February 2021 Volume 43 Issue 2

The Binnacle

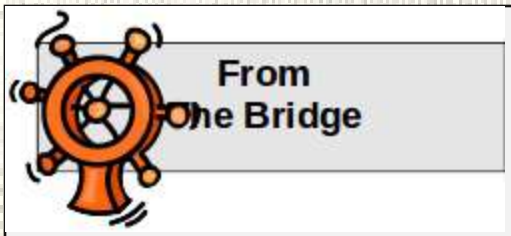
Victoria Model Shipbuilding Society
Victoria, B.C.

Ken Lockley on Jim Carson's Dauntless and his own Tusker.

Ron Hillsden and his City of Nanaimo.

Edward White on John Cabot and the Matthew.
News from Sutton Hoo.
How much Power?

http://www.vmss.ca



Provincial Health has continued restrictions indefinitely, so we don't know when there will be a prediction when our lives will return to some what normal. I know some members are independently using our waters at times other than Sunday to avoid a gathering, and that is good. Get outside and enjoy our hobby individually. We just can't all get together.

Our Zoom meetings are maturing. We are still limited to 40 minutes, and the last one ended abruptly because we spent too much time talking about business. It did get everyone talking though, and the meeting evolved into what I think it should be – a discussion amongst members. Questions were asked, news and information were exchanged and it became lively and interesting.

We will be having another Zoom meeting this Thursday Feb 11. I have only one item of business – whether you feel it is ok to record the meeting. We may or may not be able under the Protection of Privacy Act, and other issues, but we will be looking into that.

To start the Zoom discussion, if you have something for show and tell, please hold it up or display it on your screen depending on your level of Zoom expertise. Talk to each other. This is our opportunity to socialize and share information.

Hope to see you Thursday.

Ron

2020 Executive Committee

President: Ron Hillsden	*479-5760*
Vice-Pres: Dave Nelson	*812-1942*
Secretary: Elgin Smith	*384-0574*
Treasurer: Mike Creasy	*888-4860*
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Binnacle Editor: Edward White	*385-6168*
Quartermaster: Vacant	
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Membership: Bev Andrews	*479-2761*

All above area code (250)

ON THE RADAR

Upcoming Events

Meetings: Second Thursday 7:30 on Zoom.
Upcoming meeting: 11th February

Sundays 9-11
Harrison Model Yacht Pond (HMYP)
Dallas Road at Government Street

LANGFORD LAKE
Wednesdays 9:30
Langford Lake, Leigh Rd. at Trillium

Victoria Model Shipbuilding Society
Minutes
Zoom Meeting January 14 2020

Welcome: 13 members present. No new members or guests

Outreach: Nothing known.

Business

- You can pay dues now, either by cheque or e-transfer,
- Other projects, such as the asset inventory, holding until Covid over
- Treasurer Mike Creasy reports the bill for website hosting has been paid: $125. Also our insurance broker may be warning us that our liability insurance may be increasing substantially. Executive will discuss when the bill arrives.
- There was a discussion whether we should purchase a ZOOM licence so we can have longer meetings. We feel we will do that if more members attend. Ron will send more reminders to see if that increases attendance..

Other

- A You-tube video, an 8 minute TV presentation of a model ship regatta at Spokane was shown.

Round-table

- There was an excellent and lively discussion about Christmas presents and the status of members projects and models.

Adjournment

- The meeting ended abruptly at the 40 minute limit on free Zoom meetings.

Post Meeting Note:

A member asked:

Can they be recorded and made available to members who couldn't make the live version?

Members who could not participate would still learn about what the club and members are up to.

I replied: Good question. I'm a Zoom newby too, but this is what I found on Zoom's help site:.

"Overview. Local recording is available to free and paid subscribers, but is not supported on IOS or Android. Local recording allows participants to record meeting video and audio locally to a computer. The recorded files can be uploaded to a file storage service like Dropbox, Google Drive, or

a streaming service like YouTube or Vimeo."

I use an ipad (IOS) so we will need someone with a Windows PC to record it, and obviously we would need everyone's consent/agreement to record it.

I'll ask in the next Binnacle and meeting. Ron.

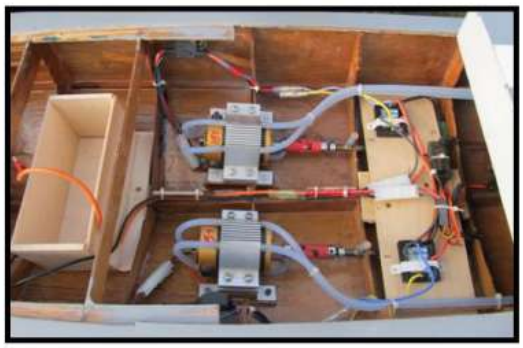
NEXT BUILD issue: #41 by Ken Lockley Febuary 2021

There's a pretty happy guy at "Harrison" these days. Jim Carson, looking at his 4-5 month build, a Dumas Kit of the "Dauntless " that dates back to the 1950's. Jim purchased the boat as a partially started project by a builder up in the Maple Bay area.

The previous owner had started hull construction but ran out of steam. Fortunately for Jim the work that had been done was of a very good quality and in particular the installation of shafts and motor mounts. The purchase came with two excellent motors including water jackets for the motors.

With some help finishing the hull and fiber glassing outside and inside surfaces the fun started, making purchases for radio, speed controllers and all the small connections needed.

The battery installed is a no brainer, the boat was going to require considerable ballast and lots of room for a 5.5 lb. gel cell, sitting slightly forward of midship. This being a 48inch model there's lots of room for a very neat installation and you can see the pictures on the next page showing just that. The water pickups for the motor cooling are working really well and I'm sure at the hottest days at "Harrison" these motors will only be luke warm. Running at full speed the boat is moving alright but not enough to cause much concern for others using the same water. He's currently getting the small details on the vessel and in this build he has really learned a whole lot about the hobby.



As you can see, the motor area is nicely laid out. The battery fits snugly in the box with no chance of moving around. The neaprem tubing you see is the water cooling for the motors. The water discharges through the transom. The remaining two pictures show the boat at full power. I was amazed at how effective the twin rudders are for steering, either at low or highs speeds. Well done "Jim"

In the Workshop:

The top picture shows the first layer of planking on the hull. This first layer planking is by far the harder of the two layers needed. I soak many of the cedar planks in tall wine bottles to make bending possible. Gluing both surfaces and lots of straight pins are needed.

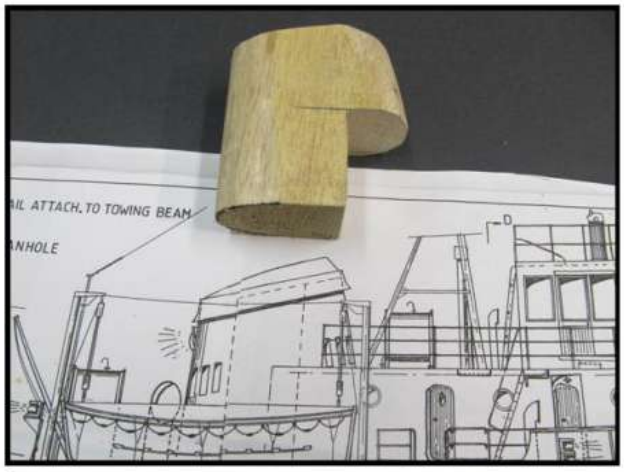
Second picture is my bit of plumbing pipe, making my Kort Nozzle. This is my first effort installing a fixed nozzle and it went better than I expected. I sanded the purchased plastic thoroughly and found no problem epoxying wood pieces to it.

The bottom picture shows my rudder in place with some additional fitting needed but getting there. More on the rudder at a later date.

The picture below is showing my sponsons, clamped and drying in the correct position . The clamps look like a overkill, but this process I have use many times and it works well for me. I clamp 2 layers of 1/4 inch square material and then shape when dry, using a miniature wood plane and lots of sanding and filling.

A few more pictures up to February 1, 2021. Actually I'm a way ahead on my building, as the extreme isolation of the last five weeks has made for lots of building time. I expect lots of building is going on within our VMSS builders.

The picture on the right shows the plan and the drawing of the funnel. I have pre-shaped the funnel out of hard balsa wood. This gets covered with very thin styrene and I try to duplicate the detail you see on the plan.



The next picture shows my deck beams all in place. The 7.2 volt battery will slip into the bow area under the foredeck. I have done this in the last few boats and it seems to work well. Also you can see the shaft and a stabilizer keeping the shaft rigid just before connecting to the motor.

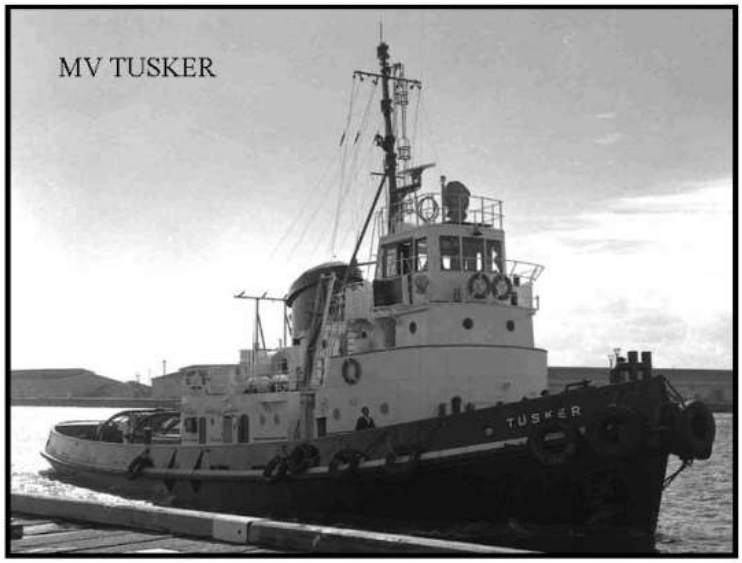
The bottom two pictures show the bulwarks all in place with scuppers. The fitting of bulwarks is one of the most difficult areas of construction for me. But it gets easier each time I need to do it. Tusker has a mustered coloured deck which you can see here. The paint tones down with a couple more coats. There is wood planking in the fore and aft decks which greatly reduces the painted surfaces.

Over the years I have purchased a number plans from many different sources, some I have built and just as many I haven't, but to me they are part of the hobby. There's times during a construction you need to compare one aspect with another similar situation and this is when having a few extra plans can be a great help. I recently purchased the plan to the right .
"Vintage Plans" have made great progress with their web site and plan service. My one sheet plan and 17 pages of instructions, originally drawn by Vic Smeed, cost $14.21 including postage and a delivered to the door purchase!!

MV. CERVIA EX. EMPIRE RAYMONFD

https://www.vintagemodelplans.com/products/full-size-printed-plans-article-scale-1-48-l-28-cervia-thames-tug

As I am finishing up another copy for the "Binnacle" and realizing I have been doing different types of modeling for 70 years and still learning every day in the "workshop". Over the last 30 years with the VMSS we have had teachers, Bill Barker, Jack Lenfesty, always ready to show a better way to make something. In our miniature shipyards we learn crafting with wood and styrene. Some small machine shop work and miniature electronics and finish up with painting, oil or water based paints. Varnish or Polyurethane to complete the model. This is all good stuff!!!!!!!!!!!!!!!!



The picture to the left is by a Australian photographer, Trevor Powell. I am up to picture 26-27 of "Tusker" This picture was taken in the 1960-1970's
This I find amazing considering the "Tusker" was sunk about 30 years ago. Continuing to find more pictures sure keeps my building me enthused about the project.
I'll be doing my first water test at Harrison in a couple of weeks.

Model Steamship City of Nanaimo launched January 2021

The Esquimalt and Nanaimo Railway Co. operated two wooden steamships to compliment their rail operations. The *City of Nanaimo* ran on the passenger route between Victoria, Nanaimo and Comox, with intermediate calls at the Gulf Islands, while the *Joan* normally ran between Vancouver and Nanaimo.

The *City of Nanaimo* was built by Mc Alpin and Allen at Vancouver in 1891 for the Mainland & Nanaimo Steam Navigation Co. Ltd. of New Westminster, and was acquired by James Dunsmuir on a mortgage foreclosure in 1896. She was a wooden vessel of 518 tons, 159 x 32 x 9.4 feet, powered by a reciprocating engine of 750 horsepower and capable of a speed of 11 knots.

The Canadian Pacific Railway purchased the rail and steamship lines of the E & N Rwy Co. from the Dunsmuir coal interests in 1905. After serving CPSS, she worked for Terminal Steam as *Bowena* and Union Steamships as *Cheam*. She was scrapped in 1926

I am really pleased with the way the model handles and appears on the water. I should have the boats davits finished this weekend, then there is just the fire buckets to complete it.

Ron Hillsden

A Model of Matthew, John Cabot's Ship.

Who discovered Canada? Most likely a small group of men and women hunting something like the wooly mammoth between the ocean and the glaciers of the B.C. coast. Twenty, or forty, or sixty thousand years ago. Or Bjarni, blown off course from Greenland in the 11th century, followed by Leif and Thorvald Erickson. Fishermen from the Basque country or from Bristol may have landed to set up drying racks for Newfoundland Banks cod early in the fifteenth century. It's .....complicated.

Christopher Columbus, in 1492, got nowhere even near Canada.

Anyway, in 1496, in Bristol, England, there was a man called John Cabot, a friend of Columbus and a dab hand with an astrolabe, probably originally Genovese. He had persuaded Henry VII to give him a warrant to explore westward, and some Italian merchants in London to lend him money, to equip a ship to go and look for a place, maybe a large island, called Hy-Brasil. There was a Celtic legend that Hy-Brasil was out beyond Ireland, and a story among Bristol seamen that Bristol fishermen had seen it but then lost track of it.

Cabot knew that the earth was a big ball, and that the distances around the ball were smaller if you were well north or south of the equator, and that Columbus hadn't found any silks, spices, or Chinese pottery. So maybe if he could find Hy-Brasil, it would turn out to be Marco Polo's Cathay. And if it did, his astrolabe would let him find it again, and everyone would get really really rich.

So in May 1497, he set sail in a small ship called Matthew with a crew of 18 to twenty men. On the 24th of June, he landed on the North American coast, probably the shore of Newfoundland. He spent a week or two exploring the coast line from the ship and then turned back for Bristol before the weather was likely to turn bad. He got back, using the now favourable westerly winds, by the 6th of August and was in London by the 10th. Henry VII welcomed him as a hero and gave him first a gift of $10, (about two years wages) and later a pension of $20 a year for life.

Henry encouraged Cabot and partly financed him in making another voyage in 1798, this time with a fleet of five ships. They set off at the beginning of May 1798 but there is very little known about this major expedition or its results.

There is not even any record of Cabot's latitude at his landing point in the earlier expedition, though it is virtually certain that he would have gone ashore and made a very careful noonday sight at that point. But this, of course would have been a huge commercial secret, especially to be kept from the Spanish, and most of what we now know of Cabot's voyages comes from Spanish letters about it.

There is still a lot of research to be completed about Cabot and his voyages, especially since the major historian of Cabot, Alwyn Rudd, never published the book that she planned, and ordered all her research notes destroyed on her death. (2005.)

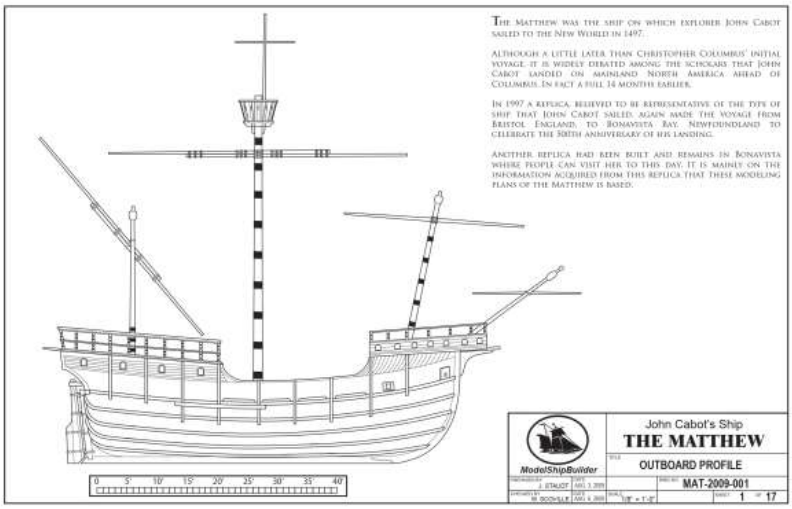
The Cabot Project, from Bristol University, has picked up on her work, and published in 2016, the book "Cabot and Bristol's Age of Discovery" but I haven't got that book, (Yet!), and can tell you no more.

Enough! This is about the chance to build and dream over a model of the Matthew!

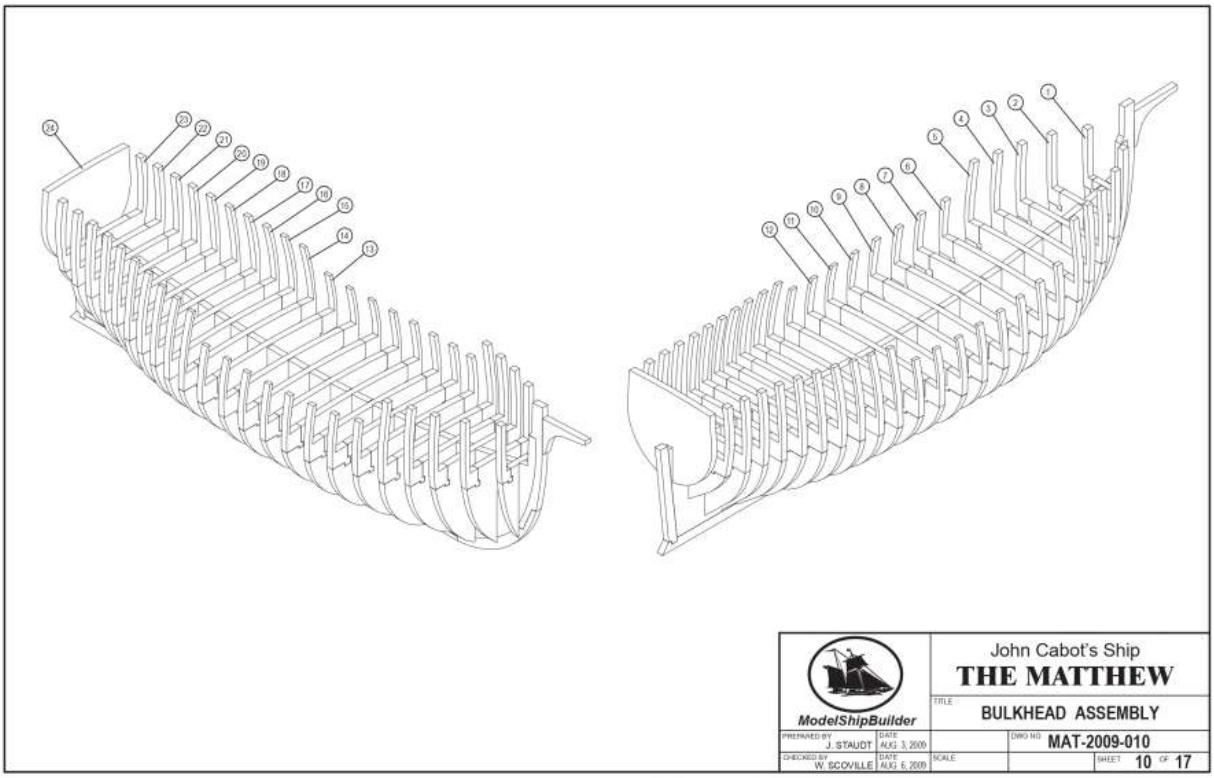
For the 200th. anniversary of Cabot's voyage in the Matthew, a full size replica of the ship was built and sailed to land in Bonavista, Newfoundland, being met by Queen Elizabeth and family in the Royal Yacht Britannia. That replica returned to Bristol and is now moored in Bristol harbour, but a second replica was built for Bonavista and is open to the public there. The replica was designed by Colin Mudie as typical of the Bristol ships of the period, and informed by the Mary Rose, which was built in 1510.

Best of all for us, plans for a model of the Matthew were taken from the Bonavista replica and

published by Model Ship Builder magazine. They are on the internet as a freely available pdf file here: http://modelshipbuilder.com/page.php?64. (and of course on my hard drive!). We are talking 17 sheets of lovely detail here!



They are for plank on bulkhead construction, and are really for a static exhibition model. But by cutting out the centres of the bulkheads, and adding a false keel and ballast weight, and a perspex rudder extension, as I did with my model Thames Barge, you could easily build a radio controlled sailing model that will perform on the pond at least as well as the original.(probably better!). By the time you've done it,(likely a year or so), you'll be primed to build anything you like from the age of sail.



I want to finish with a plug for the Model Ship Builders website. They are about static models, which we haven't featured much in the Binnacle, but the challenge of putting together a sailing ship exactly the way she was originally built but to scale, seems to me to be the pinnacle of model craftsmanship. Even if you never do it, reading about it is deeply satisfying.

Stop the Presses,- There's news from Sutton Hoo.

Many of you should by now have seen the newly released movie "Dig". It arrived on Netflix on the 29th of January. It's a Hollywoodised version of the discovery of the Sutton Hoo ship burial and treasure in 1939. If you haven't seen it yet, chase it down. It's not amazing, but it's quite watchable for a couple of hours in a pandemic lockdown, Ralph Fiennes does a very workmanlike job.

But that's not the Big News. In Woodbridge, across the estuary of the River Deben from Sutton Hoo, there's a huge workshop, the Longshed. That is where the Sutton Hoo ship will be re-created. That's almost 1400 years after she was first built.

And the keel logs have arrived! On January 20th. They're in a barn nearby, where they are going to be prepared before they come to the Longshed. Presumably they'll be debarked and squared off.

This is intended as an experimental archaeology project. So the work inside the Longshed will be, as far as possible, with only the tools that were available in the seventh century.

The project is fund-raising right now by selling the titles to numbered rivets, bolts, spikes and other fixings. 4300 of them will hold the ship together. So my older sister just got title to rivet number 359 for her ??th. birthday.

Purse Lid from the Sutton Hoo Ship Burial

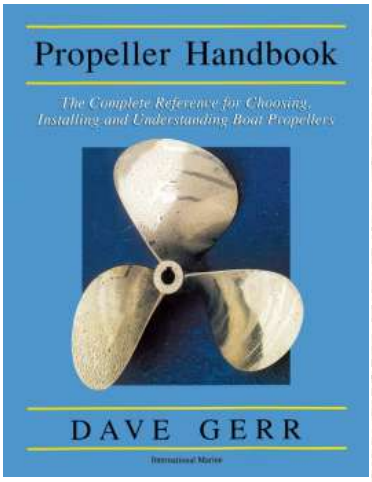
And some years from now, the ship will take to the sea again. It'll be an amazing day. Nearly 200 years before anybody called anybody a Viking, 200 years after the Romans left Britain, there was a bigger, faster, longship than any that Scandinavia has uncovered, near the Hall of a King of East Anglia, Raedwald, a new Christian, but with a wife who still worshipped Woden and Freyja, speaking the language of Beowulf, rich with goods from as far away as Syria.

That's worth not dying before I get to witness it!

How Much? Props, Motors, and Batteries. Part 1

Ever since I have been interested in model boats, I have been a little frustrated by the question of how much power my latest idea for a model will need.

It seems like there should be an easy answer, but there rarely is unless you start from a plan or a kit for which the designer has specified the prop size and motor.



Well, I recently spent my Christmas book token and bought the book "Propeller Handbook" by Dave Gerr, published by McGraw Hill, International Marine. The book is about propeller selection for full size craft, but its approach could be used to reduce the mystery for models where we want realistic looking performance on the water.

I say "reduce the mystery" from my experience as an engineer. Almost always you can use science to get a partial answer to an engineering problem, but when you have it, you'd better add some fudge factors to allow for what you don't know. If human beings are going to be on it or in it, make it 2.75 times as strong as the best answer science provides.

Anyway, if you like to get nerdy, here's a bunch of ideas to help you spec out your latest model.

Let's suppose that you have chosen a full size vessel that you want to model. You should be able to get its length on the waterline, and its displacement, and likely its maximum speed or cruising speed. The scale of your model is, of course, your choice, but it's likely to be based on either the "Car Back Seat" rule, or the "My Aching Back" rule, which will make it between two and four feet long, so it fits in your car and under 30 lbs so you can get it into and out of the pond.

The displacement, the total weight of your model, will be the displacement of the full size vessel divided by the cube of the scale. So if the scale is 96:1 (1/8 th. of an inch to the foot, typical for a warship model) then the total weight of the model will be the original displacement divided by 96 three times.

A WW2 Tribal class destroyer (eg. Haida), then, will be 47 inches long, and will weigh 2520 * 2240 divided by (96*96*96)lbs. That's 6.4 lbs close enough.

Scale speed for boat models is the full size speed divided by the square root of the scale. That's when your model will throw a wake that most closely matches the wake of the full size. The square root of 96 is 9.8, so the Tribal class model should have a maximum speed of 36/9.8, or 3.7 knots.

The first thing we are going to have to calculate is the ratio between the speed and the square root of the waterline length in feet. Assuming that the waterline length is 90% of the overall length, that ratio works out at 1.95. It is called the SL ratio.

The SL ratio is related to the boat's power by the equation:

Shaft Horsepower = Displacement in lbs times the SL ratio cubed divided by 1213.

(This is assuming a propeller efficiency of 55%).

For our theoretical model Haida, 1.95 cubed is 7.415 and the displacement is 6.4 lbs. So the shaft horsepower is going to be 0.039 horsepower or 29.2 watts.

Most of this nasty math can be avoided. Here's the power calculation expressed as a chart.

CHART 2-1 DISPLACEMENT SPEED—INCLUDING SEMIDISPLACEMENT

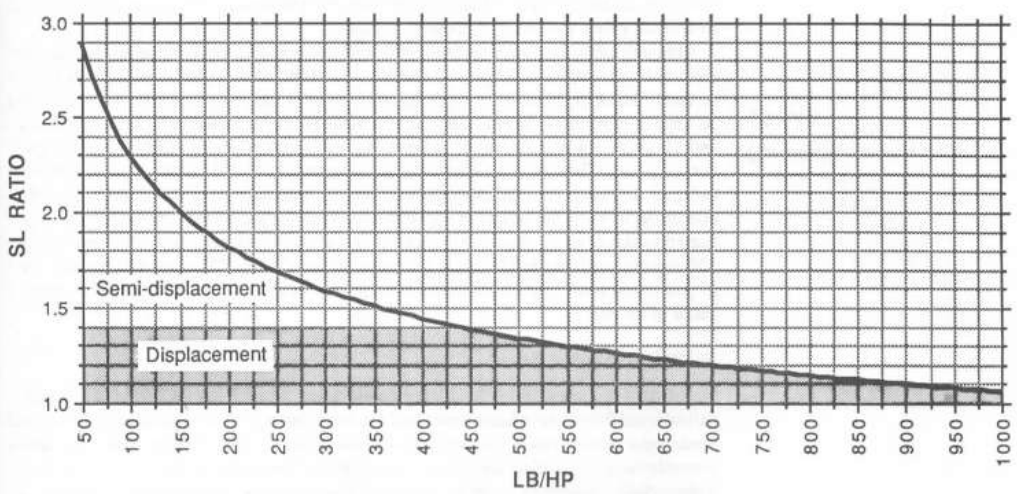


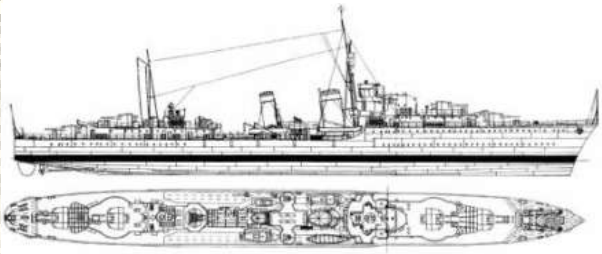
Chart 2-1. *This chart, an expansion of Formula 2-1, shows the power necessary to achieve a boat's known maximum speed-length ratio. It would be tempting to conclude from the chart that even a heavy-displacement hull can achieve SL ratios of 1.5 or higher given enough power, but in practice such an attempt would be unfeasible. For most moderate- to heavy-displacement vessels, incorporating more than one horsepower per 500 pounds or so of displacement in an effort to achieve SL ratios higher than 1.3 to 1.4 is neither practical nor economical. Heavy hulls designed with planing or semiplaning underbodies may be driven to semidisplacement speeds, but only at a great cost in fuel consumption and power (as detailed in the text that follows). For lightweight vessels, the commonsense approach is to determine the maximum SL ratio from Chart 2-2, and then determine the power necessary to achieve that speed from this chart.*

To use the chart, let's approximate the SL ratio to 2. Look across from the 2.0 on the vertical axis to where the line crosses it, and then down to the horizontal axis which shows the figure 150 LB/HP. It's saying that to reach the speed we want, the boat can weigh no more than 150 lb for each horsepower. Since the displacement is 6.4 lbs, the horsepower will be 6.4 divided by 150, which is 0.043 horsepower or 32 watts.

For the full sized Haida, the displacement is 5,644,800 lbs, the SL ratio is the same, so the theoretical shaft horsepower is 37,632 . Wikipedia says that the Haida actually had 44,000 shaft horsepower installed. For this type of guesstineering, that's pretty close.

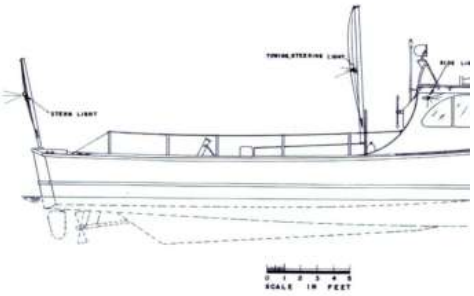
There's a bit more to say about this chart. Notice that there are two marked areas,referring to hull form, displacement and semi-displacement. And that the chart stops at 2.9 SL ratio. In real life, any craft that wants to go faster than 2.0 SL ratio has to have another hull form, planing.

There's a simple way of classifying these types, from what is called the quarter beam buttock angle. Take a look at this photo of the tug model I am currently working on. The keel on this tug is parallel to the waterline, the waterline is just about where the rudder shaft enters the hull behind the prop, and you can see that there is almost a straight line from that point down to the bottom of the keel at its lengthwise centre. The angle of that line is close to 20 degrees.



Next look for the same sort of angle on the Tribal class, I make it around 3 to 4 degrees.

Finally the Black Duck high speed launch, the chine line is 0 degrees and the keel line about 2 degrees, so the quarter beam buttock angle is about 1.75 degrees.



Rules of thumb.

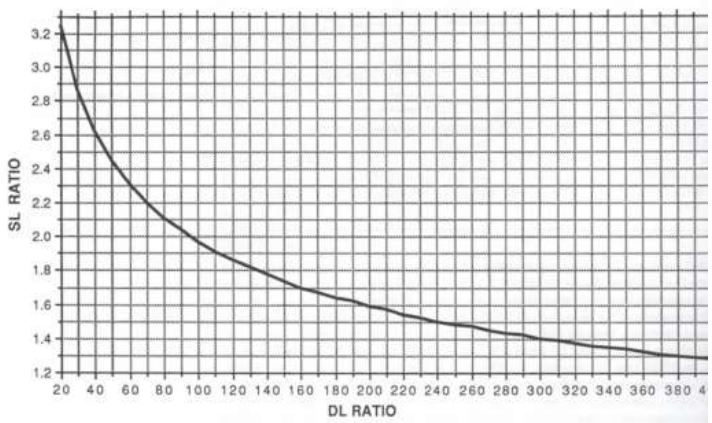
* For an angle greater than 7 degrees, the power curve no longer applies above an SL ratio of 1.5. Nothing will drive that boat any faster. It's a displacement hull.
* For an angle of 4 degrees, the maximum SL ratio is 2. It's a semi-displacement hull.
* Angles of less than 2 degrees can be powered to SL ratio 2.5 or higher. It's a planing hull.

For my tug hull, at 20 degrees, the hull speed is going to be 1.34 times the square root of the waterline length, the old standard for displacement boats.

There's another formula that will give better results for the maximum speed that a particular hull can attain. This uses the DL ratio, which is the displacement in tons divided by the cube of (0.01 * WL(the waterline length in feet)). Here's the chart that shows the relationship between the DL ratio and the maximum SL ratio. This highlights the fact that very light and/or very slender hulls can attain higher speeds than more conventional craft.

Propeller Handbook

CHART 2-2 SL RATIO VS DL RATIO



The final chart I am going to show you gives the rule for planing hulls. Once a hull is planing, its waterline length is irrelevant. So this one shows the LB/HP against the absolute speed in knots.

Propeller Handbook

CHART 2-3 PLANING SPEED

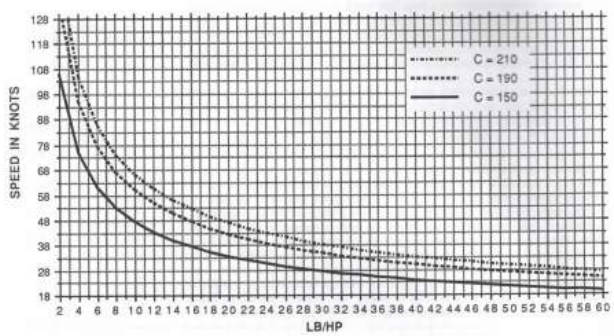


Chart 2-3. *This chart, based on Formula 2-4, shows the speed attainable by planing craft as a function of available shaft horsepower. See Table 2-2 to estimate the appropriate C value with which to enter the table. This chart applies only to true planing vessels with quarter-beam buttock angles under 2 degrees and attainable speed-length ratios of at least 2.9 or 3.0.*

The key to getting reliable results from Crouch's formula is to use the correct constant, C. They should be chosen as follows:

TABLE 2-2 PLANING SPEED CHART CONSTANTS

TABLE 2-2

C	Type of Boat
150	average runabouts, cruisers, passenger vessels
190	high-speed runabouts, very light high-speed cruisers
210	race boat types
220	three-point hydroplanes, stepped hydroplanes
230	racing power catamarans and sea sleds

Look at the LB/HP scale. These things are getting awfully light.

OK, back to the model of Haida. We're at 32 watts at the shafts.

But that's just the horsepower at the propeller shaft. To get towards the actual rating of the motor and batteries we want to install, we need to factor in the efficiency of the motor and the transmission. For the small motors we use, the best efficiency will be around 85%. Any reduction gear plus the friction of the shaft in the shaft tube will likely take 3% or so, which takes us up to needing 39 watts at the motor terminals.

But don't rush out and buy anything yet. Up there just after the power formula, there's an innocent -looking little bracket saying "Assuming a propeller efficiency of 55%" It's not that innocent, because model propellers are very different from full size.

I'm going to go over propellers in Part 2 of this subject, and that will take us around a circle back to the power formula and charts. Are we having fun.....or what?

This Month's Internet Links

* Dauntless kit: https://www.sarikhobbies.com/product/dauntless-1211-49-5-boat-kit-dumas/
* The Ships List, huge site for merchant ships: http://www.theshipslist.com/ships/lines/cp.shtml
* The Sutton Hoo ship replica:- https://saxonship.org/news/
* The Sutton Hoo museum:- https://www.nationaltrust.org.uk/sutton-hoo
* The Matthew at Bonavista:- http://thematthew.ca/
* The Matthew at Bristol:- https://matthew.co.uk/
* Vintage Model Plans, from Ken's article:- https://www.vintagemodelplans.com/

The Victoria Model Shipbuilding Society is a non-profit club, open to all, established in 1978 under the Societies Act of B.C.