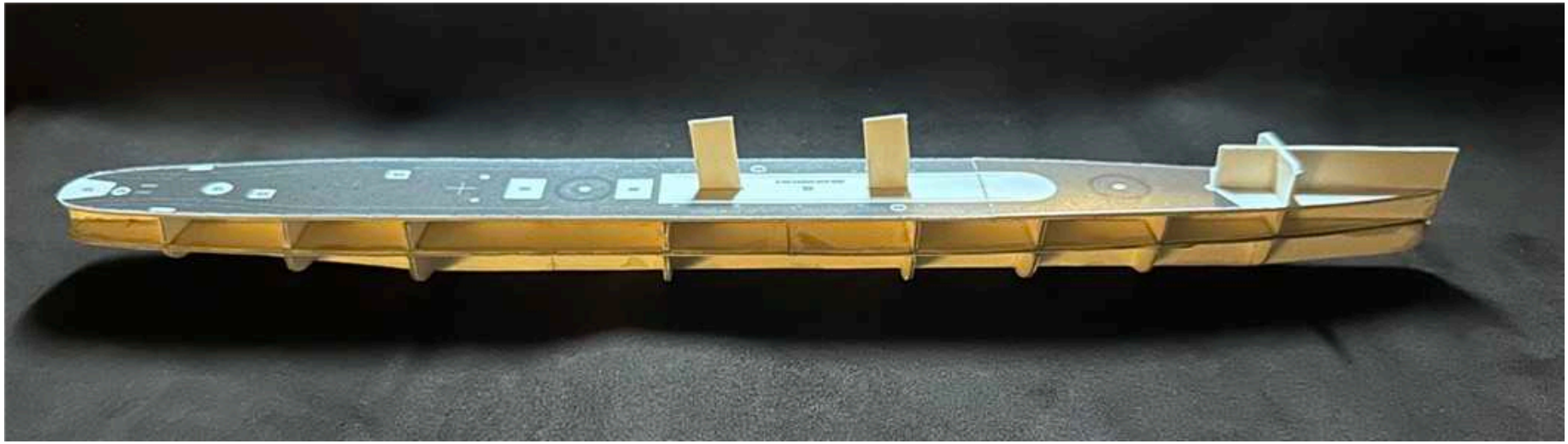
PAPER/CARD SHIP MODELING
from a purchased kit or digital download



J. Holloway
SHIPWRIGHTS OF OHIO - January 17, 2026

Paper model kits make a great **inexpensive** alternative to wood/plastic ship modeling

<u>Some advantages of card modeling include:</u>

1. **Easy access:** You can build your first card model from patterns off the internet or a purchased kit:

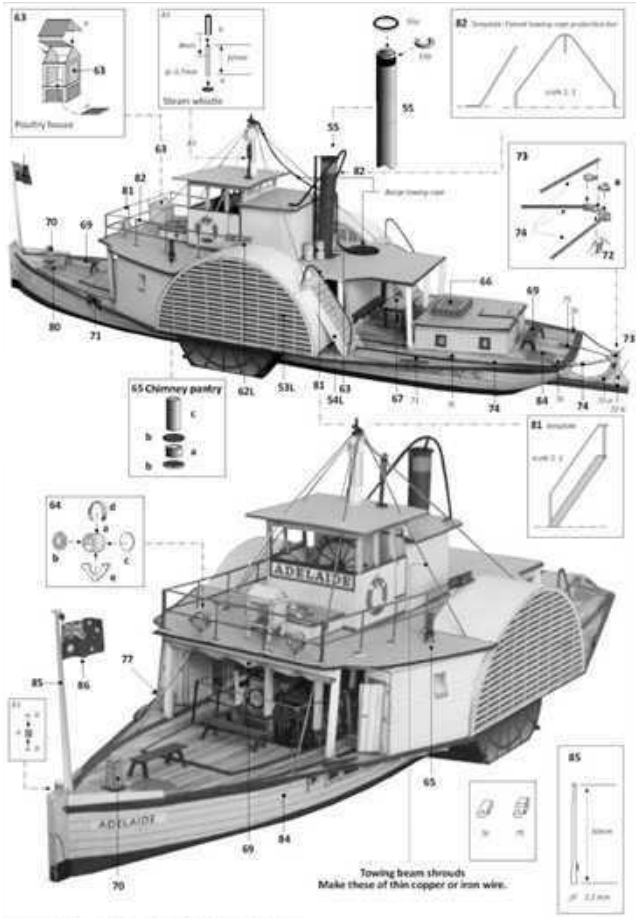
   A. **Online patterns** can be downloaded for free (or for small fee) from the internet and you can print them yourself at home or at an office supply store

   B. **Purchased kits** (usually $30 -100) include pre-printed patterns for all the parts. Laser-cut frames and color-printed sheets of parts often show intricate details such as correct planking and treenail patterns

      i. Deluxe kits can include wooden masts, deadeyes, and cloth sails, some even include turned brass cannons

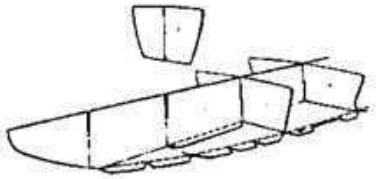
2. **No expensive tools needed**, you probably have them already

3. **Easy to transport** to go on vacations, a little more difficult to transport completed ship back home though

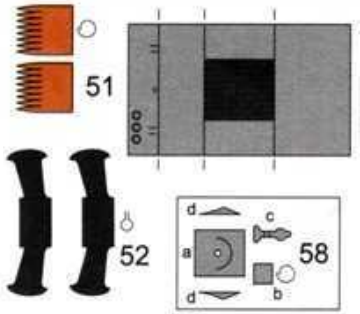


Things to look for in a card model:

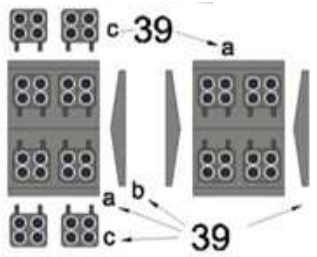
- **Good detail** of printed parts - If printing your own, color laser printers are preferred over inkjet. If purchasing, be aware some kits have mediocre quality prints
- **Parts count** - larger part counts don't necessarily increase difficulty, sometimes just how fussy cutting out the parts can be
- The **designer** is important, as important as the publisher in terms of accuracy. Do a little online research
- **Date of publication**: older kits were hand-drawn instead of CAD designed. Hand-drawn kits are necessarily bad, but an older kit may not live up to the current standards of detail, fit, and quality of art work
- **Beware of pirated plans**. Unscrupulous vendors scan commercially available card model kits and then host the files at third party file sharing sites. These are not 'free models', they've been stolen. DO NOT PATRONIZE SUCH SITES OR SHARE YOUR PURCHASES! Models obtained from such sites are pirated and thus violate MSW's site guidelines. Remember that designing card models isn't a lucrative business and designers are often fellow modelers as well. When you buy card models from legitimate sources, you support our modeling friends instead of unethical pirates



Hand-drawn (poor) detail



Computer design with moderate detail



Computer design with intricate detail

Basic Armamentarium

- Exacto knife/scalpel
- Steel ruler and square
- Cutting mat
- Binder clips
- Adhesives
- Fine-tipped tweezers
- Glue applicator
- Medium-sized scissors (optional)

Additional useful armamentaria:

- Calipers - for measuring card stock thickness, especially when laminating sheets together
- Matte clear acrylic spray varnish (for prepping and finishing)
- Paint or other media for coloring cut edges
- Assorted paint brushes - for painting and as aids for rolling tubes
- Curved, fine (iris) scissors
- #11 scalpel blades and Bard-Parker handle
- Blackened, annealed wire - an assortment of diameters is useful for making gun barrels, railings, etc.
- Styrene rod - card can be rolled into tubes, but styrene is often a better choice
- Hobby pliers - for cutting and forming wire (end nippers, needle nose, round nose)
- Thin, flexible, clear acetate sheets (for glazing windows)

Online kits

Include:
-Computer files of the plans and parts
- You can print these yourself (your printer or at an office store).
- You will need additional backing cardboard for lamination

Advantage: If you mess up, you can reprint the part

Disadvantage: plans are often just the numbering system or very cryptic

Purchased kits

Include:
-Plans, sometimes nicely detailed
-Color printed parts
-Backing cardboard
-Some kits include wood masts and deadeyes, etc.

Advantage: Plans are usually helpful, laser-cut frames reduce need for lamination and finger strain

Disadvantage: if you mess up, it can be hard to reproduce printed parts (even if you scan prior)

Some of the major publishers of paper/card kits:

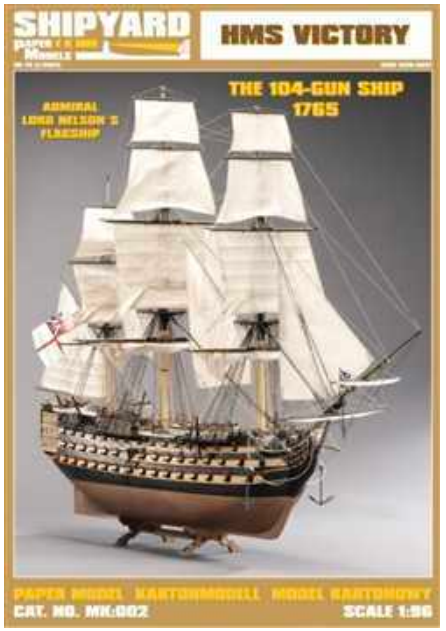
WAK: This is currently a favorite Polish publisher and shop, as they have the best shipping rates to the US
GPM: GPM is one of the largest card model publishers in Poland. They have a large selection of ship models in many scales, in their own line and from many other publishers as well. They also have an extensive inventory of after-market accessories
Modelik: Modelik carries only their own line of models, but these are not all the work of one designer. Modelik kits are generally well-regarded in the hobby
JSC: JSC have an extensive line of ship models. They are one of the few Polish publishers to offer a large selection of models in scales other than the usual 1/200 favored in that country. JSC kits are normally either 1/250 or 1/400. Many of JSC's kits are older, hand-drawn designs
Shipyard: A publisher of sailing subjects in 1/72 and 1/96 scales. Shipyard kits are available in the US from Ages of Sail.
Kartonowy Arsenal (KA): Better known as Halinski, KA offers highly detailed models. KA kits are best suited for advanced modelers
Seahorse: Sailing subjects in a variety of scales.
HMV: The Hamburger Modellbaubogen Verlag is likely the premier German ship model source. Their kits are published in 1/250 scale, the scale preferred in Germany. They have a wide selection of warships, passenger ships, and merchantmen. They offer many after-market detail sets
Moewe Verlag: Also known as Wilhelmshavener, this publisher has an extensive line of warships, passenger ships, and merchantmen in 1/250. Ordering from them can be kind of tricky, since many of their kits are older hand-drawn models, and this isn't indicated in the product description
J F Schreiber: Schreiber is the third major German publisher. Their kits are, as a rule, less detailed than either HMV or Moewe, but they offer more kits of simpler subjects suited to beginning modelers. They also offer more kits in 1/100 scale than other publishers and operate an on-line store.
Paper Shipwright: Designer David Hathaway's line of kits is unique in its extensive offering of buildiings, as well as ships. These are generally very good kits and also reasonably priced, with a fair but not overwhelming amount of detail.
Orel: This Ukrainian publisher is prolific and offers a large selection of Czarist-era warships, sailing vessels, and Civil War ironclads in 1/200 scale
World of Paper Ships: Dutch ships, ferries

In addition to the publishers just listed, there are some e-commerce sites that sell card models in general:

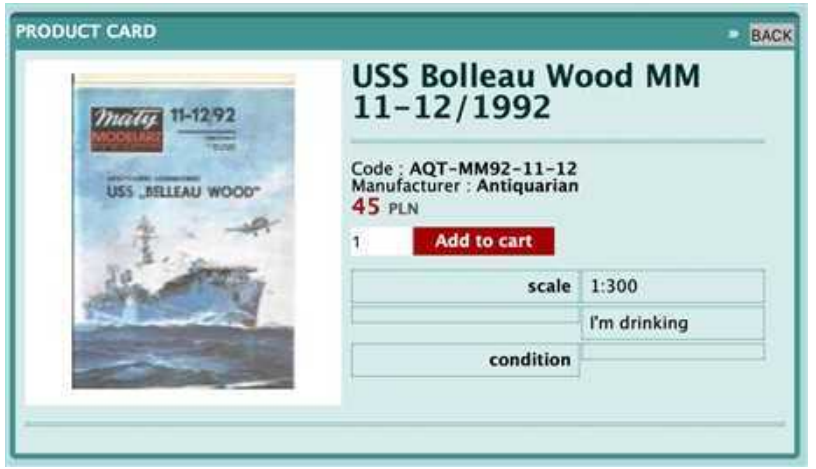
shipmodell.com (Hungary)
Karton Modell Shop (Germany)
Marcle Models (UK)
Super-hobby.fr (France)
Cardfaq.org (free, but older website that is not maintained)
E-Cardmodels (digital downloads only - pirated?)

Purchased kits:

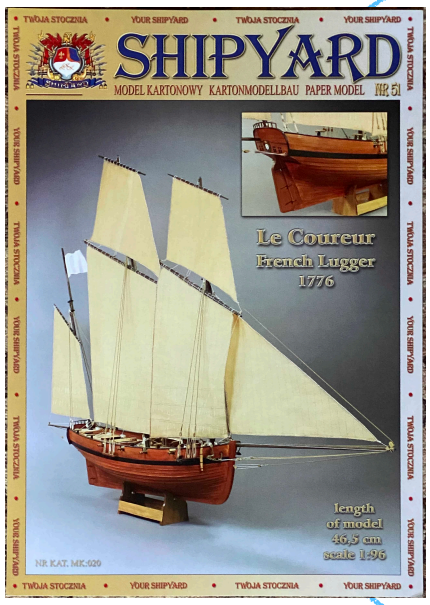
Paper Models are in book form or a set of individual sheets that contain all the printed parts. The parts that are visible on the finished model are printed in full color. Some fittings, such as belaying pins and cannon barrels, often must be made out of card or purchased separately. Masts and yardarms can be made from wooden dowels or built up from rolled paper



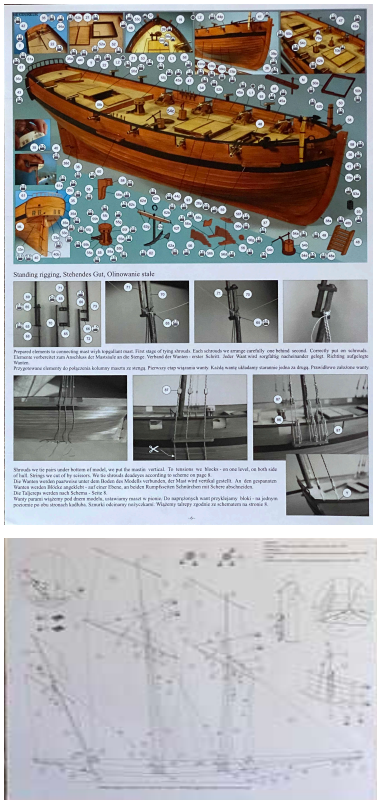
Many card ship kits are produced in Poland, as well as lighthouses and dockyard buildings for dioramas. Their model ship kits include color patterns and laser-cut card framing. Note that many parts need to be glued onto card or paper stock that you'll have to provide in order to build up their thickness, but the patterns for all the parts are included



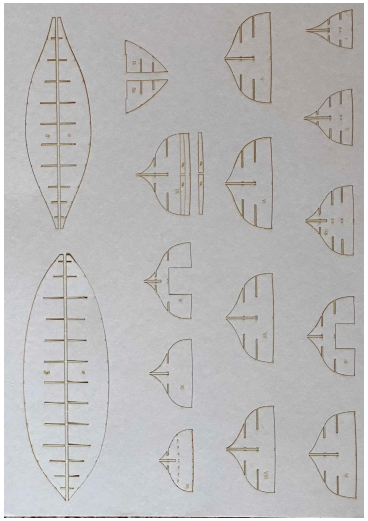
Purchased kits:



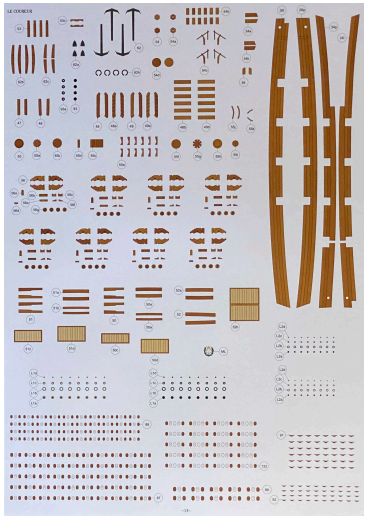
Instructions

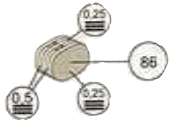


Laser-cut card Frames

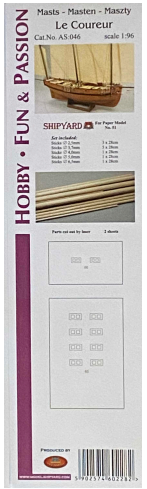


Color printed Parts





Optional Wood Parts



Le Coureur - 1776
Shipyard kit
1:96 scale

Online kits:

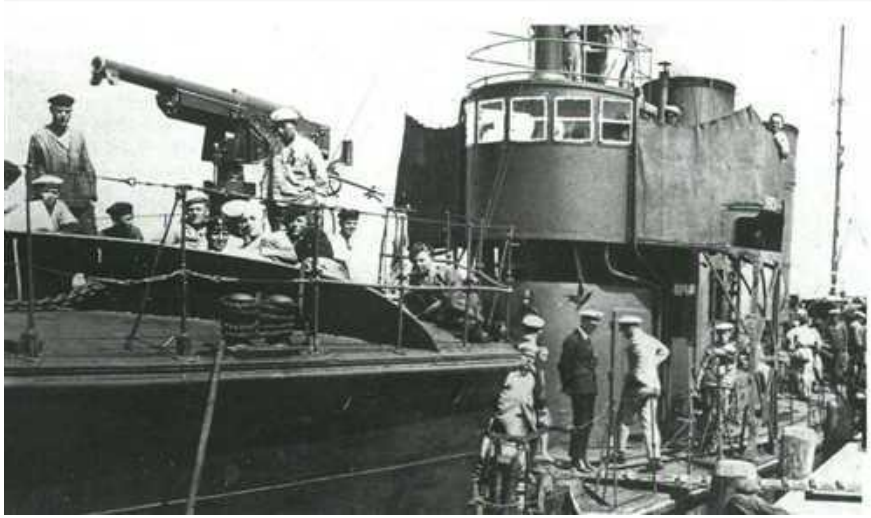
Many card model designers and publishers offer one or more free model kits. These usually come in the form of a downloadable PDF file. You simply download the file and print the kit on appropriate card stock and/or paper. Technically the kit isn't completely free, since you supply the printer, paper, and ink or pay to have it printed at an office supply store.

Example: 1/200 scale V108 torpedo boat from Digital Navy

- Roman at Digital Navy has kindly allowed MSW to host the files for download
- It is a reasonably-sized model - neither too big nor too small
- It is not overly difficult based on its low parts count
- Uses a variety of techniques: folding, curling, petals, doubling

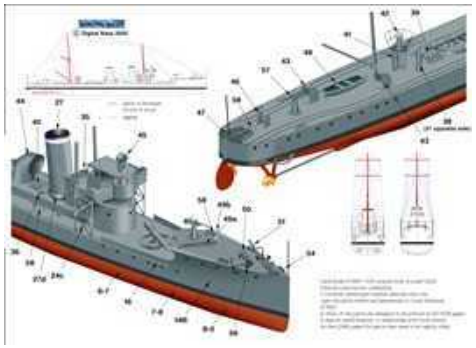
V108 torpedo boat

- **ORP *Kaszub*** was a torpedo boat of the Polish Navy
  - Built by the German shipyard A.G. Vulcan for the Netherlands Navy
  - Was still under construction at the outbreak of WWI in August 1914, and was seized by the Imperial German Navy
  - *S*erved in the Baltic and was allocated to Poland after the war as one of the first ships of that navy after Poland regained its independence in 1918. Renamed *Kaszub* after the war, it was sunk in 1925 by a boiler explosion.

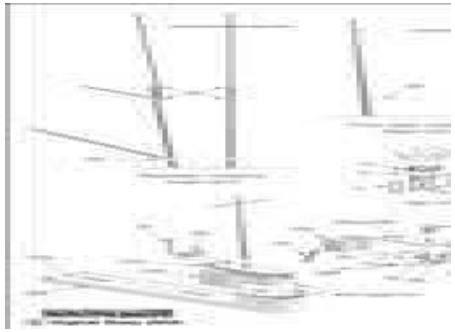


1/200 scale V108 torpedo boat (.pdf files)

cover sheet

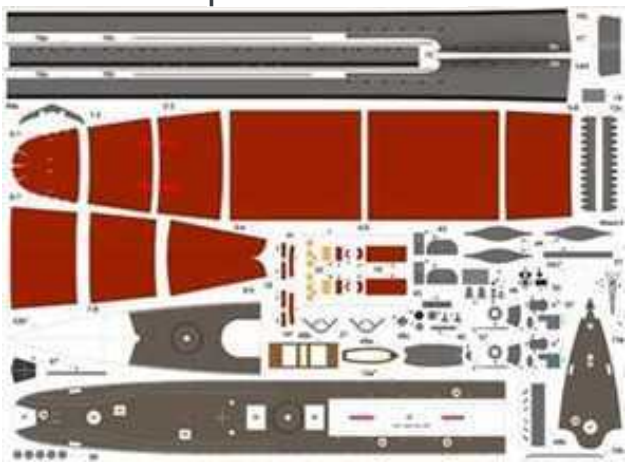


construction diagrams

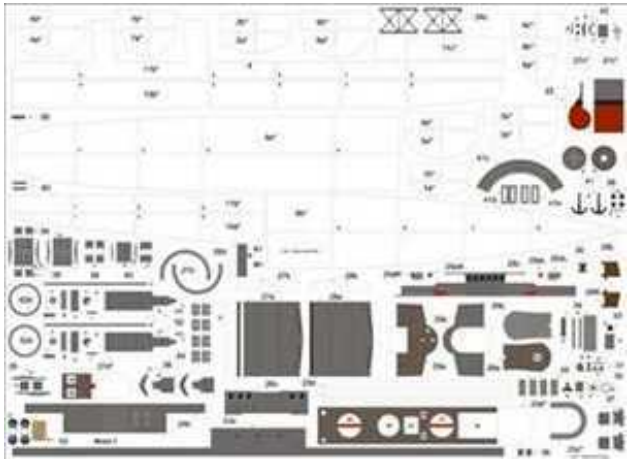


***print on regular bond printer paper**

parts sheet #1



parts sheet #2



***print on regular bond printer paper AND on white card stock, (maybe even 2 or 3 extra copies each to allow for errors)**

Steps in building a card ship:

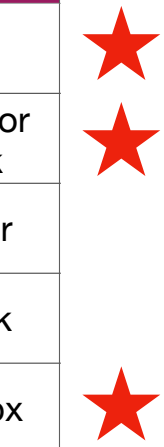
The basic sequence involved in building a card model are:

1. Printing (optional, not needed if buying a kit)
2. Laminating to appropriate thickness
3. Sealing (optional, but highly recommended)
4. Cutting
5. Assembly
    A. Scoring
    B. Folding/Curling/Rolling
    C. Gluing
6. Finishing

*not necessarily in this order

Paper types used in card modeling:

Points	Lbs	Caliper Thickness (mm)	Caliper Thickness (inches)	Use	Lay term
4	40 lb	0.10mm	0.004”	Printing: Diagrams, doubling	Regular bond printer paper
8	80 lb	0.20mm	0.008”	Printing: Parts, doubling	Pamphlet paper or Thin Cardstock
12	90 lb	0.30mm	0.012”	Lamination	Manila file folder
16	129 lb	0.40mm	0.016”	Lamination	Thick Cardstock
		0.50mm	0.02”	Lamination	Food (Cereal) box
		0.70mm	0.028”	Lamination	Back of legal pad or chipboard
		1.0mm	0.039	Pre-cut frames	Thick cardboard or chipboard

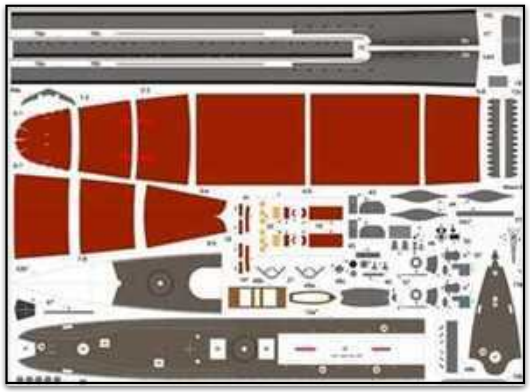


Step 1: Printing parts onto Card Stock

When considering a downloadable model, know that almost all international designs are formatted for A4-size paper. Occasionally designers will make their models available in 8.5" x 11" format, but this is the exception rather than the rule. U.S. modelers will need to scale their models to fit 8.5" x 11" or print the full-size pages in multiple pieces (not recommended, wastes paper and ink on redundant parts and seams are unsightly). With a free model, if you ruin it during construction, you're not out of a lot of money AND can simply reprint one or more pages and be right back in action

V108 sheet2.pdf

computer file of parts



parts file printed on printer paper *and/or* card stock

Printer Settings for Card Stock

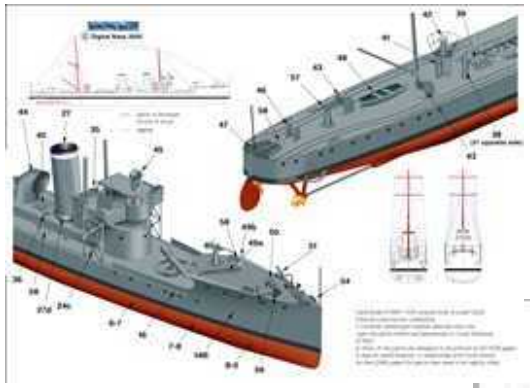
To print on cardstock, you may need to adjust your printer settings to accommodate the thicker paper. This typically involves selecting a "Cardstock" or "Heavyweight" paper type option in your printer's print dialog box

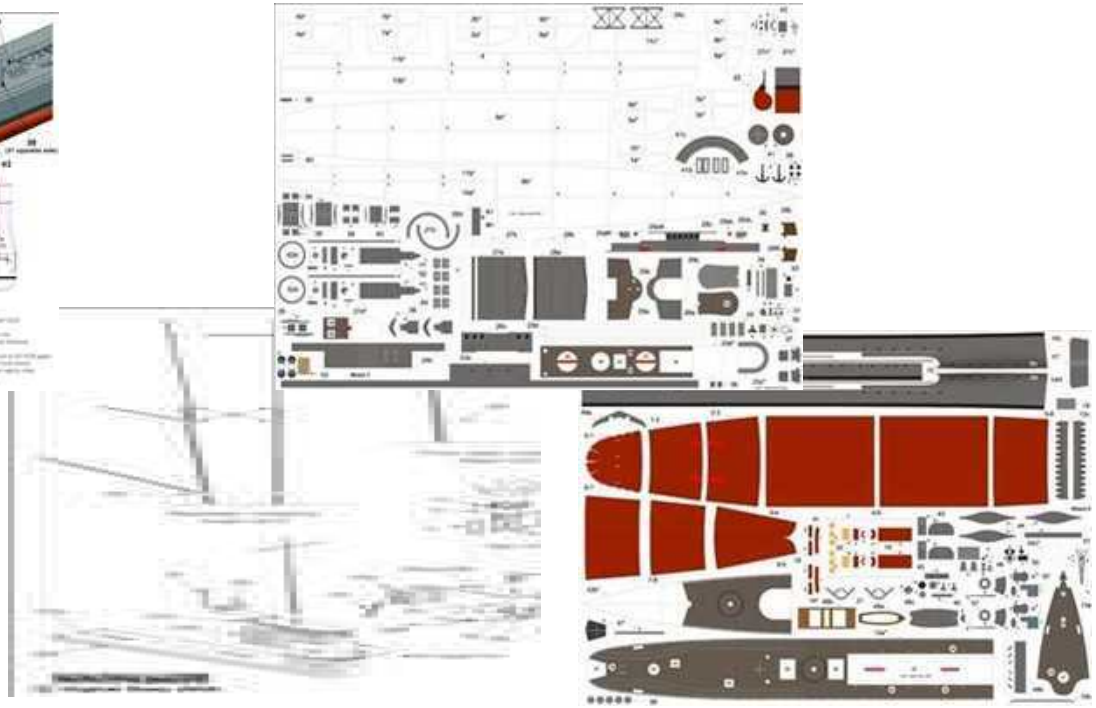
Laser color printer quality > color inkjet printer quality

1. Open your document and access printer properties: Start by opening the document you want to print and then access the printer properties dialog box
2. Navigate to paper settings: Look for the "Paper Settings" or similar options within the printer properties
3. Select paper type: Find the "Paper Type" or "Media Type" dropdown and select an option that matches your cardstock (e.g., "Cardstock," "Heavyweight," or "Thick Paper")
4. Verify paper size and tray selection:
Ensure the paper size in the print dialog box matches your cardstock size and that the printer is loaded with the cardstock in the correct tray. Some printers have a specific tray for thicker media
5. Print a test print: Print a test page on standard paper to ensure the print quality and layout are correct before printing on your cardstock

Construction plans and parts:

Read these carefully: Familiarize yourself with parts and construction diagrams before starting, maybe make a parts list



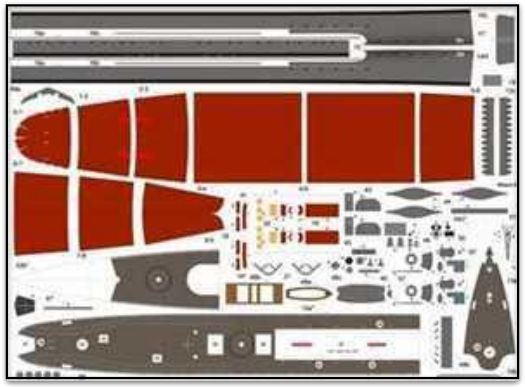


Part number	Thickness	Above waterline?	Sheet number	Part type
1a*	1mm	No	Sheet 1	Frame
1b*	1mm	Yes	Sheet 1	Frame
2a*	1mm	No	Sheet 1	Frame
2b*	1mm	Yes	Sheet 1	Frame
3a*	1mm	No	Sheet 1	Frame
3b*	1mm	Yes	Sheet 1	Frame
4a*	1mm	No	Sheet 1	Frame
4b*	1mm	Yes	Sheet 1	Frame
5a*	1mm	No	Sheet 1	Frame
5b*	1mm	Yes	Sheet 1	Frame
6a*	1mm	No	Sheet 1	Frame
6b*	1mm	Yes	Sheet 1	Frame
7a*	1mm	No	Sheet 1	Frame
7b*	1mm	Yes	Sheet 1	Frame
8a*	1mm	No	Sheet 1	Frame
8b*	1mm	Yes	Sheet 1	Frame
8c*	1mm	Yes	Sheet 1	Frame
9a*	1mm	Yes	Sheet 1	Frame
9b*	1mm	Yes	Sheet 1	Frame
10a*	1mm	No	Sheet 1	Frame
10b*	1mm	No	Sheet 1	Frame
11a*	1mm	Yes	Sheet 1	Frame
11b*	1mm	Yes	Sheet 1	Frame
11c*	1mm	Yes	Sheet 1	Frame
12a*	1mm	Yes	Sheet 2	Frame
12b*	1mm	Yes	Sheet 2	Frame
13a	Card stock only	Yes	Sheet2	Forecastle deck
13b	Card stock only	Yes	Sheet 2	Breakwater
13c	Card stock only	Yes	Sheet 2	Connector

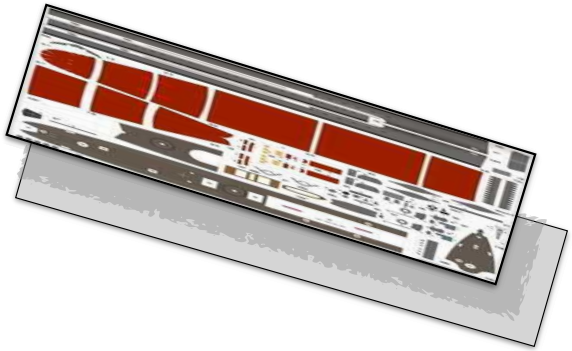
Step 2: Laminating printed parts onto card

Find which parts need to be increased in thickness. In most kits, there are parts that need to be laminated to increase thickness (in this case, 1mm), are indicated by an asterisk.

Part number	Thickness	Above waterline?	Sheet number	Part type
1a*	1mm	No	Sheet 1	Frame
1b*	1mm	Yes	Sheet 1	Frame
2a*	1mm	No	Sheet 1	Frame
2b*	1mm	Yes	Sheet 1	Frame
3a*	1mm	No	Sheet 1	Frame
3b*	1mm	Yes	Sheet 1	Frame
4a*	1mm	No	Sheet 1	Frame
4b*	1mm	Yes	Sheet 1	Frame
5a*	1mm	No	Sheet 1	Frame
5b*	1mm	Yes	Sheet 1	Frame
6a*	1mm	No	Sheet 1	Frame
6b*	1mm	Yes	Sheet 1	Frame
7a*	1mm	No	Sheet 1	Frame
7b*	1mm	Yes	Sheet 1	Frame
8a*	1mm	No	Sheet 1	Frame
8b*	1mm	Yes	Sheet 1	Frame
8c*	1mm	Yes	Sheet 1	Frame
9a*	1mm	Yes	Sheet 1	Frame
9b*	1mm	Yes	Sheet 1	Frame
10a*	1mm	No	Sheet 1	Frame
10b*	1mm	No	Sheet 1	Frame
11a*	1mm	Yes	Sheet 1	Frame
11b*	1mm	Yes	Sheet 1	Frame
11c*	1mm	Yes	Sheet 1	Frame
12a*	1mm	Yes	Sheet 2	Frame
12b*	1mm	Yes	Sheet 2	Frame
13a	Card stock only	Yes	Sheet2	Forecastle deck
13b	Card stock only	Yes	Sheet 2	Breakwater
13c	Card stock only	Yes	Sheet 2	Connector



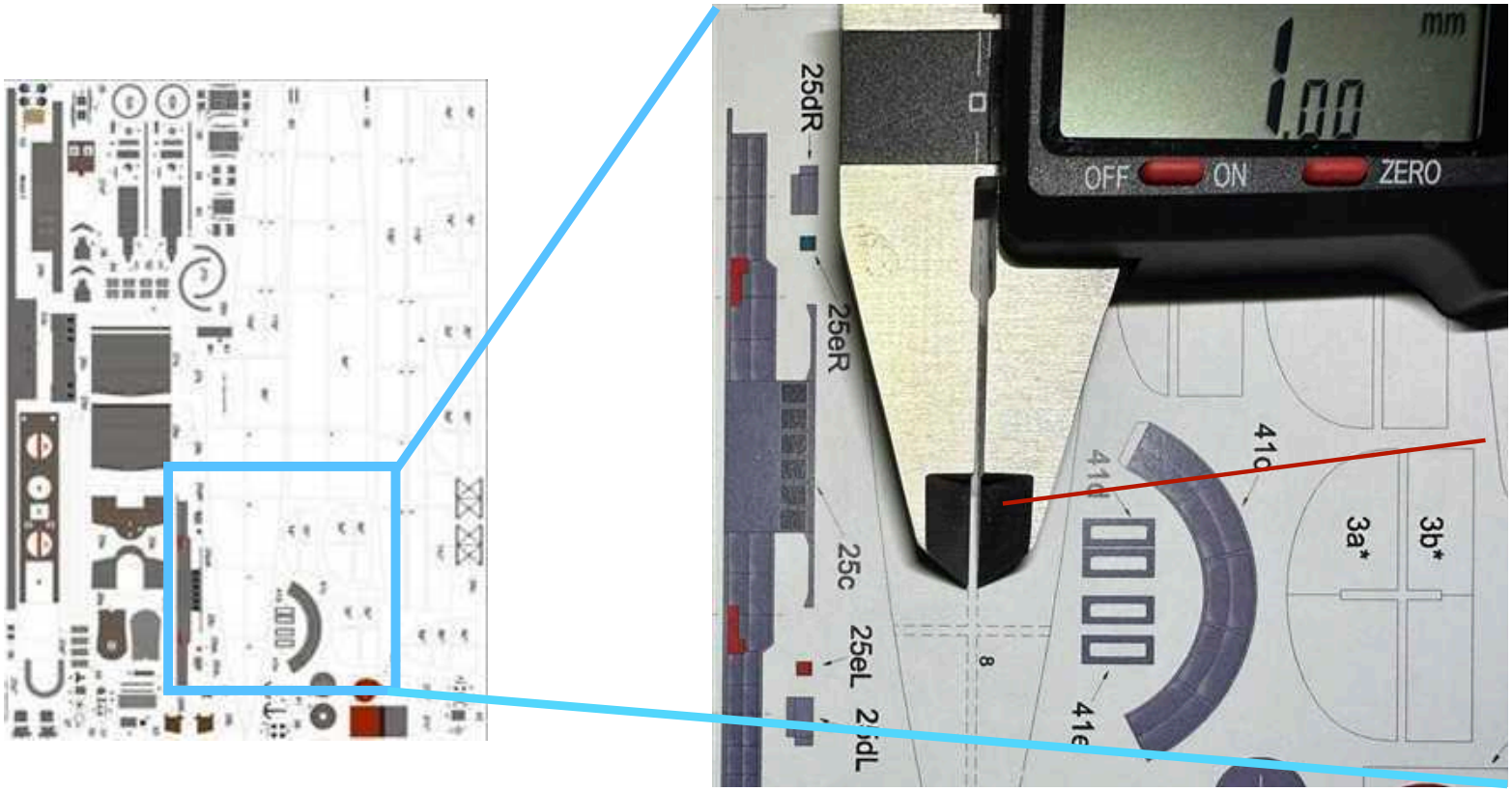
parts file printed on printer paper *and* card stock



printed parts glued onto backing card/cardboard to appropriate thickness

Step 2: Laminating printed parts onto card

If lamination thicknesses are not given, measurements of frame can assist:

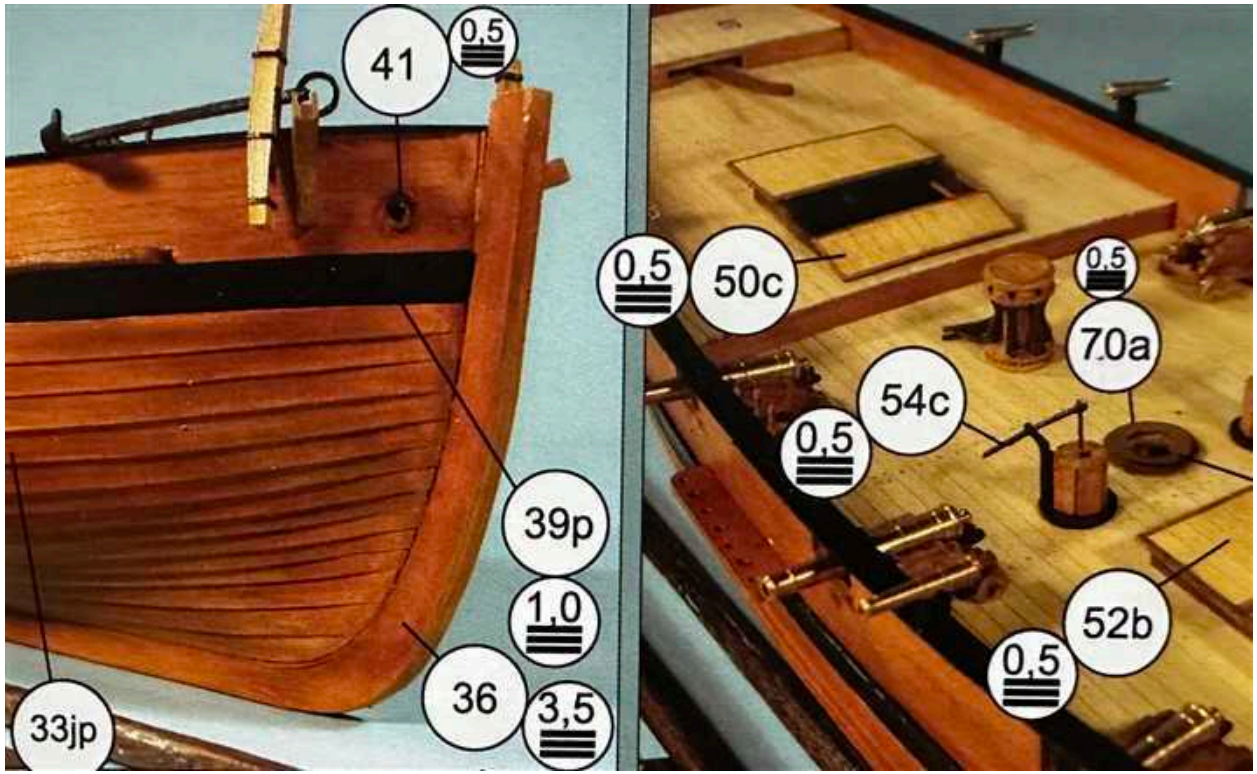


<u>Total thickness</u>
(card/paper printed part) + (backing cardboard) =

1mm

Step 2: Laminating printed parts onto card

Some kits have parts that need to be increased by many different thicknesses:



Total thickness may require multiple laminations

Total thickness = 0.5mm

Total thickness = 1.5mm

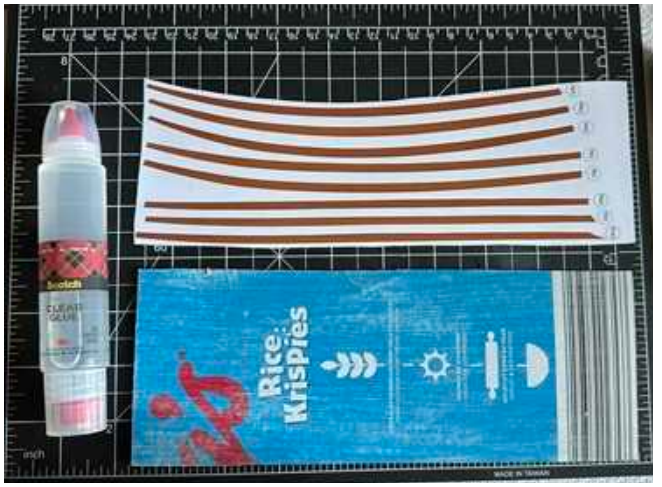
Total thickness = 3.5mm

General cautions regarding the adhesives used for card construction:

- Keep fingers, cutting mat and tweezers clean from adhesives. Even a slight hint of adhesive can mar/detach the printed side of a card or paper part

- Let glued parts dry thoroughly before attempting to cut. Even low moisture adhesives will cause wet paper to rip or deform while cutting

- When sourcing inexpensive cardboard backing (cereal box, etc.), be aware that the printing may interfere with adhesion. Avoid cardboard boxes the have foil or varnished (shiny) surfaces and lightly sand any surfaces that are thickly inked



Adhesives for laminating printed parts to card

Low-moisture adhesives are best suited for adhering printed parts sheets to backing card.

- **Contact cement (**not rubber cement) is a non-water-based glue. Repositioning of parts once they come in contact with each other is not possible. Good for gluing large surfaces together, contact cement sets rapidly. Aerosol contact adhesives require a spray box
- **Glue sticks** are solid, hard adhesives that possess a short working time without bleed through or warpage of card. Users can apply glue by rubbing the exposed stick against a surface. Glue sticks are solid adhesives of PVA or PVP. A short setting window allows some limited repositioning while glueing up
- **Photo-safe clear craft glue** contains some liquid and should only be used on card, not paper. Dries clear and will not affect color prints
- **Regular PVA glue** is water-based (except in stick form) and therefore not a good choice for gluing large surfaces together due to possible ***warpage, wrinkling and color instability of printer inks***

Adhesives for laminating printed parts to card

A good adhesive for adhering parts printed on card to backing cardboard: **Scotch Dual-tip Clear Glue**

- Thin, modified PVA that sets in 5 minutes
- Photo-safe, printer ink safe* in accordance with ISO Standard 18916
- Dries clear and is color stable (will not yellow over time)
- Makes decent ***FLEXIBLE*** windows (similarly to Kristal Klear)***
- Two different applicator tips:

Fine tip

Broad sponge tip

*Contains some liquid and should only be used to laminate card **(not paper)** to backing cardboard. It is too wet to use on paper

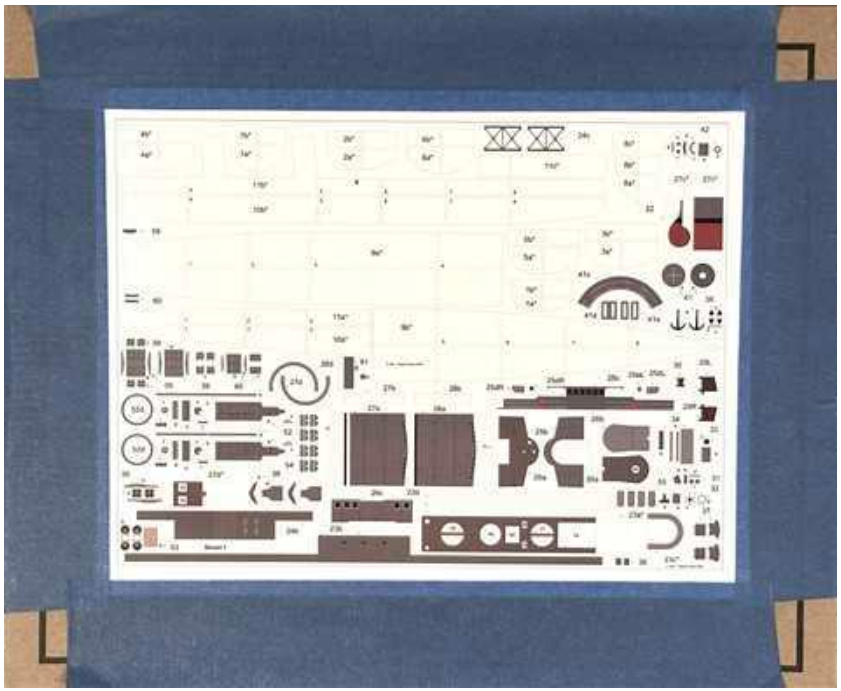
Step 3: Sealing the printed card

Application of a couple of ***light*** coats of matte clear acrylic spray varnish adds a little bit of added stiffness as well as:

-some protection against accidental spills

-resistance to abrasion of the color print while rolling/folding parts

-easier removal of adhesives/paint **without damaging the printed colors**



Painter's tape helps prevent curling of both paper and backing cardboard as varnish dries

Step 3: Sealing the printed card

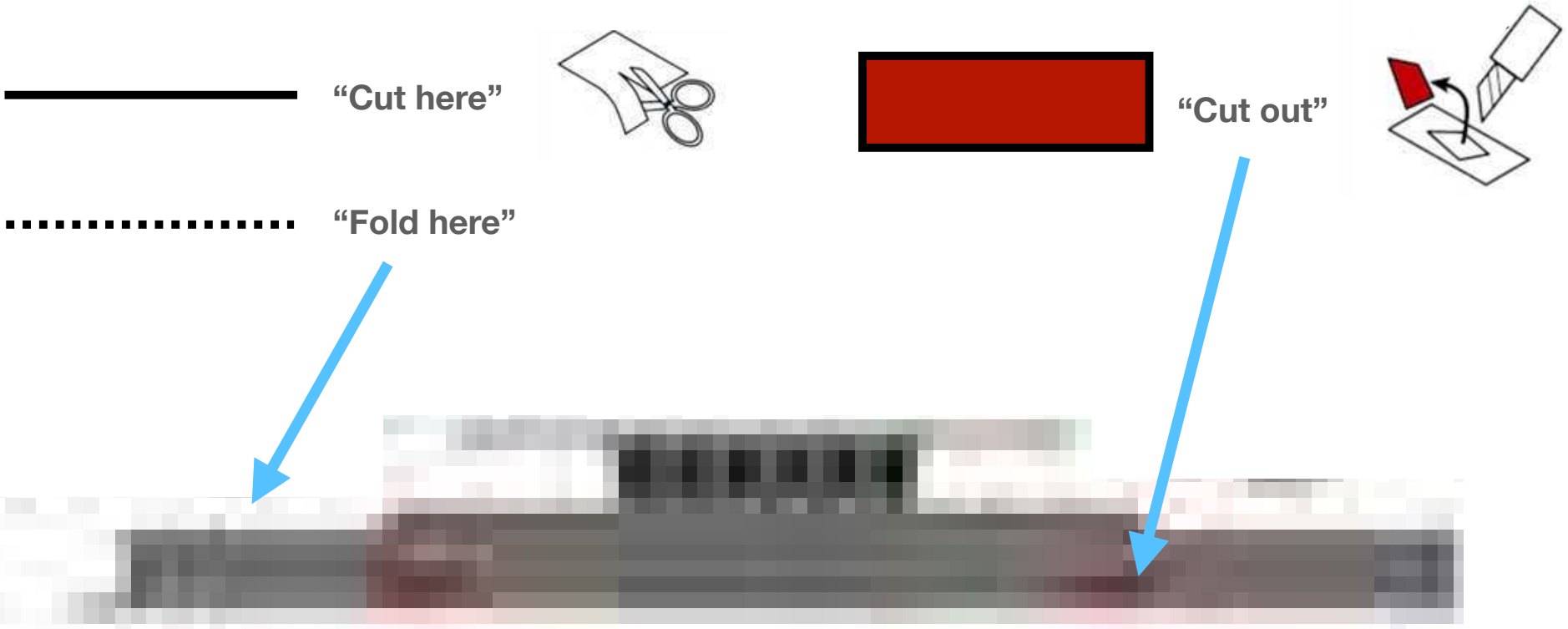
Application of 1-2 ***light*** coats of matte clear acrylic spray varnish adds a little bit of added stiffness and protection of the printed inks

Do not spray too thickly, surface cracks will appear on parts that need to be rolled or bent

Do not use matte clear acrylic varnish ***in a bottle***, printed inks may be soluble

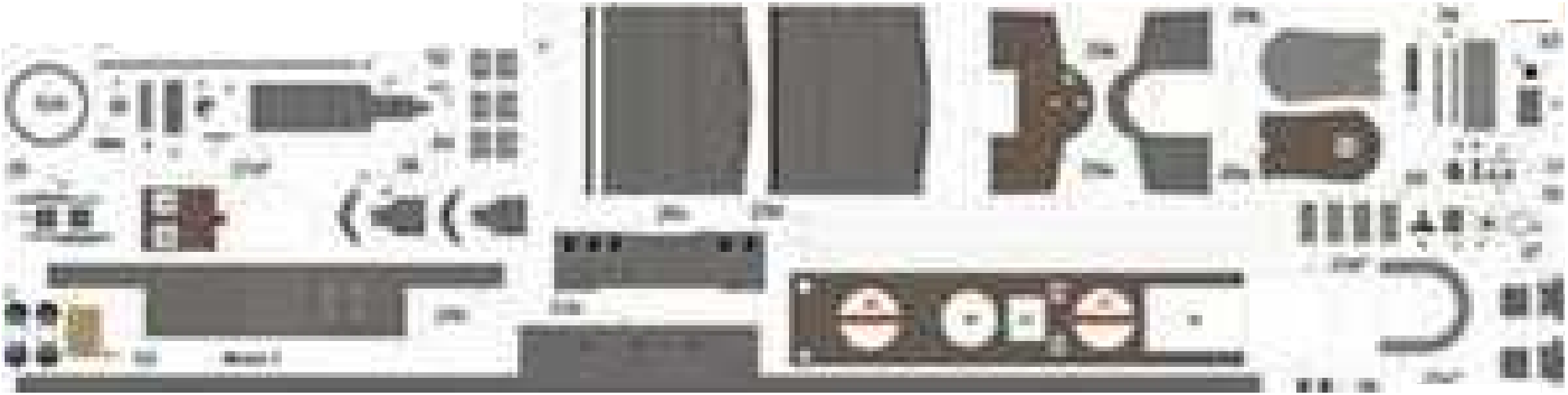
Step 4: Cutting - where to cut

How to read symbols in construction diagrams (in general):



How to read symbols in construction diagrams:

Some systems of symbols are more commonly used than others, but there are no agreed-upon standards. It is easy to find examples of the same symbols used for opposite meanings in different paper model kits. Most kits use solid lines to indicate where the pieces should be cut out, but some use dashed lines instead

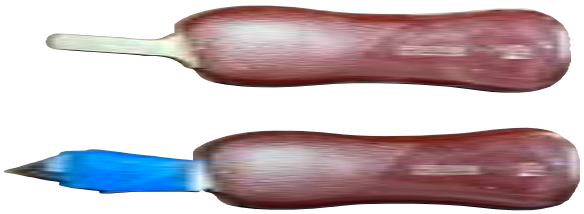


Step 4: Cutting - blade recommendations

PAPER

Surgical blades

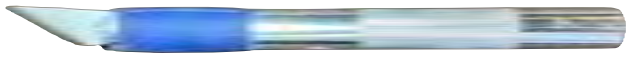
Blade thickness = 0.4mm (0.02”)



CARD

Craft blades

Blade thickness = 0.4mm (0.02”)



CHIPBOARD

Utility blades

Blade thickness = 0.6mm (0.02”)

General cautions:

- Keep a cup/receptacle for cut-offs to be discarded. Keeping a meticulous workspace will save frustration
- Keep a separate cup/receptacle for small parts. Don’t even breathe near this
- If it goes on the floor, it is likely gone. However, shining a flashlight at floor level may allow you to recover larger pieces
- Carpet is even worse. If your workplace has carpet, print multiple copies of parts sheets because carpet eats small parts

Step 4: Cutting - sequence

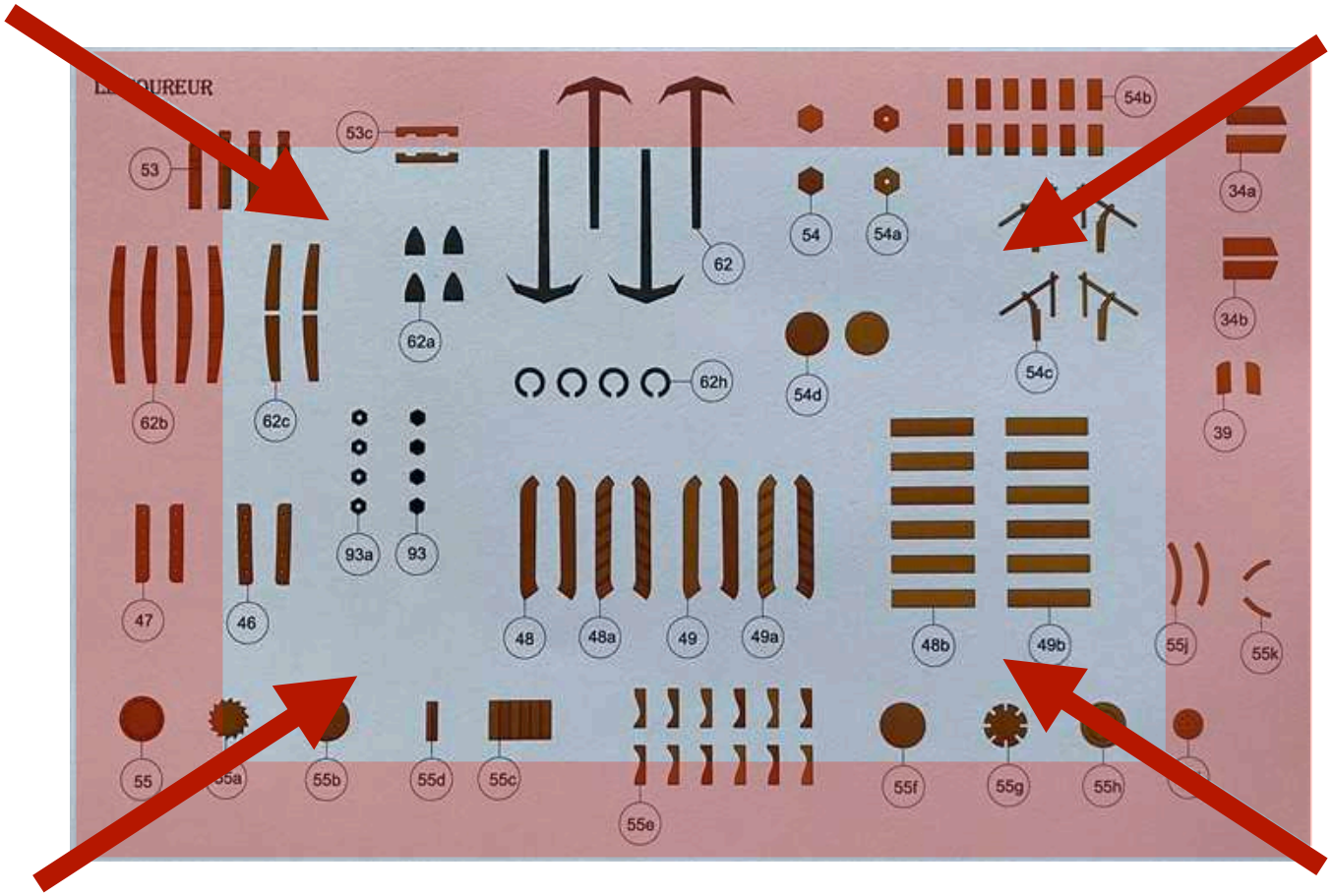
Pearls of wisdom:

- **ONLY CUT OUT PIECES AS YOU ASSEMBLE THEM.**

- Note the way the parts are laid out on the page. If you cut out the parts in the numerical order, you may be left trying to cut a very small piece out of a very small piece of card, which is extremely difficult. Therefore, you may need to ignore the numbering sequence

- Start cutting out parts **IN ASSEMBLY ORDER** nearest the outside edge and work towards the center

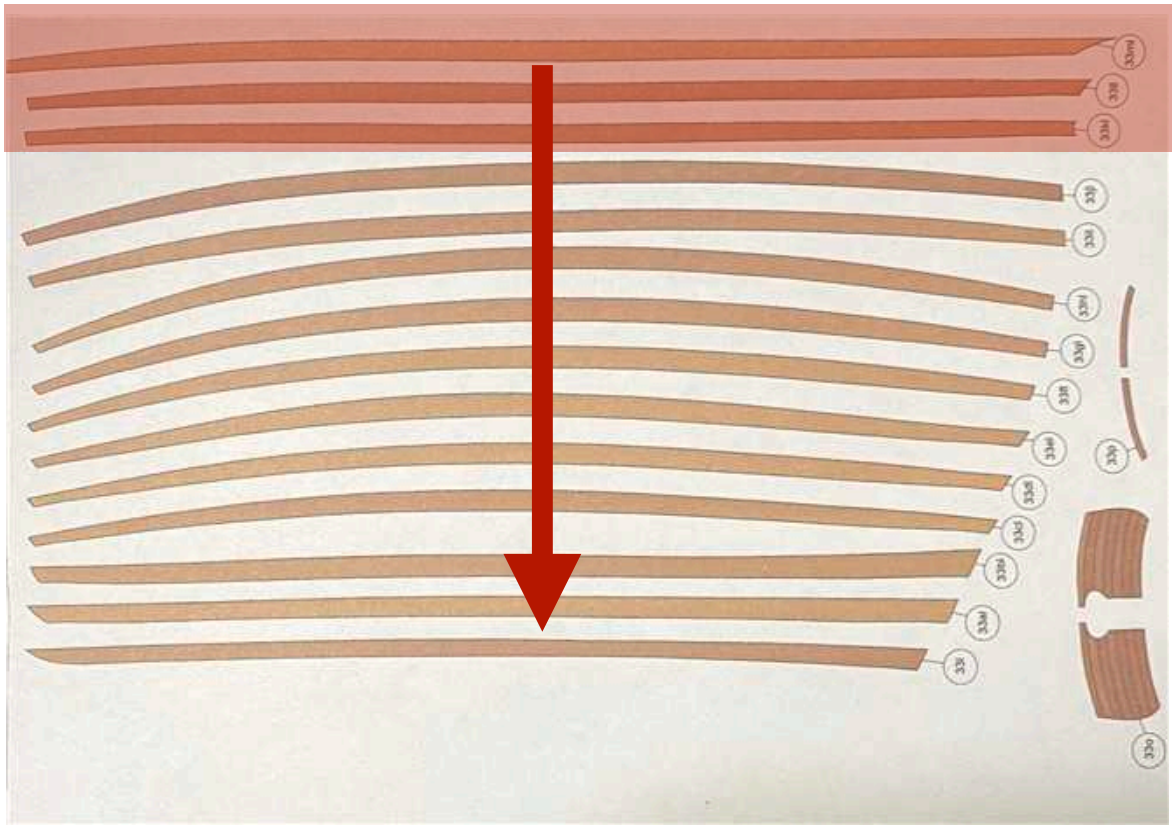
Step 4: Cutting - sequence



Step 4: Cutting - sequence

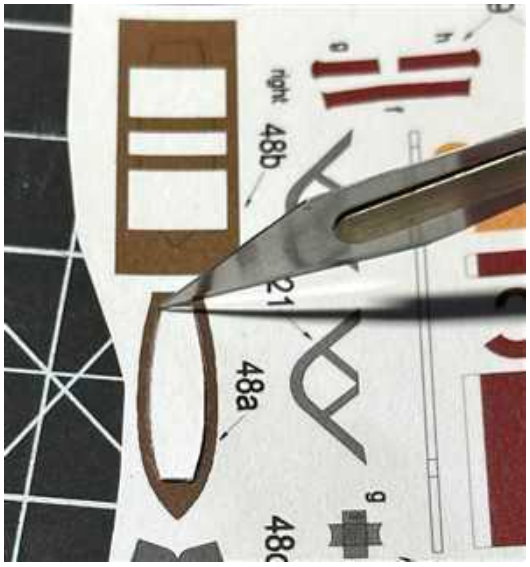
Trying to cut long, thin parts from narrow strips of card is also very difficult. Note that most of the edges of ships of sail are not entirely straight, but slightly curved

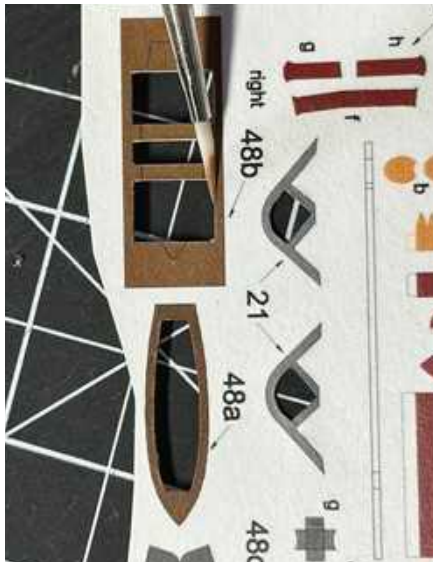
Number the backs of small parts with a pencil and store in a lidded jar for safe keeping



Step 4: Cutting - sequence

Also, the same philosophy applies to parts that have interior sections to be cut out. Cut out the interior section using a **PUSH CUT**, color the edges, then cut the part from the parts sheet:



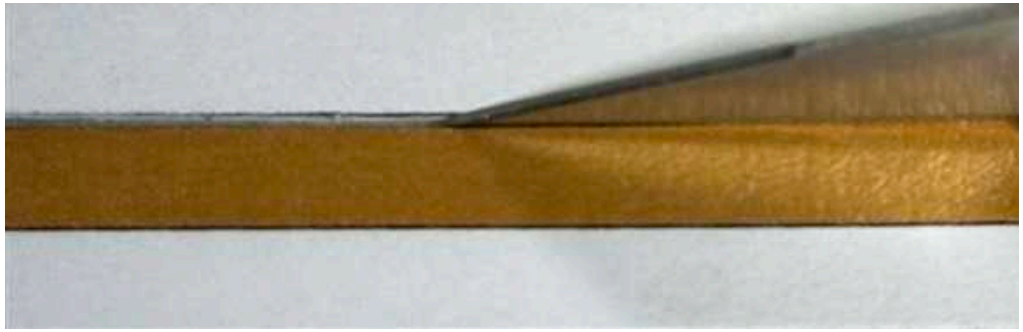


General caution: Do not pull out interior sections; if not completely cut in the corners, it will leave a tuft of ripped paper/card. Lightly push and recut until the interior piece falls out easily.

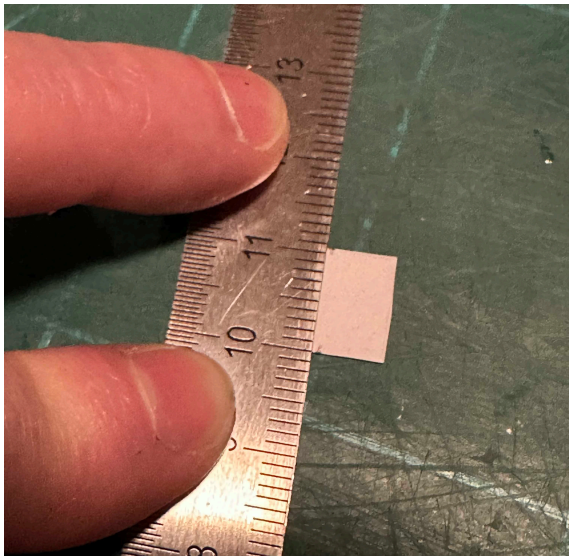
Step 4: Cutting - technique

Should I cut *on* the line, *outside* the line, or *inside* the line?

There is no clear consensus, many advocate cutting just inside the line so that a white or black line does not appear at the edges of the part.

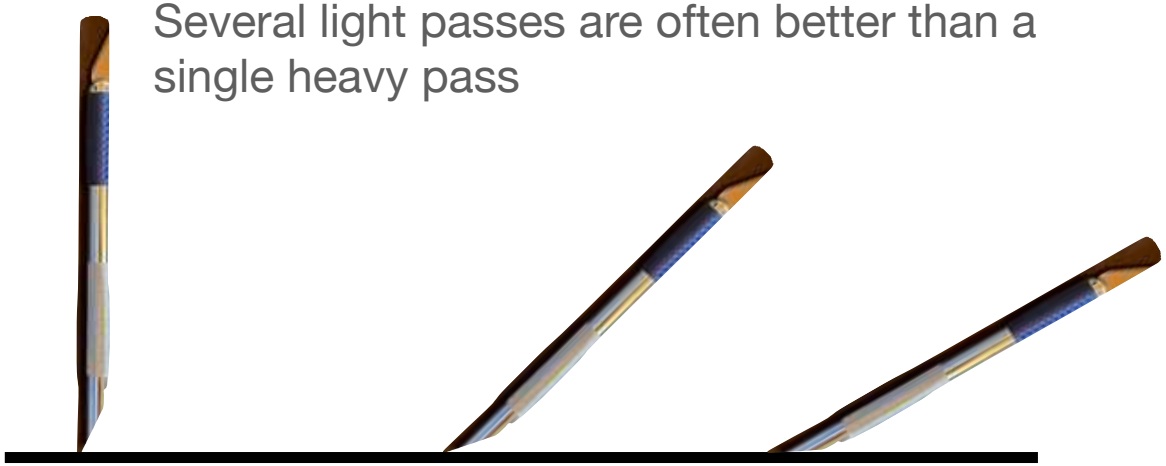


When cutting straight lines, remember to place your metal ruler OVER the part. That way if your blade deviates, your part will be protected by the ruler.



Step 4: Cutting

Vertical blade angulation is important when cutting curves and cutting through thick laminated card. Lateral angulation can create a bevel, which can be wanted or unwanted. Several light passes are often better than a single heavy pass



Curves and interior push cuts

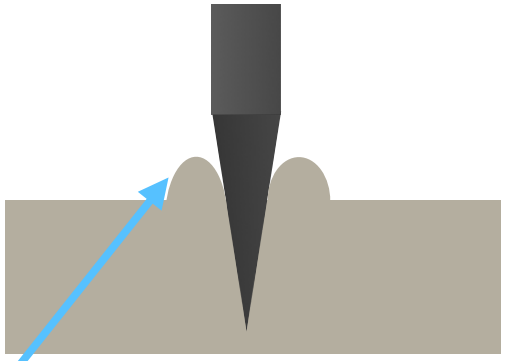
First pass

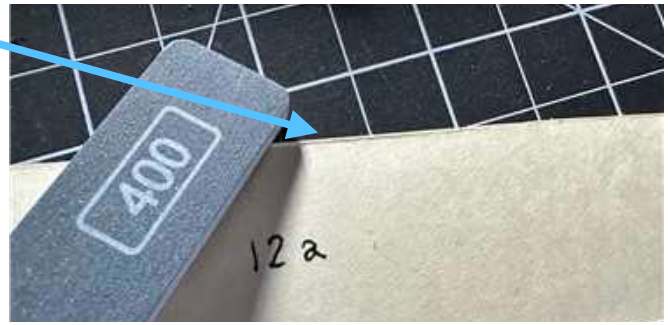
Second pass

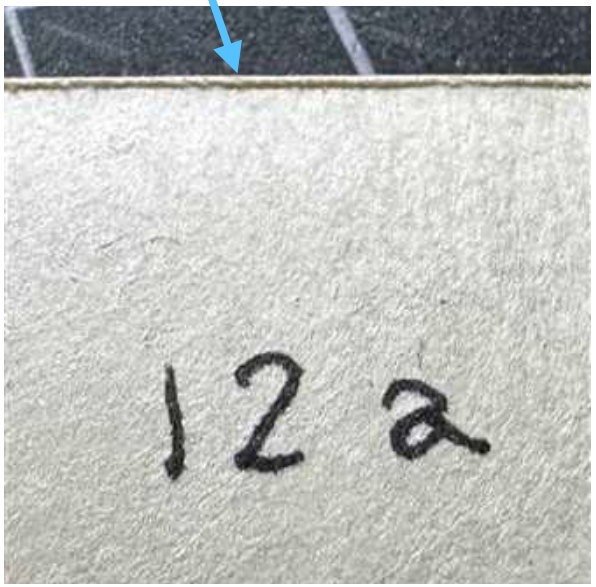
Lateral blade angulation is important when cutting butt joints. A bevel (undercut) can reduce gaps.

Step 4: Cutting - technique

For card, use an X-Acto knife or one of the several similar brands. A #11 straight blade is suited for most cutting and change/ sharpen the blades whenever it begins to drag and catch. More than one pass is recommended. Often, the blade will leave a rolled edge, so use the side of the blade handle to burnish the edge into the desired profile. If it is not on a printed portion, you can sand it



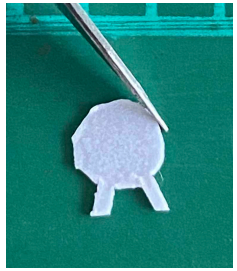


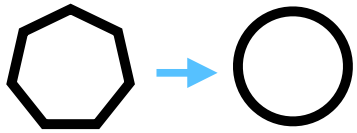


Step 4: Cutting circles

DSPAIE stepless circle cutter

Iris scissors

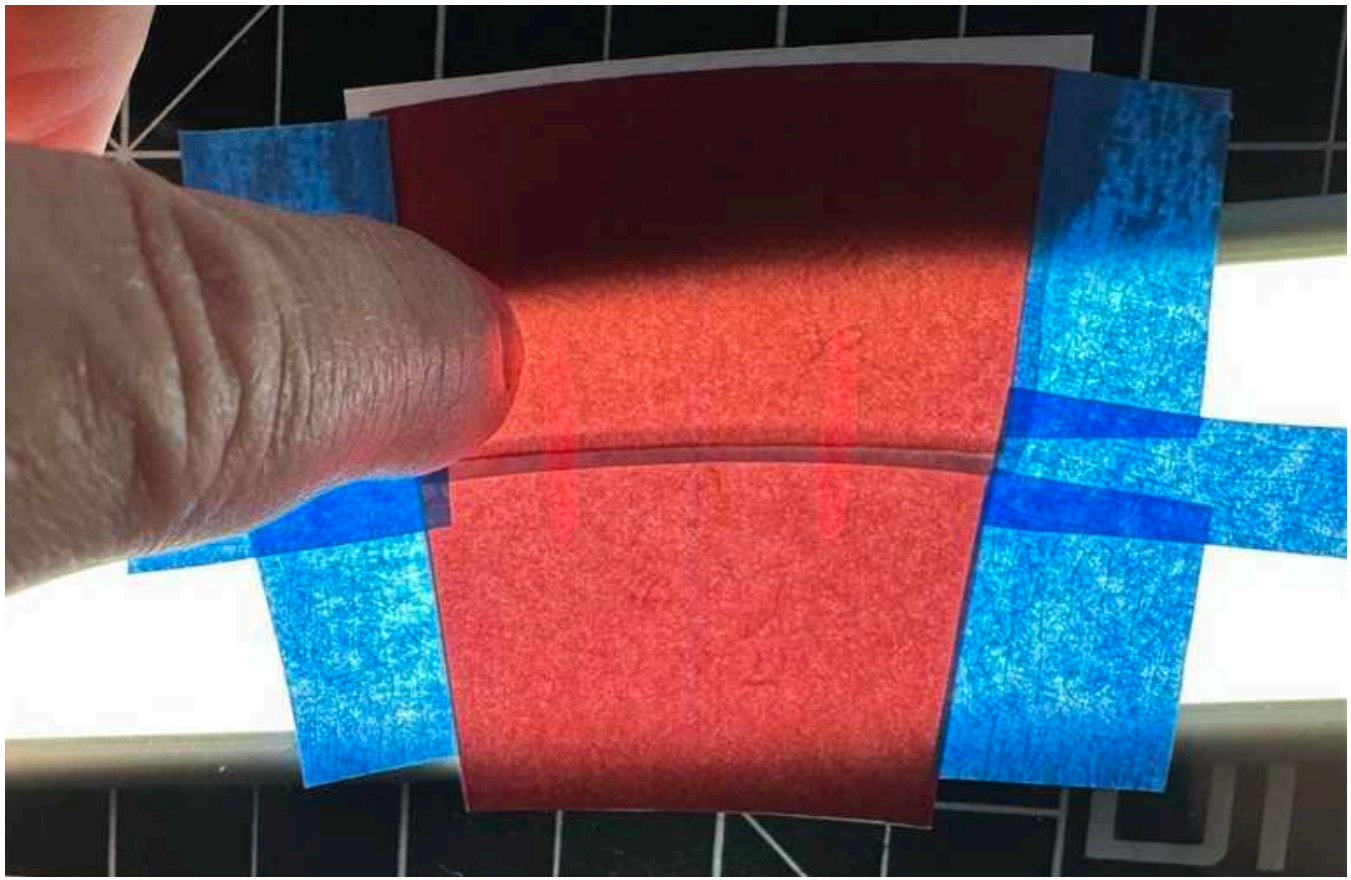




Small part
corner-cutting

Step 4: Cutting - technique

Double-cutting of abutting paper pieces is aided by backlighting



Step 5: Assembly

In general, card model parts are numbered in the sequence in which the designer intended they be assembled, but it doesn't always make sense to follow this sequence. This is why the diagrams and parts sequence should be studied and pondered before doing any assembly. For example, a bad sequence can be recognized:

- when it makes more sense to install small, almost hidden parts before adding the deck or hull “skin”

- when the instructions indicate skinning the bow before the stern.

    (Universally, the stern should be skinned first)

How to read symbols in construction diagrams:

When it comes to paper models there is no international standard for explaining how to build them. Some paper model designers seem to view the assembly as a sort of logic game, where you must match one number or symbol to a corresponding number or symbol to figure out where or how the pieces connect

“Fold here”

“Glue here”

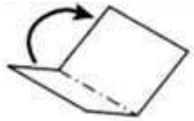
“Glue on this side”

“Glue back-to-back”

“Paste to the part with the corresponding number”

“Fold line towards back”

Valley fold



“Fold line towards front”

Mountain fold

“Fold part of the line towards back”

“Cut out this section and paste to the part with the corresponding number to the back”

https://www.wurlington-bros.com/Workshop/step1.html

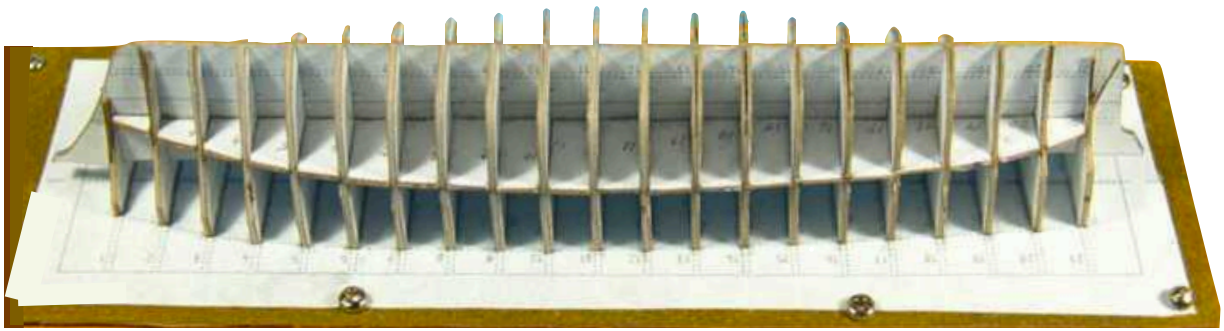
Step 5: Assembly - Dry fitting

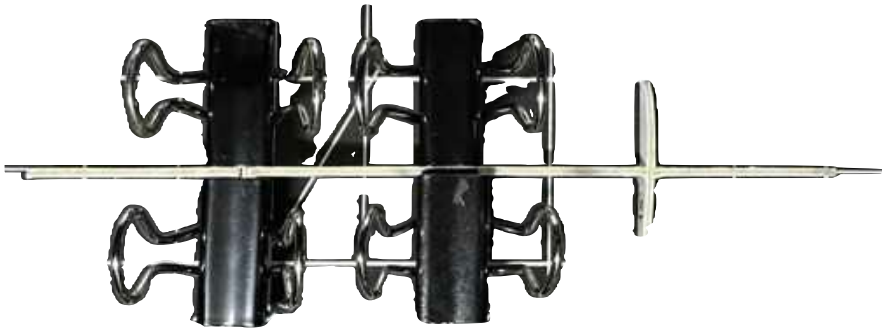
"Fit twice - glue once"

Dry fitting is essential, look for parts that need to be bevelled or faired. Sanding after glueing is not an option, unless they will be covered later (frames). This will become even more important later, when pieces need to be curled or folded

Step 5: Assembly - framing

Framing is done much the same as wood construction

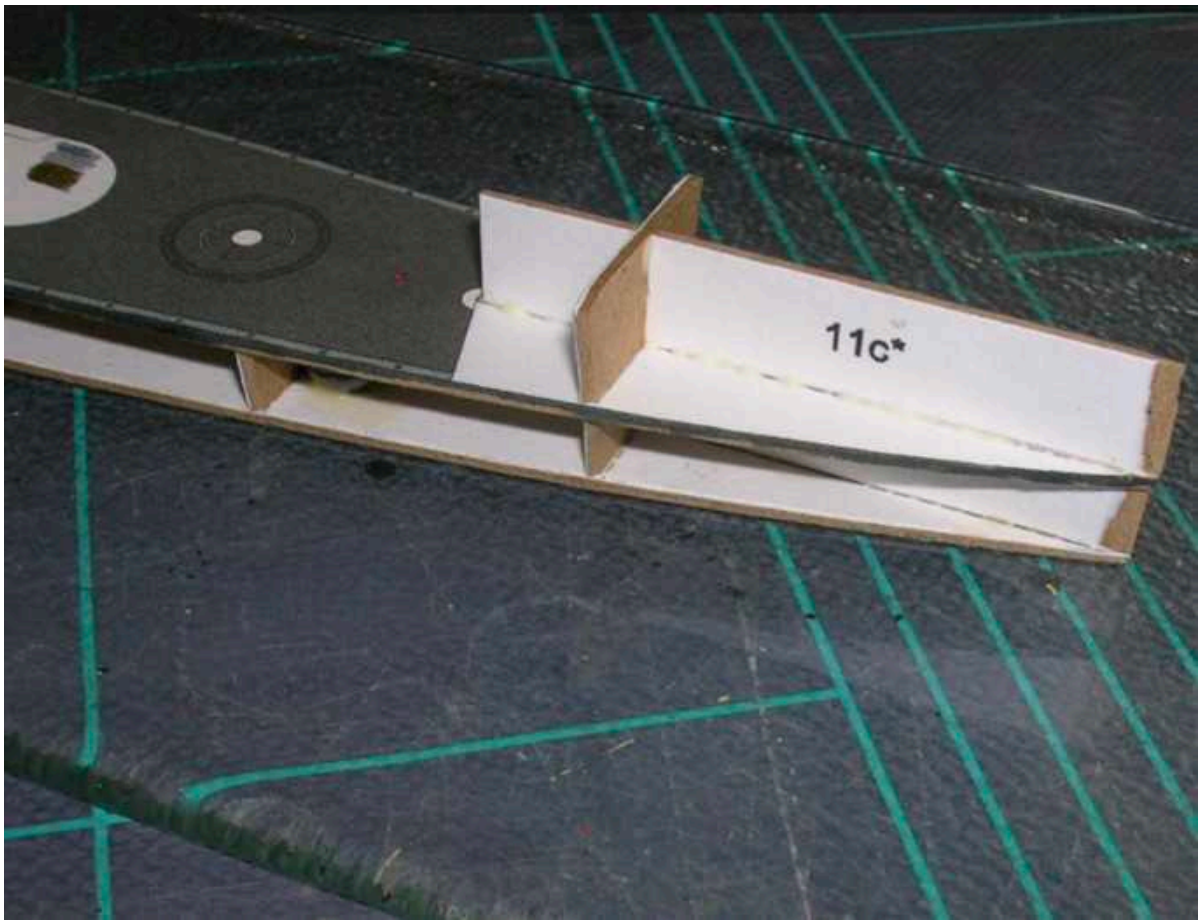




Clamping: Use binder clips to clamp frames. Small scale projects require small clips

Step 5: Assembly - framing

If you choose to make a waterline model, attach the bottom frame to some plate glass using contact cement to keep the model stable during construction.



https://modelshipworld.com/topic/2780-pt-v-building-v108-the-hull/

Step 5: Assembly - skinning the hull

Make a felt-lined stand prior to skinning the hull to protect it, if not constructing a waterline model

Adhesives for attaching printed parts together

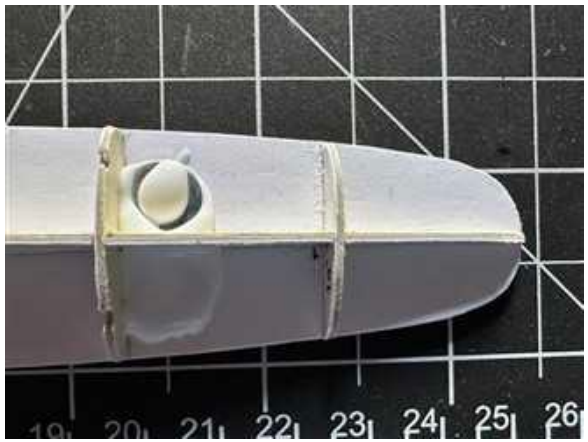
A good adhesive for adhering card-to-card:

Aleene's **Fast Grab** Tacky Glue - PVA

- Fast-grabbing, ultra-thick formula - low moisture content does not swell or deform card
- Can dilute with water for ultra small parts
- Grabs hard-to-hold items almost instantly - great for parts you need to hold in place because you can't clamp it
- Works on most materials
- Dries flexible, permanent and "mostly" clear. Color stable
- Not sandable (rubbery)
- Cleans up easily with slightly moistened cotton-tipped applicator or brush

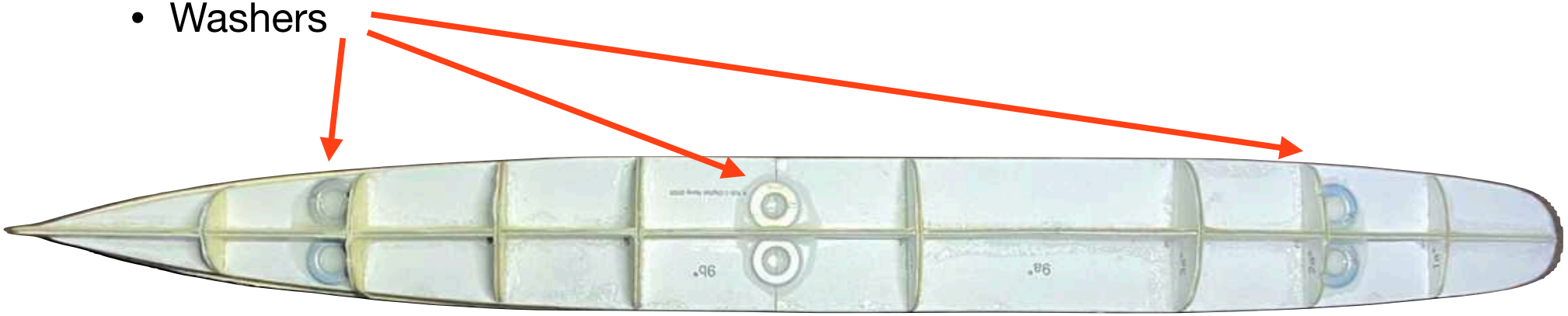
Step 5: Assembly

Addition of weights to add heft to model



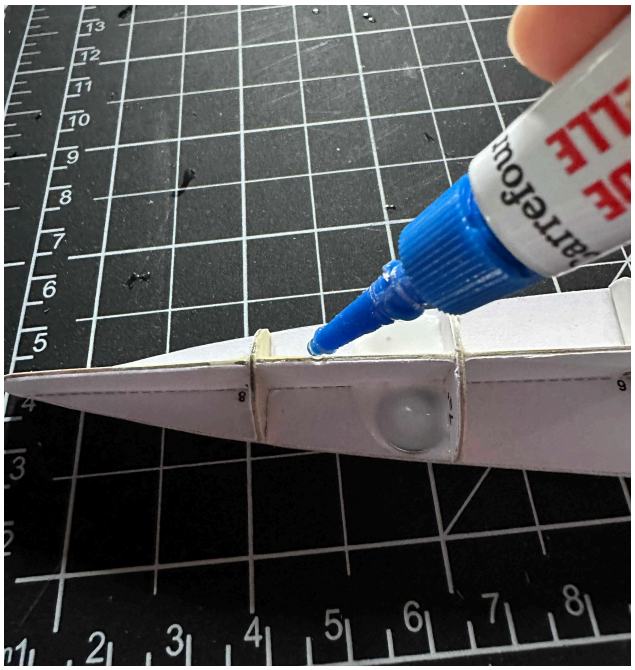
To help in holding this featherweight object without crushing/deforming it, glue inside the hull:

- Lead fishing weights
- Washers



Adhesive for frame stiffening

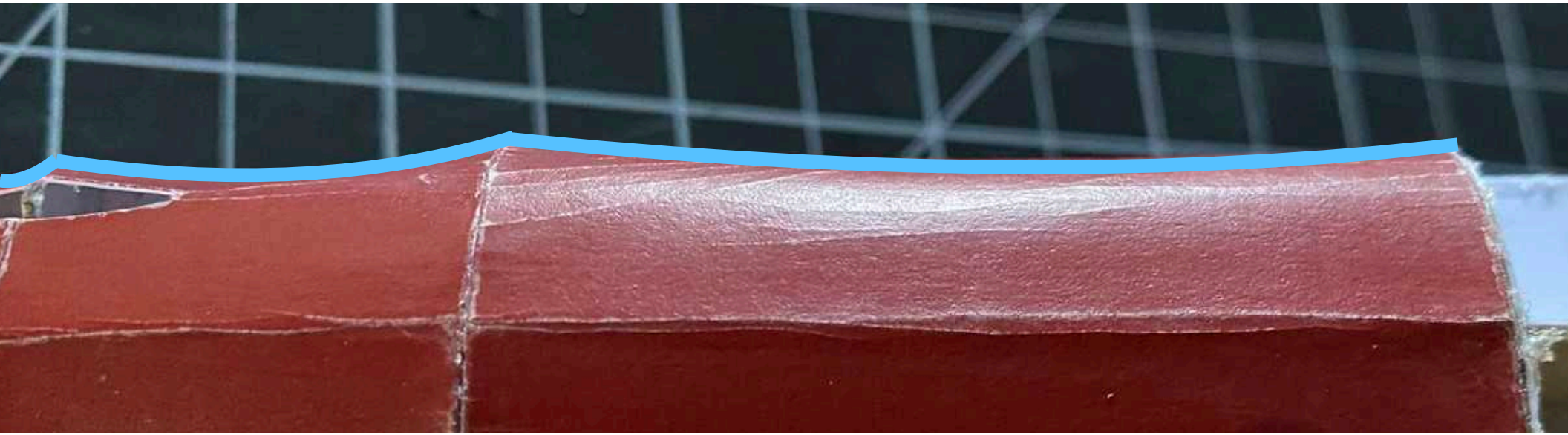
Fast-cure, thin CA can be wicked into card stock to stiffen the frames of a ship. This will help resist deformation and allow you to sand/fair the completed frame.



Medium-cure CA is useful for gluing parts made of different media (metal-to-paper) however…. CAUTION: CA can and will bleed through paper, causing any print to bleed or discolor, so limit to the frame or test printed parts first

Step 5: Assembly - skinning the hull

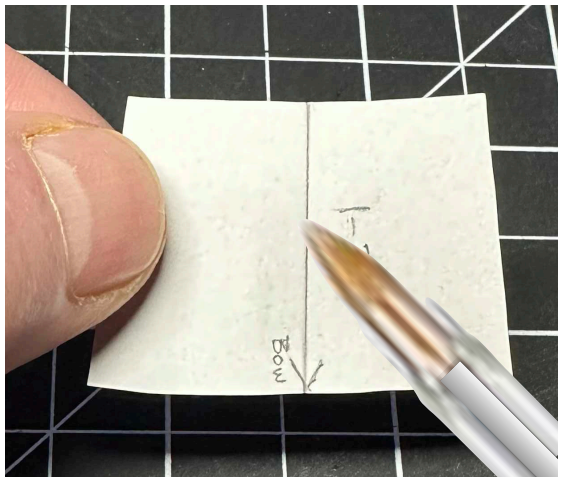
The greatest difficulty in this step is avoiding the “starving cow” look. **Minimize the amount of glue used and pre-shape the pieces so that no finger pressure is needed to keep them in shape - especially if below waterline.**

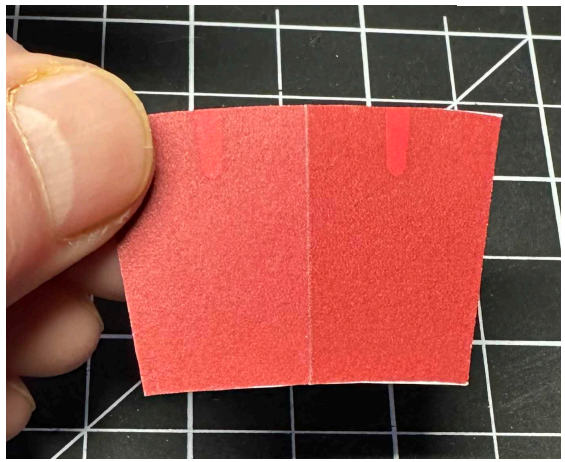


Step 5: Assembly techniques - Scoring and Folding

Scoring

Paper models often require scoring (creating a crease) along fold lines before folding the individual pieces. This ensures clean folds and reduces cracking. Run a dry ballpoint pen over the fold line (on the back) to help fold paper neatly. Scoring card with a perforating wheel can also help in folding card, but can weaken the fold area.

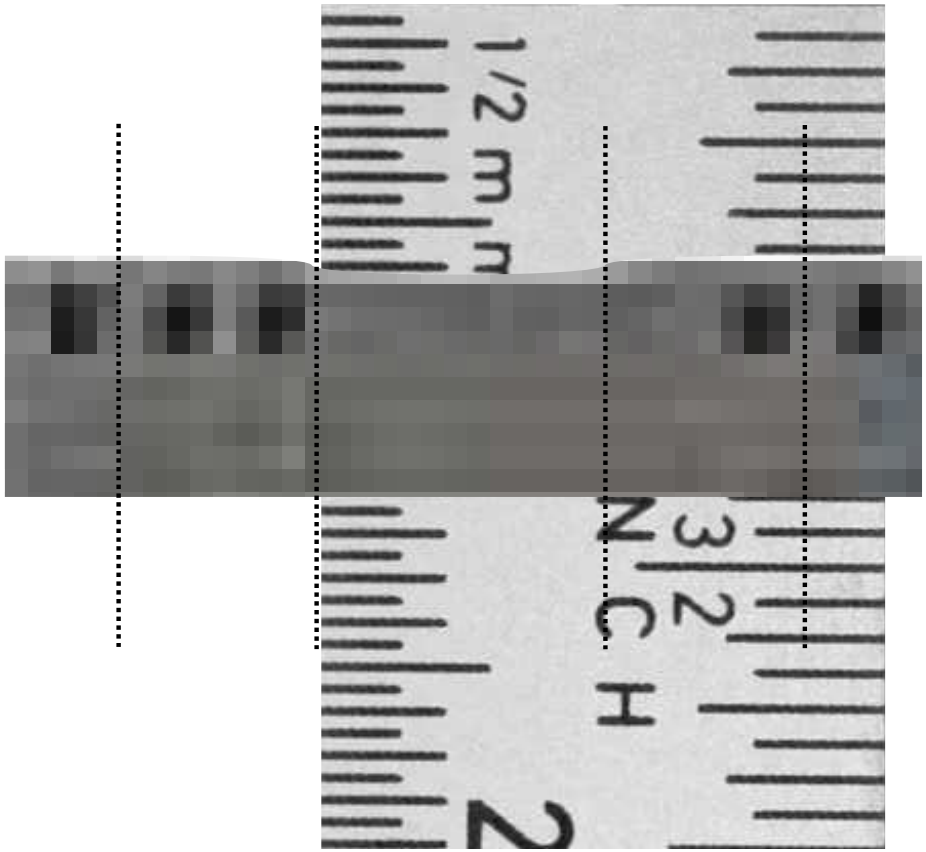




Step 5: Assembly techniques - Scoring and Folding

Folding

After scoring, straight folds can be aided by bending the card around a straight-edge ruler. Unfortunately, this often causes cracking of the print. In some instances, cutting each panel and glueing them together as separate parts (as with the walls of the radio room shown on right) will give a cleaner look. Moistening the paper at fold lines can help create smooth curves and prevent paper from crinkling, but test prior to ensure printer inks don't run. Fold over a ruler for straight folds



Step 5: Assembly techniques - Curling and Rolling tubes

You will need tools to help curl parts and roll tubes. Match the diameter of the tool to the final diameter of the part to be curled:

10mm dowel

8mm brush handle

6mm chopstick

4mm brush handle

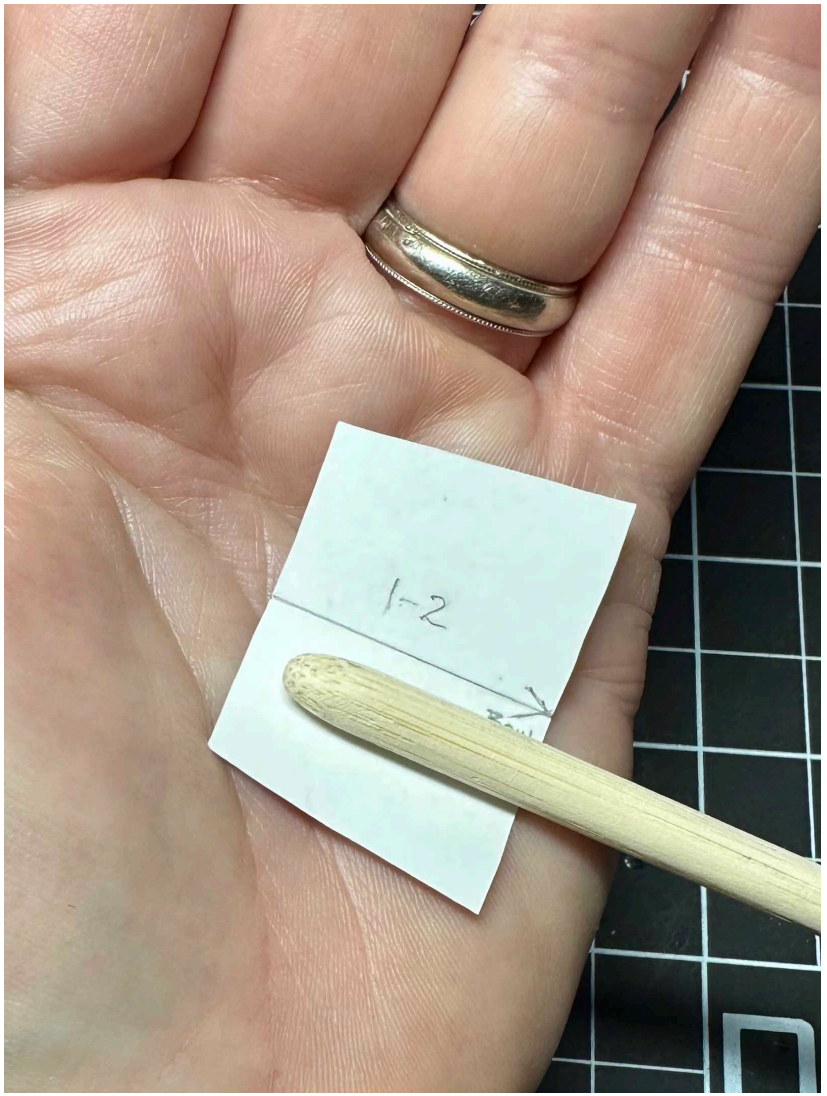
2mm toothpick

1mm upholstery needle

Step 5: Assembly - Curling techniques

1. **<u>Curling</u>**
   Using a round instrument, apply pressure to the card part uniformly while supporting the part in your palm

2. You can vary the amount of curl by cupping or flattening your palm thereby varying the stiffness of the support

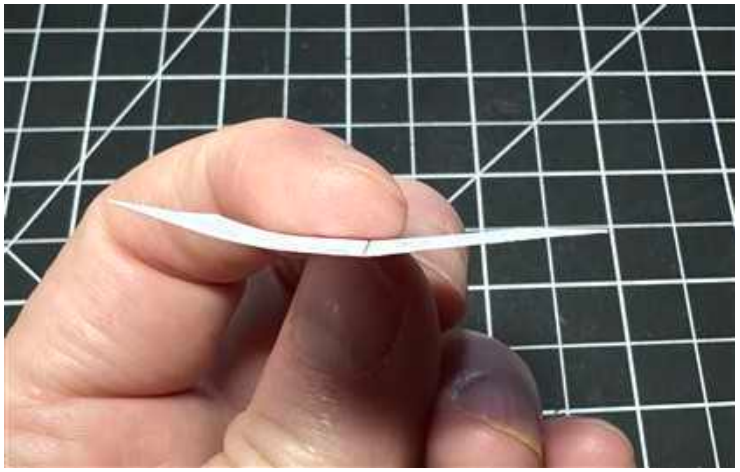


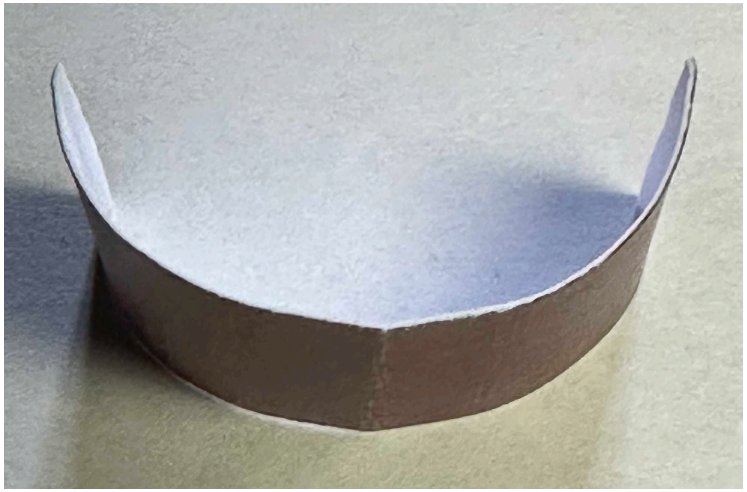
Step 5: Assembly - Curling techniques

3. Practice curling on an extra piece printed on regular paper prior to glueing

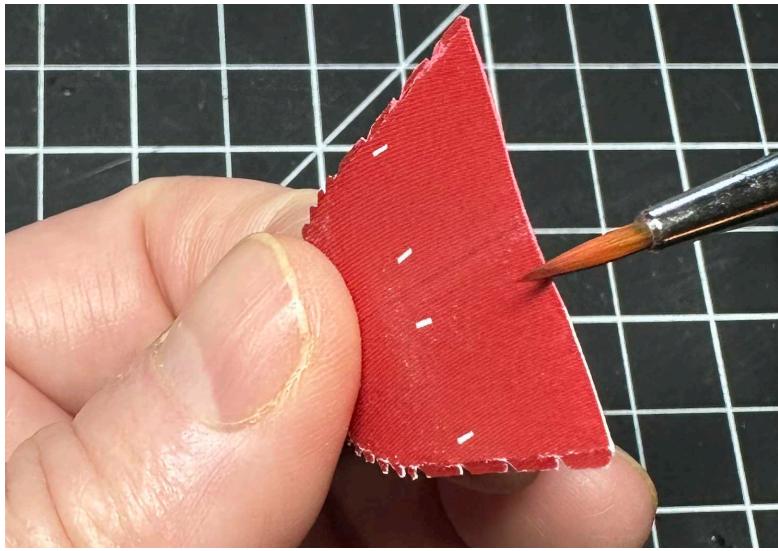
4. Gentle curves require a larger diameter instrument

5. Correctly curled parts should fit the frame without finger pressure





Step 5: Assembly - Edge coloring

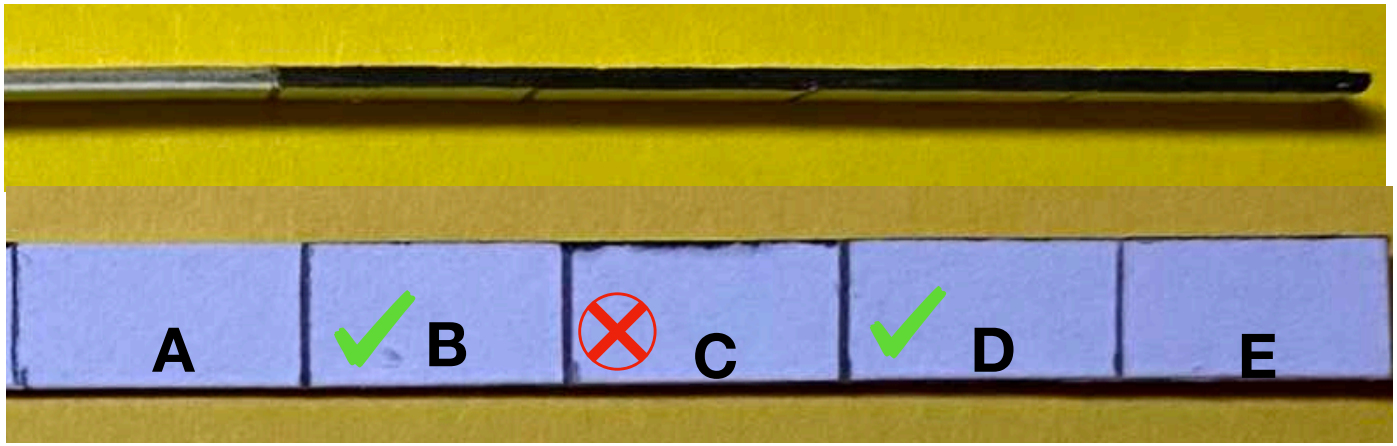


Edge coloring philosophies:

Cut-out parts have white/white + cardboard edges, so you can:

1. ***Do nothing*** and leave them white as card builder's a badge of honor
2. Perfectly the color the edges to ***exactly match*** the printed part using custom-mixed watercolors, acrylics, felt-tipped marker or gouache - time consuming but beautiful
3. Edges are visually ***minimized***. Common practice is to make the seams and exposed edges less obvious, but not necessarily invisible by a light paint wash

Edge coloring - must be done BEFORE assembly!



A:	No edge colorant
B:	Watercolor paint ✓
C:	Felt-tipped marker ⊗
D:	Dilute acrylic paint ✓
E:	Acrylic paint

Edge coloring

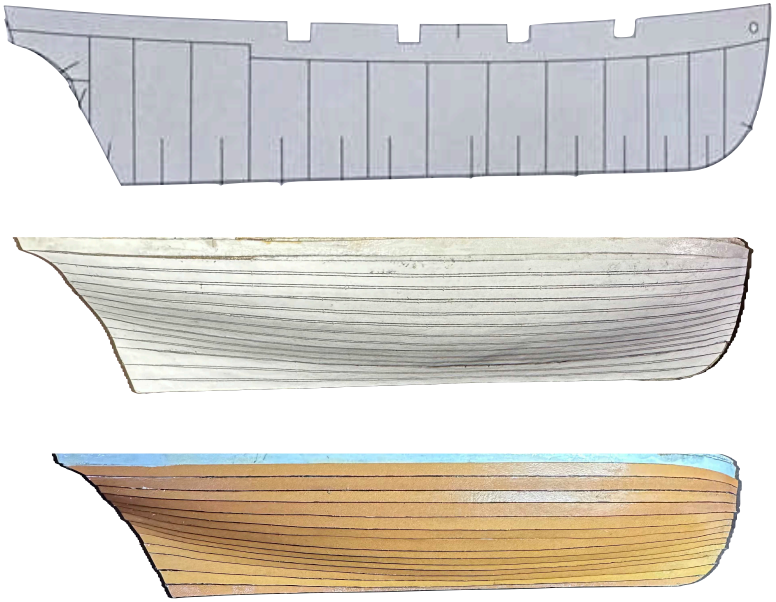
The surface acrylic varnish cannot stop the bleed-through of a felt-tipped pen. Watercolors (in a tube) are handy, even if they dry you can still use custom mixed tints by just wetting them again

General caution:

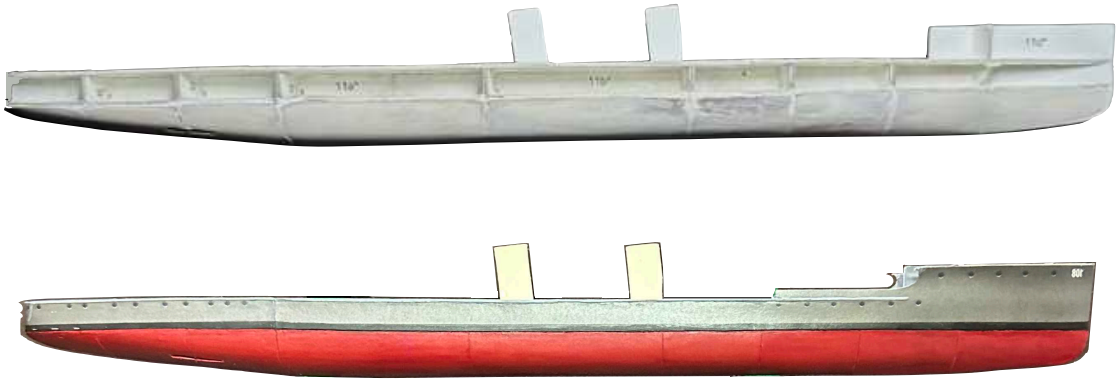
Let the paper/card dry completely before attempting to manipulate the part or it will deform and/or disintegrate

Step 5: Assembly - skinning the hull

How do you fix a starving cow hull?
Double skinning/planking technique - many age of sail card models use the double (even triple) planking technique.



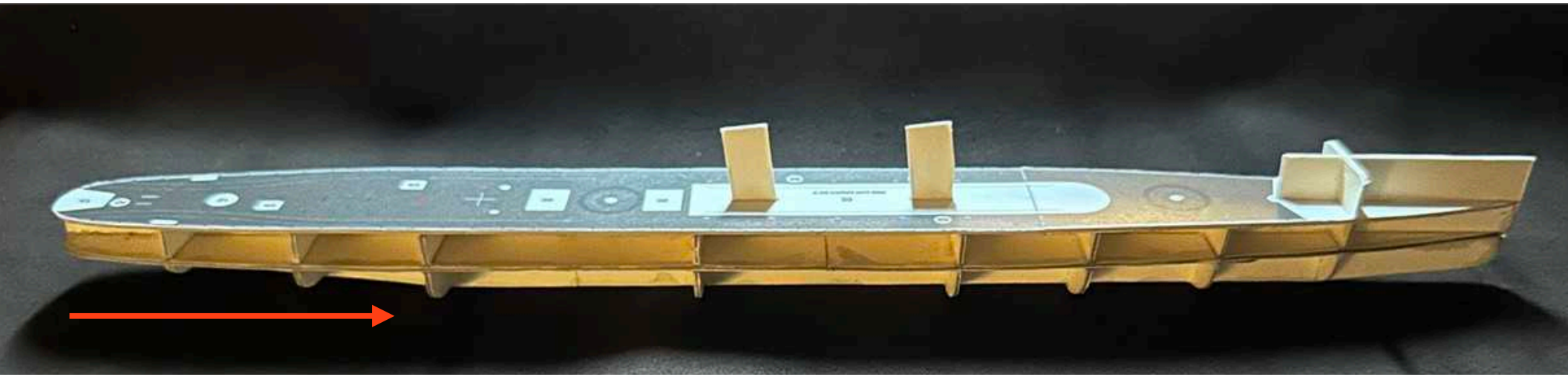
(I used wood filler, faired it,
then re-skinned with paper)

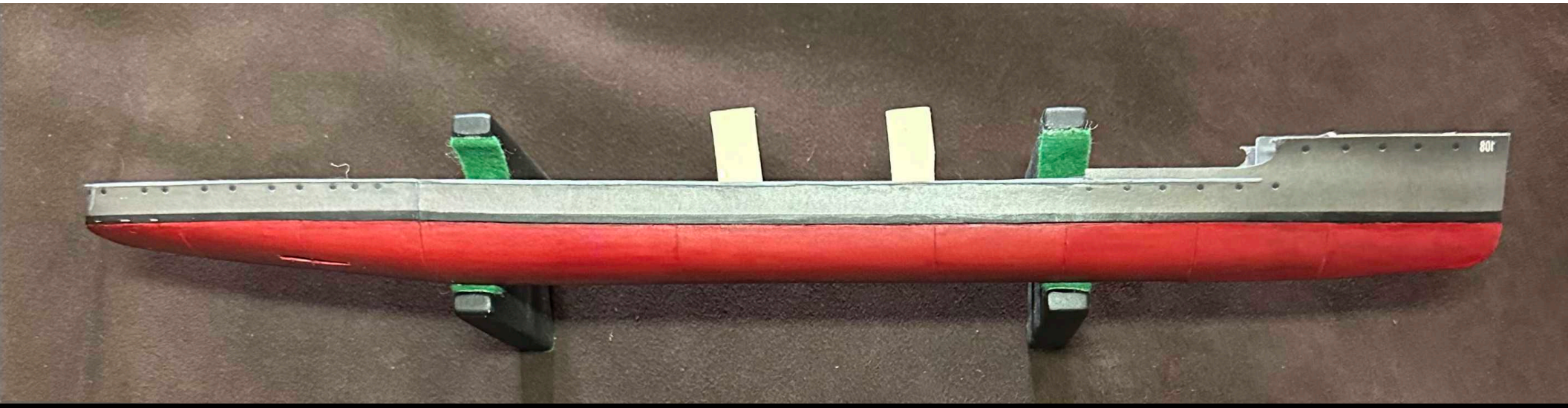


Step 5: Assembly - skinning the hull

1. Start at the stern and work towards the bow

2. Waterline models add have better stability and lesser difficulty level

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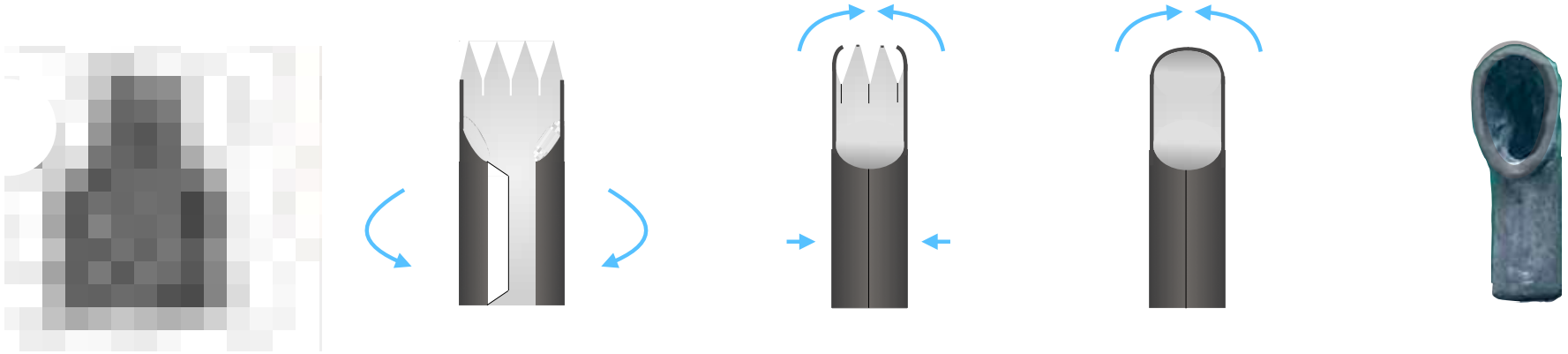
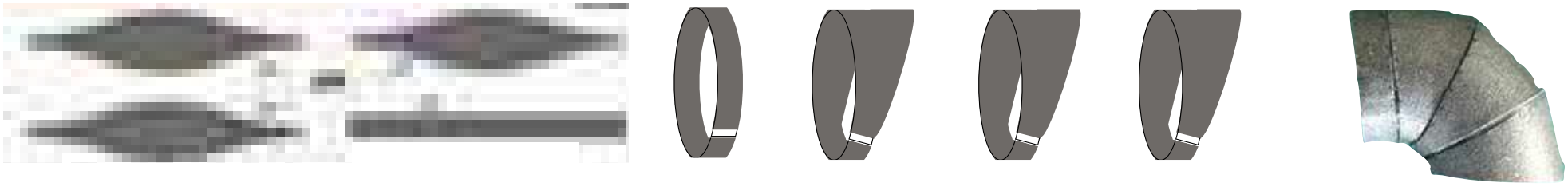
Step 5: Assembly techniques - Petals and consecutive slices

Petals are one way of producing curved tubes or rounded cones like the ventilator shown below. Petals are one of the most difficult card structures to form and glue properly.

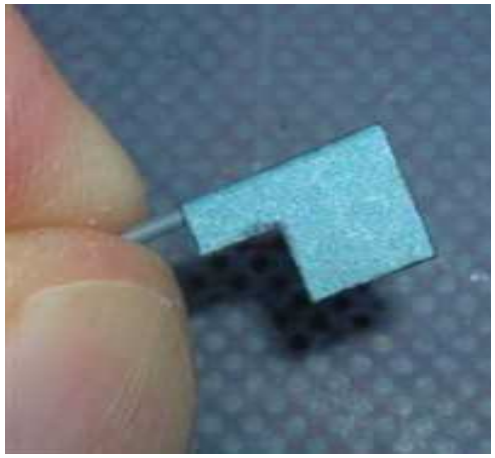


Consecutive slices are a series of rings put together to make a curved tube. To avoid rings of different diameters, make sure the overlapping ends meet precisely. The fit between adjacent rings totally depends on how accurately the parts are cut; very small errors will result in unsightly gaps in the seams.



Step 5: Assembly techniques - Rolling tubes

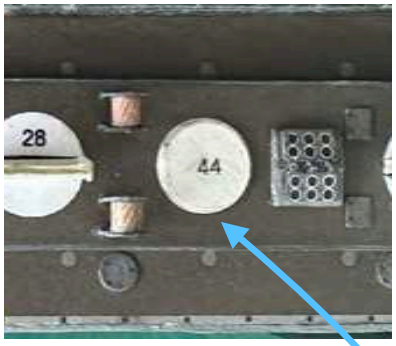
Rolling hollow tubes
(especially if small diameter) requires:
- -removal of glue tab
- -slight undercut of butted joint cuts
- -correct size round rod for forming
- -sometimes using thinner paper instead of card



Rolling solid tubes
(especially if small diameter) requires:
- -sometimes using thinner paper instead of card
- -polystyrene or wire to roll paper/card around

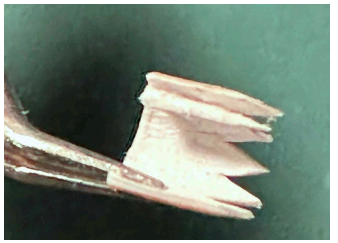
Step 5: Assembly techniques - to tab or not to tab

For adding parts to ship: joiner tabs



Large parts:
Tabs are excellent for joining large, angled parts but can be problematic for adding parts to the deck due to spring-back. Instead, cut a 1mm thick stack of card slightly smaller than the base of the part as a support

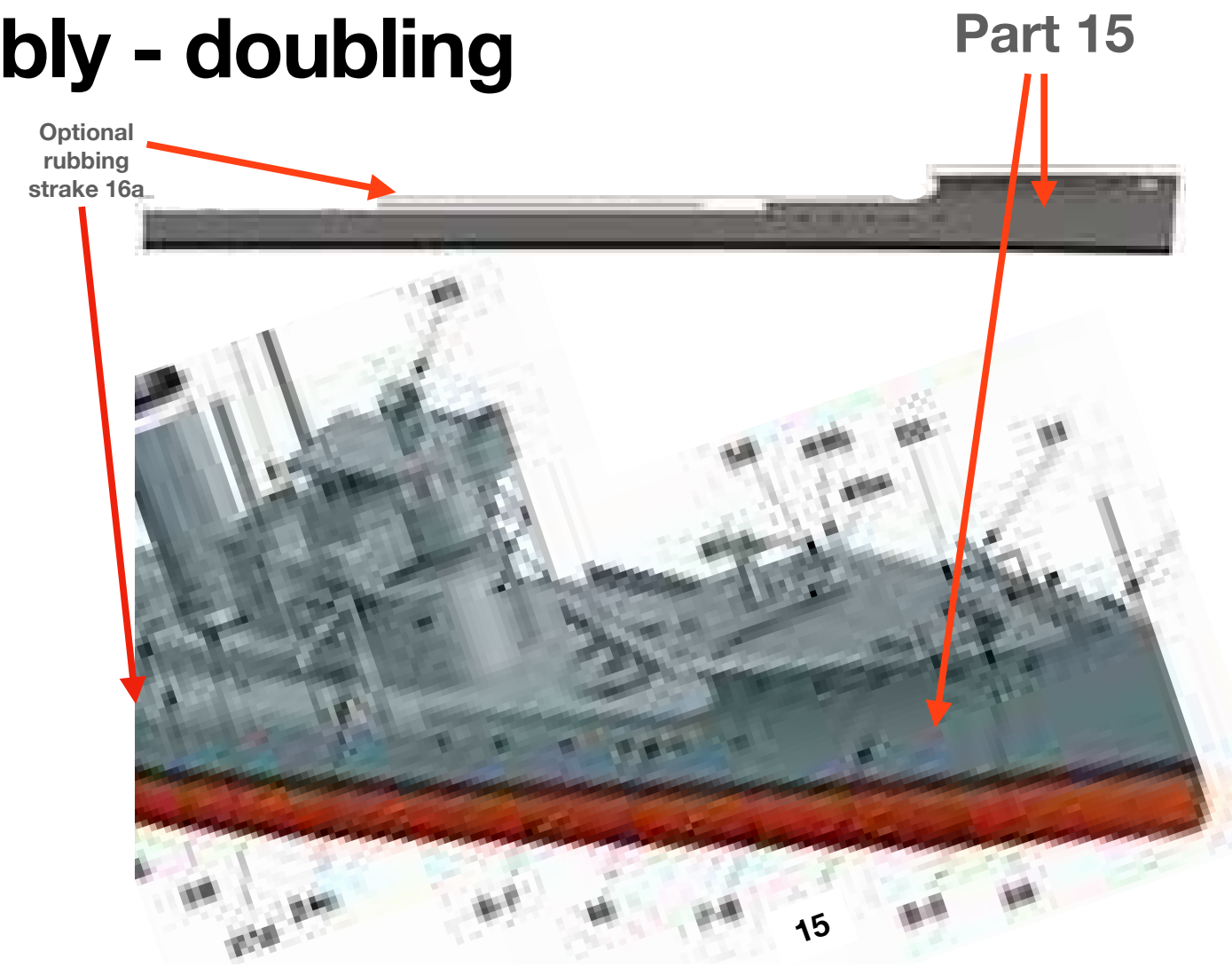
For joining together folded/curled parts



Tabs for small parts are often too bulky:
-thin the card part of the tab
-remove the tab completely and use paper tabs inside
-remove the tab completely and glue as butt joint

Step 5: Assembly - doubling

Doubling: A rubbing strake is already printed on part 15, but by adding an optional strake you can give your model more depth. This technique is called 'doubling', because you're doubling the thickness of the part. Since they are tiny, thin parts, cut them out first and glue them to the part they are attached to **PRIOR** to assembling the larger part to the ship



Finishing

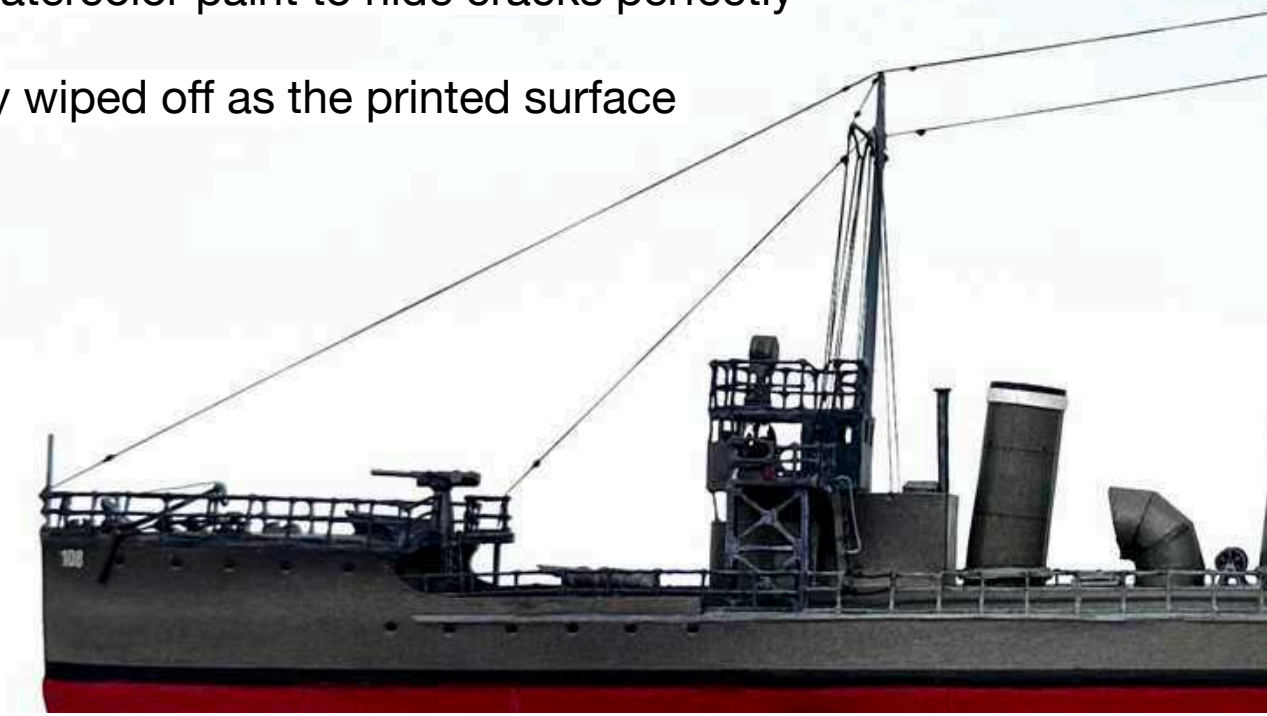
1. Most experienced card modelers prefer to spray the sheets with acrylic varnish before they start - this helps prevent cracking, flaking and damage to the print

2. Use watercolors for edges ***and*** touch ups, Any cracked, white areas where the paper has been bent will absorb watercolor paint to hide cracks perfectly

3. Any extra paint/glue can be easily wiped off as the printed surface is protected by the varnish

4. After completing the model, then touch up again and then respray the whole model

5. This final coat of varnish helps protect against insects as well as "fixing" the watercolor



In conclusion:

- Card kits are an inexpensive, yet exacting way to model
- Stiffen the frame (only) with liberal applications of cyanoacrylate adhesive prior to fairing
- Protect colors and minute details of printed parts with spray acrylic varnish prior to cutting the parts out
- Make a felt-lined stand prior to skinning the hull to protect it, if not constructing a waterline model
- Pre-shape card for skins and use very light pressure and minimal PVA to avoid the « starving cow » look
- Biggest frustration - small parts just disappear

Transporting a card model

- Two chip cans
- Bubble wrap
- Polymer “bean bag” beads (pillow refill - 1L)

Reference materials on V108 torpedo boat

Forums and support for this Card build include:

Excellent tutorial by ccoyle: https://modelshipworld.com/topic/2701-intro-and-table-of-contents

Excellent build logs:

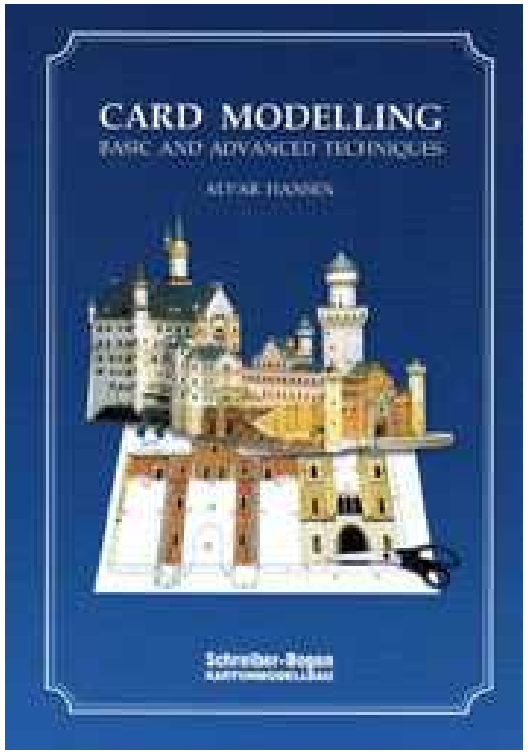
- https://en.m.wikipedia.org/wiki/ORP_Kaszub_(1921)
- https://shipmodeler.wordpress.com/2017/07/10/an-intro-to-card-models-v108-torpedo-boat/
- https://modelshipworld.com/topic/16325-v108-by-catopower-digital-navy-1200-scale-card-torpedo-boat-msw-tutorial-build/
- https://modelshipworld.com/topic/19619-v108-torpedo-boat-by-glennreader-digital-navy-1200-card
- http://www.modelshipgallery.com/gallery/misc/sms/v108-200-mvs/mvs-index.html

Reference materials on Le Coureur (1/96)

Forums and support for this Card build include:

- https://modelshipworld.com/topic/16958-le-coureur-1776-by-heinrich-der-seefahrer-shipyard-196-card-french-lugger-and-additives
- https://modelshipworld.com/topic/34621-le-coureur-by-chazg-shipyard-196-card
- https://shipmodeler.wordpress.com/2022/02/13/my-newest-ancre-books-acquisition-le-coureur-monograph

Reference materials on Card Modeling



Card Modelling (Basic and Advanced Techniques) by Alvar Hansen

(Marcle Models- UK)

Forums and support for paper/Card ship kits include:

- Papermodelers.com
- Ecardmodels.com
- Paper Ship Models Facebook group
- Kartonmodellbau.org
- Papershipwright.co.uk (free downloads)
- Models 'n' Moore: (free downloads)
- Paper Shipwright
- Model Ship World
- Super-hobby.com
- papel3d.com/en
- modelland.co.uk
- Cardfaq.org

Contact me at: **prosjules@me.com**