



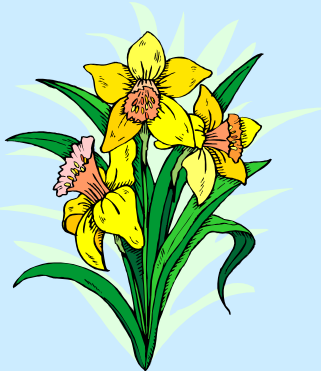
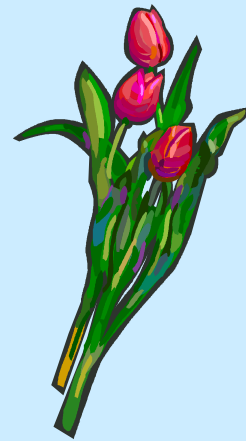
The Binnacle

Victoria Model Shipbuilding Society
Victoria BC Canada
vmss.ca



Yahoo! Newsgroup : VIRCB
Vancouver Island Radio Control Boaters

Springer Time at Harrison...



See page 10...

Photos by Bill Andrews

Victoria Model Shipbuilding Society

General Meeting – March 10, 2011

Call to order: 7:30 pm (24 members and 1 guest in attendance)



1. Welcome: New members Bob Hughes and Ian Fraser with Carter attending as a guest.
2. Outreach: No report.
3. Club Finances: Mike Creasy reported we have \$1175 in our chequing, \$2267 in savings and \$7500 in the GIC. Currently we are breaking even for the year.
4. Upcoming Events: Frosty Fever takes place on Sunday, March 13th at Beaver Lake. Start time is 10:30am. Twelve to fifteen boats are expected. We will not be participating in Pirate School this year. The Battle of the Atlantic Celebration is on May 1st and Saanich has invited us to the Annual Strawberry Festival on July 10th.
5. Open Forum: Scott Munford went over the qualifications for the 'New Build Award'. Jack Plummer thanked all those members who came to his house to purchase items so he can downsize. He is having another sale this Saturday as well. He also donated an easel w/legs to the club.
6. Show & Tell: Barry Fox showed his way of putting numbers on sails.
7. Adjourn business portion & break
8. After the break, the members broke into small discussion groups ranging from sailing to non-destructive naval combat.

Respectfully Submitted
Scott Munford, Secretary

2011 Executive Committee

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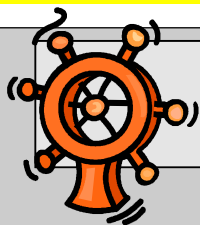
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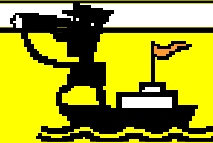
April already. A lot of Canada is just starting to get ready to find sail-able water soon (they hope) and here we are getting out every weekend in many cases. We shouldn't gloat too much!!!

Our breakout sessions at last month's meeting looked to go quite well as it kept most of the folks in attendance in the hall until almost 9:30 so I have to take that as a big positive. This month we are having a building presentation for everyone. The topic is Springer Tugs and an overview about how simple they are to build will be given. From what I hear there are a number of us looking at building one of these "spec" boats to use at the pond and from my browsing around the Internet it looks to me like we will be joining a huge worldwide community.

Around here we tend to think of these boats as the ones you use to play water polo with but my poking around the network shows me that they are finished to look like just about anything. I saw a few that were finished to look like submarines, one with a "Barbie" Jeep stuck on top (yes it was pink) and one that was supposed to be a whale of some sort.

Out of all that you see these are used for a great number of different activities, all the way from traditional steering and towing through gathering items floating on the surface and even as rescue boats for other boats that have stopped running. A very versatile ship.

As you may be able to gather, I'm hunting up pieces of wood to make one for myself. They look like they are very maneuverable, have very good pulling power and the idea that



ON THE RADAR

INFORMATION ON UPCOMING EVENTS

May 1st, Battle of the Atlantic, HYMP
July 10th, Annual Strawberry Festival,
Beaver Lake



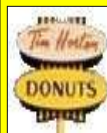
Meetings: Second Thursday 7:30-9:30
4050 Carey Road
Next is: May 12th, 2011



POWER: Sundays 10 – 12
 Harrison Model Yacht Pond (HMYP)
Dallas Road at Government Street



SAILING: 1st and 3rd Sundays 1 – 3 PM
 Beaver Lake
Next is April 17th, 2011



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

you can make them look like anything you want (above the waterline) means that we should have some interesting variety to watch.

I think this has great potential to attract some new folks to join us as these are simple to build and can be done quite economically. High performance, highly maneuverable and inexpensive; a hard act to beat.

So this month will be a presentation and next month will be our breakout groups again.

It looks like the City is leaning toward supporting a couple of our pond improvement projects. Not the one we want most (abundant clean water all the time) but at least we will get some better amenities around the pond. See you at the meeting. And at the lake.

-Barry



THE SUB SUBJECT

Last month's "Sub Subject" gave an overview of the CIA's Whys and Hows of Project Azorian—the covert effort to recover a 136' portion of the K-129 Soviet submarine That had sunk about three miles down in the North Pacific. In the end, they had to settle for just 38', but that glitch does not detract from the engineering products that were designed to pull off the covert intelligence coup. First the Lift Ship, *i.e.* the Hughes Glomar Explorer (HGE).

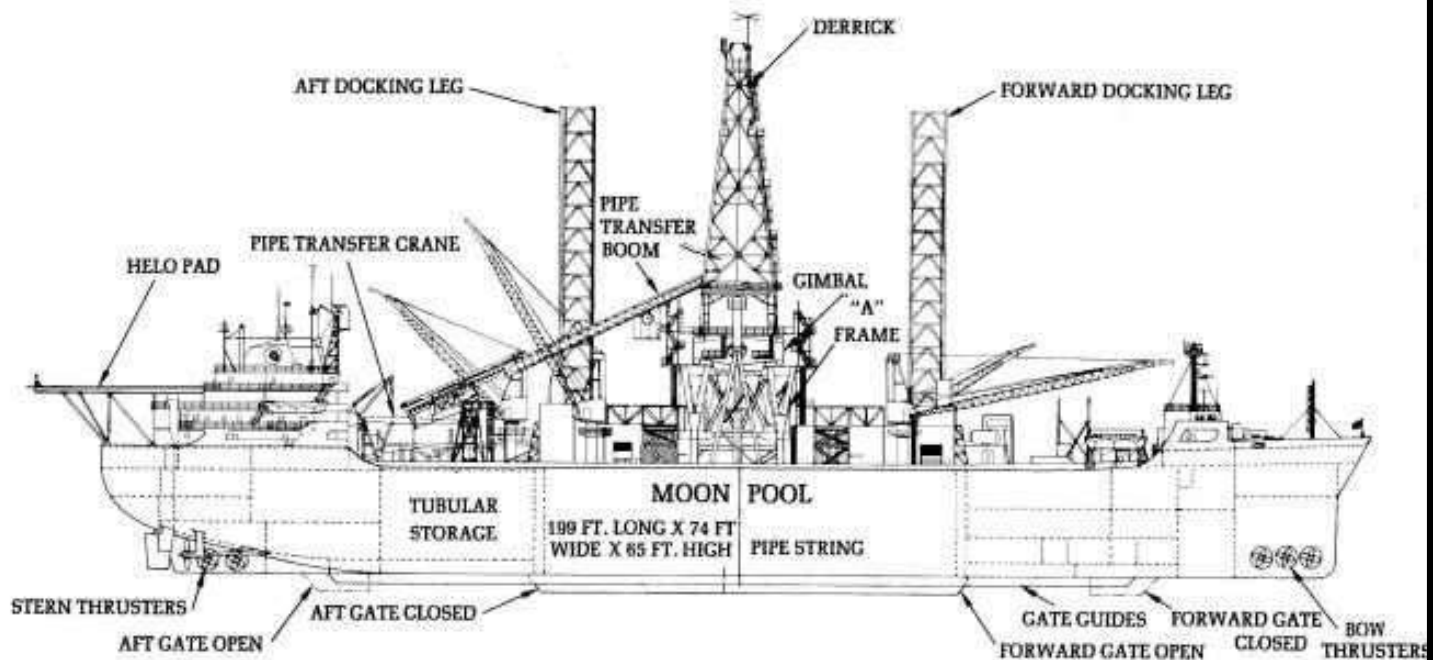
HGE was designed by Global Marine, in co-operation Sun Shipbuilding of Chester, Pennsylvania. She (ultimately) measured 618.67' l.o.a. by a beam of 115.71' —too wide for the Panama Canal. She displaced 21,000 tons. But beyond those basics, HGE had a host of task specific features, such as three through-hull bow- and two stern thrusters, each one kicking out 60,000 lbs. when asked.

Owing to her numerous, unprecedented design aspects the American Society of mechanical

The success of the Hughes Glomar Explorer proves that the impossible is, indeed, possible when talented engineers with the courage to take prudent risks are provided an incentive to stretch the state-of-the-art.

To add weight to the citation's significance it should be noted that the Society singled out the following:

- The "Moon Pool" in the ship's centre that measured 199' by 74' by 65' with a bottom that could be opened and closed, when pumped out, allowed its contents to be examined in the dry.
- The hydraulic heavy-lift system that could handle thousands of tons (3 miles of pipe, the Recovery vehicle and its (eventual) load.
- The tapered heavy lift pipe-string (±4,000 tons) with a constant 6.00" i.d., through



Engineers (ASME) designated her "A Historic Mechanical Engineering Landmark", on July 20, 2006. In ASME's citation, the following was noted:

which pressurized water was fed, to operate the Recovery Vehicle (the crew's names for the CV were "Clementine" or "The Crab". The CIA tabooed "The Claw"). The cast steel pipes

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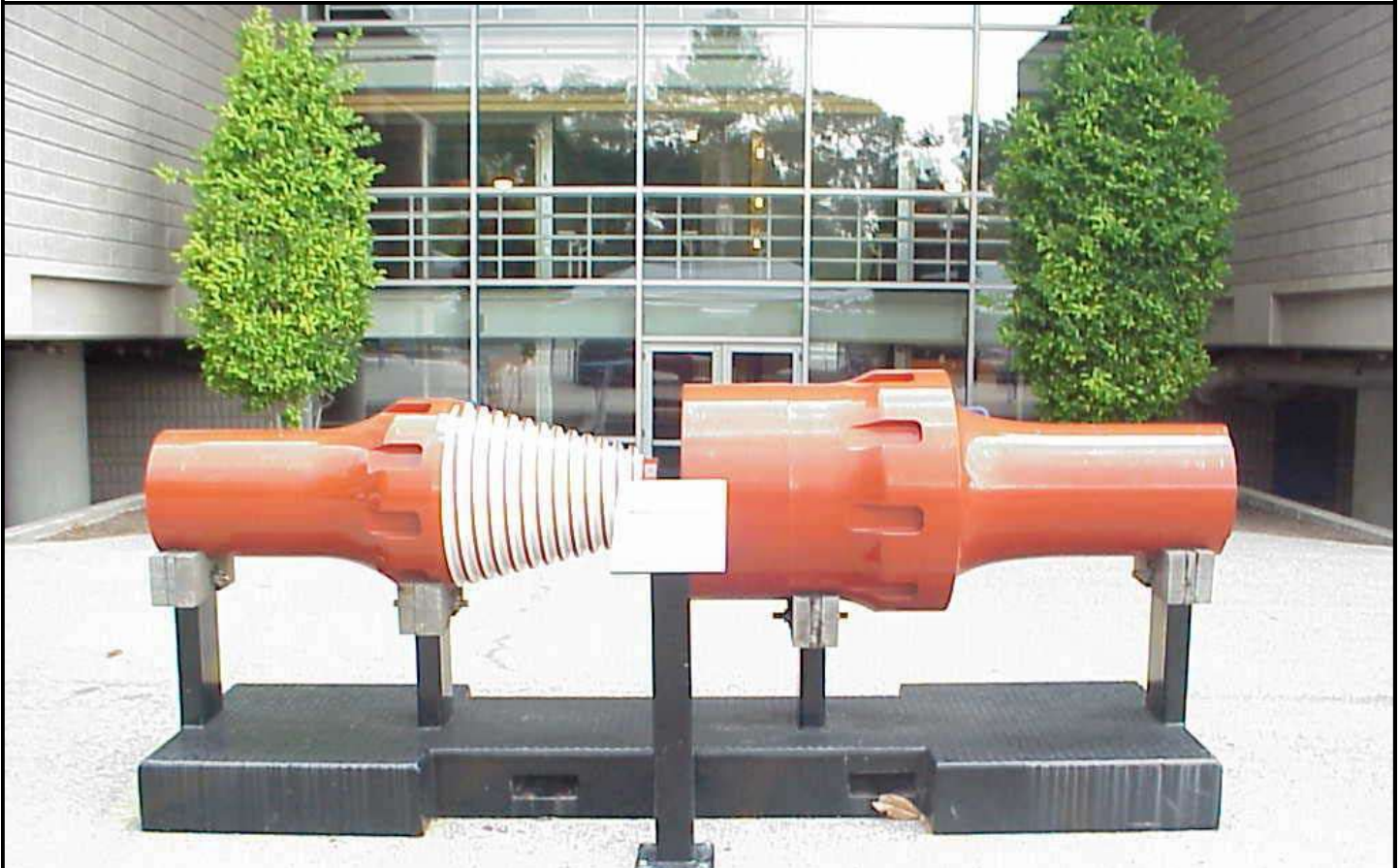
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were tensile tested to millions of lbs. For ease of lowering or raising, the 30' pipe sections were preassembled and torqued into 60' lengths.

- The RV with eight hydraulically-operated, articulated fingers that, upon eroding the sea floor under K-129's hull section could grab the wreck and, assisted by its four hydraulic

Not specifically mentioned in that list is the electronic system that, assisted by four seafloor transponders and global-positioning satellites, made it possible for the HGE to keep station within 10' either way. The system controlled all five of the thrusters and the twin screws.

Effective July 20, 2006, ASME had made its Historic Mechanical Engineering landmark



HEAVY-LIFT PIPE TOOL JOINT MANUFACTURED BY HUGHES TOOL COMPANY

(expendable) legs, help it on the 16,500 trip to HE's "moon pool".

- A gimbale motion-compensating 40' diameter work platform and heave-absorbing system, in combination, could negate the ocean's action, allowing the pipe-string to stay unbending and steady, which benefited the accuracy of the RV during its deployment.

- The two rack and pinion operated 100' docking legs that clamped it front and back and guided it into and out of the lift ship's pool—bottom gates open. All of that action was invisible to spying eyes.

award to only these five engineering feats:

1. The Wright Flyer III,
2. The Hughes Flying Boat HK-1 ("Spruce Goose"),
3. The U.S.N.'s Halibut research/spy sub (AGSS 569),
4. The Saturn V rocket and,
5. The Appolo command module.

Then ASME had the Hughes Glomar Explorer joining its lofty ranks.

(Continued on page 8)

Old Wood and Rusty Iron Hard Waters

- by Mike Creasy

The launch of the **QUEEN OF PRINCE RUPERT** at Victoria Machinery Depot in 1966 marked the start of a new era for coastal transportation. Freight and passenger transportation on the BC Coast had always been provided by a number of private operators, usually with the benefit of federal subsidies. These were a legacy of Confederation; a kind of extension of the national railway system, and by the



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HARBOUR & SHIPPING

1950s it was clear that change was needed. New shipping companies were starting up, using modern post-war equipment, and new

communities were springing up all over the coast to service growing resource-based industries.

The need to move bulk cargoes as well as growing numbers of cars and trucks meant that the old style "mixed freight" steamers of the pre-war years were no longer right for the job. Union Steamships was trying to modernize, but losing the battle - and the precious subsidies - to newcomer Northland Navigation. Canadian Pacific was still building out of date ships like the **PRINCESS MARGUERITE** (launched on the Clyde in 1949) and the **PRINCESS PATRICIA** (launched in 1948), but their Ottawa connections ensured no loss of subsidy. Black Ball was operating a successful car ferry service between Nanaimo to Horseshoe Bay and Victoria to Port Angeles, Port Townsend and Seattle as well as throughout Puget Sound (remember the **KAHLOKE**? shown here at Black Ball's new Departure Bay terminal).

Premier W.A.C. Bennett had been pressing the companies to improve their services, recognizing that transportation would be the backbone of economic development in the post-war era. Black Ball was receptive, but couldn't get financing to build



the new ships and larger terminals needed. Union Steamships had been working to improve their freight capacity, but faced a

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never-ending struggle with operating costs. CP's eastern brass told Bennett to buzz off because, as one CP steamship expert put it, they had lots of experience running ships and didn't need any advice from a hardware store owner!

In 1958, things came to head. Seafarer's International Union workers at CP went on strike for more pay, and were quickly joined by Black Ball employees. Union Steamships had already begun to shut down money-losing services after federal subsidies were eliminated. BC's coastal transportation system came to a virtual halt while political rhetoric heated up and the public steamed.

Bennett moved quickly to invoke the provincial Civil Defence Act to force Black Ball workers back to work (CP was federally

coast. The north coast, between Port Hardy, Prince Rupert and the Queen Charlotte Islands, was served by Northland Navigation, which had purchased some of Union Steamships' vessels in 1959 when Union shut down for good. Northland provided freight and limited passenger services throughout the mid- and north coast with **HAIDA PRINCE, ISLAND PRINCE, NOOTKA PRINCE, SKEENA PRINCE** and **TAHSIS PRINCE**.

Travel to Prince Rupert in the 1950s was a major expedition however you did it. One option was the auto journey up the Fraser Canyon to Prince George, then west on Highway 16 through Smithers and Terrace. This was a genuine goat trail until 1953, when Highways Minister Phil Gaglardi extended it all the way through to Prince Rupert. The other option was CPAir's DC-6 service from Vancouver to Sandspit, connecting to the PBY/Canso flying boat for the trip across to Seal Cove. Either way, the trip was long and delays inevitable. Clearly, something better was needed and BC's shipbuilding industry delivered.

The **QUEEN OF PRINCE RUPERT** soon became a regular feature on the BC Coast, connecting Port Hardy with Bella Bella, Ocean Falls, Sandspit and Prince Rupert with simple, reliable vehicle and passenger service, but it wasn't all smooth sailing.

In 1967, the QPR confirmed the location of Haddington Reef near Alert Bay. Then in 1980, she proved that the Gunboat Channel shortcut between Bella Bella and Ocean Falls wasn't suitable for big ferries. In both cases, metal was bent and pride wounded, but no one was injured.

In July 1970, QPR came to the rescue of the Alaska State Ferry **TAKU**, which had grounded near Prince Rupert. Some expert ship handling and fast work by the crew allowed them to take 70 vehicles off the stranded **TAKU**, allowing her to float off at high tide.

QPR was moved to the Prince Rupert -

(Continued on page 9)



regulated and provincial legislation didn't apply). The new BC Toll Authority Ferry System was created and work began on the car ferries **SIDNEY** and **TSAWWASSEN**, along with new terminals at Swartz Bay and Tsawwassen. Federal politicians, meanwhile, were rummaging around for maps of Canada to see where all the noise was coming from.

BC Ferries began Swartz Bay to Tsawwassen service in the summer of 1960, and it was a roaring success from the start. Black Ball, still operating on the Horseshoe Bay to Nanaimo and Langdale routes, was bought out in 1961 and new ferries and routes were added throughout the south

(Continued from page 5)

(As a personal observation: where was the Boeing 747 when ASME placed its trophy shop order?).

The vital connection between HGE, the lift ship, and the Recovery Vehicle (RV), was the pipe-string. It was designed and cast, by Hughes Tool Company, in cannon barrel-grade steel in 30' lengths. To save handling and torquing during deployment at sea, the pipes were stored on board joined in 60' lengths. This took only three turns of the heavy-lift equipment with a low-pitch (but very deep) thread design.

The interior of the whole pipe-string had a uniform 5" hollow core, through which high-pressure water was pumped to operate the CV. The pipe's outside diameter, however, tapered down from the top (15.5") to the bottom (13.0").

The pipes were colour-coded, to avoid any confusion that could have set in during the hectic procedure of getting the lengths out of the below-deck storage, into the derrick and down the deep. It had been estimated that it would take six minutes to lower a pipe, but it turned out to be closer to 10 minutes, and up to more than 18 minutes. Also, down times came about fairly often. The pipe-string, by the way, came in at \$1000 a foot—in 1974 coin.

In addition to its lifting and water-carrying functions two coaxial cables were attached, through which all the down-deep power and video were operated.



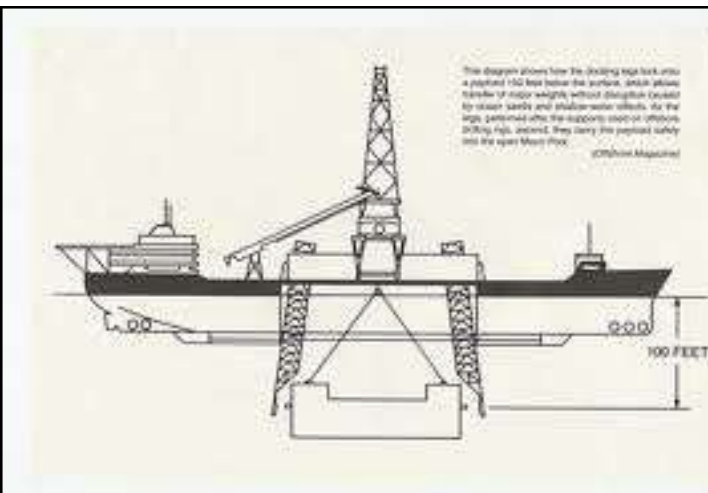
Attaching the first pipe down to the RV was done with a 30" Dutchman, an apex block and a three—cable bridle assembly. Thrusters on the RV kept it from turning—all of which was controlled by various control centres up top.

Since the pipe sections were purpose-manufactured, they were sold off as scrap steel when the CIA's mission came to an untimely end.

The Recovery Vehicle (RV) was built by Lockheed's Ocean Systems Division, in Redwood, CA, at a given cost of ±\$200,000,000, *i.e.* as much as the Hughes Glomar Explorer. Its configuration matched the shape and contours of K-129's forward 136'—known as the Target Object.

To the Project Azorian's crew, the RV was variably known as "Clementine", or "The Crab". The CIA did not like the term "Grabber", which was perhaps too descriptive of its function, as was "Claw".

Upon its final assembly inside the covered submersible barge, its strongback (made up of two 179' long, parallel beams that carried three articulated fingers and a steel net to its port side (Nos. 1,3, &7). The net was intended to prevent the front one of the



sub's three Serb missiles from slipping out of the launching tube. On the RV's starboard were five fingers: 2,4,5,6, and 8.

The RV's dry weight ran 2,300 tons upon descent. Coming up, loaded with part of K-129, but with its four breakout legs abandoned on the ocean's floor, 3,449 tons (plus the pipe-string (initially)) hung on to the heavy-lift system. Enough to make Paul Bunyan wince.

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The RV was loaded with sensors, video cameras, and transponders to enable it to lineup accurately with three points on the hull: a towing eye, a stanchion and a crack in the hull aft of K-129's sail.

Once the RV was accurately positioned, its fingers (under two mill lbs. of pressure) dug under the hull with the help of high-pressure water jets. That done, the RV was lifted free with the help of its four 35' (6' dia.) abandoned legs.

Some 3,000' up, matters turned for the worse. The sub's Target Object shifted to port. Arm No. 6 lost all hydraulic pressure, and Nos. 4 & 5 broke away. Cracked, apparently, because some of the operators had resorted to excessive pressure when progress was lacking. The ocean's bottom was much harder than anticipated. Also, the CIA's late in the day decision to increase the RV's carrying capacity, had made Lockheed decide on a switch to manganese steel—the strongest known in metallurgy, but brittle

when cold. To be sure: finger-pointing must have been the order of the day.

What hadn't been suspected (deceived by Halibut's picture gallery) was the weakness of the wreck. As a result, the ±100' hull section that included all of the sail, all three Serbs, and (potentially at least) the code books and machine. But the CIA still got something. Which, under the circumstances, was an incredible, mechanical achievement.

Next month: some details regarding the hiring of the crew, their accommodation provisions and, space permitting, the submersible barge.

Back in May...already.

Romanus Unicum



VMSS MODEL BOAT PHOTOGRAPHY CONTEST

OPEN TO MEMBERS OF ANY MODEL BOAT CLUB

Just a few Rules:

1. Maximum of 3 entries per amateur-photographer/member: **DIGITAL (jpg) only!**
2. Send by email attachment to: vmss@shaw.ca **subject line: "PhotoContest Entry"** (important!)
3. Model ships and related topics only, please. **Limit of 3 (three) entries** per person.
4. **Deadline November 15th, 2011.**
5. Judges decision final; prizes to be announced at a later date in **The Binnacle**.

NOTE: It is intended that the top 12 BEST entries will be used in our VMSS Calendar for 2011. **Questions:** email to: vmss@shaw.ca

GOOD BOATING AND SHOOTING!!

(Continued from page 7)

Skidegate route in 1980, after a very short career operating Victoria - Seattle as a replacement for the **PRINCESS MARGUERITE**.

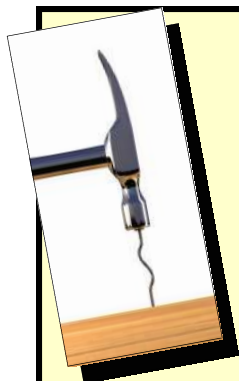
She was replaced on the Prince Rupert run by the **QUEEN OF THE NORTH**, now infamous for its unsuccessful attempt to move Gil Island in 2006.

QPR was quickly pressed back into service on the Prince Rupert run until 2007, when the new **NORTHERN ADVENTURE** and **NORTHERN EXPEDITION** joined the fleet. The **QUEEN OF PRINCE RUPERT** was officially decommissioned by BC Ferries in April, 2009, after 43 years as part of the coastal scenery. BC's coastal communities owe a lot to this ship, and to the foresight of a sharp hardware store owner.

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Bibliography

WAC Bennett and the Rise of BC, David J. Mitchell, Douglas & McIntyre, 1983
 The Pacific Princesses, Robert D. Turner, Sono Nis Press, 1977
 Whistle Up the Inlet, Gerald A. Rushton, Douglas & McIntyre, 1974
www.westcoastferries.ca



My Springer

To say that the **Springer** is getting to be a phenomenon is like saying a border collie is a pretty good sheepdog. I have looked at these boats and turned up my nose in the past, but I see people having a lot of fun with them. So I grabbed my self and said: "lets re-evaluate my thoughts about what makes a beautiful tug". A tug's job in life is to move things around on the water, there are very few other designs of tug that do this as well as a Springer; all of a sudden this little thing starts to look better.

So I built one: never have I had a project go together so well. The club will be building three for kids to operate at our events. I know of at least three other that are being done. With the pusher posts on the front, you can design an array of implements to help you have fun. Not just pushing a ball from pillar to post, but a contest of rounding up plastic ducks, putting them in a coral, gathering logs, pushing barges, handling freighters, are only a smattering of ideas of games that can be played.

Building my Springer

In my **Springer** I used 1/4 " plywood sides and 1/8 " birch bottom and top. The birch was soaked in ammonia for 15 minutes and it bent to shape very nicely. In the club boats, I used 1/8"

mahogany and it bent very well cross grain without soaking. I would think next time I might use 3/4" cedar for the sides as then you would not have to put in a screwing strip along the sheer line. I finished the hull with two layers of silk span and weldbond glue, it gave a real nice finish. For power I went to the **Shaver Shop** and **Jeff** sold me a motor (AX24004) that seems to be custom made for the purpose, together with my Viper speed control and a new 6 volt lead acid battery and a three to one reduction gear I can run for at least 1 and a half hours. Like I said, this is a real elementary build, maybe I needed some thing simple to get my fire going again, try one you'll like it.

Dave Denton



Please add this P.S.. to my article: I am tired of fibreglassing. All my moulds are up for grabs, first come, first served.

Plans:

http://web.me.com/hookpilot/North_West_RC_Ship_Modelers/Springer_Class_files/springerPlan_1.pdf

[Copy/paste all three lines into your browser]

Burnaby Hobbies ([604-437-8217](tel:604-437-8217)) is the distributor now for Mtroniks speed controls. He has all models in stock – a 15 amp runs \$36.00, 20 amp runs \$45.00. They have a pretty good rating.

Submitted by: **Michael E. Claxton**



Shelbourne Shipyard

As I stated in my previous article, the new Project Manager assigned by the shipyard owner, was unhappy with my progress and budgets. She proceeded to bring in two extra workers from New Brunswick to help out. They showed up for work on March 27th. Nepotism apparently runs rampant back East because both workers were family of the new Project Manager. This resulted in a work stoppage at the yard. I held my ground until the owner relented and sent the replacement workers away. They only went two floors away, just close enough to use as a threat to bring them back at anytime over my head. However now it's my turn, the Blue Flu has struck. Actually not sure if it's blue but I am definitely coming down with something. Can't do too much work with watery eyes and sneezing.

However, before all the excitement began I did some work. Ready to paint the bottom portion of the hull for the Hunter, My new motors came for the Birch but when I hooked them up it was apparent they ran at different speeds. Using one speed controller for both motors I'm aware I'll never get them to match exactly but the difference was too great. So I ordered two more and will match the best two. With only 3 weeks until the Battle of the Atlantic Celebration I still have plenty of work to do to have a military vessel ready for that day. See everyone on the water, or under it.

Scott Munford
Yard Master



Non-Renewing Members

The following list of names are members who have decided not to renew their memberships for the upcoming year:

- Robert Ames
- Vince Bialkowski
- Tim Calcutt
- David Cook
- Doug Dyer
- Steve Ecker
- Mark Giles
- George Hickson
- Ryan Hull
- Paul Jordan
- John Launder
- Robb McDonough
- Eric Paul
- Shawn Smith

We wish them well in their future projects and we hope that someday they find their way back to the club.

Scott Munford



WINTER 2011

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What To Do When the Water That Doesn't Freeze Does

By Barry Fox

Sitting around and not sailing can lead to some interesting projects.

During one of these periods, I got to talking to fellow sailor Jan Schmidt about building the small piece that go into the structure of a boat. Things like fin boxes, mast pockets, small braces; those kinds of things.

Sometime ago Jan had constructed a vacuum system from some plans and parts he found on the Internet but had so far not made anything. I was starting in on a fresh build and was going to be in need of a fin box to fit a keel I have had for sometime as well as a mast pocket.

Away we went.

We started out just trying to build a fin box that would maybe become something that we would have in a standard size that we could make for anyone who needed one. The standard size would probably require anyone who used it to do some modifications to the

top of their fin to fit it but that isn't an unusual thing to have to do.

Jan took a piece of MDF and routed the shape we thought would be right into it and then we took a piece of UHMW plastic I

even better. We were fortunate (?) in that we were getting down to right at 35% epoxy. So these first pieces were a bit flimsy but the fit and finish was just great.

Now we turned our attention



This is the mould part made from MDF covered in packing tape and the UHMW plug pieces sitting in place. You can also see the Plexiglass piece used to form the vacuum against

had that was the right thickness for my fin and made a plug that would fit into the routed shape. We simply covered the MDF with clear packing tape (epoxy doesn't stick to it), cut some strip of fiberglass, mixed up some epoxy and kind of followed what we had watched in some YouTube videos. Sealed it all up and turned on the vacuum.

What we discovered is that we could draw most of the epoxy right out of the piece and make it be very light. Almost paper thin and not very rigid. Our information told us that a really well done, hand laid, moulding would be about 50% cloth and 50 % epoxy. It also said that Vacuum bagging could result in a 60/40 ratio, or

to different combinations of cloth and worked our way toward what we thought was a good compromise between weight and strength.

Next we worked out what was needed to make the mast pockets. One of the first things we arrived at was that we would like to have the fin box and mast pocket be an integrated piece. For my boat I knew exactly where the mast was to sit in relation to the fin so we had hard dimensions to work from.

Soon Jan had his router at work again and fabricated a new MDF mould that would contain all our pieces. We looked at pictures and other diagrams that we could find and discovered that most had

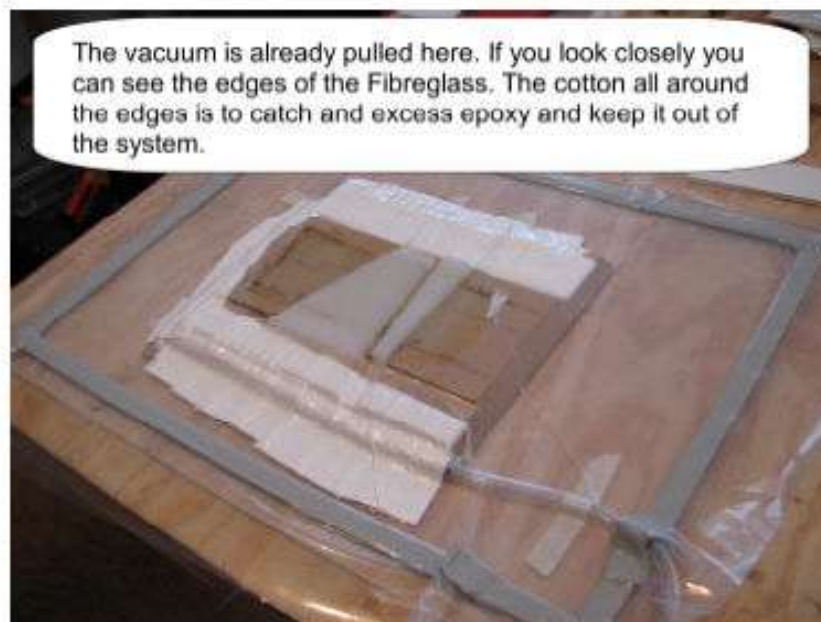
Wanted

Used Soling One Metres,
in various states of repair,
by a growing fleet in the
West.

Contact Lawrie Neish
wlneish@shaw.ca

with price and where, etc.
and the information will be
passed along to the right
people.

PAGE 12



The vacuum is already pulled here. If you look closely you can see the edges of the Fibreglass. The cotton all around the edges is to catch and excess epoxy and keep it out of the system.

their mast pockets designed with a vertical forward face and allowed for as much as 7 degrees of rake. Based on our original pieces made we had a bit of an issue as we had not sloped the forward face of the fin box and so the mast pocket would hit the front of the fin box. That caused us to adjust the leading edge of the fin box to match the mast tube slope, and away we went.

With the MDF routed out to exactly half depth, UHMW plugs for the new fin box shape and the mast pocket in hand, we laid up an assembly using our last good cloth arrangement.

When we first pulled the vacuum we ran into a bit of a problem as the plastic we were using as the bag component stretched across the gap between the fin box and mast pocket and wouldn't have done a good job of the joint between the two sections. So we released the vacuum and held a small block between the sections before introducing the vacuum. What that really did was introduce some slack in the plastic bag so that it had some reserve to

get down into that space.

Next day (there is always a day, or at least 12 hours or so, to let the epoxy set up) the finished part came out and looked terrific. When trimmed of all the extra flashing it weighed a mere 17 grams. It looked pretty useable but we felt that it was maybe a little thin. It was reasonably rigid and

once glassed into the hull and deck would be quite rigid. But we thought that is should be better.

Lots of head scratching, some complete guessing and we arrived at a cloth layup that we thought would keep the weight close to what we already had but would be a lot more substantial. Here comes the complicated part. On each side of the structure we used (in this order) a layer of $\frac{1}{4}$ oz cloth, layer of 2 oz cloth, a layer of 6 oz cloth cut on a 45 degree bias, another 2 oz. and another $\frac{1}{4}$ oz.

Away we went. Laid down the cloth and epoxy on one side, pressed the plug pieces in, put the five layers on the other side, sealed the bag onto the plate we were using, held some small blocking piece down to help get nice sharp edges around the sections and let the vacuum go to work. It all pulled down nicely as we watched the excess epoxy belled out into the cotton placed around the work piece.

Next day we pulled the piece out and found that our combination of thicknesses and cloth angles had produced a very stiff,



All sucked down and waiting for the epoxy to go off. Nice tight corners around the sections

CANADIAN RADIO YACHTING

WINTER 2011

This is what the finished piece looks like. This was the first of these. The second one looks the same but just a little stronger.



The vacuum tank. It is filled(?) by using an air compressor that blows air by a special valve setup that acts as a venturi, creating the vacuum. Plans and parts can be had from number of sources on the Internet



very solid feeling part. Trimmed to size it ended up 4 grams heavier, which we were very happy with.

I have just finished installing that piece in the boat it was aimed for and it fits like a glove, all the angles we had come up with work out perfectly and it looks very top rate.

All of this just wet Jan's appetite and we have been trying to arrive at all the right combinations to do a hull. But that is another story and could be just as long as this one. Maybe next issue.

The above three pages are from Winter 2011 issue of:



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