



Le Bois Boucherie No.1



First Experience with Small Boat  
Construction:

# The Hybrid Kayak Project



July 3, 2015

Long Island, New York

40° 52' 31.7604" N

73° 11' 3.5700" W





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## Contents

Journal du capitaine.....	5
First Things First.....	5
First Things Second.....	6
More on Work Space.....	6
The Work Area.....	7
Boat Parts, Epoxies, Fiberglass, Gloves, Respirators, etc.....	8
Work Area Wall Art.....	9
Wet/Dry Vacuum; 2 Piece Paddle; Boat Sling for Storage.....	10
Close-up of Boat Stands.....	11
Stands Converted to Sawhorses.....	12
Stands Converted to Hold Boat on its Side.....	13
Bottom and Side Panels Laid out for Epoxy.....	14
And Assembly Begins.....	15
We Pause to Pose a Poser.....	16
Let the Epoxying Begin... ..	17
Starting to Prepare the Exterior.....	18
The Epoxied and Glassed Hull with Stripping Forms Installed.....	19
The Epoxied Hull with Stripping Forms Installed-2.....	20
Scrap Wood in the Bow to Anchor the Strips.....	21
Several Potential Deck Designs were Considered.....	22
Another Candidate-2.....	23
And so on...-3.....	24
First Strips in Place.....	25
King Plank, Coaming Apron and First Dark Strip in Place.....	26
Deck Starting to Appear!.....	27
Another Angle...-2.....	28
Completed Deck Removed from Hull and Inverted.....	29
Epoxied and Glassed Bottom of the Deck.....	30
Deck Temporarily Placed on Hull; Hatch Hole Cut.....	31
Looking toward the Bow-2.....	32



A Problem Appears .....	33
<i>Before and After Views of the Modified Bulkhead-2</i> .....	34
Attach Deck to Hull.....	35
Attach Deck to Hull-2 .....	36
Preparing to Fiberglass the Deck .....	37
Painter's Tape and Plastic Sheeting to Protect against Drips.....	38
Sanding Between Epoxy Layers .....	39
Attaching the Coaming .....	40
Attaching the Coaming-2.....	41
Attaching the Coaming-3.....	42
Attaching the Hatch Sill and Rim .....	43
Attaching the Hatch Stiffener.....	44
Preparing for the End Pour .....	45
Preparing for the End Pour-2 .....	46
Final Sanding and Surface Prep was Completed Outdoors.....	47
Preparing to Paint the Bottom Panels.....	48
The First Coat of Primer Applied .....	49
Sanding the Primer between Coats-2 .....	50
Sanding the Primer between Coats-3 .....	51
Initial Paint Coating Applied.....	52
Side Panels Varnished .....	53
Deck Varnished .....	54
Deck Varnished-2.....	55
Adding Optional Equipment – Bow Pad Eye and Toggle .....	56
Adding Optional Equipment – Stern Pad Eye and Toggle.....	57
Adding Optional Equipment – Stern Pad Eye and Toggle-2 .....	58
Adding Optional Equipment – Stern Pad Eye and Toggle-3 .....	59
Adding Optional Equipment – Foot Braces.....	60
Adding Optional Equipment – Deck Lines.....	61
Adding Optional Equipment – Creature Comfort Seat, Hatch Closing Toggles and Gasket.....	62
Masterwork Realized .....	63



Useful Web Sites for Plans and Kits .....	65
Handy Tools and Supplies.....	66



# Journal du capitaine

The following pages describe the several stages involved in the construction of the author's first boat, a kayak kit. The presentation format is simple: each step of the build was captured by one or more photographs. Explanatory captions follow most pictures.

The project followed parallel tracks: physical construction and various lessons learned along the way. In addition, work area preparation, utilized tools, materials and some useful websites are described as well.

## First Things First

After weeks spent performing internet searches, visiting many websites, watching online videos, downloading product brochures, engaging in email exchanges, following multitudes of boat builder threads and purchasing some instruction manuals, a specific kit was selected. The craft's formal identification was the Wood Duck Hybrid 12. The kit and all documentation were products of Chesapeake Light Craft, LLC, of Annapolis, Maryland, <http://www.clcboats.com>.

Why was Chesapeake Light Craft (CLC) selected? This particular choice was made for several reasons. To start, the business had longevity; it was founded in 1991. Further, the CLC website was well-designed and actively maintained; information was current and articulately presented. There was a wealth of technical information available through this site; the Builders' Forum was especially valuable.

Besides e-tailing, the company had embraced modern manufacturing technology, CNC, CAD and CAM. In turn, these abbreviations stand for Computer Numerical Control, Computer Aided Design and Computer Aided Manufacturing. In short, CLC had the resources to design and manufacture their kits with great precision. All the abbreviations also meant that CLC had invested heavily into its corporate future and had achieved consistent, repeatable precision with product offerings.

Another important factor in selecting Chesapeake Light Craft was the quality of the staff. They were unfailingly polite, patient, knowledgeable, dependable and prompt. The author had many interactions with the company across the several months' life of the project.

In summary, corporate longevity, a fine website, use of modern manufacturing techniques and exemplary staff translated to active involvement by excellent management. This author can attest to this having had many email exchanges and telephone conversations with the CLC principal, John C. Harris. John was a wealth of knowledge and the source of workarounds when things went occasionally astray. Thanks for your help and sage advice, John.



## First Things Second

While the foregoing extolls the virtues of Chesapeake Light Craft, LLC, the Wood Duck Hybrid 12 (WDH-12) kit selection was not discussed. This was not an accident since confidence in the manufacturer was this author's primary consideration. If a) materials were not precisely manufactured and of first quality; b) if the company was at risk of dissolving in the near term; and c) if consultations were not readily available, a successful project conclusion would be jeopardized. For this builder the actual kit was important, but it was a second-tier consideration.

Okay, okay, but why was the WDH-12 chosen? As usual, multiple factors contributed to the decision. First, the kayak's design was graceful and pleasing to the eye. Second, the craft could accommodate the author's 6' 2" height and 250lbs. size. Third, the dimensions of the WDH-12 fit into the available workspace (more on this later). Last, the WDH-12 was affordable. However, *would-be first-time builders beware*: whatever the purchase price of a kit, realize it is a starting point only. There will be inevitable increments in cost due to shipping, add-on features, replacing consumable materials and acquiring tools not in one's starting armamentarium.

What is a *hybrid* kit a la Chesapeake Light Craft? Briefly, it is a combination of construction techniques. In the case of the WDH-12, stripping and stitch & glue techniques were incorporated into the kit. The deck was built using wood strips of varying lengths which were glue-jointed to form an esthetically pleasing design. In contrast, the kayak's bottom, sides and transom were created by jointing plywood panels using copper wire as thread and epoxy of varying consistencies for glue. Other designs were available which utilized single construction techniques, e.g. lapstrake, strip or stitch and glue.

## More on Work Space

The work area was chosen carefully, especially since the project was anticipated to be of several months duration which included the winter season. Environmental elements needed to be controlled such as temperature, available light and dust. Physical dimensions of the workspace needed to accommodate the kayak, tools, consumables and benches. The floor had to be protected from damage due to dropped tools, spills, drips and the like. The space had to be secure. Noise from power tools and construction odors due primarily to turpentine and varnish had to be contained. These factors suggested a heated, indoor area would be ideal. Last, the construction space had to include a viable transport path to the outdoors for The Launch.



## The Work Area



Wood floor approx.  $\frac{1}{4}$ " X 8' X 16'; benches total 16' length X 2' deep X 32" high. There are two work stands that can be quickly converted to sawhorses. The near bench holds a number of frequently used tools. The picture shows a freshly prepared, but as yet unused workshop.



## Boat Parts, Epoxies, Fiberglass, Gloves, Respirators, etc.



This is the same work area from another angle.



## Work Area Wall Art



This is more work area detail.



10

## Wet/Dry Vacuum; 2 Piece Paddle; Boat Sling for Storage



Still another work area view...

## Close-up of Boat Stands



Each stand was built from a single 2" X 4" X 10' board + ½" X 12" X 27" piece of pine. The straps were constructed from 1½" wide webbing and a couple of pieces of dowel, 1" X 4". This configuration held the boat right-side up.



## Stands Converted to Sawhorses



This configuration was used whenever the boat needed to be positioned upside down.



## Stands Converted to Hold Boat on its Side



Yet another configuration...



## Bottom and Side Panels Laid out for Epoxy



Note puzzle joints... Look carefully - the 3<sup>rd</sup> board from the left has a partially assembled puzzle joint. Before gluing the author needed to determine which board sides were cleaner, i.e. had better grain and fewer imperfections.



15

## And Assembly Begins...



This is a picture of the Happy Helper (author's son) and the WDH-12 hull. The side and bottom panels were stitched together with copper wire. There was no epoxy yet, but note the plastic drop cloth on the floor in anticipation.



## **We Pause to Pose a Poser...**

The original working title of this epistle was Bateau Atelier d'Arts, literally Boat Arts Workshop. Reconsidering after weeks of slaving away (and several mistakes), it was thought that a more accurate appellation would be Le Bois Boucherie or The Wood Butchery.

Why is the title in French ? Pourquoi pas?



## Let the Epoxying Begin...



Note the copper "thread" and hull forms have been removed. The vertical piece is the bulkhead. The seams have been filleted and the inside has been fiberglassed and epoxied. Note the craft was supported by the work stands in their sling configuration.



## Starting to Prepare the Exterior



Note the (\*%\*%\*^ sand-through near the bow. The top-most layer of the ply is about 1mm thick or about 0.04". Need to think up something clever to cure the boo-boo... The stands are in their sawhorse configuration.



## The Epoxied and Glassed Hull with Stripping Forms Installed



The hull was wrapped in plastic to protect the finish from rubs and glue drips during the stripping process.



## The Epoxied Hull with Stripping Forms Installed-2



Another angle... The wooden circle-like object on the top of the hull is the coaming apron. It was positioned thus to verify fit and placement of the forms.

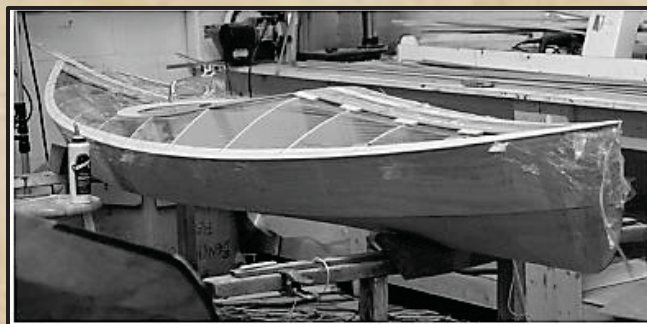


## Scrap Wood in the Bow to Anchor the Strips



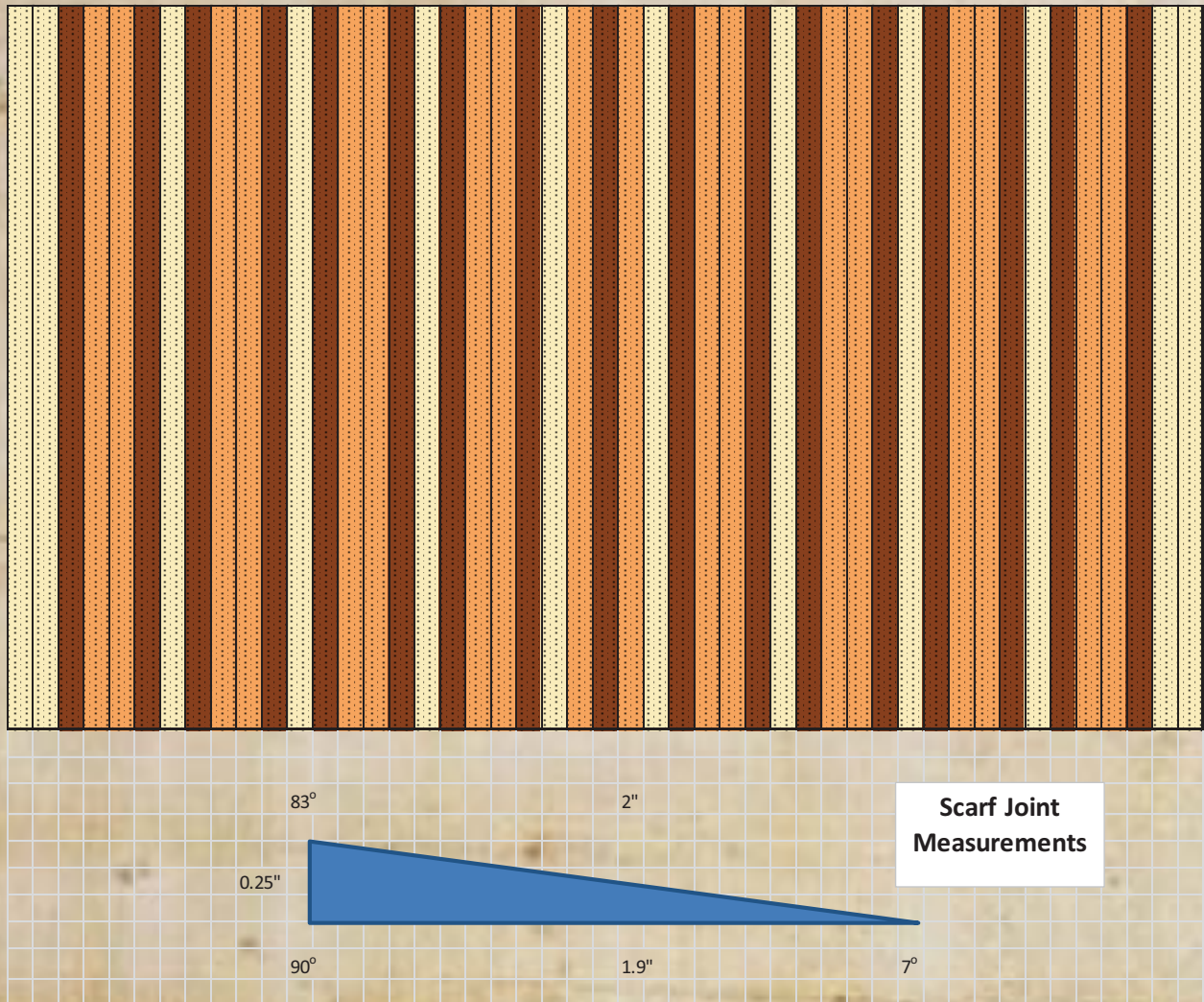
The shape of the hull and forms for the deck imposed significant bends and twists to the strips. The scrap wood (False Sheer Clamp) provided a temporary, stronger area to tack the strips until the deck was glued.

The strips were each about 8 feet long X  $\frac{3}{4}$ " wide X  $\frac{1}{4}$ " thick. Various species of wood were used, often mahogany, red and yellow cedar. The first three strips in the design ran the entire length of the boat or about 12'. Actually, they were somewhat longer to accommodate the bends and twists of the design. Eight foot strips were glued together to make six 16 foot strips, three for each side of the craft. Once in place, they were cut to the exact lengths required. The result was approximately thus (picture courtesy of the WDH-12 manual):





## Several Potential Deck Designs were Considered

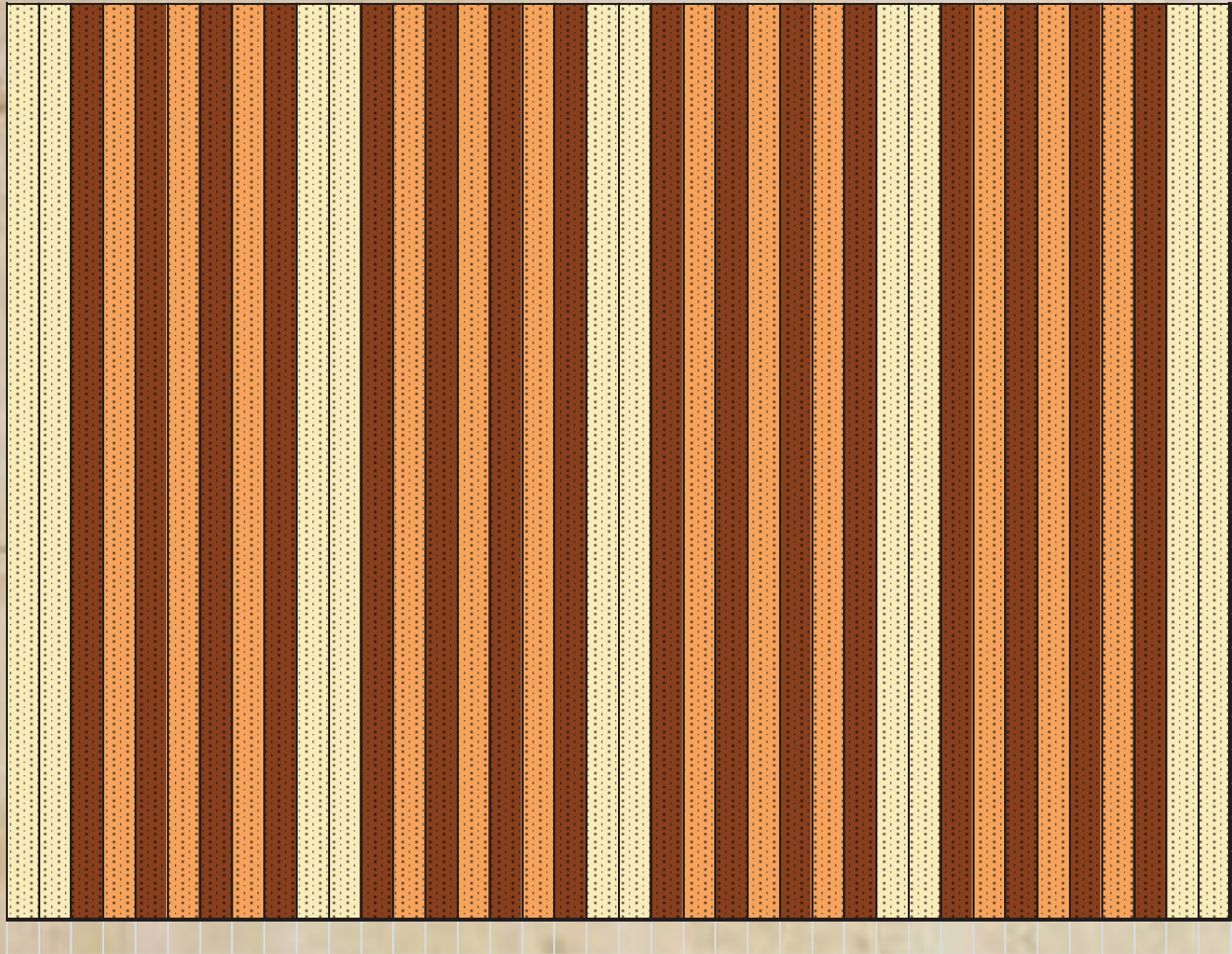






24

**And so on...-3**



This design was the final selection.



25

## First Strips in Place





## King Plank, Coaming Apron and First Dark Strip in Place



The strips needed to butt the coaming apron. Note the sharp angles that were hand-cut for the strips as well as the curves and twists they must accommodate.



## Deck Starting to Appear!



Damn handsome...



28

## Another Angle...-2



There were never too many clamps.



## Completed Deck Removed from Hull and Inverted



The wet spots were due to glue that had seeped through the joints. Thank goodness for the protective plastic wrap.

## Epoxied and Glassed Bottom of the Deck



Note that the coaming apron was joined to the strips by epoxy fillet (pronounced appropriately, fill-it). The excess fiberglass had to be trimmed from the coaming apron and deck edges. Reaching this milestone required lots of sanding and multiple coats of epoxy (with more sanding between applications).



31

## Deck Temporarily Placed on Hull; Hatch Hole Cut



This shot looks from bow to stern...

## Looking toward the Bow-2



Staple marks were clearly visible. Rather than using staple-less techniques, staples were used to ensure the strips closely followed the forms. There are different schools of thought regarding the esthetics of marks due to staples or other fasteners which are byproducts of the construction process. Some folks like them, others not so much.



## A Problem Appears



The project should have been at the point of permanently attaching the deck to the hull, though clearly the installation had not proceeded. While temporarily fitting the deck, it was found that an 11/16" space between the bulkhead and the deck bottom was present; this gap was too large to simply use fillet. Correction required embarkation on a side trip that included manufacturing an insert to plug the gap; applying two coats of epoxy to the insert; gluing the insert to the bulkhead; and then epoxying/filleting the insert permanently in place. What fun!

Note the hammer that was pressing the tip of the insert onto the bulkhead. If the insert failed, the plan was to take the hammer to the craft.



***Before and After Views of the Modified Bulkhead-2***  
**Addressed 11/16" Gap between Deck and**  
**Bulkhead by Adding an Arch**



Shop-fabricated arch insert included: 2 coats of epoxy; attached with Titebond III and fillet; fiberglass; 2 more coats of epoxy.



## Attach Deck to Hull



Packing tape was used to hold the deck in place temporarily. The craft was turned on its side in anticipation of epoxying 3" fiberglass tape along the full length of the side seams. After the first side was completed, the boat was turned and the other side was glassed. The forward section was particularly difficult since the cockpit-to-bow length is far longer than the builder's arm; a home-made tool described in the WDH-12 manual was used to facilitate the process.



## Attach Deck to Hull-2



Another view...



## Preparing to Fiberglass the Deck



The fiberglass cloth was draped across the entire top of the kayak; a 2"-3" cloth overhang was established.



## Painter's Tape and Plastic Sheeting to Protect against Drips



Thank goodness for tape and plastic sheeting! The initial epoxy application to glass the deck resulted in many hours of sanding to remove drips and to “feather” in the fiberglass along the side panels.



## Sanding Between Epoxy Layers



Each fiberglass application required 3 layers of epoxy to achieve a smooth surface by completely filling the weave of the cloth.



40

## Attaching the Coaming



Clamps, anyone? The coaming assembly was a sandwich of 2 spacers and a top piece. The picture was taken immediately after the parts were put in place.



41

## Attaching the Coaming-2



Another view... Allowed 24 hours for the epoxy to cure...

## Attaching the Coaming-3



Yet another view... The high luster of the deck was produced by epoxy before final sanding.

