

PADDLEWHEEL AIRCRAFT CARRIERS

A Prime Example of Necessity Being the Mother of Invention

~ Introduction ~

During a large percentage of my working years, I was associated with the design, construction and testing of nuclear-powered aircraft carriers. I witnessed and at times even made small contributions to some pretty innovative things. Consequently, I have a lot of related 'sea stories' to share. But none of them are quite as unusual as this tale of two aircraft carriers that were propelled by paddlewheels! Anyone familiar with modern-day carriers should be intrigued, if not downright amazed by what follows.

Bill Lee

Following the attack on Pearl Harbor, two things became readily apparent: aircraft carriers would play a much larger role in warfare than had previously been envisioned, and the success of carriers would depend largely on the skills of well-trained pilots.

A massive plan was instituted to qualify 45,000 Navy pilots. Three huge naval aviation training schools were set up. But there was a practical problem. Although it was relatively easy to teach fledgling pilots to fly, the skills required to fly on and off of a carrier was something that could only be perfected through actual experience. Before pilots could be assigned to combat duty on aircraft carriers, they had to demonstrate a proficiency for underway flight operations. The Navy stipulated that trainees had to take off and land a minimum of ten times (later reduced to eight) in order to become qualified.

Complicating this problem, there were no carriers available for student-pilots to use. The few existing American aircraft carriers couldn't be spared for this duty. Even if carriers had been available for training purposes early in the war, the waters around the United States were infested with enemy submarines and considered unsafe for such operations.



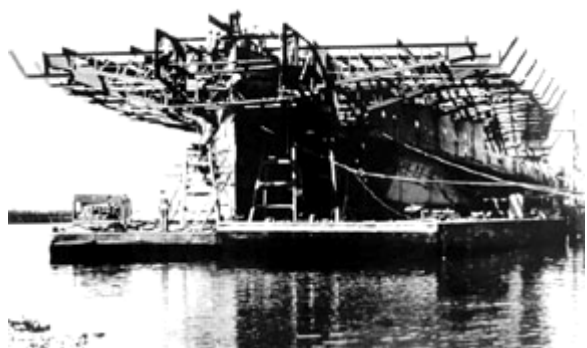
In 1941, Commander Richard F. Whitehead was aviation aide to the head of the Navy's Great Lakes Training Center, located about 35 miles north of Chicago. Months before Pearl Harbor, when America was feverishly preparing for the inevitable, he had advocated converting existing lake steamers into training aircraft carriers. No one in the Bureau of Ships hierarchy listened. But after the Japanese demonstrated the potential of naval air power at Pearl Harbor, the idea gathered supporters. When it got to Admiral Ernest J. King, Chief of Naval Operations, he liked the idea. Very soon the Navy was on a fast-track to create a pair of fresh water training carriers.

That effort entailed, strange as it may seem, the acquisition and conversion of two vintage side-paddle-wheel lake steamships! In March of 1942, the Navy requisitioned the Great Lakes' steamship *C&B* from her namesake owners, the Cleveland and Buffalo Transit Company. Her curious name was a combination of the firm's initials. Later that same year the steamer *Greater Buffalo* was similarly acquired. Both of these vessels were a number of years old, built largely of wood and were coal-burning, steam-powered twin side-wheelers; capable of carrying hundreds of passengers on America's inland sea.

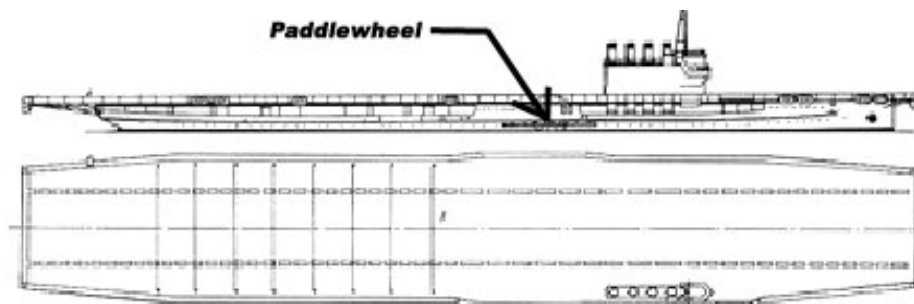


Great Lakes' shipbuilders stripped away their passenger decks. Cut down to their hulls, the two ships looked more like Mississippi riverboats than aircraft carriers. They retained their archaic propulsion equipment, straight stem bows and graceful spoon stems.

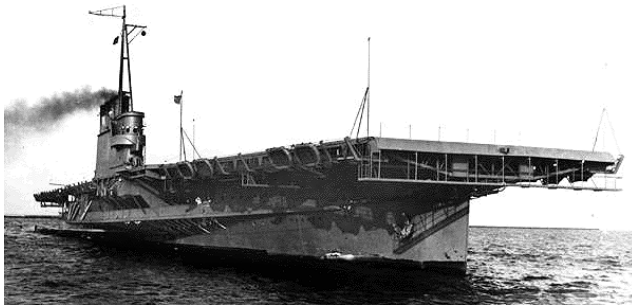
Flight decks were constructed atop each hull and fitted with eight sets of aircraft arresting gear. Both vessels' flight decks had to be extended far beyond their bows and sterns to provide suitable simulations of combat carriers' flight decks.



Combination pilot house/control tower/multiple smokestack structures were erected on the vessels' starboard sides, mimicking the design of combat carriers' island structures. But they had no aircraft hangars, maintenance capabilities, elevators, or catapults. They lacked any armor or armament, since they were intended to only be operated in the safety of Lake Michigan.



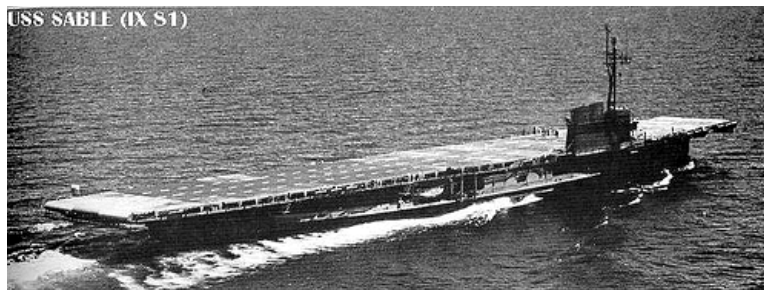
Because they didn't have hangars for storing or servicing aircraft, they presented a most unusual look when viewed from dead ahead at water level; unlike other aircraft carriers. In addition, when operating at flank speed, which for them was a maximum of 18 knots, their multiple coal-fired boilers spewed clouds of dense black smoke in the air.



The former steamer *C&B* became a US Navy miscellaneous auxiliary vessel and was designated IX-64. She was renamed USS WOLVERINE in honor of Michigan, the Wolverine State. IX-64 was commissioned in August of 1942 and immediately commenced flight training operations. WOLVERINE qualified her first pilot on September 12, 1942.

In October, Admiral King made a visit to see the nation's newest aircraft carrier in action. Embarked in WOLVERINE for a day, his four-starred flag flew from her masthead, denoting that she, albeit briefly, was the flagship of the United States Navy.

The WOLVERINE was joined in March of 1943 by the former *Greater Buffalo*; renamed USS SABLE (IX-81). Both vessels measured about 550 feet in length; roughly two-thirds the length of American fleet carriers, but sufficient for training purposes. Together, the two improbable paddlewheel carriers qualified pilots and trained flight deck crews in large numbers, just as Commander Whitehead had envisioned.



WOLVERINE was fitted with a wooden flight deck built of oak planking, similar to the combat carriers of that era. However, SABLE had an experimental metal flight deck, which was a forerunner to the design incorporated in the nation's aircraft carriers that were developed towards the end of World War II. SABLE also was a test bed for non-skid deck coatings, which were applied in checkerboard fashion for evaluation purposes.

Soon, the sights and sounds of multiple aircraft carrier operations became commonplace along the shores of Lake Michigan. A small pier located next to downtown Chicago's massive and aptly-named World War I memorial *Navy Pier* became their base of operations. Each evening, when the carriers returned, off-duty crew members enjoyed Liberty in downtown Chicago. Good duty!



Both of the training carriers were capable of steaming fast enough, when headed into the wind, to accommodate most World War II combat naval aircraft. Some days, their operations took place less than a mile offshore, causing traffic jams on Lake Shore Drive as people stopped to watch. About 300 landings and take-offs were made per day, per ship. No night operations were ever attempted. Day-time training was perilous enough and Midwest winter conditions often made things very dangerous as Coast Guard icebreakers assisted the carriers. Frigid day-to-day operations continued until thick ice forced the carriers to remain alongside their pier.

Although the inexperienced pilots did not have to contend with the pitch and roll of a carrier at sea, they often had to deal with limited visibility due to snow, unpredictable gusts and those ever-present clouds of coal smoke. Cockpit canopies were required to remain open during takeoffs and landings, to allow for a pilot to escape a sinking plane. Cold winter winds whipping into a cockpit presented another hazard they would not experience, once qualified as naval aviators and sent to the Pacific. In addition, the training carriers' flight decks were only 27 feet above the water, significantly reducing the margin of error when approaches were being made.

Future naval aviators were shipped from basic flight schools in Florida and Texas to an advanced flight school at the Glenview Naval Air Station, 25 miles northwest of Chicago.

"We were only there for about three days," recalls a career naval aviator who qualified in 1943 at age 18. *"We spent a couple of days practicing approaches to the training field, and when our instructor felt we were ready, he sent us out to the carrier."*

"I remember doing my practice field landings in February of 1944 with snow piled up so high on both sides of the runway it looked like I was flying into a tunnel," reminisces another pilot-candidate, who later qualified on WOLVERINE.

Landing Signal Officers (LSO's) were part of the Carrier Qualification Training Unit (CQTU) stationed at NAS Glenview. They had their own Disney-inspired logo. During carrier qualifications, LSO's stood on exposed platforms at the training carriers' sterns to help pilots land. Weather permitting, trainees in small groups would leave Glenview airfield seven days a week. Rendezvousing over the white and highly visible Baha'i temple on the lakeshore in nearby Wilmette, they would be given directions to a carrier.



Each pilot, in order to become qualified, had to make several successful landings and take-offs on one of the training carriers. A number of aircraft crash-landed or had other mishaps that extended or terminated their pilots' qualifying efforts. One such incident was recently recorded as part of an oral history program by a former naval aviator:

“My first carrier landing came aboard the USS Sable on Nov. 28, 1944. Each naval aviator candidate was required to complete eight successful landings. A successful landing meant that one didn't crash on the flight deck or land in Lake Michigan.

“I flew upwind on the starboard side of the carrier with the canopy open to the freezing wind and my nerves stretched pretty thin (understatement). As I passed the Sable's bow, I snapped the aircraft into a hard 180-degree port turn. I lowered the wheels, flaps, and landing hook as I flew the aircraft downwind along the carrier's port side. Next came the gentle turn into the landing groove to sight the LSO, receive his "cut" signal, and make my first arrested landing on a carrier.

“Due to the sudden deceleration, when the hook engages the arresting wire, one must lock the canopy open, remove the hand from the throttle, and remove the feet from the brakes. I forgot all three. When my Wildcat hit the deck and grabbed the cable, the canopy slammed forward, my hand shoved the throttle to full power, and my feet applied the brakes! The Wildcat's nose went down and the tail went up. With luck, no damage was done.



“The air boss, who was standing on the deck in the freezing wind in a full-length leather coat, was about 6 feet 4 inches tall, and looked as if he could eat ensigns alive - and very nearly did. Afterward he made his way to shepherd the next aviator to come aboard and was mumbling something about ‘idiots in airplanes’.

“This was the first of many hundreds of carrier landings I experienced in my naval service, but I will always remember that first one on the USS Sable.”

Pilots who passed the test were quickly assigned to fleet or escort carriers, usually in the Pacific. Those that could not qualify because they were unable or just plain afraid to land properly were 'washed out' and flew back to Glenview in disgrace to be reassigned to less demanding naval aviation duties. Some of them quite literally washed out.



Roughly 120 planes missed the carriers' flight decks and plunged to the bottom of Lake Michigan. Eight pilots were lost, but the remainder were rescued by the Coast Guard, using two winterized watercraft which trailed along behind the carriers during flight operations.

A problem the two paddlewheel carriers occasionally faced was a lack of sufficient wind over the deck (WOD) for safe flight operations. Certain WOD minimums were required in order to facilitate the landing of heavier and faster naval aircraft such as Wildcats, Hellcats, Corsairs and Avengers. When there was little or no wind on Lake Michigan, operations often had to be curtailed because the carriers couldn't generate sufficient speed on their own to meet the WOD minimums. Most likely, attempting to qualify pilots in marginal WOD conditions probably contributed to the number of aircraft lost.

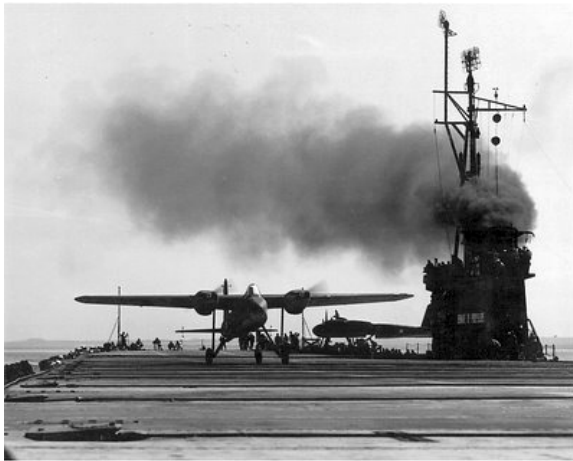
Occasionally, even today, one of those lost aircraft is discovered, recovered and removed from Lake Michigan; frequently to be restored to near-original condition for museum display. Often, when such aircraft are dried out, the pilots' log books and other paperwork can also be recovered and restored; thanks to the cold fresh waters of Lake Michigan that help enhance their preservation for decades.



By the time each successful pilot was shipped out to a fleet or escort carrier, he typically had experienced two years of preparation and had between 300 and 360 hours of flight time under his belt. Among the thousands of pilots who qualified in the USS SABLE was a then 20-year old Lieutenant, Junior Grade, future-President George H.W. Bush; depicted here later in the war, flanked by his two aircraft crew members.



Recently, President Bush recalled his initial carrier qualification training experience: *"I remember those Great Lakes flights very well in the open cockpit that winter. Coldest I ever was in my life."*



In August, 1943, the SABLE also briefly served as a floating base for operational testing of a little-known experimental weapon. The TDR-1 (Torpedo Drone) was a remotely controlled small airframe originally developed to serve as a target. Then, the Navy decided to equip drones with weapons and TV for remotely controlled guidance purposes, thus creating the world's first TV-guided missiles. Two of these curious craft were successfully launched from the flight deck of the USS SABLE.

For some reason, they flew off her stern as she steamed backwards. This feat was made possible because the ship had a rudder built into her bow, originally placed there to facilitate docking when she was a paddlewheel steamer. A fortuitous feature, to be sure!

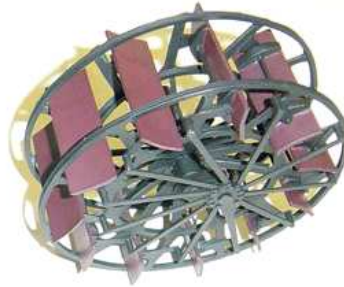
The TDR-1 looked much like conventional aircraft, but in actuality, it was a missile. Built mostly of wood, the feasibility of at-sea deployment of this weapon was first demonstrated on a paddlewheel flattop. The TDR-1 was tried in combat in late 1944 and made a few successful precision attacks on Japanese homeland targets, guided by manned control aircraft. It was withdrawn from combat, because of its inability to deliver the massive amounts of ordinance considered needed to crush the enemy.



By the end of World War II, approximately 116,000 carrier landings had been made on the two ships. A total of 17,820 pilots were qualified for combat carrier duty and another 40,000 sailors were trained on Lake Michigan to be part of fleet carrier deck crews. An unknown number of LSO's also learned their trade on the job...on Lake Michigan.

Both ships were decommissioned in November of 1945; then turned over to the Maritime Administration for disposition. Later sold for scrap, the Navy's World War II training carriers were but a memory by 1948.

~ Postscript ~



One interesting, visual reminder of the paddlewheel aircraft carriers is a rare, vintage motion picture film clip of the WOLVERINE in action. It can viewed on the Internet at:

<http://www.britishpathe.com/record.php?id=60671>

Tales of the ingenuity, inventiveness and rapidity with which the Navy as well as the entire nation successfully responded to the challenges of World War II continue to amaze me, as I periodically discover some of the lesser-known accomplishments, such as this unlikely story of the world's only paddlewheel aircraft carriers.



All of which is just another indication why I believe The Greatest Generation is so aptly named. Their ranks may be thinning, but their exploits will live forever.

~ Addendum ~

Vintage still photographs do not provide much detail of the numerous unique features found in these two vessels, following their conversion. But vivid close-ups of a large and beautifully detailed model of the first paddlewheel aircraft carrier built for an aviation history museum in Kalamazoo, Michigan do so quite nicely.



The following additional photos of this model serve to augment the descriptions of some of the features of these unique naval vessels. Numerous additional photographs of this exquisite model can be seen at the following web site:

<http://www.modelboats.co.uk/news/article.asp?UAN=47&v=1&sp=332733698988332916368>

(All the photographs in this addendum are courtesy of master model builder Bill Waldorf)



Figure 1 - Details of starboard paddlewheel

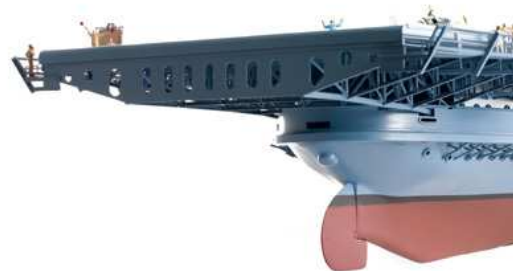


Figure 2- Extreme cantilevered overhang of aft portion of flight deck and main rudder



Figure 3- Bow, showing unique auxiliary rudder almost hidden in vessel's forefoot



Figure 4 - Uptakes from boilers and island structure



Figure 5 - LSO on platform at extreme aft-port corner of flight deck



Figure 6 - A successful 'trap'