

# TF 144

TASK FORCE 144

The Official Newsletter of Model  
Warship Combat, Inc.

[www.mwci.org](http://www.mwci.org)  
Volume 2013

WINTER 2013  
Issue 2

09.16.13

# NAVSEA

Never Forget



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Winter 2013

## This Quarter in History:

**December 2, 1943:** Bari chemical warfare disaster: A surprise Luftwaffe air raid on Bari in Italy sinks 28 Allied ships in the harbor, including the American Liberty ship SS John Harvey, releasing its secret cargo of mustard gas bombs, inflating the number of casualties.

**December 24, 1943:** U.S. General Dwight D. Eisenhower becomes Supreme Allied Commander Europe. He establishes Supreme Headquarters Allied Expeditionary Force in London.

**December 27, 1923:** The crown prince of Japan survives an assassination attempt in Tokyo.

**January 10, 1924:** The British submarine L-24 sinks in the English Channel; 43 are lost.

**January 26, 1934:** The 10 year German-Polish Non-Aggression Pact is signed by Germany and the Second Polish Republic.

**January 29, 1944:** HMS Spartan (95) is sunk by a Henschel Hs 293 guided missile from a German aircraft off Anzio, western Italy.

**February 1, 1924:** The United Kingdom recognizes the Soviet Union.

**February 3, 1944:** United States troops capture the Marshall Islands.

**February 26, 1914:** The ocean liner that will become HMHS Britannic, sister to the RMS Titanic, is launched at the Harland and Wolff shipyards in Belfast.

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## USS AUGUSTA BY ADAM KRAKOWSKI

Most people's hobbies are a sport like football or tennis, but my dad's and mine, is much more exciting since we blow up battleships. We are in a club called MWC which stands for Model Warship Combat. My Dad and I go to ponds in South Georgia where we put 1/144<sup>th</sup> scale world war battleships on the water. When all the boats are out on the water, it looks like a real battle, only from really far away. The ships have fiberglass hulls, which some people call the ribs, balsawood on the outside, and various materials for the superstructure on the top. The best part, though, is the BB guns. The inside of the boats is a jumble of wires, batteries, a motherboard, electric engines, and a huge silver can with a valve hooked to the ship's guns. That can holds pressurized CO2, which is used to shoot the BBs at the enemy ships. (continued on next page...)

## UPCOMING EVENTS:

- 22 MAR - 24 MAR: BROUHAHA ON THE BAYOU**, Wade's Pond, Boutte, LA  
Contact: Wade Koehn, [bismarck3@cox.net](mailto:bismarck3@cox.net)  
Sanctioned
- 24 MAY - 26 MAY: TANGLER AT ENGLER**, Thomas Lake, Farmington, MO  
Contact: Kevin Kaminski, [kevin.ski77@yahoo.com](mailto:kevin.ski77@yahoo.com)  
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Please add [TF144] to the beginning of email subject line!

The hull of my ship is called "ghost" because it is entirely gray like a ghost. The ship is controlled by a transmitter which sends info to an antenna, which tells the ship what to do. The controls are easy. If you push the lever up, the ship will go forward, and vice versa. When you push it to the left, the rudder turns left, and vice versa. My favorite button, though, is on the right side of the controller. That is the button that controls the BB guns. The ship that I use, The *Augusta*, was a WWII Cruiser that was sold for scrap after the war. The cruiser has minor historical history, as it took FDR to meet the English prime minister in 1941. The cruiser that I drive can only carry a grasshopper to meet his first BB wound, but that is beside the point. If you were to stand on the deck of the tiny ship somehow, all you could hear would be put...put...put....putputputputput of its guns, or you could hear the thwack of BBs hitting the *Augusta*. Model Warship Combat is the best hobby ever known to mankind!

## RAP4 CO2 VALVE, BY MARK ROE



This project started when the needle valve on my 3.5oz tank no longer sealed. I wanted to buy the same valve that was on the bottle. No luck. All the web sites showed this RAP4 valve with a larger shiny knob. I decided to purchase three valves. The plan was to install one valve, and have two spares.

I received three valves and had three different amounts of knob rotation. The question became which one is correct? Is this a needle valve or a quarter turn valve? The other issue was two of the three had rough knob rotation. Adding to the confusion, it is not obvious how to disassemble the RAP4 valve. I decide to purchase more valves with the intent of sawing one apart to see how it is constructed. The second shipment consisted of two valves and the 5oz bottle with valve already installed. The valve on the bottle opened nice and smooth. It and valve #2 opened more than one revolution. I decide to use this action as the reference. The goal was to find out if the other valves could be made to do the same. Using a magnifying glass I discovered threads in the hole in the knob. Mystery of how to disassemble the valve was solved.

# RAP4 CO2 VALVE

Before				After			
Valve	Knob rev	Smooth	Comment	Knob rev	Smooth	Comment	
1	1 1/8	Y	Only valve w/ lubricant inside. Only valve w/o debris inside.	1 1/8	Y		
2	1 1/8	Y		1 1/8	Y		
3	5/8	Y		5/8	Y	Much cleanup of internal parts yields no improvement.	
4	5/8	N	Rough spot mid rotation	1 1/16	Y	Much improvement	
5	1/2	Y		7/8	Y	Don't expect any flow issue with 7/8 revolution of opening.	
6	5/8	N	Rough entire rotation	1 1/8	Y	Much improvement	

Concerning valve #3 there is insufficient clearance between the seal screw and the retaining nut. Perhaps the pocket for the nut is too deep or the valve port pocket is too shallow. Regardless this valve will have flow issues.



**Upper L to R:** Valve Body, Seal Screw, Shaft, Shaft Retaining Nut, Washer, Knob, Spring, Knob Nut  
**Lower L to R:** Size comparison of the new RAP4 valve to old valve. Old valve disassembles to one part.



**Upper L to R:** Valve Body, Seal Screw, Shaft, Shaft Retaining Nut, Washer, Knob, Spring, Knob Nut  
 If you zoom in you can see the brass debris on the retaining nut Teflon ring. This debris is being ground into the Teflon by the rotating action of the shaft.

The RAP4 valve is significantly bigger than my old needle valve. It is longer, wider, and a full ounce heavier. The RAP4 weighs 6.0ozs!

The RAP4 valve is a face seal valve. As the knob rotates CCW to open, the shaft unscrews the seal screw. The hard nylon seal surface pulls away from the port in the valve body. The shaft does move outward, but it's 1mm movement is hidden inside the knob. The knob does not move outward as it opens. The 1 to 1 1/6 revolutions of the knob is the correct amount of opening.

There is an O-ring inside the shaft retaining nut. It is the same O-ring we use inside our cannons.

Important: Do not over tighten the knob. Too much force will screw the nylon seal into the metal port hole and tear up the seal.

Another word of caution. If you see somebody else's valve leaking in the ice chest at a battle, DON'T tighten it. You may have just ruined the seal in their valve!



## RAP4 CO2 VALVE

### Issues discovered:

- Slot in the seal screw is off-center. This was most of the cause of the knob binding.
- Burrs on the seal screw and the screw driver head of the shaft.
- Brass debris imbedded in the Teflon ring of the shaft retaining nut.
- Brass debris in the threads of the valve body port.
- Poor quality threads on the seal screw.

### Valve disassembly:

Clamp the valve in a vice with the knob pointing up. Turn the knob so the valve is open in the mid range. While holding the knob use small needle nose pliers in the two holes of the alum knob nut. Unscrew the knob nut CCW. The knob nut unscrews about 10 turns, and you can finish unscrewing with your fingers. Remove the nut, spring, knob, and plastic washer. Use a 12mm wrench or socket to loosen the shaft retaining nut. Takes about 12FTLBS (a fair amount) of force. Remove the valve from the vice. Unscrew the shaft retaining nut. The shaft comes out trapped in the nut. Pull the shaft out, and use it as a screw driver to unscrew the seal screw.

### Valve assembly:

You'll figure it out. I tightened the shaft retaining nut to 150inlbs (12.5ftlbs). I tightened the knob nut just snug. It is a delicate fine pitch thread.

### Valve use:

I put CO2 gas (no liquid) into the 5oz bottle. The valve seals nicely with light closing torque. With the bottle installed in my ship the valve opens and closes smooth and easy. The CO2 does not leak out the valve stem in any opened position from min to max. The valve held gas pressure inside the bottle until I opened the valve 17 days later.

### Conclusion:

On the down side: Heavy, marginal quality out of the box, possible reliability issue with the rotating face seal.

On the up side: Inexpensive, the face seal is replaceable, but maybe not at lakeside.

## 3D PRINTING, BY CLARK WARD

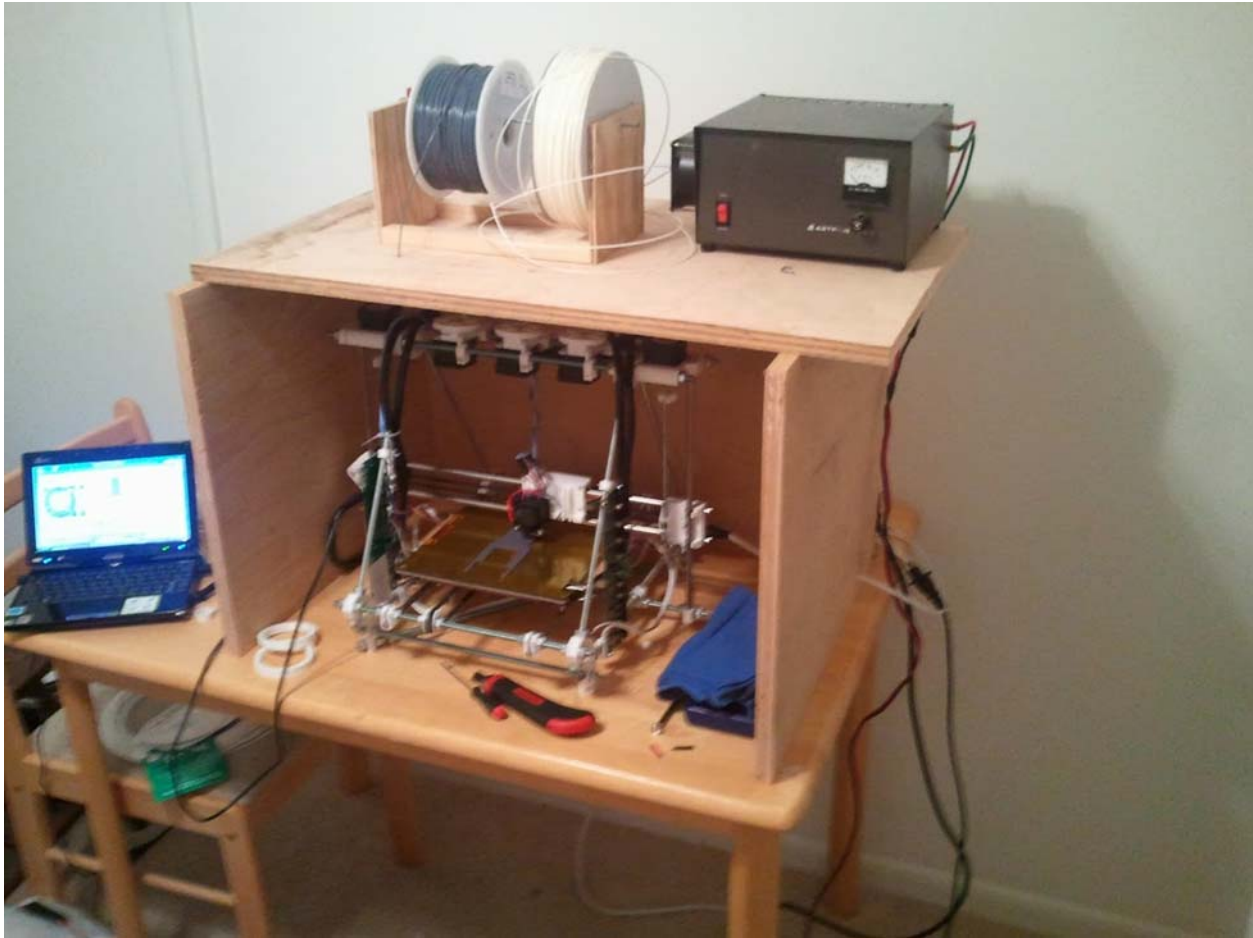
What is it, and what can it do for me? Or more specifically, what can it do for me in RC model warship combat?

**WHAT THE HECK IS A '3D PRINTER'**, you ask? It's a machine that takes a set of instructions from your computer, and makes it reality in plastic, one layer at a time. The process begins when you get an idea for something that you want to make. You need to use a piece of software, either a CAD program or something like Sketchup (free to download) to draw in 3 dimensions what you want to make. The object has to be drawn in scale, and it has to fit in the print volume of the printer you want to use.



# 3D PRINTING

## 3D PRINTING, BY CLARK WARD



A Mendel 3D printer in its home environment, with a netbook running it, a power supply, and an enclosure (minus the front anti-cat cover).

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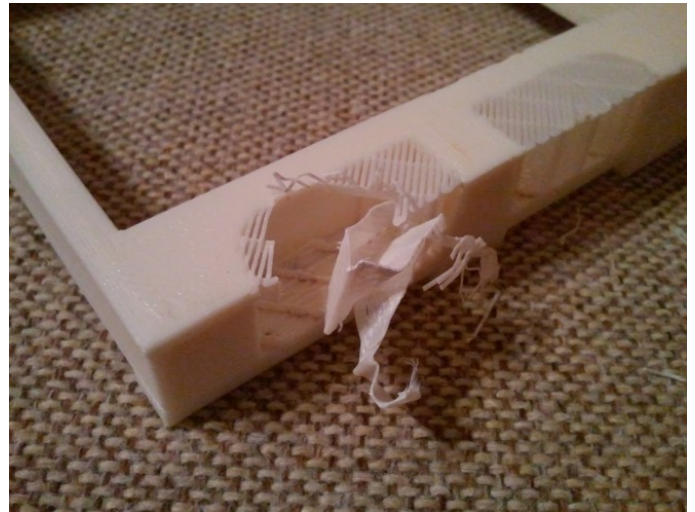
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## 3D PRINTING



Stern superstructure 01 level for my HMS Malaya, a reasonable example of what I have been using my 3D printer to make.

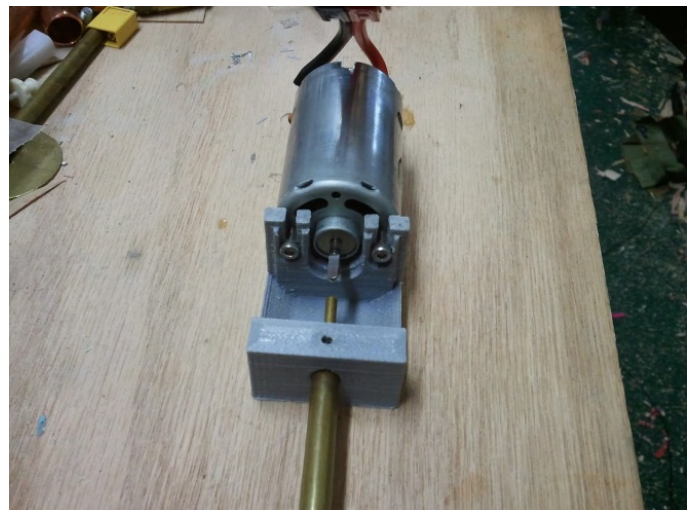
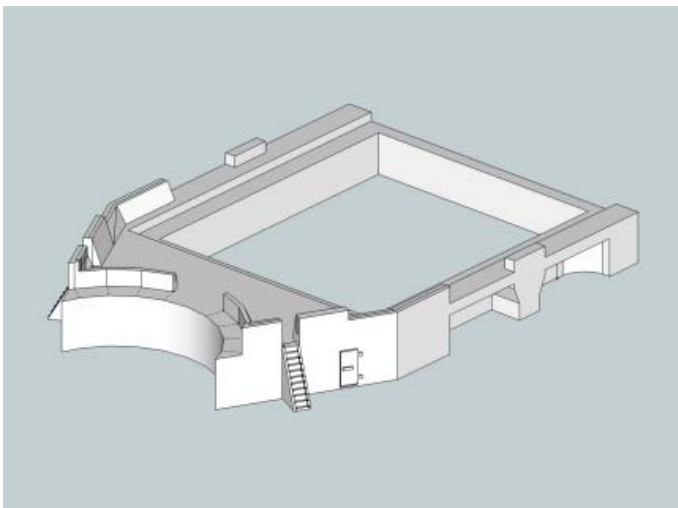


Breakaway support material.

If you look at the picture of the Malaya stern SS, there are supposed to be two deep coves on the sides; the one to the right in the picture has had this support material removed, and to the left of that cove, you can see some odd diagonal pieces zig-zagging back and forth inside the cove. That stuff is the breakaway support material of which I speak. You can see it coming out in the picture above.

'SURE,' you ask, 'but how STRONG is it? Can it take hits?'... this is also something that requires some trial and error. The SS piece in the photo was taken outside and subjected to destructive testing at about 6 to 12 inches range with a well-tweaked cannon. Yes, I took a ricochet in the nards to satisfy your (and my) curiosity. The splinter shields (above the door and stairs) did not enjoy being shot, but then 1) the base was  $1/8''$  thick, and they tapered to  $1/16''$  at the top edge, and 2) I found that there were some issues with the print settings that resulted in poor adhesion between layers. The main structure laughed at the impacts, even the stairs and the door, and the  $1/4''$  thick piece on the end away from where the turret goes. Boo-yah. So armed with a little test data, the print settings got refined, the splinter shields got thickened up to  $1/4''$  at the base and  $1/8''$  at the top, and they are now tough enough to be shot.

The beauty of 3D printing is that it's easy to improve things without feeling like you have to redo a whole lot of work. In this case, 20 minutes in Sketchup changed the design, and I went to the printer, and told it change these two settings, and print me a new one while I play video games and then go to sleep. I woke up the next day with a pretty new superstructure waiting for me. Similarly, I made 3 tries at a gearbox until I was happy with it.



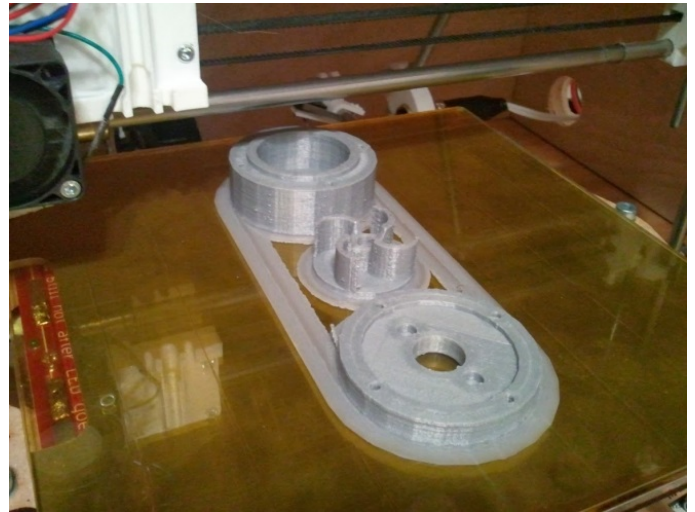


## 3D PRINTING



VERY ugly pump prototype in PLA. Even in the small photo, the part does not look smooth as it should be.

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After 2 months of tweaking and a complete re-do of the design, the quality is noticeably better.

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The ease of 'do-overs' makes it no big deal to try new iterations until your part comes out as you want it to. You can also try printing it in different materials to see which suits your application best.

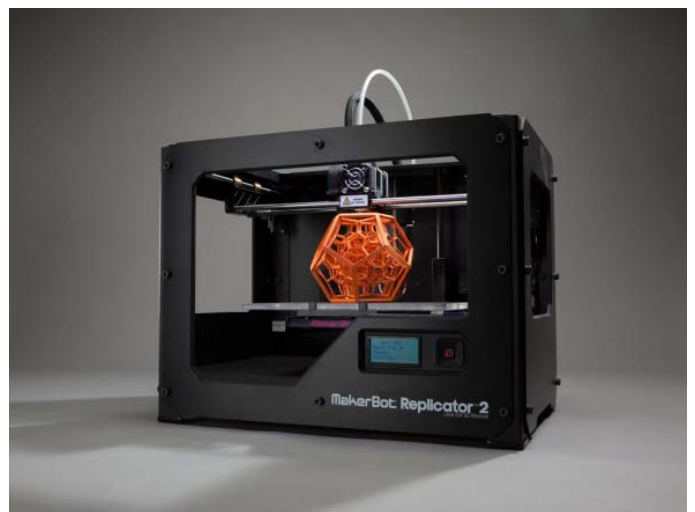
Several plastics can be printed, depending on the capabilities of your printer: ABS, PLA (a biodegradable plastic), polycarbonate (yes, the stuff bulletproof glass is made from), and nylon, among others. Of these, ABS is probably the best choice for model warship parts, as it's damage resistant. PLA is easier to print in, but it's very sensitive to heat. Leaving PLA parts in a car in the summer will result in warped PLA parts, not really desirable! Polycarbonate is still relatively new and expensive to play with. Nylon holds great promise, with its high strength and high heat resistance. Several companies are experimenting with new thermoplastic polymers that will expand what the printers can do.

My armored cruiser Lil Scharnie went into battle in the Fall sporting a 3D printed prop. A 1.3" 5-blade printed prop. Still room for improvement on the design, but it actually worked, and held up in battle. One's imagination is the main limit. Along with the laws of physics, the behavior of thermoplastics, and the aggressiveness of one's shop cat watching the printer.

Sounds great, doesn't it? Will everyone soon have their own 3D printer in their home to print ships and parts? Probably not. It is possible to build a good printer for under \$1,000. BUT. It takes a good bit of technical skill to build one, and a lot of precision and attention to detail. You can buy a hobby-grade 3D printer ready-made for between \$600 and \$2500, and the higher-end ones in that category are very good indeed.

One of the more popular brands is MakerBot, which sells the very good Replicator 2X that can do 2 different colors or types of plastic in the same print job, using two extruders.

The proprietary software is also easy to use and you get dedicated support, unlike the home-built machines like the Mendel. But even after you have a properly-built and set up printer, there is a learning curve to getting good results. There are literally more than 100 different settings to tweak (or to know to leave alone) that affect the quality of the objects produced. The quality of available filament varies widely and this has a profound impact on print quality as well. Online forums are a good source of reviews of the offerings available.





## 3D PRINTING



Lil Scharnie getting resheeted, printed prop already mounted.

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This technology is not for those who aren't into locking themselves in a small room and geeking. If one is fortunate enough to live in a larger urban area where there are Maker spaces (or public libraries even) holding classes in 3D printing, it will save a lot of time and mental stress if you can go and learn from someone with experience.

So the short answer at the end of a long ramble is: 3D printing will not revolutionize your battling, and it will not make a duffer into a holy terror on the water. It does allow some aspects of building to become easier in terms of supply chain; you have a new guy coming to a build session with his empty hull. You can leave the printer working the night prior cranking out a pair of gearboxes and a pump for him. If he stays with the hobby, you helped him by lowering the price of entry. If he leaves, hey, you're out \$5 in plastic filament and \$0.50 in electricity. For me, the best part is seeing stuff you've designed actually become real, and then putting it in your ship and seeing it work. The first time we got a good pump designed and built and watching the stream of water fly to the far end of the pool was utterly awesome. As the price of entry into 3D printing lowers and the software becomes more user-friendly, I expect that we will see more and more battlers turning up with their own designs made manifest and equipping their ships.

# USS INDIANA PROW

## USS INDIANA PROW DEDICATION, BY STEVEN COX

On September 7th, I was able to attend the USS Indiana's (BB-58) Prow Dedication at Indiana University prior to the IU versus Navy game. The dedication was attended by the Secretary of the Navy Ray Mabus; superintendent of the U.S. Naval Academy Vice Adm. Michael H. Miller; commander of NSWC Crane Division Col. Alan Pratt; the University's President Michael McRobbie; Indiana's Lieutenant Governor Sue Ellspermann and 20 of the USS Indiana's original crew.

The prow was saved from scrapping by the Spenger family in the 1960's and sat in from the family's restaurant in Berkeley, California. After Indiana University recently found out about the prow's location, it was donated to the University by the Spenger family last July. The prow now sits in front of IU's Memorial Stadium with the Indiana's main mast and two guns that were donated by the Navy in 1966.

The USS Indiana (BB-58), the lead ship of the second Indiana class of battleships served from 1942 to 1947, where she received 12 battle stars for her service in the Pacific Theater.



Secretary of the Navy Ray Mabus and Editor of the TF144 Steven Cox at the dedication.



Prow of the USS Indiana in front of Memorial Stadium.

In next quarters edition:

- More well written articles.
- Building and Construction Articles

If you know of an event in the next Quarter (March-May) and would like to see it in this Quarter in History. Please send the information to [cox.steven@gmail.com](mailto:cox.steven@gmail.com).

