



Aerial by Jim Brogan who flew over the Battleship in November 2009

Where History Comes Alive

BATTLESHIP NORTH CAROLINA

Scuttlebutt

April 2010

Past, Present and Future

The Battleship NORTH CAROLINA turns 69 on April 9th, the day of her commissioning in 1941. While her keel was laid in October 1937 and she was launched in June 1940, it's the commissioning date that officially marked her date into service in the U.S. Navy. She was beautiful and glamorous and they nicknamed her the "Showboat."

69 years later she's still looking good. Nolan Painting Company is painting her exterior in Measure 32 camouflage again. When that is completed, the anchor skid plates can be re-installed on the bow and new tour route signs will replace weather worn ones.

Volunteers and the living history crew continue to refurbish areas, such as the Bridge and Sick Bay. Even the brass plates throughout the tour route are shiny now. (see page 10)

The Visitor Center is being spruced up too. A new awning will be installed at the entrance to make it more welcoming. We are refurbishing the lobby to look more exciting and impressive. The Maintenance Dept. is almost finished renovating the visitor center exterior restrooms.

The Museum Department presented many programs this past winter: three Hidden Battleship tours, the new Power Plant Program, and we hosted a special group from GE/Hitachi. Exploring the

"hidden" ship is best done in the winter when the steel hull keeps the interior cool.

On June 12 we will host our first Firepower Tour focusing on the guns and fire control systems. Guests will enjoy in-depth presentations, lunch and camaraderie and take home an informative CD-Rom. Details on the right.

The Programs Dept. is busy with rentals and planning the Easter Egg Hunt and the May Fantail Film Festival.

The Easter Egg Hunt will feature games, the fabled Easter egg hunt, plus small petting zoo, pony rides, refreshments for purchase, and Buddy the Battleship Bunny!

This May's Film Festival focus is on blockbuster hits. On Friday evenings you can watch a movie on the fantail for \$2 a person. This year we are showing the classics *King Kong* and *Wizard of Oz* along with favorites *Willy Wonka & the Chocolate Factory* and *Raiders of the Lost Ark*. See page 9 for details.

The Battleship's rental facilities are available for meetings, weddings, receptions, birthday parties, and more. Spaces are the fantail, marine compartment, mess decks and even the whole ship! At night various groups conduct paranormal investigations. On April 9th "Ghost Hunting with Dustin Pari" will be on the Battleship. He is on Ghost Hunters and Ghost Hunters

International. (The event is sold out.)

Over in the Promotions Department they are working on a new design for the Battleship's website and a new brochure. We are also developing a visitor's hand-out for our Battleship guests. A documentary film is in the works and don't forget to visit us on Facebook and Twitter!

Along with other changes on the horizon we will have a new format for *Scuttlebutt* that is better designed for electronic transmission.

Meanwhile, in this expanded edition we asked for articles from our many knowledgeable volunteers who study many aspects of BB55. They are the corps for our historical-related programming for adults and children. They study gunnery, engineering, daily life, ship's history, and more to help bring this ship to life. They also work on various restoration projects. Each month our volunteers give at least 250 hours. In 2009, they logged a whopping 3,663 donated hours!

Another group of volunteers is the Board of the Friends of the Battleship. Eleven people have generously offered their time and talent to serve on this board which will meet in the near future. Stay tuned for updates!

After 69 years the Battleship NORTH CAROLINA is in good stead.

Firepower Program

Saturday, June 12th

(Register by June 4th)

10AM—5PM

Learn about and explore the Battleship's 16-inch, 5-inch, 40mm, and 20mm guns, the fire control system (plot and FC tower) and combat information center

Small group sizes

Lunch included

\$95/\$85 Friends member

Call 910-251-5797

For inquiries & registration. Program limited to 50 participants, ages 16 and older

Interesting Facts from Engineering

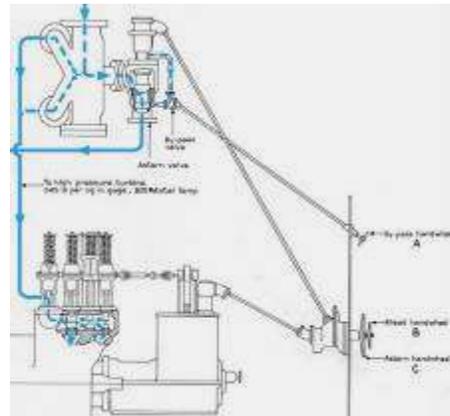
As I was reading through the "Main-Propulsion Turbines and Gears and Associated Condenser Equipment" technical manual, I jotted down some interesting specifications and realized that others may think so too, so let's start from the beginning.

The Battleship's turbines, reduction gears and condensers were designed by General Electric (GE) but only the equipment in Machinery Space #4 was made by GE. The propulsion equipment in machinery spaces 1, 2, and 3 were built by the New York Navy Yard. Our sister ship's (USS WASHINGTON) only GE engine was in her Machinery Space #3 and was the mirror image of the BB55 main engine.

I have done a little research into why GE didn't make the equipment for all four machinery spaces or let the shipyard to make all four and have not found anything conclusive. The only thing that I found was a theory from a mechanical engineer that was related to reliability. The theory is that if one manufacturer made all the engines and something in the manufacturing process caused a failure, then this failure could happen to all the engines. If one engine is made by another manufacturer, then the worst case scenario is that three engines fail and there is still one engine to get you back to port. If you have another theory of the actual answer to this question, please let me know.

Next, let's look at the throttles. It never looked correct: the ahead throttle is the smaller handle and the larger is the astern throttle. The ahead

hand wheel controlled a series of throttle valves through a hydraulic control system. This is equivalent to the power steering system on your car; therefore the hand wheel is easy to turn. The astern throttle hand wheel is directly attached mechanically to the single, astern, globe valve. The main steam pressure is on top of a large valve poppet which made it very difficult to open therefore it requires a larger wheel to get more leverage. It was so difficult to open that if you look to the left and above the throttles in Machinery Space #4, you will see a small valve hand wheel. This



is the bypass around the astern poppet valve. This valve had to be opened first to help equalize pressure above and below the valve which reduced the force required to lift the valve from its seat.

Astern turbine operations

When operating the astern turbines:

- Superheated steam had to be secured and the temperature dropped to 675F within four minutes.
- Max power was 8000 shaft horsepower (SHP) per turbine,

at 133 RPM for 22.5 minutes.
- Half power was 4000 SHP per turbine at 100 RPM for 1 hr and 15 min.

- The limiting factor was the High Pressure (HP) turbine 1st stage shell temperature which could not exceed 900F.

Have you wondered why there are 13 sets of moving blades on the HP turbine, but only 12 stages? That's because a "stage" is defined as a pressure drop which only happens in a nozzle. The 1st stage is the HP turbine is a Curtis stage. This stage consists of a nozzle and a stationary, redirection blade between two sets of moving blades.

Each of the following stages has a nozzle diaphragm preceding a single moving blade.

Did you know that there is a sentinel valve on the cross-over piping between the HP and LP (Low Pressure) turbines that sounded at 65PSIG (pound-force per square inch gauge)? This

was an audible alarm to the throttle man that there was excess pressure in the cross-over piping. It's interesting that this valve was plumbed to the bilge like a relief valve where they were normally open to the atmosphere where they could be heard.

Well, that's some of the interesting facts I found on the first two pages of the technical manual. I will write more in the future if I find anything of interest in the remaining 66 pages.

Kirk Binning

Keeping Secrets

Throughout history the armies of nations in conflict have tried to protect their tactical and strategic plans from the enemy. This was never truer than during World War II when the opposing military organizations had sophisticated eavesdropping and monitoring capabilities to try to unravel the secret codes of their enemy.

During World War II the Germans had an extremely well organized and pervasive communications monitoring capability. They were successful, to some degree, in breaking some of the Allied Codes such as the weather forecast and merchant shipping codes. These were extremely beneficial for the Luftwaffe's reconnaissance planes and especially for the German submarine service.

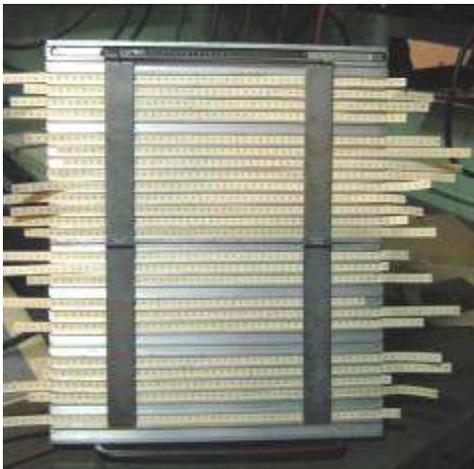
The Japanese also had an eavesdropping and monitoring service but it wasn't as sophisticated as the Germans.

On the Allied side, the Polish, British, Russians and Americans were extremely diligent in monitoring Axis communications and exploiting them which eventually helped to shorten the war.

The United States used several very successful and secure methods of communicating tactical and strategic information throughout their armed forces. The Navy used two of these systems almost exclusively in ship-to-shore and ship-to-ship secure communications. The first, and most sophisticated device, was known as the ECM Mark II (CSP-889) which was an electro-mechanical machine that automatically enciphered and

deciphered messages. On BB55 this machine was located in the Code Room next to Radio Central on first platform. (An example on loan from the National Cryptological Museum is on display.) The ECM Mark II was operated solely by officers.

The second device that was available to BB55 was the "strip-cipher" device (CSP-845).



The strip-cipher was a manual device that was less sophisticated than the ECM Mark II and was operated by the Radio Supervisor, an enlisted man, in Radio Central. Typically, messages for decipher by the strip-cipher device were time perishable and less critical than those for automatic decipherment by the ECM Mark II.

The strip-cipher device was an evolutionary improvement over its predecessor the cylindrical cipher. (In the movie DaVinci Code they used a cylindrical cipher to try to determine the code.) The cylindrical cipher was used in World War I for tactical se-

crete communications.

The strip-cipher was an improvement because it allowed for more opportunities to vary the codes in use. The device was metal with channels and came with a set of paper alphabet strips. The channels allowed the operator to change the specific code per line in use at any one time. The paper strips could be changed hourly, daily, weekly or per Operational Plan (OP) as necessary.

There were 30-channels for use with the alphabet strips and only 25 of these were used on any OP. Once the strips were placed in the channels the only operation necessary was to slide the strips horizontally along the channel until an English word appeared vertically.

BB55 received hundreds of Morse Code enciphered messages daily in 5-letter groups by a Radioman listening to a Fleet Broadcast frequency. Most of these messages were deciphered by the ECM in the adjoining Code Room and only three or four messages a day were deciphered using the strip-cipher device.

There is no indication that during World War II either of these systems were ever exploited by the Axis powers. The ECM Mark II was retired in 1959 from use because it was "just too slow."

Cort Barnes



Fire Control Computers

The USS NORTH CAROLINA, commissioned in 1941, was a modern battleship due in part to the computers that aided in the targeting and firing of the ship's weapons. Many people are amazed when you tell them that in the early 1940s there were computers on the ship.

Located on the First Platform are two Mark 8 Rangekeepers in Main Battery Plot and the four Mark 1A Computers in Secondary Battery Plot. They were made by the Ford Instrument Company.

The Mark 8 Rangekeeper was used to compute the firing solutions for the ship's massive 16 inch/45 caliber main batteries. These guns were designed for use in ship to ship engagements. However, after the Pearl Harbor attack and the United States entry in WWII the battleship's role shifted. With the advent of airpower and aircraft carriers, most of the major sea battles in the Pacific theater were fought by combatants who never saw each other. The battleship's role became to protect the carriers and provide gunfire support for the invasion forces on their island hopping campaign across the Pacific.

The Mark 8 Rangekeeper was an integral part in providing accurate targeting information to the 16-inch guns. The Mark 8 received information from a number of sources: Spot 1 and 2 Fire Control Directors, radar, visual information from the ship's lookouts, the ship's pitometer and gyroscopes. It was also linked to a Stable

Vertical (gyroscope) in Plot.

Numerous complex variables involving range, speed, and ballistics were fed into the Mark 8 computer which calculated the firing solution to put the round on target. The computer was able to update this information quickly as the guns fired at a rate of one round every 30 seconds.

The Mark 1A Computers located in Secondary Battery Plot (5-inch guns) were not only used for providing targeting information for ship to ship or ship to shore bombardment but also for targeting enemy aircraft as part of the ship's formidable air defense capabilities.

The primary difference between the Mark 8 and the Mark 1A was that in addition to range, bearing and speed the men needed to factor in that the target was generally not on the same horizontal plane as the ship. The target (enemy aircraft) was moving at a much higher rate of speed and course changes came much more rapidly. Therefore, calculating the point in space where the target was at any given moment was much more complicated and required more calculations than that of an enemy ship or land mass. The Mark 1A computer was linked electrically with the Mark 37 Fire Control Director as well as a Stable Element (gyroscope).

Both the Mark 8 and the Mark 1A were mechanical analog computers. They did their respective calculations using cams, gears, multipliers and component solvers. They were

state of the art as the high speed digital microprocessors of today's computers had not been invented. Specific information was sent to each computer electrically, mechanically and manually by turning knobs, cranks and dials. General Electric provided the switchboards that tied the components together.

The Mark 1A computers weighed nearly 3000 pounds each and needed many electrical cables to operate. Ship designers had to take these factors into account and built full-scale wooden mock-ups of main and secondary battery plots in a warehouse. Space was tight for the switchboards and computers and the many men needed to operate them.

Main and Secondary Plot are located three levels below the main deck in order to protect them from enemy bombs or torpedoes. They are within the ship's armored citadel and were designed so they could be sealed airtight for up to 10 hours. Plot was one of the few spaces on the ship that was "air conditioned," (cooled, purified and re-circulated air) although the air conditioning was to keep the equipment cool and not intended for the crew's comfort.

It is interesting to note that on the Iowa class battleships these very same model computers were used to fire 16 inch guns during Operation Desert Storm (8/1990-3/1991), a testament to their design and durability.

Frank Glossl



Computer Mark 1 & Mods. Adjustment Procedure, 1944

A “Second” Pearl Harbor—The West Loch Disaster



On Sunday, 21 May 1944 our ship, USS NORTH CAROLINA [BB55], was in Dry Dock #4 for repair to our rudders. Other preparations were being made on board for our next operation, the taking of Tinian and Saipan Islands. A shipmate, Joe Klineburger and I came topside to get a little air and we assumed our usual position on the 36-inch searchlight #1. We had been there only a few minute when there was terrific BOOOM and shortly the concussion wave struck us. We knew this was something big. We began to look around and saw all the signalmen on the Signal Bridge, up on their toes using long glasses and binoculars, trying to see what was happening.

Lesser explosions continued in rapid succession followed by dark clouds of black smoke rising from the direction West

Loch, Pearl Harbor, where we later learned 29 LSTs were loading in preparation for the Tinian-Saipan Operation. We could barely make out what was going on, but subsequently learned that six LSTs and three LCTs had been destroyed by fire and exploding ammunition with a loss of 559 men killed or injured.

Joe and I had to return to our duties and did not learn of the extent of this catastrophe until much later. On 24 May our ship was underway and headed for Majuro, Marshall Islands. No news of this event was released to the public until several months later.

*Charles M Paty RM2c – CR
Division USS North Carolina*

Editors Note: 29 LSTs were nestled together in six berths at West Loch Pearl Harbor preparing for an attack on Saipan. At 3:08 p.m., an ex-

plosion blossomed out of LST-353. Apparently the blast originated near the bow of LST-963, where Army troops had been unloading mortar ammunition. Red hot fragments showered the clustered LSTs, igniting gasoline drums lined up on the exposed forecastles. In minutes, the explosions began to rip the invasion fleet apart. Fires began to blaze from stem to stern. The explosions continued, damaging more than 20 buildings shore-side at the West Loch facility. For 24 hours fires raged aboard the stricken ships. Dead were 163 men and 396 were wounded. Investigations could not pinpoint the cause. During the explosions and fires, firefighters had prevented further loss of ships that would have delayed the invasion of Saipan. As it was, only a day was lost in the departure of the invasion fleet.

The Legacy Continued



A print of the Ship of the Line NORTH CAROLINA (1820-1867) now hangs in the officers' wardroom on the submarine NORTH CAROLINA. Space is premium on a submarine so a white board was placed on the back side of the frame. They can flip the entire picture around and use the white board during training!

“Everyone who has seen the picture thinks it is a fabulous addition,” wrote CDR W.E. Schlauder, USN, Commanding Officer of USS NORTH CAROLINA (SSN 777). We “thank the Battleship for your kind donation.”

Note: Funds from the Friends of the Battleship purchased the original 1827 watercolor painting in our collections.

In Their Own Words: Secondary Battery Plot

We used to have switchboard races during quiet times. We would make up and call out dummy set ups clocking the operator's response by stop watch. The results were posted....

Secondary Battery Plot was the computing station for the 5-inch, 38 caliber dual purpose gun battery. These guns were used against air and surface targets and in shore bombardment against shore installations, troops and vehicles. Visual or radar ranges, bearings and elevations to the targets were received in Plot. Gun lead angle and elevation were calculated at the computers and transmitted to the [gun] battery ensuring, hopefully, that the projectile and target would meet at the predicted point.

The fire control switchboard in Plot conveyed complete flexibility in electrical connections between the four gun directors which tracked the targets, the four computers which solved the fire control problem, and the ten gun mounts which were "aimed" by the computer solutions. The switchboard operator could connect any director to any computer to any gun mount or combination of mounts by throwing the rotary switches to the desired set up. This allowed the ship to

quickly change set ups in response to battle damage, equipment failures or visibility problems. Being fast on the switchboard was an important skill and a competitive one. We used to have switchboard races during quiet times. We would make up and call out dummy set ups clocking the operator's response by stop watch. The results were posted and, although gambling was officially illegal, it is suspected that certain monetary or edible possessions changed hands during competition.

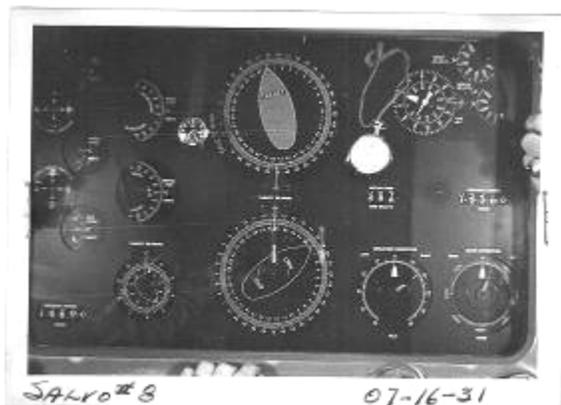
Because of the high speed and short advance notice of air or submarine attacks we normally operated at sea in Condition Three. This meant that one third of our secondary battery battle stations were kept manned around the clock. Our crews stood four hours on watch (in the battery) and eight hours off (for sleep or regular duties) on a repetitive cycle. When under attack we went to Condition One in which all battle stations were manned. For lengthy periods of combat, Condition Two

could be set with one half of the battle stations manned. Thus one half of the crew could be released for rest or meals while the others maintained reduced around the clock fire.

The ship's crew...had precious little locker space available to them. Our plotting room crew had a tremendous advantage as under the deck plates...were wireways with plenty of extra unused space. Under those deck plates was all manner of contraband such as hobby materials, cookies from home, snacks brought aboard when possible, leftover treats from the mess hall, and anything else that would not survive the periodic locker inspection in the living compartments. I later learned that some enterprising sailors found a recipe and produced hard cider under those deck plates after the battle for Okinawa.

Capt. Tracy Wilder, USN (Ret.) then Ensign Wilder, 1944-1945.

In Their Own Words: Secondary Battery Plot



Note the watch sitting on top

After each enemy air attack the ship was required to submit a Battle Report in considerable detail. In all the excitement of battle people's memories of what happened varied considerably and it was difficult to put together an accurate Battle Report so we came up with the idea of taking pictures of the computers during air attacks in order to assist us in reconstructing the attacks for the reports. We mounted a 35mm camera over each of the four

computers. The cameras had a remote control to a photographer in the plotting room who took the pictures during air attacks. The system worked fairly well except on occasions when the photographer, in the excitement of the attack, would forget to take the pictures.

Capt. James M. Mason, USN (Ret.) then Lt. (jg) Mason.



Light Anti-Aircraft Weapons

The Battleship is an impressive anti-aircraft weapon but it didn't start out that way. The NORTH CAROLINA was originally fitted with twelve (12) 50 caliber Browning machine guns which lacked range and firepower. They were mounted on the main deck, two on each side of Turret II and four on each side of Turret III. Heavier firepower was provided by four quad 1.10 inch mounts where the current 40mm mounts are below Spot 1 and Spot 2, so the ship started with 28 light anti-aircraft barrels and ended with 108 barrels (60 x 40mm and 48 x 20mm) by the end of the war.

First I would like to give credit to the website

www.navyweaps.com and the book *US Naval Weapons* by Norman Friedman, Conway Maritime Press, 1983, for most of the information in this article. Of course, this work would not have been possible without the assistance and resources of BB55 Museum Services.

Theory and Doctrine of Light Anti-Aircraft Artillery

To figure out why the designers originally equipped the ship with such a meager anti-aircraft suite, one has to understand the theory behind the design. Between the wars, aircraft weren't that capable. They weren't that fast, didn't carry very big bombs (compared to a shell from another ship) and weren't that accurate in delivering the weapons. As a reference, think of our Kingfisher. It carried two 100 lb bombs, two 30 cal machine guns, and cruised at 119 mph. It was not much of a threat against a ship designed

to take a 14 inch shell. The aircraft and weapons were unlikely to do serious damage to a maneuvering capital ship, but there was a danger that strafing attacks could injure/damage unprotected personnel and equipment on deck. The original thought was that the light anti-aircraft weapons would make it difficult for these lightly armed attackers to operate near the ship.

As the attacking aircraft became more capable (faster, carrying bigger bombs and more accurate) upgrading the ship's defensive weapons took on new importance. But the Navy still lacked the fire control, weapons, and ammunition to reach out and destroy enemy aircraft before they got to the ship.

The Navy had figured out that level bombing from high altitude didn't constitute a serious threat. Level deliveries weren't very accurate. The time-of-fall of the bomb was such that a maneuvering ship could avoid the weapon as long as there weren't many attackers.

The biggest threat was thought to be dive bombers. Dive bomb deliveries were more accurate and the time from weapon release to impact was much shorter. The Navy determined the time between the ship's detection of the attacker and bomb release could be as little as 30 seconds. Before radar, the ship couldn't detect and target the attackers far enough out to prevent the attack, but they could harass the pilots enough to spoil their aim and make them miss a maneuvering ship. The mission was to harass bombers attacking the NORTH CAROLINA rather than the

eventual mission which was to be part of a screen, throwing up a curtain of anti-aircraft fire and protecting nearby aircraft carriers.

Rate of fire and muzzle velocity values are important because as we consider various weapons, it appears that the Navy felt they had to have certain numbers to defend against aircraft.

Muzzle velocity is important because it determines target lead angles and is a component in determining the effective range of the weapon. The Navy wanted a muzzle velocity around 2800 feet per second (fps). The slower the bullet, the more you have to lead the target. If the bullet travels one mile in three seconds (40mm) against a 240 mph aircraft, the lead is almost 1100 feet and you'll need a computing gun sight. If you're shooting a laser at the speed of light, you can pretty much aim directly at the target and that's why Captain Kirk (*Star Trek*) shot lasers.

The Navy seemed to be looking for a rate of fire of about 500 rounds per minute (rpm) from a light anti-aircraft mount or single weapon. As the bullets got bigger, the rate of fire for each barrel decreased. You can compensate by adding more barrels to increase the number of rounds per minute going down range to the target. That's why the Battleship had Quad 1.1s and then Quad 40s. The Bofors fired at 160 rpm so with four barrels they achieved 640 rpm if the loaders kept up.

(Continued on page 8)

Light Anti-Aircraft Weapons *continued*

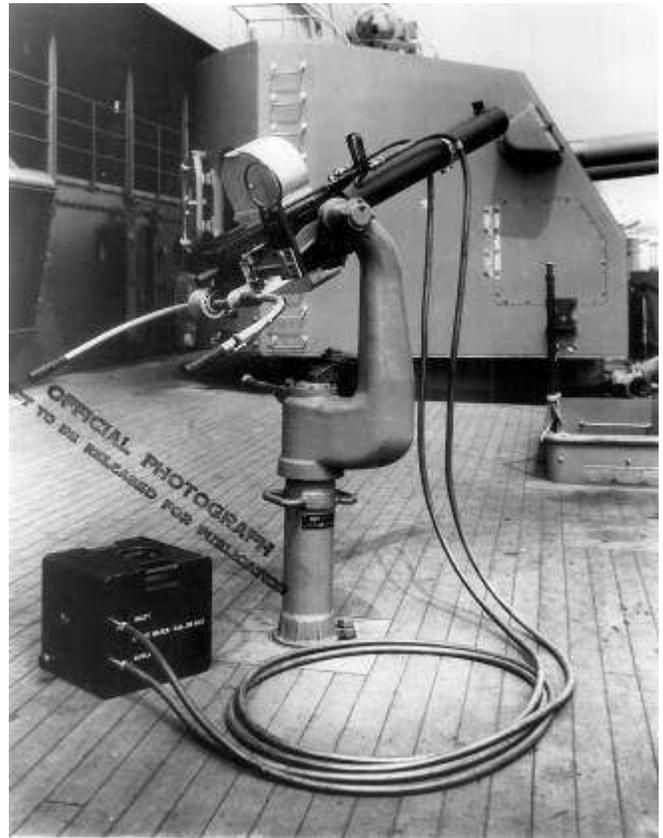
Proximity fuses and radar would have a dramatic impact on anti-aircraft weapons, but in 1940 these advances weren't available so the only solution was to put up a lot of bullets as fast as possible. [The Battleship was designed and built in the 1930s.] The trade-offs were bullet density against the size of the bullet. The probability of a hit is better if you shoot a lot of bullets. The probability of a kill (given a hit) is better if your projectile is bigger. This was an important consideration in the anti-kamikaze campaign when the Navy realized that the 20mm and 40mm projectiles couldn't stop an aircraft coming directly at the ship. The Navy gunners could hit them with the 20mm and 40mms but they needed a three-inch shell or larger to stop them in their tracks.

Enough theory. The best weapons available to the Navy in 1940 were the Browning 50 caliber water cooled machine gun, developed near the end of WWI and the Quad 1.10 developed in the early 1930s.

The Browning 50 Caliber Machine Gun

The Browning Machine Gun fired a 1.7 ounce solid bullet at a rate of about 500 rpm, a muzzle velocity of 2900 fps and an effective range of less than a mile.

The Browning was water cooled and fired rounds from a 100 round belt. The Navy doctrine was to squeeze the trigger and walk the bullets into the target. A 100 round belt lasted about 14 seconds. The weapon's effective range was less than a mile, so this



whole evolution occurred pretty quickly and by the time the complete belt was expended, there was no time to load another belt of ammunition except to be ready to engage a different target.

The weapon was water cooled because they weren't firing in bursts which would allow an air-cooled barrel to cool down. Interestingly, the air-cooled version of this weapon is the current light anti-boat weapon used by many navies. If you just fire 10-15 round bursts, the lighter air-cooled version provides a lot of firepower. It just wasn't a very good anti-aircraft weapon. Without a self destructing charge, the attacking pilot was not too distracted unless the ship got a lucky kill

shot with a 1.7 oz slug.

The Browning 50 calibers were replaced by the Oerlikon 20mm in much greater numbers. The Oerlikon threw a tracer/high explosive self destructing projectile that was 2.5 times the size of the Browning projectile at approximately the same rate of fire and muzzle velocity. The Oerlikon's effective range was also slightly greater (about a mile), but the big benefit was the increase in effective firepower from the bigger projectile.

Stay tuned, next issue we'll talk more about the Quad 1.1 mounts and the Oerlikon 20mms.

Ken Rittenmeyer

Fired at several planes crossing the bow from port to starboard. No planes came in on the starboard bow. Fired about 200 rounds. There were no casualties or jams.

*DC Langdon, Coxswain,
Gunner on Number 5
Browning 50 Caliber
8/24/1942*

Calendar of Spring and Summer Events

Battleship Easter Egg Hunt

April 2nd (Good Friday)

9:30 am, 11:30 am, 2:00 pm

Join us for a fun-filled Easter Egg Hunt in Battleship Park. Children will have loads of fun in Battleship Park with a traditional Easter egg hunt, candy, games, pony rides, petting zoo., and the Buddy the Battleship Bunny! This wonderful holiday activity is only \$5 per child. Recommended for ages 2 to 9. Please bring your own basket. Pre-registration is required: 910-251-5797.

Battleship Alive!

May 8th; 8:00 am – 5:00 pm

Watch and interact with World War II living history interpreters as they bring the Ship to life by re-enacting daily duties & drills. Free with Battleship admission.

Fabulous Fantail Film Festival

Every Friday night in May (May 7th, 14th, 21st, & 28th)

8:30 pm

Enjoy watching movies on the fantail of the Battleship underneath the stars. Tickets are \$2 a person and go on sale at 7:30 pm. Chairs are provided but camp chairs & blankets are welcome. Popcorn & drinks will be on sale. *NEW! Buy dinner on May 21st and 28th when our new sponsor, Chick Fill A, will be here! Other movie sponsors are Time Warner Cable and Pepsi.*

May 7th – *Raiders of the Lost Ark (1981)*

May 14th – *King Kong (1933)*

May 21st – *Willy Wonka and the Chocolate Factory (Gene Wilder, 1971)*

May 28th – *The Wizard of Oz (1939)*

USS NORTH CAROLINA Battleship Association Annual Crew Reunion

May 5th – 8th

The crew of the Battleship NORTH CAROLINA and their families return for their annual reunion.

On Memorial Day the Battleship switches to summer hours: 8 AM—8 PM; last ticket sold at 7 PM

45th Annual Memorial Day Observance

May 31st; 5:45 pm

Remember those who gave their lives in service by honoring veterans at the Battleship's traditional Memorial Day Observance featuring a military guest speaker, an all-service Color Guard, a 21-gun salute by a Marine Corps Honor Guard, a military band, *Taps*, and a memorial wreath cast onto the waters. FREE.

Museum Ships Weekend—Azalea Coast Amateur Radio Club

June 5th – 6th; 9:00 am – 4:00 pm

Battleship NORTH CAROLINA will be one of 63 ships world wide participating in this annual event. The radio club will operate voice and Morse code stations using original equipment when possible. QSL with a SASE to P.O. Box 4044, Wilmington, NC 28406. Contact is Allan Pellnat at kx2h@att.net.

Firepower Program

June 12th (register by June 4th); 10AM—5PM

An engaging, in depth program with presentation and exploration for adult learners covers the workings of the ship's guns and fire control system that enabled the ship to find and hit targets. Tickets are \$95 or \$85 for Friends members and active military. Please call 910-251-5797 to register or for more information.

Battleship 101

June 19th; July 17th; August 21st

10:00 am – 4:00 pm

Ship volunteers stationed throughout the ship engage visitors in specific subjects and areas including: gunnery, radar, sickbay, galley, engineering, and daily shipboard life. Free with Battleship admission.

Keeping BB55 Ship Shape



Bill Barnes cleaning brass fixtures (below) and plates along the tour route. See the difference right.



“...a complete silver plating facility was transferred from the warehouse (at Pearl) to the base of Sky One (5-inch director). The equipment included vats, silver bars, acid and other equipment needed for silver plating. This turned out to be a brass polisher’s dream from heaven. It also explains why all of the round brass switches on the electrical switchboards, the firing keys on the stable elements in Secondary and Main Plot and many other brass fittings around the ship are silver plated.”



George Burn removing paint from parts of the steering wheel located on the bridge. Brass is revealed below layers of paint (below left) In 1941, the steering apparatus (below center) was hidden by sensors. Newly painted and polished engine room telegraph (below).



- Business Office:** Director: Capt. Terry Bragg, USN (Ret.)
Maintenance Director: Roger Miller; Comptroller: Elizabeth Rollinson
Candy Edwards, Kim Mintz
- Maintenance:** Robert Hall, Terry Kuhn, Steve Lewis, Phil Southworth, Gary Pietak, Jason Boyd
- Museum:** Kim Sincox, Mary Ames Booker
- Programs:** Danielle Wallace, Shelly Robinson, Christine Jamet, Julia Yannetti
- Promotions:** Heather Loftin
- Ship’s Store:** Leesa McFarlane, Cathy Shipman, Devin Buie, Tara Banks, Sabrina Porter, Joy Lynch, Joanna Zazzali
- Night Watchmen:** Danny Bradshaw, Bill Parr, Brian Gibson