

EDINA MODEL YACHT CLUB

SAIL & SCALE NEWSLETTER

JANUARY 2013

VOLUME 22, NUMBER 1

Hull Trussing

By Bill Hamelink

I was searching the net for information on 1890s lumber haulers (for a model I am building) when a strange looking bulk goods hauler caught my eye. It was the twin screw 238 foot steel over wood

Dean Richmond. What was the big arched structure on the side of the ship? Answer: A trussed beam (like a bridge or roof truss for instance) to reinforce the center hold area of the ship. This was an extra long wood hulled ship and the frame and plank structure used on shorter ships just didn't work on a 238 foot hull. When she went down during a Lake Erie storm in 1893 she was carrying a load of zinc ingots.

This trussed beam structure just had to be looked into and the internet yielded sufficient information to satisfy my basic needs.

HULL STRESSES

The hull is stressed when the weight center deviates longitudinally from the center of buoyancy. In a standard frame and plank boat the stresses are shared by the keel, the hull planking and the decking. As the load increases, the length increases, the keel strength decreases, or the planking integrity decreases, the hull strength suffers. This strength decrease can be recovered by diagonal or truss bracing.

(Continued on Page 4)



Photo of the Dean Richmond

SCHEDULE OF EVENTS:

February 19, Tuesday	7:00 p.m.- 9:00 p.m.	Membership Meeting
March 19, Tuesday	7:00 p.m.-9:00 p.m.	Membership Meeting
Open Centennial Lakes Water	To Be Determined	Centennial Lakes Center Pond

COMMODORE'S CORNER



By Wayne Snyder

Encouragement--the Webster dictionary says it means to give courage, hope or help to. To me it also says that I can now get busy and finish the Ulyssis tug boat kit that has languished in my shop for a couple of years. Thanks to Dick Walker, who very generously planked the hull for me, I can now feel confident to complete the rest of the boat. During the time Dick accomplished this task he also gave me lots of tips and during our discussions he imparted many ideas that I learned from. I have seen this happen many times during my time with the club where members have very generously shared their expertise with others. This is one of the strengths of our great club, encouraging others and giving of themselves to help and encourage. Last year I had a lot of help with ideas for programs and am grateful for that help.

At the pond nights I have seen others put their boats up and help someone who was having trouble.

This month's program will be Captain Robb telling us about his Duluth experience of piloting a giant ship into port. Our newsletter problem has been solved with the generous support of John Bertelsen who will print the newsletter for free using his business associate's copier. We will use the added membership fee

to buy more newsletter letterhead paper. This is another strength of our club, namely working out a problem with the resources we have in our members. Thanks to every one who gave ideas to solve the problem. The dates for our Parade of Boats, Light House Night, and Dry Dock Party are saved with Centennial Lakes. Ramsey and Rick's Hobby Farm will be on the agenda also this year, no dates for these yet. Ideas for programs are always welcome and needed. Let me know about the Summerfest event date at Long Lake, it sounded like fun so it also can become an event for us. From my experience the more events in a club the healthier it becomes. - *Wayne Snyder - Commodore*

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Special Thanks...To members that contributed their time to this issue: Bill Hamelink, Jim Smith, John Bertelsen, Dale Johnson & Wayne Snyder. A thank you also goes to David S. Holman's Law Office for the FREE newsletter printing!

NAUTICAL KNOW-IT-ALL - THE BOAT THAT BECAME A KIT

By Kitt N. Kaboodle

There are many people that build boats from kits, there is another who built a real boat into a 1:1 scale kit. Name the location of this boat and the builder of the boat kit that is shown in these pictures.

Editor's Note: What a way to draw attention to EMYC if we had one similar to this on the water!



ANSWERS TO NOVEMBER'S KNOW-IT-ALL QUESTIONS

1. The theatre of conflict for the first three years of the show *McHale's Navy* was the Pacific theatre.
2. In the fourth season, the small Italian village that McHale and his men called home was Voltafiore.
3. Lieutenant Commander McHale's first name was Quinton.
4. The unseen ensign that Ensign Parker replaced during the first episode was Ensign Farthingay.
5. Gavin MacLeod's full name on "*McHale's Navy*" was Joseph "Happy" Haines.
6. Captain Binghamton, played by Joe Flynn was nicknamed "Old Leadbottom" by McHale's men.
7. Lieutenant Elroy Carpenter was Captain Binghamton's aide played by Bob Hastings, who also appeared in a number of "*Sergeant Bilko*" episodes as Colonel Hall's aide.
8. Lieutenant Commander McHale was the skipper of the U.S. Navy Torpedo Boat "PT73".
9. Commander McHale and his crew had their very own cook, named Fuji Kobajji.
10. "Seven Against the Sea" was the pilot episode to "*McHale's Navy*".
11. The PT boat used in the TV series was a 72 foot Vosper Motor Patrol Boat. The real "PT 73" boat used in WWII was a 78 foot Higgins boat.
12. The "*McHale's Navy*" PT boat was previously owned by Howard Hughes and used as a backup rescue boat for the flight of the "Spruce Goose" on Nov. 2, 1947. Before this, it was an active boat during WWII.

Hull Trussing (cont.)

The first picture shown below demonstrates what they call sagging buoyancy, like a typical center loaded beam.

This could be a ship with a load in its hold and/or a ship being supported by waves at the bow and stern but not mid-ship.

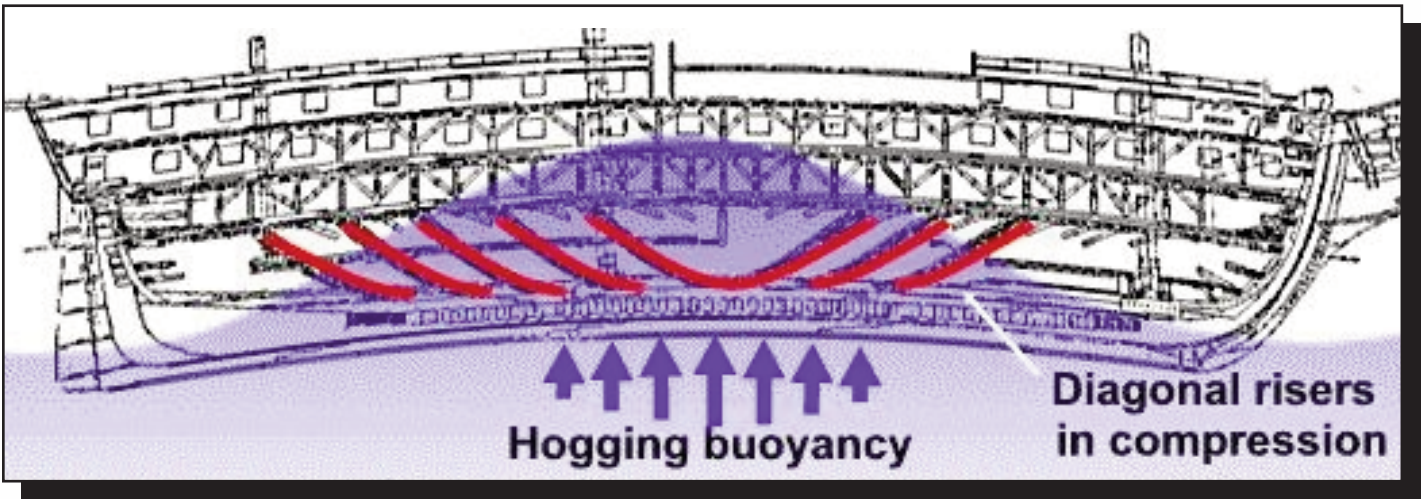
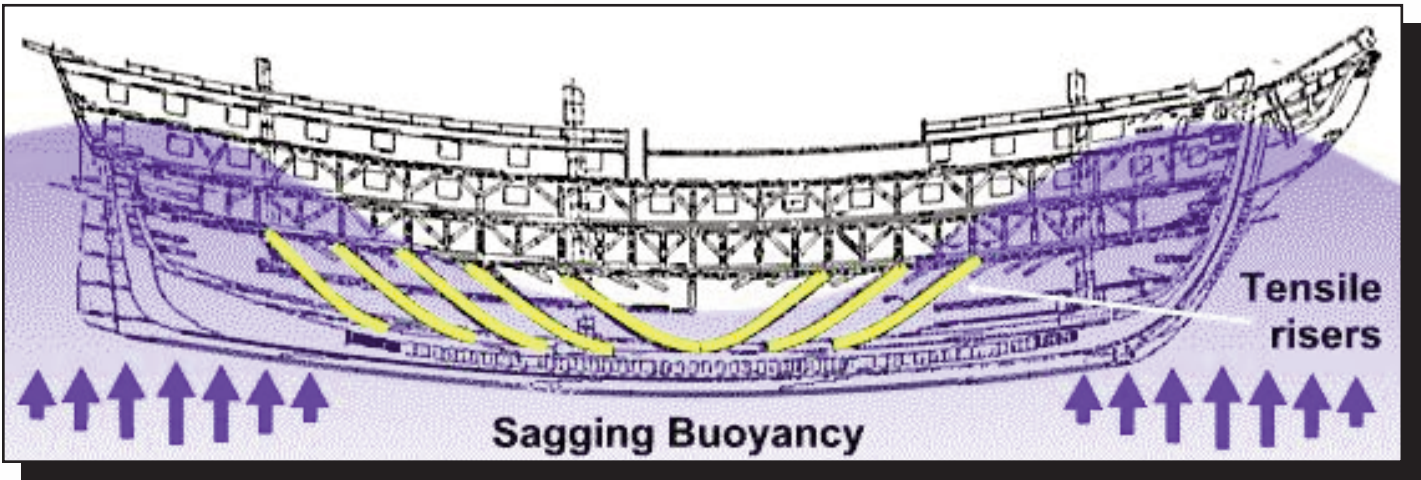
This puts the yellow diagonal elements into tension, or at least puts a tensile vector into them. The reverse situation is called hogging buoyancy and is shown in the next picture below.

This reverses the stresses from the

sagging situation.

While a ship is in operation in the sea, the hull switches between sagging and hogging stress elements. This would be a lesser problem on a river or inland lake than on the high seas. Remember that this stress problem applies to wood hulled ships; Steel has enough strength to accept these stresses in most ships.

Trusses need not be so evident as on the Dean Richmond. They can be designed into the deck supports, inside the upper planking, added to the keel, or distributed throughout the ships structure. The stresses may also be born by a more continuous skin on the hull; welded steel, sheet stock, etc. Do you



Hull Trussing (cont.)

think trusses are a recent item?

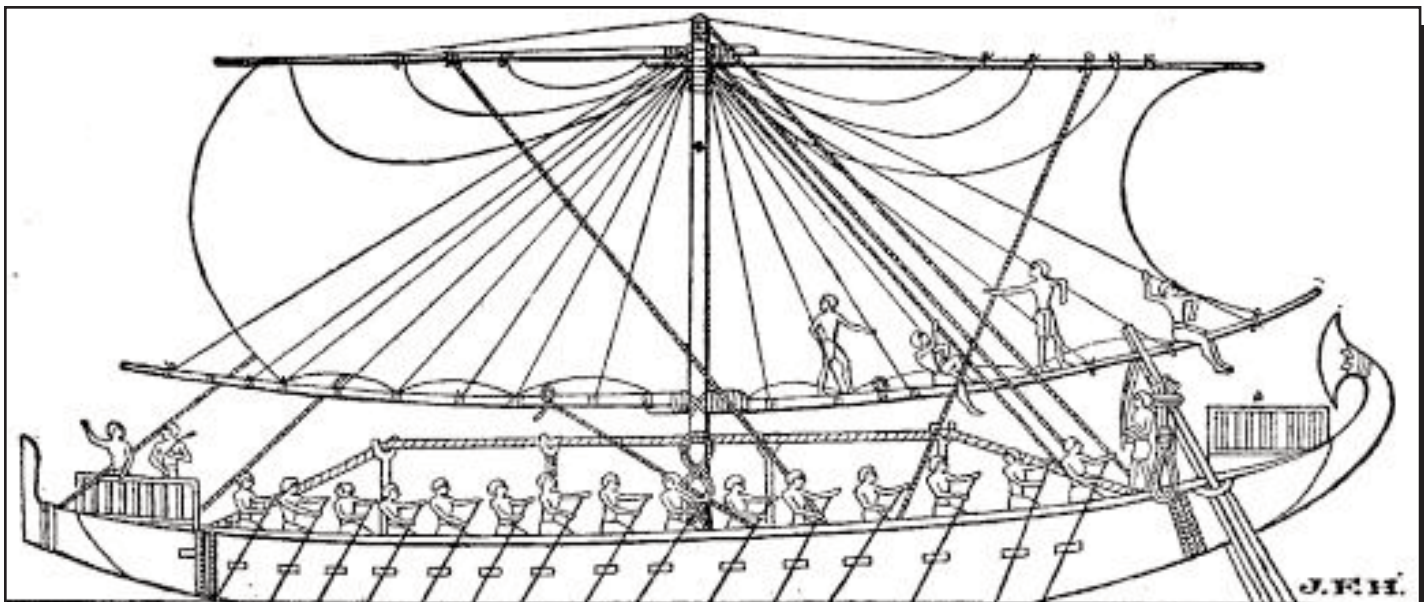
Below is a 1250 BC 200 foot long Egyptian ship. Notice the rope lying on the vertical posts and secured on the bow and stern, a truss.

The story goes that Egypt had no good source of wood and the boats were made from many small pieces tied together with pegs and rope. These ships could not stand the stresses of the Mediterranean Sea and needed the truss to survive.

In 1817, Robert Seppings described his experiments with a diagonal framework (trusses) on a discarded gunship to the British Royal Society. His experiments were a demonstrated

success and he suggested they should be used on the heavy gunships of the time. One other notable finding was expressed in his writing.

Operation of the guns on a gunship introduced considerable horizontal stresses to the hull. He countered these by laying the decking at an angle (thus trussed) rather than lengthwise. This was also successful.



Egyptian ship on the Red Sea, about 1250 B.C. [From Torr's "Ancient Ships."] Mr. Langton Cole calls attention to the rope truss in this illustration, stiffening the beam of the ship. No other such use of the truss is known until the days of Modern engineering.



Another recent, 1878, externally trussed boat was the ferry San Rafael, shown on the left, and her sister ferry Saucelito. These were in service in San Francisco Bay. You may have to look closely to see the trusses surrounding the side wheel.

External trusses had their day up to the turn of the century but you will be hard pressed to find one today.

-Bill Hamelink



LITHIUM POLYMER (LI-PO) BATTERIES

By Jim Smith

I have not been active at the pond of late and as a result, my supply of Ni-Cd packs have mostly gone "toes up." Even later day Ni-Cds will reliably last only about as long as the lead-acid battery in your automobile ... about five years. I stitched the information below from various manufacturer's literature, hobby web sites and general hearsay. With that in mind, you may want to do a bit of additional research yourself before investing in this technology. I am not an expert by any measure but Li-Pos look like the power source of the future (present) to me.

Since most of my Ni-Cds are now somewhere in the Hennepin County recycling system, I decided to take a serious look at Lithium Polymer batteries. "Serious" is the operative word here from both a cost and a safety perspective. Note that as of 2012, while worldwide use of Ni-Cds is decreasing by about 20% per year, and Ni-Mh is increasing only marginally, Lithium Polymer use is growing by upwards of 20%. Supply (China) and demand should continue to trend Li-Po prices downward.

One of the first things you will note with Li-Pos is the use of the letter "S" to designate the number of cells in a battery pack where in the past, "C" designated number of cells. Although some offshore makers still identify cell number with the "C", most have adopted the "S" designation for "Series Element" ... the latest industry term. The change was made to free up the letter "C", now used to identify a battery's capacity. Although weight is

usually of no consequence in a scale model boat, it is worth mentioning that a Li-Po battery will weigh about half of what a Ni-Cd of the same capacity weighs. Sailboat racers with Kevlar hulls and Monokote decks, take notice!

Lithium batteries are contained within a thin, soft, aluminum coated polymer pouch case, not the usual hard metal case that we have become familiar with since ... forever. The manufacturers shrink wrapper ads a bit of stability and color along with minimal information such as voltage, capacity ("C"), and maximum allowable continuous discharge rate. Even the cheapest hobby Li-Po has a maximum discharge rate of 10. For example, an 800mAh battery can deliver $800 \times 10 = 8000\text{mA}$, or 8 full amps, continuously. The rate can usually be doubled for short periods only. Higher quality Li-Pos have advertised discharge rates as high as 50C. Charging at no more than 1C is the usual recommendation.

Normal voltage of single Lithium cells (oops ... series element) is 3.7 volts, so a two cell pack exhibits 7.4 volts, three cells, 11.1 volts, four cells, 14.8 volts, etc. Most hobby batteries have two connectors, one for charging and discharging and a second, multi wired connector for balance charging ... charging cells independently of one another. On a two cell pack, this connector has three leads, on a three cell - four pins, always one more pin on the connector than cells in the pack.

Although a Li-Po battery can be charged directly, without using the balance plug, there is no way to determine the degree of charge of individual cells within the battery. With each charge discharge cycle, the cell capacities become a bit more uneven so, a balance charger is really a must-have. Fortunately, they are readily available at low cost. The price increases with the number of cells to be charged and the rate at which you wish to charge your pack. A cheap, wall charger will take "forever" to charge a high capacity battery. Lithium batteries will self discharge at a rate of approximately 20% per year in comparison to Ni-Cds loss of the same percentage in one month.

Charging Lithium batteries can be a bit tricky (note the reference to "serious" above). All manufacturers warn of fire hazard during or after high rate charge or discharge. If a battery is

(continued on page 7)

BUILDER'S CORNER (CONT.)

too hot to touch (120°F) after charging or use, you have exceeded the battery's acceptable limit. Do that a couple of times and your battery will be toast (literally). If swelling of the soft case is evident, remove the battery from the charger or model and place it in a non-flammable location until it cools. Gasses given off by an overheated, leaking battery include 8% hydrogen and 13% methane, so you can see where the fire hazard comes from ... plus, the lithium itself can begin to burn if it becomes hot enough ... and now we're talking 1,100°F.

Somewhere in just about every manufacturer's literature is the warning; "Do not leave a battery that is being charged unattended. "Additional "do not" warnings include such things as do not puncture, incinerate, use if damaged, do not leave in model during or after charging or after use, do not dispose of in water. One label even warned; "Do not put the battery into microwave, washing machine or drying machine." Really?

At this time of year, questions of storage arise. Since most chargers display some indication of amount of charge, charge to about 50% of capacity and store in a cool (and fireproof) place. A refrigerator is ideal... close to but above freezing (32°F). Do not store in the freezer, or in your garage in Minnesota (or Arizona)! Note that many of the newer LiPo chargers have a "storage" setting to prepare batteries for long term non-use.

If a balance charger is used, cycling of Li-Pos is not necessary. Li-Pos will maintain their charging capacity for upwards of 1,000 cycles. Unlike Ni-Cds where each partial discharge and

recharge is considered a cycle, a LiPo complete charge and complete discharge equals a cycle ... for example; discharge 25% and recharge four times is equal to one cycle. Li-Pos, treated carefully, should last a long time.

Newly available Lithium Iron (Li-Fe) batteries are quite similar beasts with slightly higher capacity and discharge rates. Their 3.3 nominal voltage allows two "series elements" ... in series, (6.6volts) to power older radio systems (usually rated 4.8 volts, but with a 6 volt upper limit being acceptable).


Time will tell how well these new "series elements" stand up to a typical modeler's (mis) use. - *Jim Smith*

**NEW 2013 EMYC
ANNUAL MEMBERSHIP
RATES**

\$30/ Member \$40/ Family
\$25/ Youth

A SPECIAL THANK YOU

The Sail & Scale issues this year will be printed each month for FREE. EMYC member John Bertelsen has offered to print the newsletter each month. John will be using David S. Holman's Law Office copier for this. Dave Holman works as an attorney in the office next to John, and shares his office copier with John Bertelsen. David's practice specializes in Estate planning, Business, Real Estate & Creditor Representation, located in Burnsville, Minnesota. - *Todd Moen*

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EDINA MODEL YACHT CLUB

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Edina, Minnesota 55435
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JANUARY MEETING

TUESDAY, JANUARY 15, 2012 7:00 P.M.
CENTENNIAL LAKES GARAGE BAND ROOM

AGENDA:

-Captain David Robb -navigating a large ship at the Duluth-Superior harbor

Special Interest Contacts:

Scale Boating:

To Be Determined (Anybody Interested?)

Sail Boating:

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Fast Electric:

Dan Proulx (763) 551-4953 dproulx@emyc.org

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