3 Lapstrakes lay down (traditional method)

Sheet 12

Planks are laid down according to traditional method as follows:

Sheet 41

- ✔ Spil each plank, according to sheet 41

Sheet 43

- ✔ Cut-out, present, adjust.

Sheet 44

- ✔ Make end chamfers (sheet 44)
- ✔ Mark and plane the chamfer (22 to 24 mm) to receive the following plank
- ✔ Lay down the plank according to chosen fastening method.
- ✔ Repeat with the opposite plank. It is preferable to plank progressively both sides to avoid any hull distortion.

Note that the first plank (garboard) must cover the keel up to centreline. It will be covered afterward by the false-keel.

The sheerstrake (last plank to be fitted) is made of timber instead of plywood. This will allows to have it varnished. See sketch on the BC-2 paragraph. This has also be chosen to avoid an additional plywood panel (kit or patterns). If you prefer to use plywood, then add to gunwale an additional external layer (rub-rail) with a rabbet to cover the plywood edge.

Tip: when 2 strakes per side are glued, it is preferable to stop planking process and to fit the skeg and plane out the garboard to receive the false keel. The bilge-keels may also be laid down after the fourth plank is glued (see next paragraph).

BC-4 External completions of the hull

Plan 21

To do before turning over the hull:

- ✔ Lay-down the false stem. Shape it on the bench, leaving a 18 mm about width flat surface on the fore end (a little more than the metal keel band). Adjust, glue and screw in place from outside.
- ✔ Plane the planking horizontal at centreline to receive the false keel and skeg. The centreboard slot is to cut-out in advance.
- ✔ Laminate the skeg if not already done.
- ✔ Lay-down the hardwood false keel.
- ✔ Lay down bilge keels to protect the hull when aground. They are to be cut-out to shape from timber. Make a pattern with light plywood to get the hull camber.
- ✔ Saturate all plywood strakes edges with epoxy resin. Repeat as necessary to get a good protection.
- ✔ Screw down the brass, bronze or stainless steel keel band on full length, from stem-head to lower rudder pintle. There is two keel bands in way of centreboard slot. Use stainless steel screws.

BC-5 Turning over and just after

Sheet 05

Be very careful for turning over. Check available space and resistance of hanging points. It is better to have many hands to help and a good coordination. After turning over, wedge the boat, checking that is is not twisted before resuming work.

If you have used rivets, then it is time to clench them. Then apply epoxy on the inside seams.

BL – Planking with timber strips

BL-1 Strip planking

Sheet 31

Appendix 1

The sheet 31 describes the planking process. Strip planks are glued to frames and screwed to stem and transom. Use screws or nails into frames, every 3 strips, to get a good bond. If you intend to varnish the hull, the best is to use coper rivets.

The first step is to fit the sheer-strake (see profile on plan 02). Then fit all strip planks up to centreline. It is not necessary to get a good fit between both sides planking at centreline, as it is possible to fill with epoxy putty. This area is later covered by the false keel.

Strips planking

Closing planks, which may be done with several strips glued in advance

BL-2 External completions of the hull

Plan 21

Sheet 07
Sheet 08

To do before turning over the hull:

- ✔ Lay-down the false stem. Shape it on the bench, leaving a 18 mm about width flat surface on the fore end (a little more than the metal keel band). Adjust, glue and screw in place from outside.
- ✔ Plane the planking horizontal at centreline to receive the false keel and skeg. The centreboard slot is to cut-out in advance.
- ✔ Laminate the skeg if not already done.
- ✔ Lay-down the hardwood false keel.
- ✔ If you build over laminated frames, sheath the full planking with a 200 to 300 g/m² cloth and epoxy. The sheer-strakes may not be sheathed. If you build over station moulds with steam bent frames, you need to sheath when frames are fitted. Sheathing may be avoided if you have a very good timber quality and if you intend to take care of your hull (no long time exposure to sun or rain).
- ✔ Lay down bilge keels to protect the hull when aground. They are to be cut-out to shape from timber. Make a pattern with light plywood to get the hull camber.
- ✔ Then the hull may be painted, at least under waterline, to avoid further turning over.
- ✔ Screw down the brass, bronze or stainless steel keel band on full length, from stem-head to lower rudder pintle. There is two keel bands in way of centreboard slot. Use stainless steel screws.

C – Interior assembly

C-1 After turning over

The hull is very flexible, mainly if it has been built over station moulds. After turning over, wedge the boat, checking that is is not twisted before fitting frames. Put in place some cross spalls to maintain the proper breadth of the hull and avoiding opening of the hull when framing.

Check also the sheer-line which must be fair and elegant. If necessary, it is still possible to plane out some millimetres to be fully satisfied.

C-2 Fitting in-situ laminated frames

Sheet 63

Plan 21

Appendix 1

As Aber frames are at same location than station moulds, the latest may be used as mould as explained in sheet 63 (last two pages). See § AM-1 for the number of layers.

Be careful to fit frames at the proper location, in particular fore and aft of the centreboard case which is inserted afterwards.

Plywood bulkheads and floors are fitted after, glued against frames and joined to planking trough epoxy fillets (to be make discreet in visible areas).

C-3 Fitting steam bent frames

Sheet 62

Plan 21

Appendix 1

Steam bent frames are of lighter scantling than laminated frames. Mainly in the case of strip plank construction, you may double the number of frames, both to improve aesthetics (frames were very closed in traditional hulls) and to improve hull strength.

Be careful to fit frames at the proper location, in particular fore and aft of the centreboard case which is inserted afterwards.

At fore end, you will have to fit cant frames (not perpendicular to centreline, see plan 23 and 24). Then a timber floor will be added to link both sides. It is not necessary to have a connexion between these floors and the cant frames.

C-4 Centreboard case

Plan 25

The centreboard case is prefabricated according to plan. It is also strongly recommended to epoxy sheath the inside of case, as it will be very difficult to re-coat during the boat life.

Before closing the case, sheath inside with glass cloth and add a thick coat of epoxy to give a durable protection. It will be quite impossible to renew the inside protection during the life of the boat.

Fit on each case side the longitudinal batten supporting the floorboard. It is easier to do it at this stage.

Line up the cut-out in keel and false-keel. Carefully adjust the centreboard case to the keel to avoid any leak. Glued in place the case. Use screws across the logs into the keel. Drill obliquely in order to ease screwing.

C-5 Gunwale

Plan 21

The gunwale is made of two layers, just over frame heads. Use some screws when gluing the gunwale layers as glued parts are very slippery until curing is done. The screws may be covered by putty (in case of painting) or bungs in case of varnish. Clamps are added to get an appropriate pressure on the full length. The gunwale is screwed vertically into frames heads. Drill broadly in order to avoid splitting the frames and fill in the hole with epoxy before inserting the screws.

A third layer, acting as rub-rail, is added in case of a plywood sheerstrake.

C-6 Foredeck, mast partner

Plan 21

Sheet 71

The fore deck is made of transverse planks adjusted under gunwale. Knees are added aft to improve sturdiness. Add as many screws and bolt as possible, as this area is highly stressed.

C-7 Seat riser

Plan 21

The upper face, on which the thwart are laying, is located 15 cm under the upper face of gunwale. The seat riser is screwed into frames. The upper face is planed horizontal to receive thwarts.

C-8 Buoyancy tanks

Plan 21

They are located according to plan.

Plan 11

The buoyancy spaces are filled with one of following materials:

Sheet 71

- ✔ Expanded polystyrene (white) bought in sheets and cut out with a hand saw (not expensive but disaggregates easily).
- ✔ Extruded polystyrene (blue or green) sold for the house insulation, tougher than the first. Check that it does not absorb moisture.
- ✔ Polyethylene foam, also sold in sheets, of white colour, the best product on the technical point of view.

Cut out sections and fill the tank leaving a minimum of void spaces as practicable. Of course, buoyancy tanks have to be coated (epoxy or paint) inside before filling with foam.

Fore buoyancy tanks showing the centreline space used for oars stowage

For buoyancy under side seats, use shaped foam enveloped into a tarpaulin or sail canvas (preferably dark red / tan colour) in order to protect the foam and give a traditional aspect.

Attention: the compliance of your boat to safety rules is very dependent on the compliance to the designed buoyancy. It is advised to take photographs of foam before closing the tanks, in order to be able to bring a proof of compliance.

C-9 Floorboards

Plan 21

Sheet 71

Floorboards are divided into two sections: one from station 2 to station 5 (aft of centreboard case) ; one each side of centreboard case.

Concerning aft section, I suggest to have it grouped in 3 parts (2 planks each): one at centreline, under oars when stowed, one at each side which are to be easily raised to give access to drain and to allow bailing out bilge water.

Transversal floorboards are fitted over fore buoyancy. The space at centre allows stowage of oars under floorboards. The raised space over these floorboards is the best one to keep bags if you have some belonging on board.

C-10 Foot rests

Plan 21

I suggest “statical” foot rests as shown on plan. Then you always find one pair to put you feet, without anything to adjust. Also, there is no transversal bar which prevent the oars stowage and may be lost in a capsize.

Fit at least 3 pairs of foot rests per thwart, located at 100 mm interval. The intermediate one is about 650 mm from the aft edge of thwart. A fourth one may be added if you have long legs as shown on the plan. If you intend to have children or small persons, you may add one additional pair toward the thwart (at least for one thwart).

The foot rests are cut into a 35 X 45 hardwood planks. The easiest way to fasten them to floorboard is to glue them in place with a weight above. When the glue has cured, turn over the floorboard and add long screws which are the only true and long lasting fastening.

C-11 Mast step

Plan 21

It is made of thick plywood (2 X 10 mm) and is fitted on the inside profile of stem which is designed accordingly. Small battens on either sides of stem allows a proper fastening with screws.

C-12 Drain plug

Fit a drain plug to empty the boat when on trailer. Locate it aft of the centreboard case, at 15 cm about from centreline, in order to have access through the removable side floorboards.

Buy a model adapted to plank thickness.

C-13 Thwarts and seats

Plan 21

Sheet 71

On such an open boat, thwarts represent an important weight and it is advisable to use a light timber, mahogany or conifer.

Be careful with the side seats. They are thinner and wide. An excellent wood is required to avoid warping. An other way is either to use two planks with a small interval or to make a glued wide plank with 50 mm wide about battens (alternating wood rings orientation).

C-14 Painting

Sheet 91

The sheerstrake may be varnished or painted with a different colour. Note that a clear colour outlines the strakes on a clinker construction and give a better looking. Refer the sheet 91 for general painting instructions, as well as pictures on my web site to get colour ideas.

D – Rig and fittings

D-1 Centreboard

Plan 25
Sheet 72

The centreboard is made of 2 plywood layers. It is ballasted with a lead insert. It is hoisted by a line passing through an eye-bolt as shown on plan. It may be sheathed if you want to improve stiffness and lifetime.

There is a simple hole for the pivot (well protected with epoxy).

Plywood taps are screwed both sides, with a small quantity of putty, allowing both watertightness and easy dismounting.

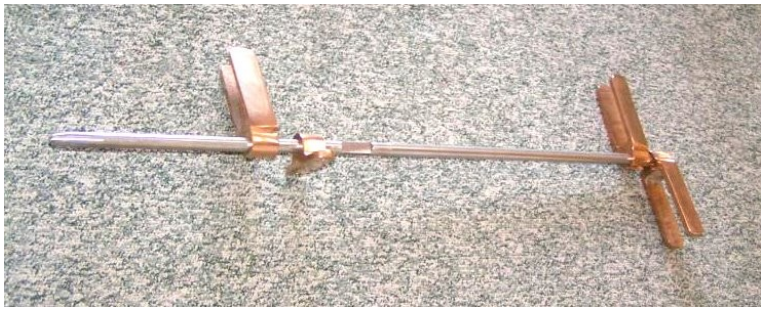
D-2 Rudder

Plan 26
Plan 27

To be made as per plan. The rudder is made of 2 layers plywood. It may also be made of timber (glued strips) taking the same precautions (transverse wood rings...) as for transom or hull planking (see sheet 31).

If the rudder is made of plywood, it may be sheathed for better durability.

Rudder fittings are designed to allow a vertical movement. In case of grounding, the rudder is able to slide upward.



It is also possible to make a simpler system according to plan 27. A thin line is attached to the lower pintle and is able to guide the rudder in place. The free end of line comes to a clam-cleat screwed on a rudder side to maintain the rudder down. When beaching, the line has to be released by the helmsman. This system was used on Youkou-Lili and was very effective.

D-3 Oars

Plan 11
Plan 36
Sheet 81

Rowing oars are lightly designed to allow rather long distance, even in open sea. There is no need to control blade angle and the pivot point cannot move.

Bulls are fitted with 2 holes. The inner hole is the usual one. The outer one allows more power in adverse weather conditions.

Keep on board a paraffin fragment and rub the thole pin with it. It is an excellent lubricant, which avoids any chafing noise and does not stain cloths or sail.

These rowing oars are not designed for sculling. If you need it for a short ride in harbour, do not force. If you intend to scull frequently, it is better to make a dedicated oar, in ash or Douglas fir, about 2.8 m long.

Of course, you may use classic oars of the same length with bronze oarlocks.

Oars are stowed according to plan 11, under the fore floorboard.

D-4 Standing lug rig (misainier)

Plan 21
Plan 31
Plan 41
Sheet 81
Sheet 82

Aber is rigged with a standing lug sail. That means the sail is always on the same side of mast, usually port. Therefore the halyard cleat is on starboard side.

An efficient tack purchase allows proper tuning of the luff tension. See plan 21 for tack rigging.

A cleat is screwed on the fore side of bulkhead 2 to allow the helmsman to make a sheet return. On this type of open boat, it is recommended to keep the sheet in hand, ready to release in a squall. It is possible to add a cleat on the centreboard case. In a breeze the crew may help the helmsman to haul taut the sheet.

D-5 Sprit rig

Plan 21
Plan 32
Plan 42
Sheet 81

The mast partner is located at the same place as for the standing lug rig. However, the mast rake is much smaller (2°) and therefore the mast step is moved afterwards as shown on plan 21.

Small cleats (5 mm thick only) are fastened to the after face of mast for the sprit snotter. 2 cleats are screwed to the mast, on for the halyard, the other for the tack downhaul.

The halyard is light and used only when reefing. The usual way to unrig is to remove the sprit, roll the sail around the mast (add a small seizing rope) and unstep all. To set up the sprit, it is easier to put the lower end into the water, insert the upper end into the sail grommet, and then push upward using the light rope to prevent unjamming.

Detail of the snotter arrangement. The clam-cleat allows tuning of the sprit tension

D-6 Lug sloop rig

Plan 21
Plan 33
Plan 43

This rig requests for an additional mast thwart and a mast step located over the keel. If you keep the original mast partner and step of the standing lug rig, it is possible to move the mast forward and to sail under main only. This is useful when single-handling or by fresh breeze.

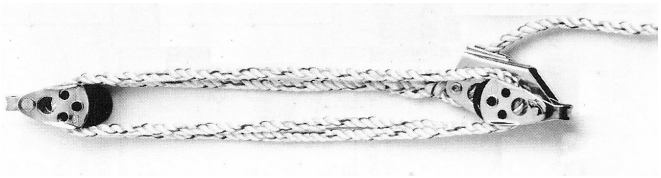
Sheet 81

The stem has to be cut 30 mm about above sheer-line as the bowsprit is located at centreline. This allows to attach the bowsprit to mast using standards rudder fittings as on the picture of an other boat:

Therefore, it is easy to take in the bowsprit and the jib tack may be directly lashed to the bowsprit end. To rig the jib, just put the bowsprit in place and hoist. A **U** shaped collar is screwed on the stem sides and maintains the bowsprit on the stem-head.

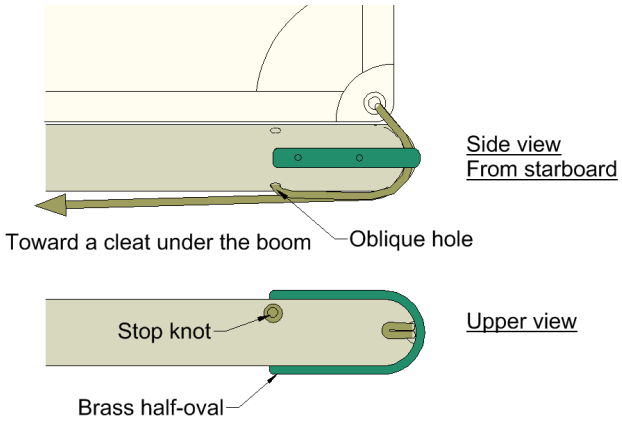
The mast thwart is bolted under a knee which is itself fitted under the gunwale. It is important to have the thwart, knees and gunwale well fastened with screws and bolts to withstand the involve stresses.

A semi gaff jaw is glued and screwed to the boom to maintain to boom against the mast and preventing it to move forward. A powerful purchase is to be rigged as a down-haul, made with small stainless steel blocks:



The purchase is tied to a line coming through a hole in the thwart and attached to the mast step. This avoid to pull the thwart upward.

Take care to attach the tack of the main sail as close as possible to the boom fore end in order to avoid jamming of the jib sheet when tacking. This sketch show a possible arrangement:



The main sheet is located in front of the helmsman, a double block with cam-cleat being fitted on the floorboards at centreline.

For the jib sheets, screw down leads on a frame or on the gunwale. Sheets may be belayed on a cleat screwed on the centreboard case cap, just ahead of aft thwart.

D-7 Sails and ropes

Plan 31

The best aspect is with sail made of Clipper Canvas or Oceanus, a soft polyester cloth having the touch of traditional cotton. In addition, such cloth is easier to stow on board when rowing. Clipper Canvas is available in cream or tan colour. Otherwise, use a modern polyester cloth (maximum 160 g/m² to avoid a “cardboard” effect) available in white and also in cream and tan (but tan has a glossy effect and I prefer cream). Note it is easier to find light cloth in white.

Concerning ropes, there is today “hemp like” ropes, made of polypropylene or polyester (better).

D-8 Trailer

Choose a trailer with a payload of 30 kg about over the boat total weight to take in account equipment on board. I strongly recommend to weight the finished boat, as the weight is deeply depending on the materials used for construction and “improvements” which may have been made.

The model on picture, with two rows of lateral rollers, gives full satisfaction. They are generally sold for motor boats with **V** shaped hull. Avoid models with roller under the keel, which keep the boat higher and make launching more difficult.

Hull shown on picture is not an Aber

With the clinker version, if built lightly, it is possible to buy a dinghy type trailer with a separate beach launching dolly (with low pressure tyres) which come over the road trailer.

Aber – Appendix 1 rev 5
Timber list

Item (sorted by wood type and scantlings)	**Version**	**Wood code**	**Quan-tity**	**thick.** mm	**width** mm	**length** mm	**comments**
Keel	All	A	1	18	110	3 900	
Stem and transom knee (or sternpost)	All	A	1	15	260	3 200	Or other dimensions allowing to cut-out the 8 parts (see sketch 1)
Transom, upper board	All	A ou C	1	20	120	1 000	Avoid too soft wood
Transom, other boards	All	A	7	20	50	1 000	The 1 m length allows to make the 2 last strips. Battens width may be increased up to 100 mm depending on wood quality. Transom may also be made of plywood
Laminated false-stem	All	A	12	3	50	1 000	Layers width 40 mm fir clinker version.
Skeg, layer 1	All	A	1	16	60	1 600	
Skeg, layer 2	All	A	1	16	55	1 200	
Skeg, layer 3 and 4	All	A	1	16	50	1 800	
Skeg, other layers	All	A	2	16	40	1 800	
Cut-out beam, station 2	All	A	1	18	60	1 200	
False-keel	All	A	1	25	60	3 900	
Laminated frames (fitted first)	Strip	A	100	3	27	2 600	Based on 8 layers + additional layers for bevelling. It is also possible to make half frames with a linking floors.
Laminated frames (fitted inside hull)	Clinker	A	100	3	27	2 300	Based on 8 layers + additional layers for bevelling.
Steam bent frames	Option	P	24	16	25	2 300	Option in replacement to laminated frames. Double the number of frames in case of strip planking.
Sheerstrake	Strip	A	2	18	270	4 500	Avoid too soft wood Plank width may be reduced to 200 mm if the sheerstrake is made of two scarfed pieces (2400 mm long each)
Sheerstrake	Clinker	A	2	15	280	4 500	Avoid too soft wood Plank width may be reduced to 210 mm if the sheerstrake is made of two scarfed pieces (2400 mm long each)
Battens for strip planking construction	Strip	B	34	15	22	4 500	
Battens for strip planking construction	Strip	B	36	15	22	4 400	

Battens for strip planking construction	Strip	B	10	15	22	4 200	
Battens for strip planking construction	Strip	B	10	15	22	3 400	
Closing board	Strip	B	2	15	120	2 300	
Gunwale	All	A	4	18	23	4 500	
Miscellaneous battens	All	A	1	20	25	18 000	
Seat risers	All	A	2	18	35	3 600	
Centreboard case logs	All	A	2	30	50	1 200	
Centreboard case posts	All	A	1	26	35	800	Total length for 2 pieces
Batten between transom and aft decking	All	A	1	26	45	1 100	
Centreboard case cap	All	A	1	20	88	1 300	
Trim on centreboard case	All	A	1	10	47	500	Total length for 2 pieces
Tiller	All	A	3	20.5	80	1 300	18.5 layers if 9 mm plywood is used for rudder
Fore deck / mast partner	All	A	1	22	200	1 200	Avoid too soft wood
Fore thwart	All	E	1	22	220	1 300	
Aft thwart	All	E	1	22	220	1 400	
Mast thwart	Lug sloop	E	1	22	220	1 200	
Side seats	All	E	2	18	350	1 200	Or several glued battens
Aft decking	All	E	3	18	200	700	
Aft floorboards	All	E	6	16	200	1 300	
Fore floorboards	All	E	6	16	180	1 200	
Fore transverse floorboard	All	E	4	16	200	1 150	Minimum length: 1150, 1000, 850, 700
Quarter knees, thwart knees, mast partner knees, thumb cleat	All	C	2	22	120	900	Or other dimensions allowing to cut-out the parts (see sketch 2)
Bilge keels	All	C	2	22	40	1 000	To be trimed according to hull shape
Mast thwart knees	Lug sloop	C	2	22	80	500	
Fore thole boards	All	C	2	35	50	350	
Aft thole boards	All	C	2	30	50	350	
Oars bulls (for 4 oars)	All	C	1	22	35	1 200	Total length for 4 pieces
Oars wearing planks (for 4 oars)	All	C	2	10	56	900	Total length for 2 X 2 pieces
Foot-rests	All	C	1	35	45	1 400	Total length for 4 X 4 pieces
Mast	All	F	1	80	80	4 600	Diameter may be reduced to 78 if douglas fir
Yard	All	F	1	54	54	3 550	Diameter may be reduced to 52 if douglas fir

Pole	All	F	1	40	45	3 100	
Mast	Sprit	F	1	80	80	4 300	Diameter may be reduced to 78 if douglas fir
Sprit	Sprit	F	1	40	40	4 450	
Mast	Lug sloop	F	1	80	80	4 600	Diameter may be reduced to 78 if douglas fir
Yard	Lug sloop	F	1	54	54	3 300	Diameter may be reduced to 52 if douglas fir
Boom	Lug sloop	F	1	54	54	3 200	Diameter may be reduced to 52 if douglas fir
Bowsprit	Lug sloop	F	1	62	62	1 950	Diameter may be reduced to 60 if douglas fir
Oars, loom	All	G	4	34	50	2 800	
Oars, blades	All	G	8	34	40	1 100	

Note : Given length takes into account end margins; given thickness and widths are dimension of final (planed) dimensions.

Figure 1 - Stem and transom knee thickness 15 mm:

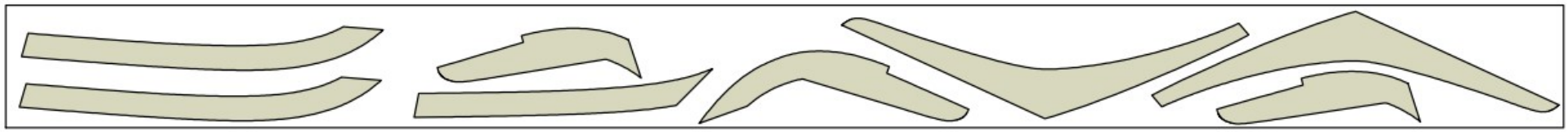
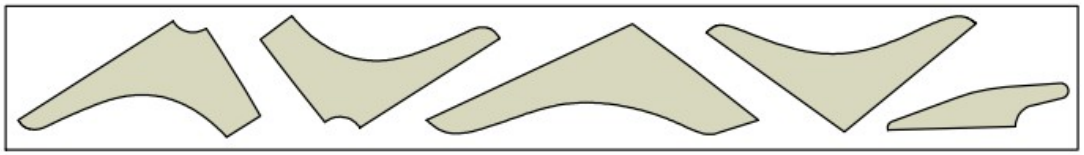


Figure 2 – Knees in oak thickness 22 mm (to cut twice):



Wood Code	**Main use**	**Recommended species**
A	Glued main structure parts : stem, laminated frames, gunwale…	Sipo, Sapele, Mahogany, Iroko, Douglas fir
B	Hull planks (strip planking)	Red pine, Spruce, Douglas fir, Mahogany, Sipo, Red cedar (if sheathed)
C	Wearing parts	Oak, Acacia, Iroko
E	Thwarts, seats and floorboards	Red pine, Douglas fir, Mahogany
F	Masts and spars	Northern pine, Spruce, Douglas fir
G	Oars	Northern pine, Spruce (Douglas fir or ash for a scull)
P	Steam bent frames	Acacia green or oak, with strait grain and without knots

Aber – Appendix 2 – rev 6
Plywood panels and parts list
clinker version

The following pages give the nesting diagrams of the plywood parts with identification of each element, the list of the panels being as follows:

Type	Format	Thickness	Quantity	Use
Marine all mahogany, sapele, sipo or moabi (Note 3)	2 440 X 1 220	10 mm – 7 veneers (Note 1)	2	Centreboard, centreboard case, rudder, bulkheads and others
Marine all mahogany, sapele, sipo (Note 3)	2 440 X 1 220	6 mm – 5 veneers (Note 4)	4 (Note 2)	Planking
Ordinary plywood	2 440 X 1 220	12 mm	5	Building frame and moulds

Note 1: 9 mm plywood is also convenient. In that case, centreboard case and tiller cut-out widths are be modified accordingly.

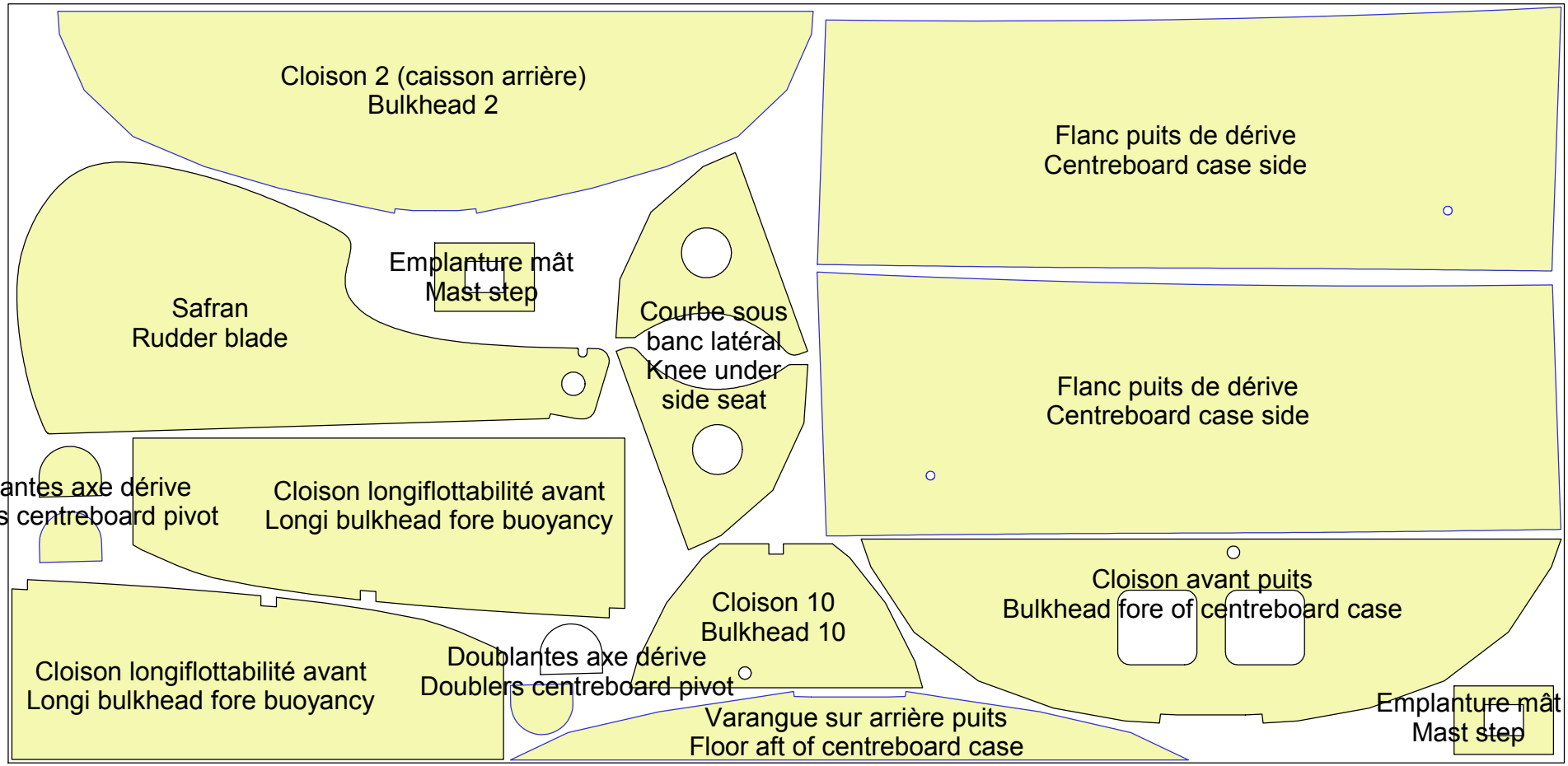
Note 2: If you do not have the kit or full scale patterns, you have to shape planking in the traditional way. Then 5 or 6 panels are necessary, according to your expertise. If you are using full scale patterns, see nesting plan is last page of appendix.

Note 3: Okume (also said Gaboon) plywood may also be used for 6 and 10 mm to get a lighter boat. In that case, centreboard, rudder and preferably bottom planking are to be epoxy sheathed.

Note 4: If you intend to fit steam bent frames (instead of laminated ones), it is preferable to use 9 mm plywood for the hull planking.

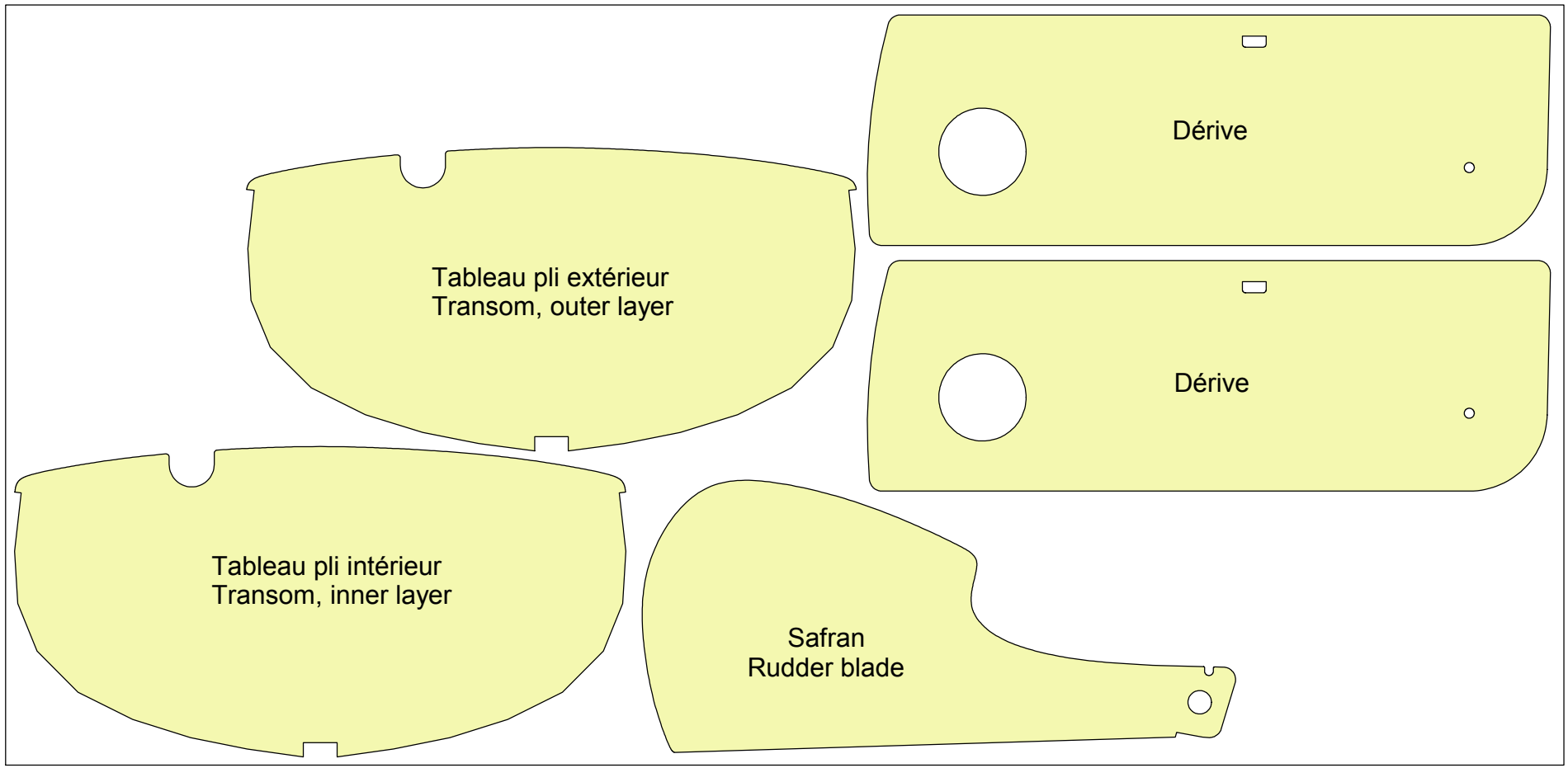
François Vivier
Architecte Naval
9 March 2012

Aber version clins - Echelle 1/10
CP marine 10 mm - Panneau 1



Aber clinker version - Scale 1/10
Marine ply 10 mm - Panel 1

Aber version clins - Echelle 1/10
CP marine 10 mm - Panneau 2

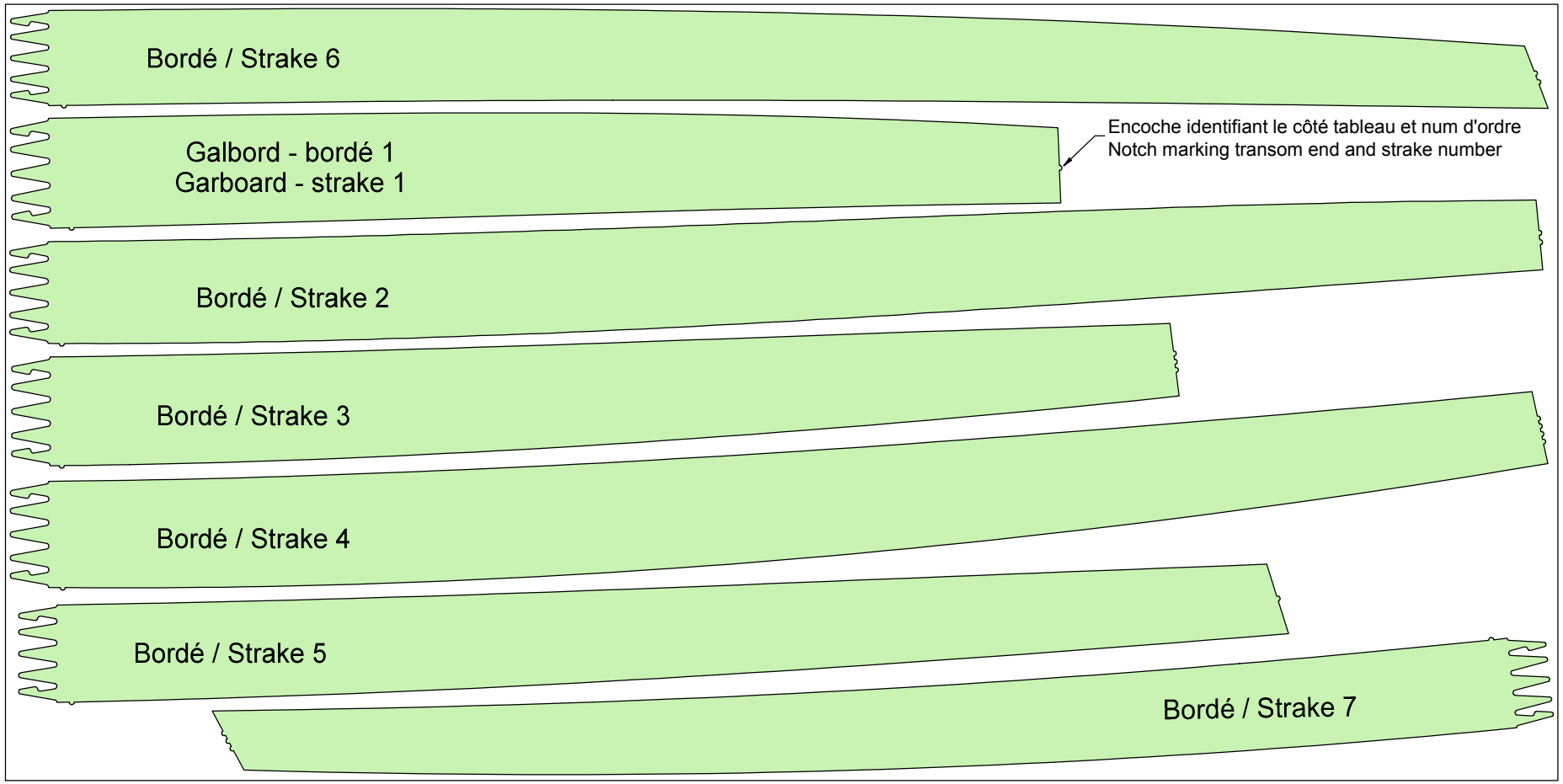


Aber clinker version - Scale 1/10
Marine ply 10 mm - Panel 2

Aber version clins - Echelle 1/10
CP marine 6 mm - Panneaux 1 et 2

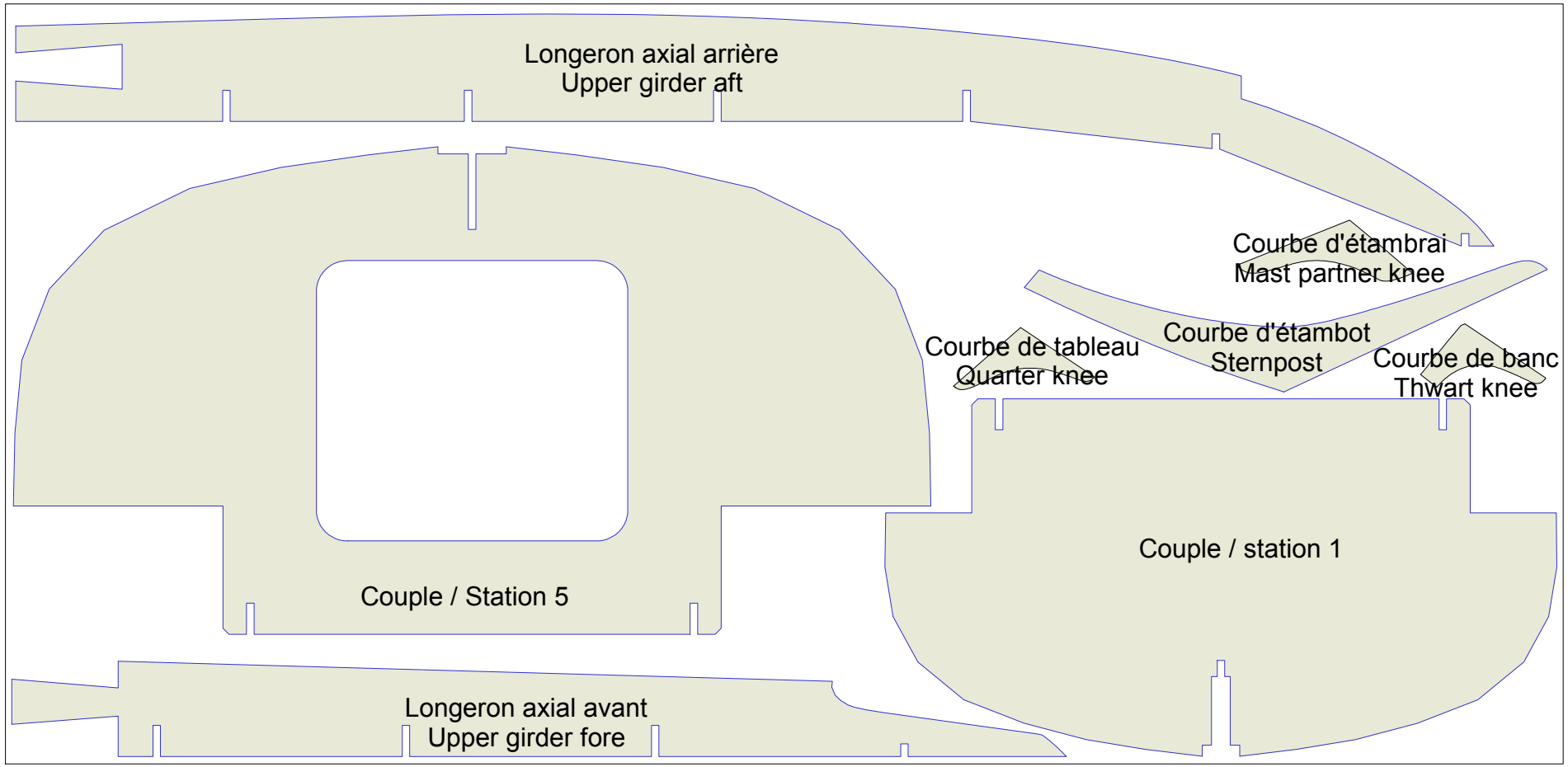
Aber clinker version - Scale 1/10
Marine ply 6 mm - Panels 1 and 2

Aber version clins - Echelle 1/10
CP marine 6 mm - Panneau 3 et 4



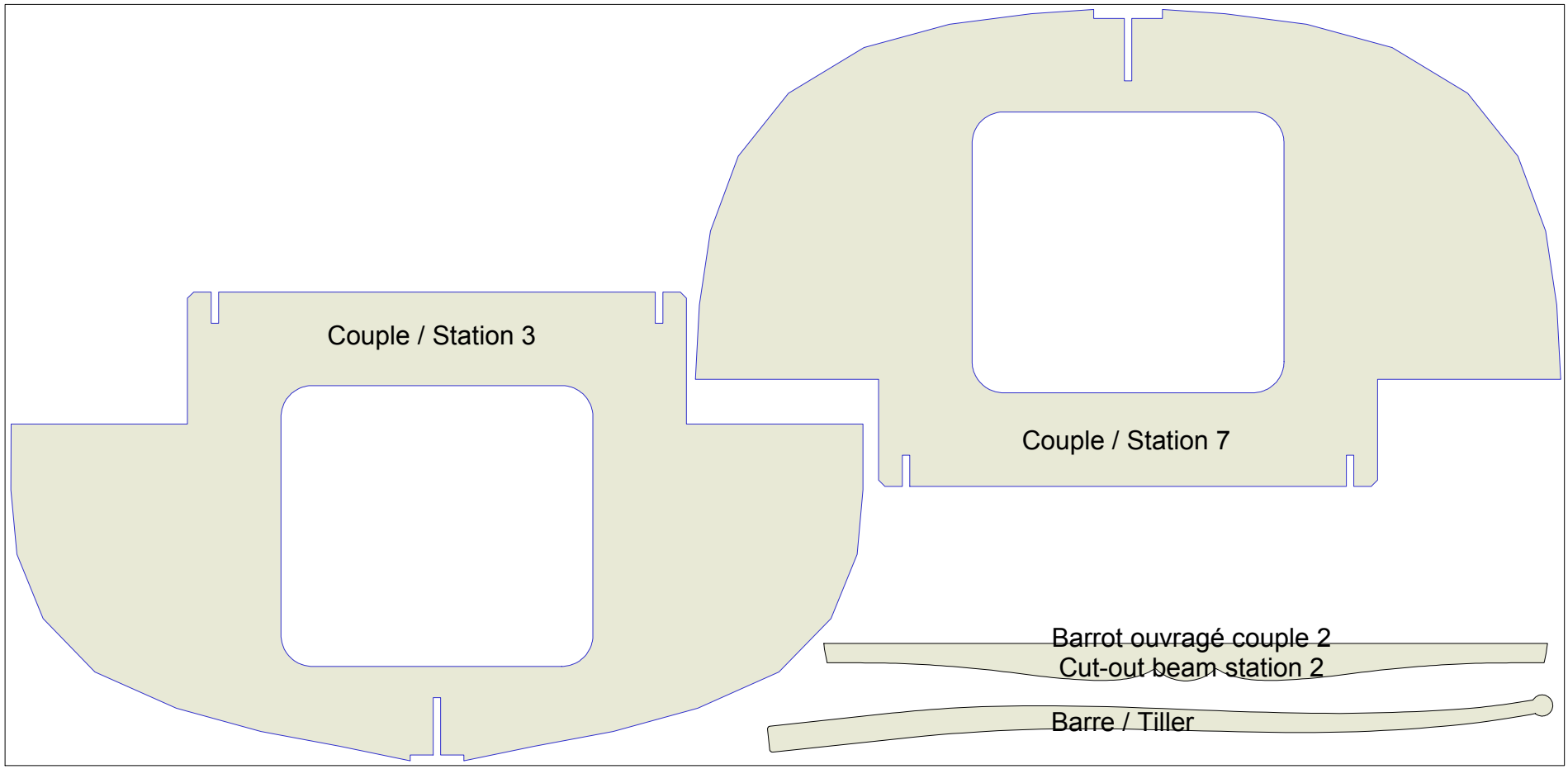
Aber clinker version - Scale 1/10
Marine ply 6 mm - Panel 3 and 4

Aber version clins - Echelle 1/10
CP ordinaire 12 mm - Panneau 1



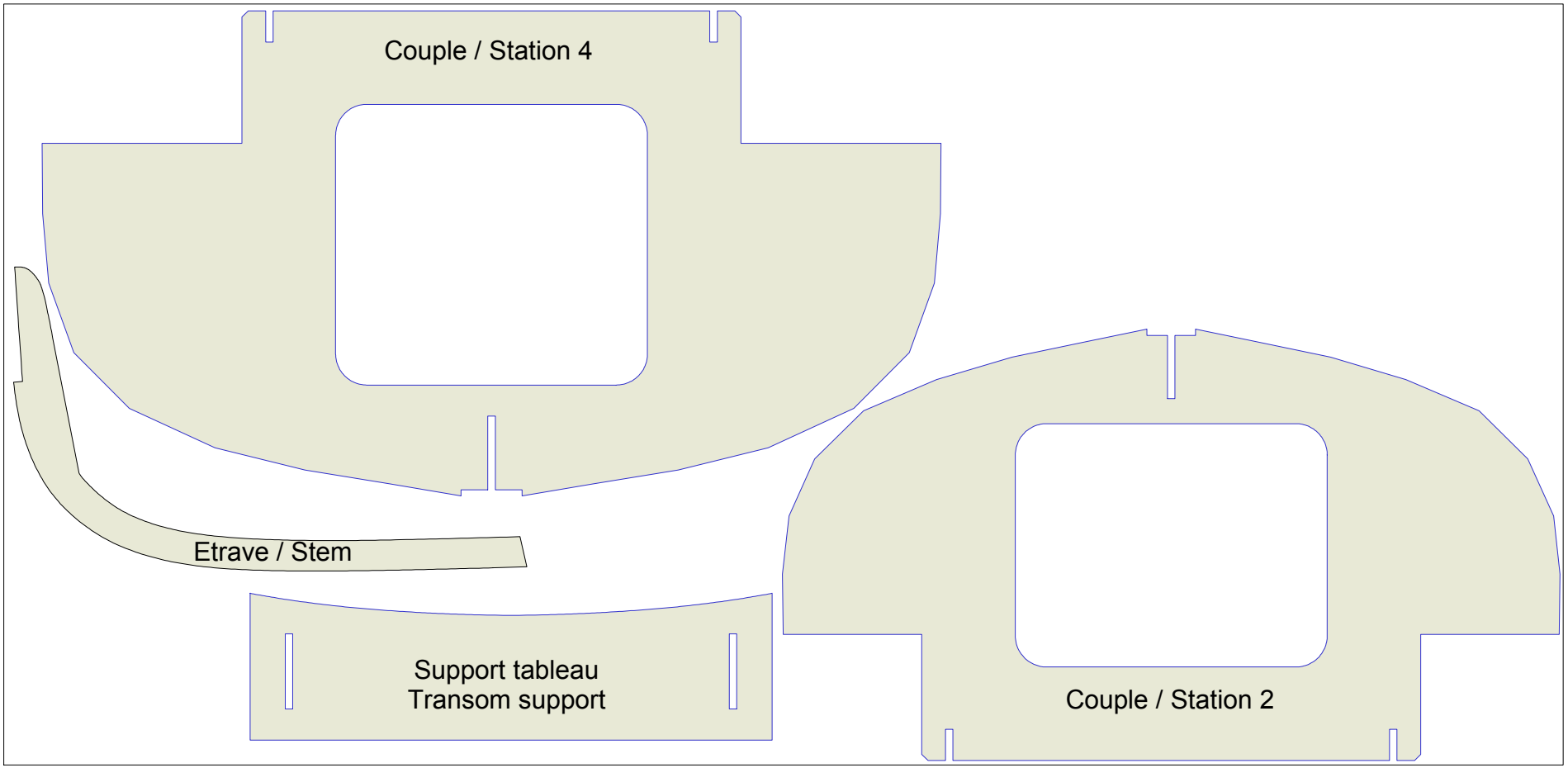
Aber clinker version - Scale 1/10
Ordinary pltwood 12 mm - Panel 1

Aber version clins - Echelle 1/10
CP ordinaire 12 mm - Panneau 2



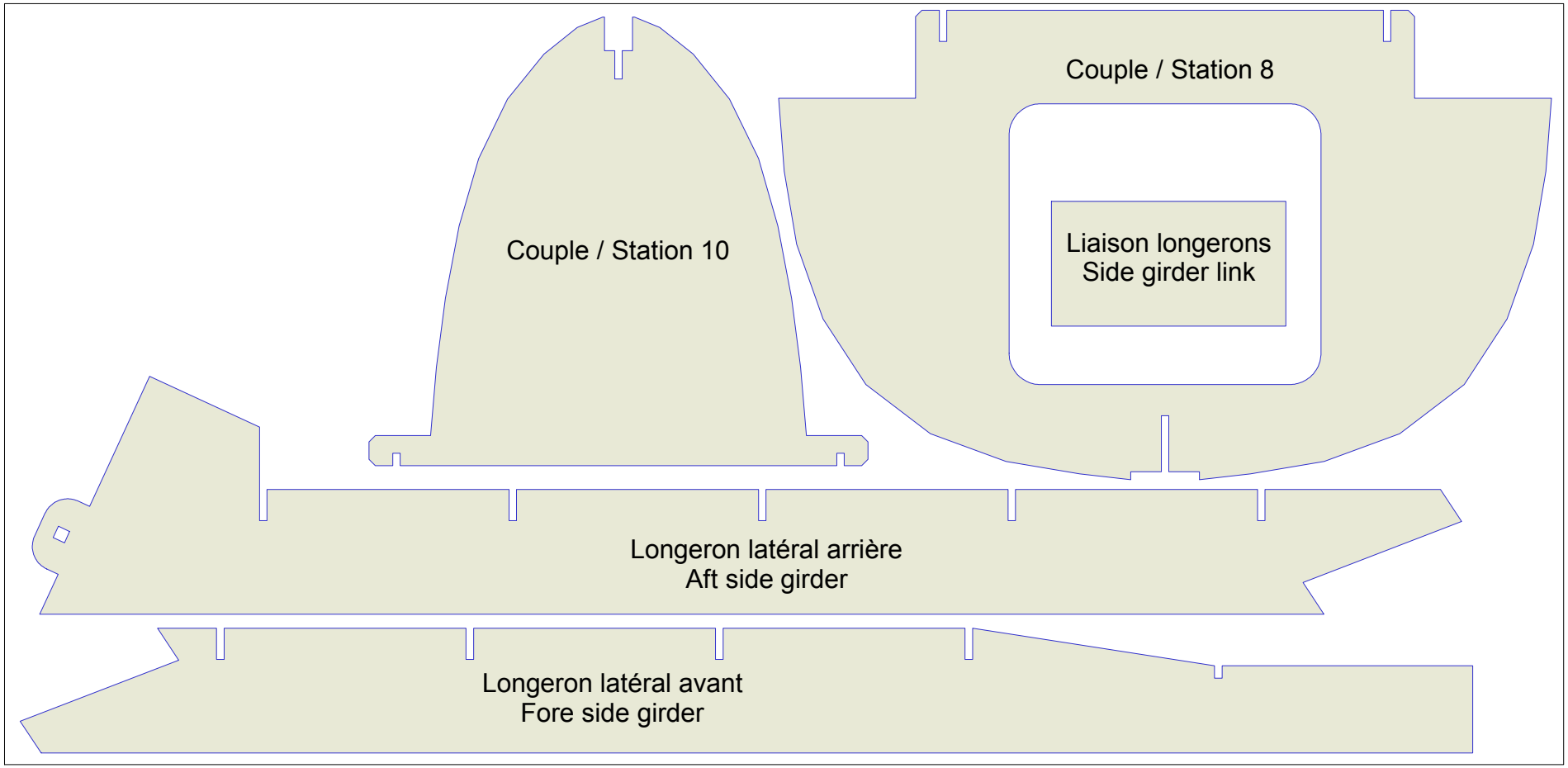
Aber clinker version - Scale 1/10
Ordinary pltwood 12 mm - Panel 2

Aber version clins - Echelle 1/10
CP ordinaire 12 mm - Panneau 3



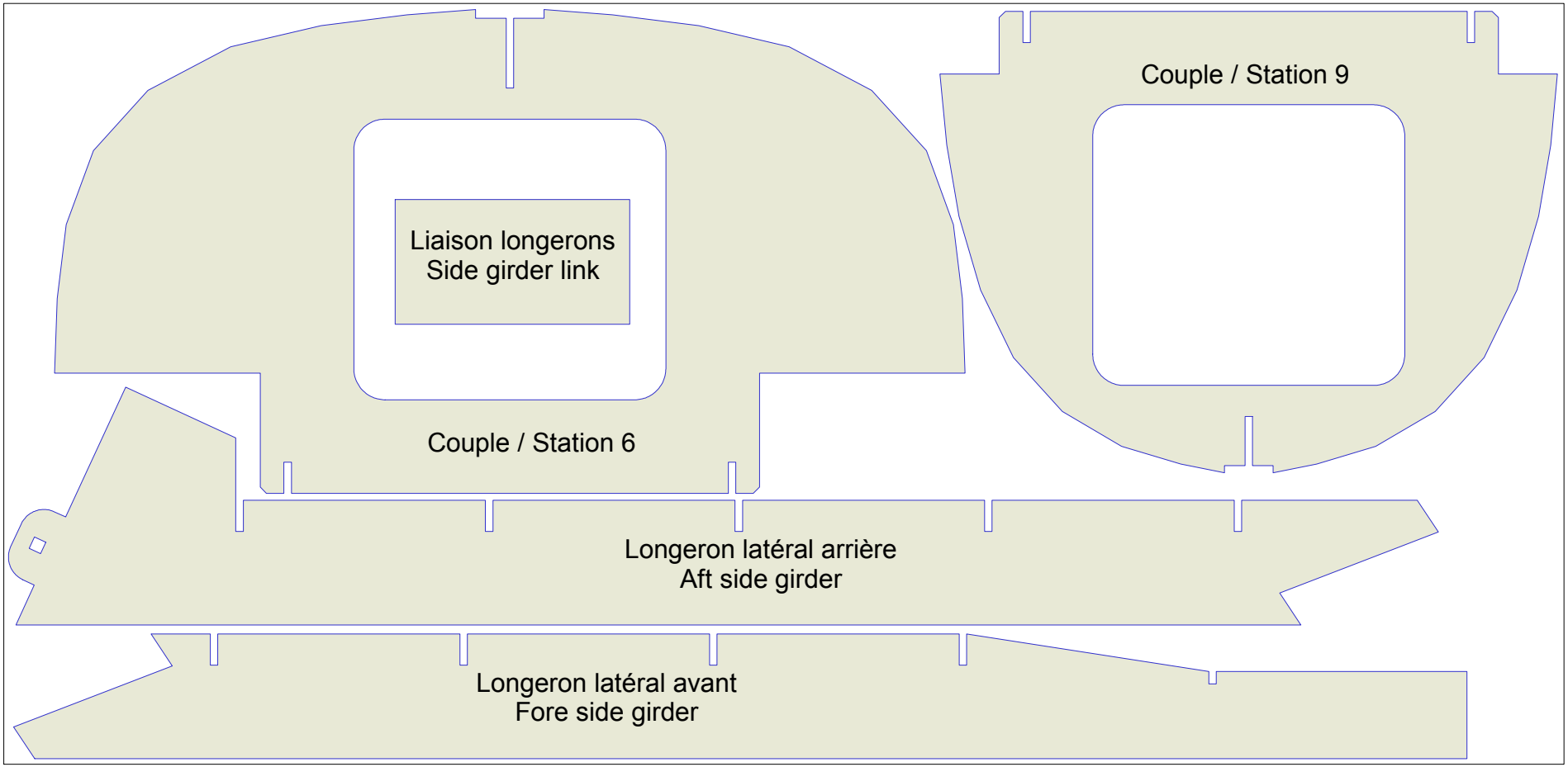
Aber clinker version - Scale 1/10
Ordinary pltwood 12 mm - Panel 3

Aber version clins - Echelle 1/10
CP ordinaire 12 mm - Panneau 4



Aber clinker version - Scale 1/10
Ordinary pltwood 12 mm - Panel 4

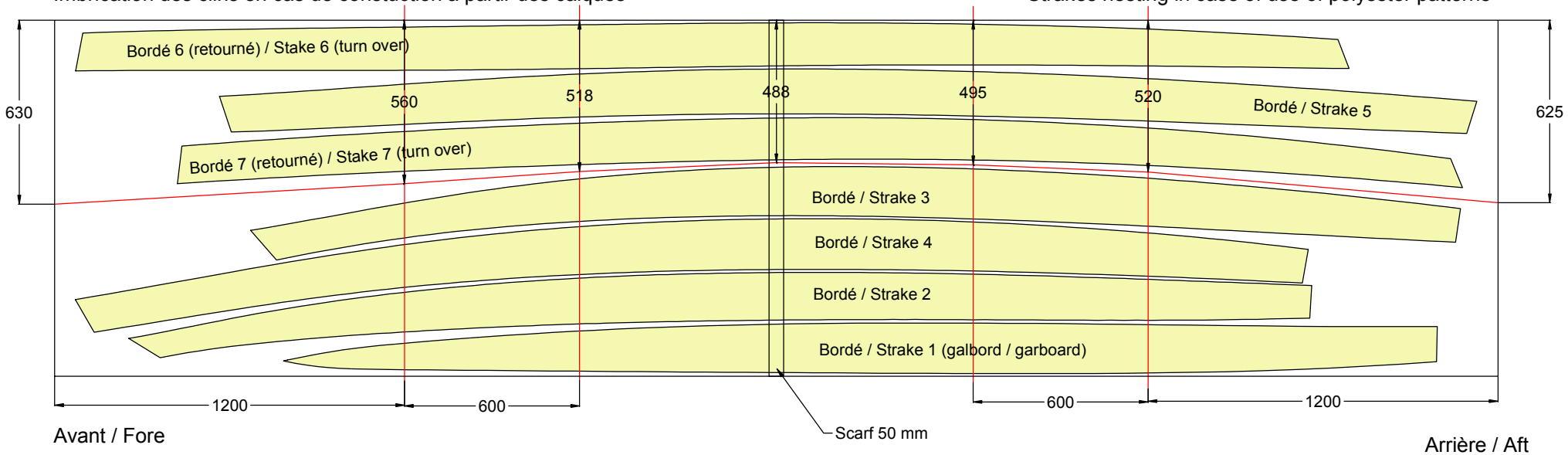
Aber version clins - Echelle 1/10
CP ordinaire 12 mm - Panneau 5



Aber clinker version - Scale 1/10
Ordinary pltwood 12 mm - Panel 5

Aber version clins - Echelle 1/10
Imbrication des clins en cas de constuction à partir des calques

Aber clinker version - Scale 1/10
Strakes nesting in case of use of polyester patterns



Avant / Fore

Arrière / Aft

Nous avons représenté une ligne cotée qui permet, en cas de manque de place,
de découper longitudinalement les panneaux et de scarfer séparement chaque partie.

We have drawn a dimensioned line which allows, in case of lack of space,
to cut out panels longitudinaly and and to scarf each part separetely.

Aber – Appendix 2 – rev 3
Plywood panels and parts list
Strip version

The panels quantities are as follows. Nesting plans of the clinker version may help in identify parts and make the best use of plywood panels.

Type	Format	Thickness	Quantity	Use
Marine all mahogany, sapele, sipo or moabi	2 500 X 1 220	10 mm – 7 plis (Note 1)	2	Centreboard, centreboard case, rudder, bulkheads and others
Ordinary plywood (only in case of construction on station moulds : steam bent frames or in-situ laminated frames)	2 500 X 1 220	12 mm	5	Station moulds

Note 1 : 9 mm plywood is also convenient. In that case, centreboard case and tiller cut-out width are be modified accordingly.

François Vivier
Architecte Naval
24 April 2008

Aber – Appendix 4 rev 2
Fitting list

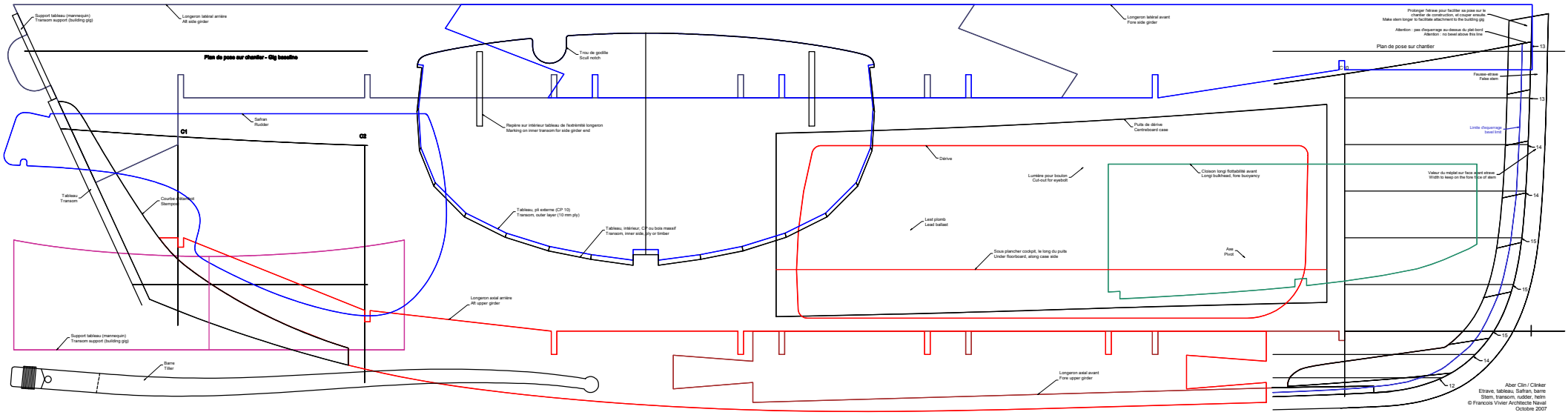
Article	Use	Quantity	Dimension	Obs.
Rudder fittings	Rudder	1 set	See plan 26	
Mast traveller, bronze or galvanized, preferably with leather	Mast	1	Inside diameter 100 mm about (80 mm mast). Rod diameter 10 mm.	
Cleat, ash or teak	Halyard on mast, sail sheet, centreboard hoisting	3	175 mm about	
Stainless steel eye-bolt	Centreboard hoisting	1	Diameter 6	
Deck clip, stainless steel	Thole pin seizing line	4	Small model	
Deck clip, stainless steel	Screwed to inner face of stem for tack line block	1	For shackle 5 mm	
Twisted shackle	For tack line block inner face of stem	1	5 mm	
Bronze of brass rod	Thole pins, stem cleat, mast partner cleat, centreboard pivot, tiller pivot	1.2 m	Diam. 14 mm	
Convex keel-band or strips, brass or bronze	Keel band	6 m	8 X 16 about	
Tufnol sheave	Mast head	1	Thickness 13 mm Diameter 60 mm Appropriate stainless steel pivot (8 mm about)	
Tufnol block Single, with becket	Sheet	1	N°12 Sheave 45 mm	

Tufnol block Single, with becket	Tack line, inner face of stem	1	N°12 Sheave 45 mm	
Cheek block, tufnol	Tack purchase along centreboard case	1	N°10 Sheave 35 mm	
Tufnol block Single, with becket	Tack purchase along centreboard case	1	N°10 Sheave 35 mm	
Cam cleat	Tack purchase along centreboard case	1	For rope 8 mm (for example Wichard 30006)	
Draining plug, brass or nylon	Hull	1	For planking 6 mm (clinker) or 15 mm (strip planking)	
Polyester rope or braid, preferably hemp like	Halyard and sheet, tack line	22 m	10 mm	
Polyester rope or braid, preferably hemp like	Tack purchase, grommets	6 m	8 mm	
Polyester rope or braid, preferably hemp like	Centreboard hoisting rope	2 m	6 mm	
Polyester rope or braid, preferably hemp like	Sail lashing on yard, reef pennants.	25 m	4 mm	
Braid, preferably brown	Protection and small lashings	50 m	2.5 to 3 mm	

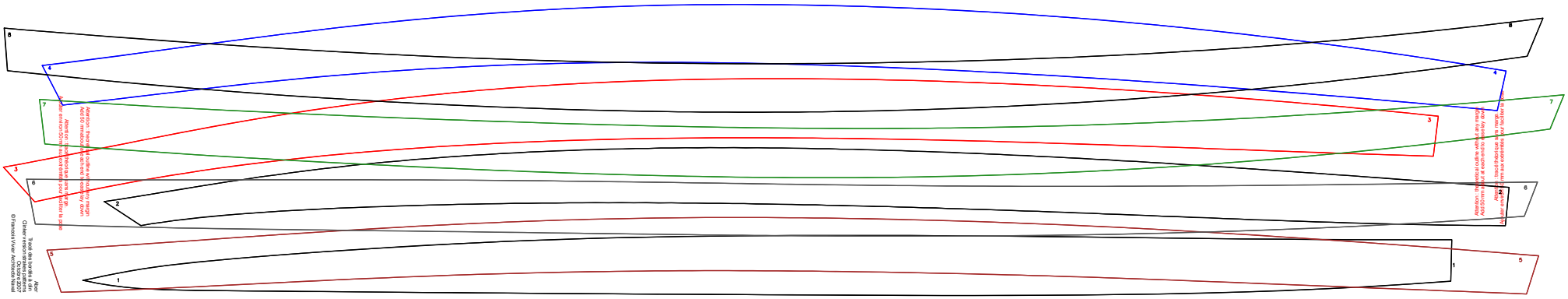
All these items may be purchased from Icarai boat-builder in France.
In UK : http://www.classicmarine.co.uk

François Vivier Architecte Naval
29 September 2006

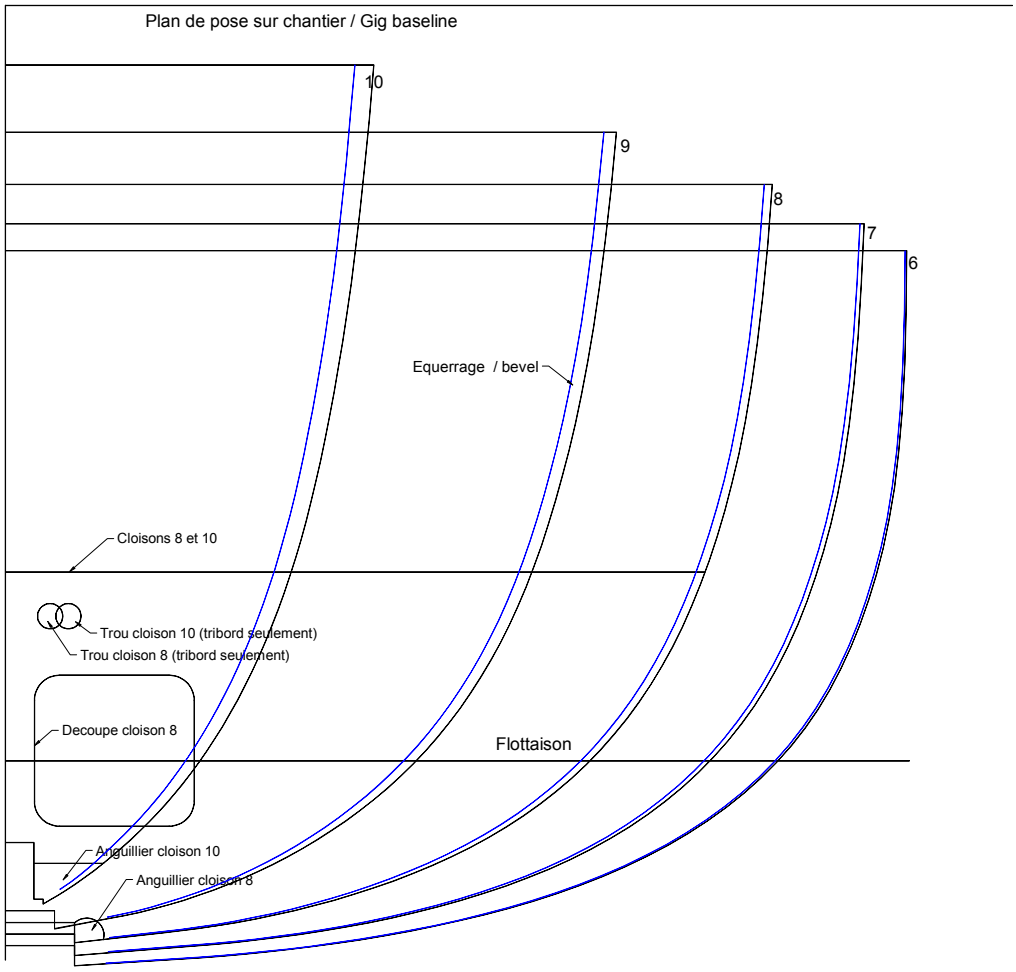
Aber full size patterns : clinker version longitudinal parts

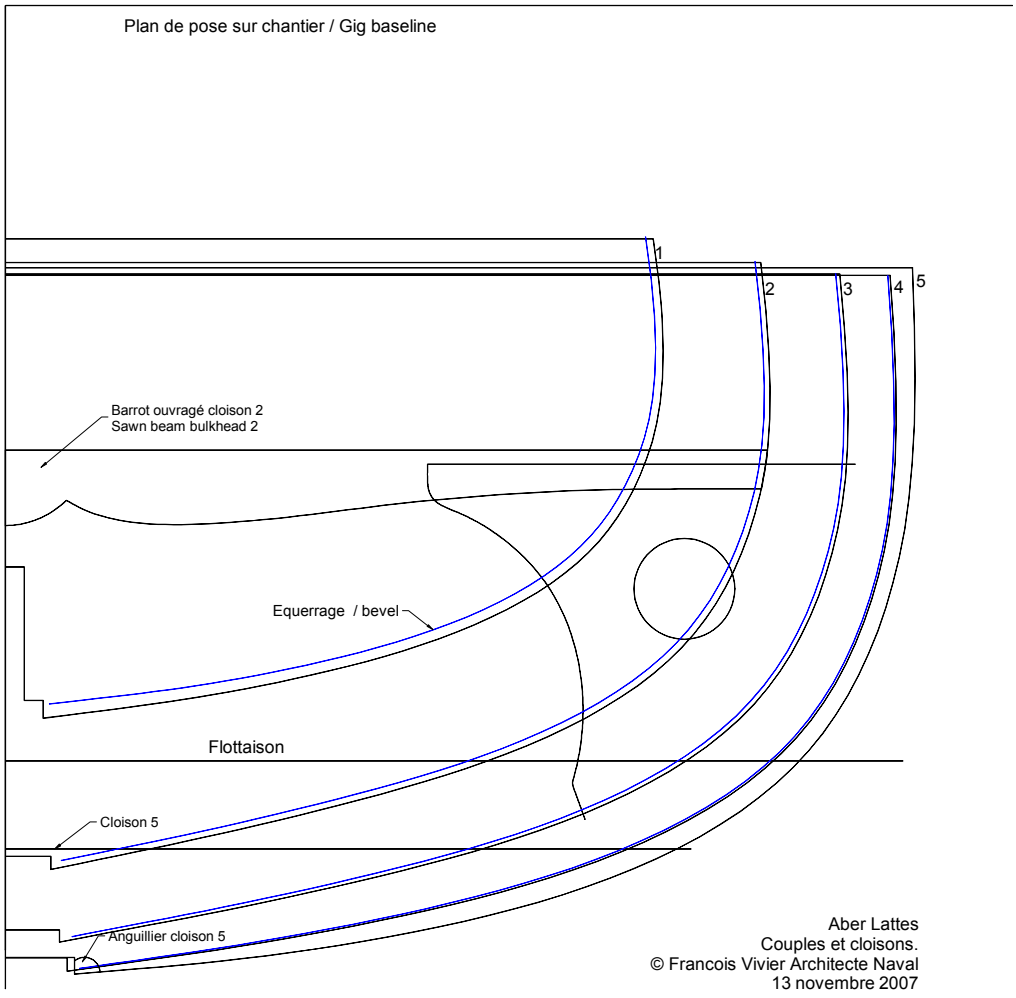


Aber full size patterns : clinker version longitudinal parts



Aber full size patterns : strip version stations





Aber Lattes
Couples et cloisons.

13 novembre 2007