

THE MIDWAY-CLASS CARRIERS: FIRST FOR THE ATOMIC AGE



USS CORAL SEA (CV-43) was the last of the *Midway*-class trio to be commissioned. Her air groups saw considerable action in the Vietnam War. After more than 40 years of service as a frontline carrier *CORAL SEA* was retired and broken up.

Months before Pearl Harbor the Navy began design studies that envisioned a quartet of giant new carriers intended to improve on the then-building Essex-class. The result would be the 45,000-ton Midway-class, the largest warships ever built for the US Navy.

It was an unusually hot summer in Washington, D.C., when naval planners gathered to tackle a thorny new project. Given a mandate to conceive a giant new class of battle carrier, heated round table discussions commenced in an atmosphere as scorching inside the bureau of ship as temperatures outside. No two people shared the same reactions to the encyclopedic masses of data on which judgements would be based.

At issue was not only the concept of how to configure the envisioned gargantuan 45,000-ton vessels, but debate if they were needed at all. The time was 1941. Though the United States was not officially at war disastrous events in Europe and Asia foretold that the thin thread of America's neutrality would soon snap under the weight of Axis aggression. A year earlier President Franklin D. Roosevelt's administration had fortuitously ordered an unprecedented naval treaties. If the United States were to become the fee world's 'Arsenal of Democracy' it would need a strong modern navy to counter the sizable fleets of Japan, Italy and Germany. Foremost in these fleets would be the large new 27,000-ton Essex-class aircraft carriers then under construction. Fast, tough, purpose-built ships embodying the very latest naval technology, the 24 Essex would become the backbone of the carrier task forces in the 1940s.

But were they enough?

Many were convinced advances in aviation technology were fast outpacing the ships that even then were beginning to take shape at naval shipyards. President Roosevelt, well versed in naval matters, had his doubts. So did the naval planners. Virtually everyone present at the planning forum - the nation's most respected naval authorities, including Adm. Ernest J. King, Commanding NavAir - held differing views regarding which course to follow. Some advocated larger numbers of smaller carriers that could be more readily dispersed throughout the fleets. Others favored medium-sized



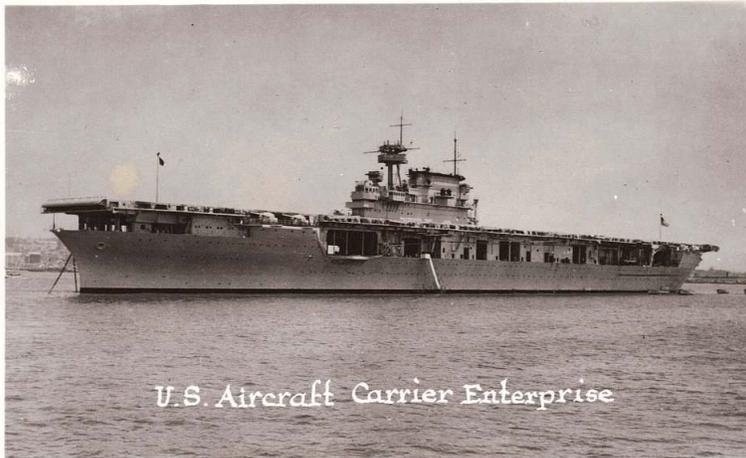
USS Essex (CV)

carriers that offered the advantage of being more maneuverable, less costly, and easier to build. The only mutually agreed upon was that every ship regardless of size, propulsion, cost, or complexity was a compromise of many requirements. All too aware of the imminence of war, and the prolonged lead time required to conceive complex new warships, President Roosevelt pushed for design studies to begin. Begin they did, in earnest.

REDEFINING THE CARRIER'S ROLE

Conceptualizing a giant new warship was far more complicated than building an entire new city - especially when it came to designing an aircraft carrier. Here the most important consideration was whether or not the ship's design would be subordinated to its air groups, or the aircraft subordinated to the prerequisites of the ship. Much akin to the enigma of whether the chicken or the egg came first, airplanes had long been built to conform to the geometries of the ships from which they flew. Flight-deck length, catapult capability, hangar space, and deck elevator size and location were only a portion of the elements which dictated the size, weight and characteristics of carrier aircraft.

Standard warship theory dominated all seven of the Navy's prewar carriers. Indeed, most



had been converted from cruiser hulls. Initially, the 1920s saw big fleet carriers looked upon as warships first; the airplane merely an adjunct weapons system, albeit a revolutionary one of unlimited potential. Early carriers were intended to fight and defend themselves like any other warship. If need be, their powerful large caliber guns would engage the enemy in ship-to-ship surface warfare. However, fleet battle practice soon indicated

this was a fallacious concept. Evolving tactical doctrine suggested that the carrier itself should be considered a non-combatant - a floating airfield not deployed into the midst of battle. Heavily protected by a screen of escorts guarding against air, surface and submarine attack, the carrier's true worth lay in the strike effectiveness of its air groups rather than in its own offensive firepower. A concept accepted by American naval planners as early as 1935, the three ships of the 19,000-ton Yorktown-class - the first carriers designed from the keel up for this role - mounted only five-inch dual purpose guns. This same philosophy had been applied to all succeeding carriers, including the new *Essex*-class. There would be no more *Lexingtons* and *Saratogas* hefting eight-inch guns.

The development of seaborne radar was to play a key role in determining how best to position a fleet aircraft carrier within a battle group. Now able to continually scan seas and skies well beyond the horizon minimized a fleet's exposure to surprise attack; the greatest nemesis of any warship. When radar was added to patrol aircraft this was extended early warning screen

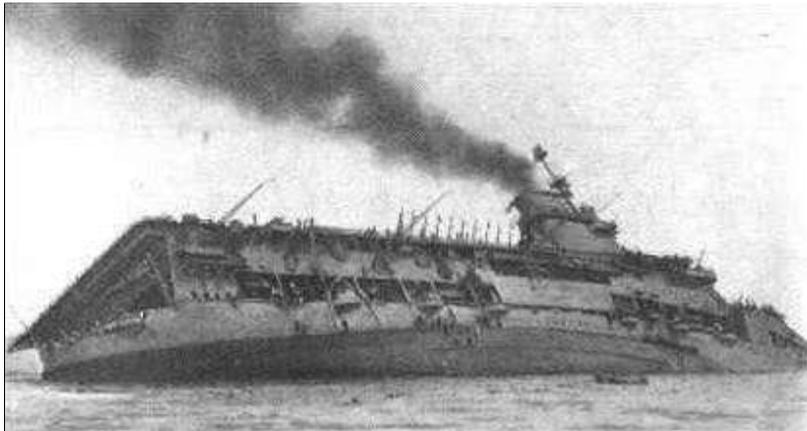
could detect and project enemy fleet movements hundreds of miles distant.

Radar was developed (c.1935–40) independently in several countries as a military instrument for detecting aircraft and ships. One of the earliest practical radar systems was devised (1934–35) by Sir Robert Watson-Watt, a Scots physicist. Although the technology evolved rapidly during World War II, radar improved immensely following the war, the principal advances being higher power outputs, greater receiver sensitivity, and improved timing and signal-processing circuits. In 1946 radar beams from the earth were reflected back from the moon. Radar contact was established with Venus in 1958 and with the sun in 1959, thereby opening a new field of astronomy—radar astronomy.

Within months of the battle carrier planner's first meetings Roosevelt's premonition of war became a dread reality. Suddenly saddled with fighting a two-ocean war, mind-boggling arrays of new priorities confronted the Navy. All at once tremendous emphasis was placed on building escorts and amphibious vessels as well as hurriedly completing the long-planned major warships already under construction. Owing to the notoriety of Japan's sneak air raid on Pearl Harbor, the importance of the aircraft carrier gained more impetus than ever before. Virtually overnight a single devastating raid on the Pacific Fleet rendered the battleship obsolete; the carrier now the supreme warship.

THE *MIDWAYS* FACE EVER EXPANDING REQUIREMENTS

Actual battle experience sharply honed the requirements of the next-generation carriers



Great Britain's early loss of six carriers to submarine torpedoes proved that carriers had to be better protected by sizable numbers of escorts. Seen sinking is *HMS COURAGEOUS*, torpedoed 17 September 1939. A seventh carrier was lost to enemy bombers. As a result, the *Midway*-class was built with extreme compartmentization to ensure survival against torpedo attack.

when the British lost five carriers to submarine torpedoes in the first two years of the war. Foremost was the need for the hull to be not only armored to provide adequate protection from torpedoes, but fully compartmentalized to minimize flooding from torpedo strikes. As the planners proceeded with their awesome project they attempted to take into consideration every element of necessity. Out of these suggestions the planning board outlined six differing concepts for further evaluation. Each projected design embodied variations in size, tonnage, propulsion, armor, logistics

and operating space for the air groups. Yet, before the ink was dry on one proposal, staggering lists of new mandates were added. Hotly contested were how many aircraft should be carried for optimum combat efficiency; how much battle damage could be absorbed without hindering flight operations; how quickly could aircraft be launched and recovered. Added to these were considerations of fuel capacity, habitability, seaworthiness, and adequate defensive firepower.

Nevertheless, early 1942 saw the battle-carrier program begin to take shape - the proposed vessels now designated "CVBs." However, discussions with aircraft designers and builders at BuAir soon dictated additional factors which had to be added to the equation. Airplanes on the drawing boards at Douglas, Grumman, North American, Boeing and Curtiss were becoming larger, faster, heavier and more complicated by the day. New twin-engine carrier-based attack bombers would soon be flight-tested, and experiments with jet engines were proving promising.

Every planner knew radical aircraft could be developed and built far faster than the carriers from which they would fly. Their task enormously magnified by the swift advances in aviation technology, the planner's chore was to conceive a state-of-the-art carrier not only well-suited for the war waging across every sea, but a ship that would accommodate naval airpower's inevitable transition into the dawning jet age.

STEEL, SINEW AND ARMOR TO ENSURE SURVIVABILITY

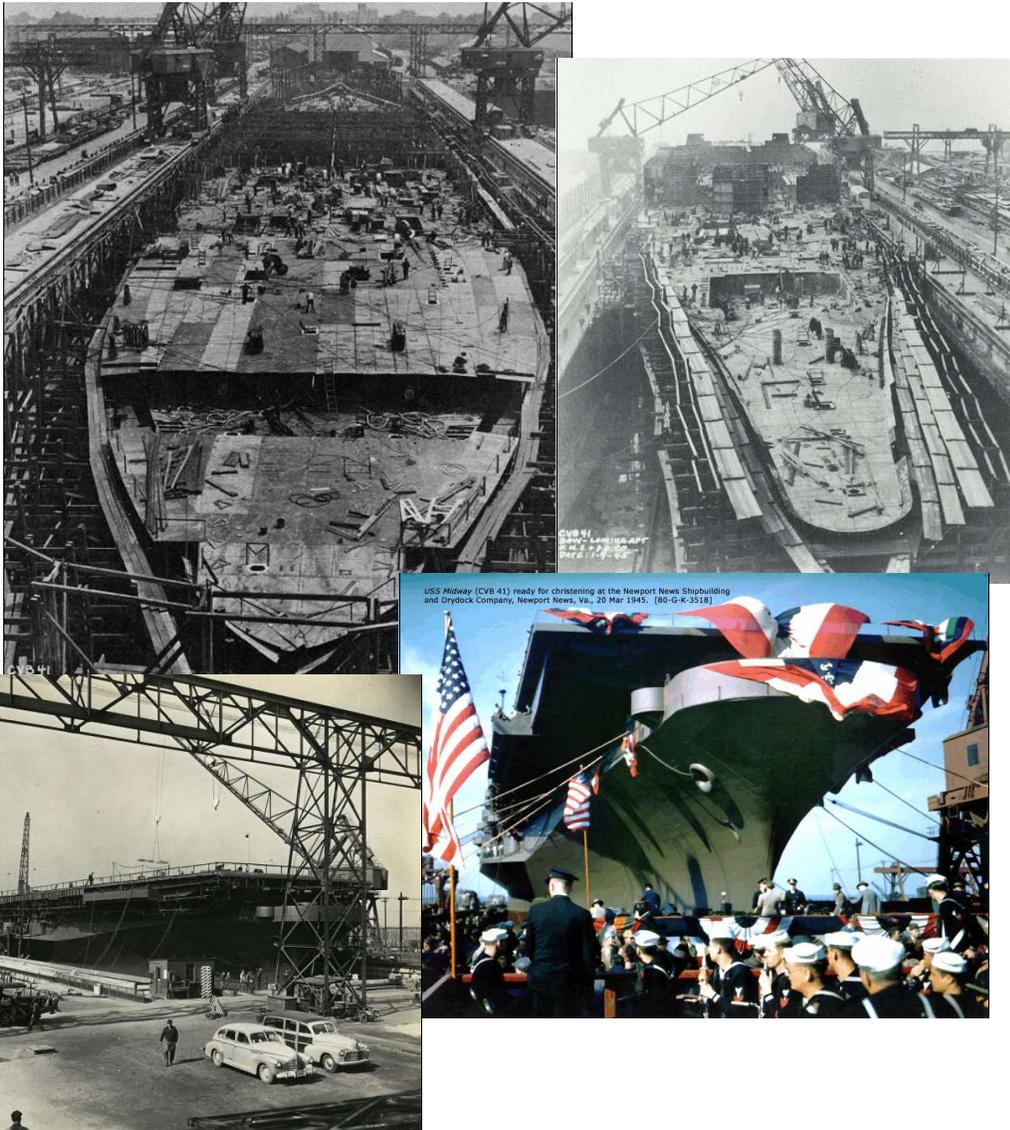
Having solved the power plant hurdle the design concept continued at a rapid pace. Early in February 1942 the Bureau of Ships forwarded a single finalized concept, accepted by BuAir, to the Navy's General Board. The Board rushed the proposal through channels; the top secret documents reaching the Secretary of the Navy's Frank Knox's desk 10 March 1942. What lay before SecNav was the basic parameters of a vessel nearly a thousand feet long (986' OA) rated at 45,000 tons standard displacement. As yet unnamed, the CVB would be extremely well-armed especially around its hull and lengthy hangar deck. Capable of carrying mixed air groups of up to 137 aircraft (46 fighters, 48 dive bombers and 43 torpedo bombers) the ship would have oversized deck elevators and most powerful hydraulic catapults then in existence.

Nov. 1, 1934 - The Naval Aircraft Factory was authorized to manufacture and test a flush-deck hydraulic catapult, Type H Mark I. This catapult was designed to launch land planes from aircraft carriers and was the Navy's initial development of a hydraulic catapult, a type which was to be the primary means of launching land planes from carriers.

These low-silhouetted Goliaths would be propelled by four shaft-gear steam turbines developing 212,000 shp and have a steaming radius of 20,000 nautical miles at 15 knots. An imposing array of armament was intended. This included 18 five-inch 54-caliber Mk-37 D/P guns in deck-side gallery-style sponsoons; 84 40mm Bofors in twin and quad mounts, plus 68 20mm Oerlikons. Ever mindful of topside weight, these lengthy hulls would of necessity have a low freeboard with a beam sufficient to maintain stability even as operation tonnage increased. Long an advocate of American seapower, and convinced of the need for carriers of advanced capability, President Roosevelt quickly approved the initial design studies. Actual lofting and dreafting of the vessel was assigned to the Brooklyn Navy Yard's highly experienced engineering

team. After much budgetary discussion six units were contemplated, with four units actually ordered and assigned ship yard slots. Cost in 1942 dollars was to be \$83 million each.

Due to their immense size it was decided to build the CVBs in drydocks which would simplify and expedite launching. Allocated numbers CVB-41 through -44, the keel of what would later become class-leader USS *MIDWAY* (CVB-41) was laid down 27 October 1943 at Newport News, Virginia. CVB-42, eventually to become the USS *FRANKLIN DELANO ROOSEVELT* (CVB-42), was begun 1 December 1943 at the New York (Brooklyn) Navy Yard.



USS Midway (CVB-41) being built...and being christened.

With the war fully expected to continue until the summer of 1946 the designers made every effort to include lessons learned from operational deployments of the Essex-class in the embattled Pacific. One of these priority elements was the inclusion of more hull

compartmentalization that initially envisioned. Though necessary to ensure optimum survivability, the intricacy of this honeycomb of water-tight compartments and work areas served to impede construction schedules.

FIRST CARRIERS OF THE 'ATOMIC AGE'

Laying the keel of the *CORAL SEA* (CVB-43) at Newport News was delayed until 10 July 1944 due to ever-altering design changes. By then the tide of the war was turning in the Allies' favor. With sufficient numbers of new carriers now in the pipeline thanks to the rapid conversion of nine *Independence*-class CVLs from *Cleveland*-class light cruiser hulls, and the additional antisubmarine support of still smaller CVE escort carriers, early in 1943 it was decided to cancel construction of the fourth unnamed CVB.

It should be noted that the original assignment of name to the CVBs caused some confusion. Two small jeep carriers commissioned in mid-1943 were initially named USS *CORAL SEA* (CVE-57) and *MIDWAY* (CVE-63). When it was decided that such pivotal sea battles better befitted the big new CVBs, the name *MIDWAY* was assigned to CVB-41, with the *CORAL SEA* becoming CVB-42. Subsequently, the two CVEs that originally bore these honored names were respectively changed to USS *ANZIO* (CVE-57) and *ST. LO* (CVE-63); the latter being sunk late in October 1944. When President Roosevelt unexpectedly passed away on 12 April 1945 it was quickly decided to break with tradition and rename the *CORAL SEA* (CVB-42) the USS *FRANKLIN DELANO ROOSEVELT* (CVB-42).

Actually, while most carriers were named for major battles or distinguished sailing-era men-of-war, the Navy's first carrier, USS *LANGLEY* (CV-1) had been named for naval aviation



USS *CORAL SEA* (CVB-43), last of the trio to commission.

pioneer, Samuel B. Langley. Naming the "FDR" set the precedent of naming carriers after presidents - still in vogue today. Moving down one slot, unnamed CVB-43 was given the name *CORAL SEA*.

When the horrific effect of Japanese bombs and kamikazes was tragically seen on *ESSEX*s unarmored decks, the

Navy's decision to armor the flight decks of the three *Midways* was well-substantiated. Despite the severe penalties in excess weight, the armor surrounding critical bulkheads, ammo magazines and fuel storage areas made these carriers virtually indestructible. Just how these watershed warships would have fared against the kamikazes will never be known. By the time the *MIDWAY* and *FRANKLIN DELANO ROOSEVELT* were respectively launched late in March and April 1945, the Pacific War was already in its final stages. Lagging a year behind, the *CORAL SEA* would be launched eleven months later, on 2 April 1946.



The *FRANKLIN DELANO ROOSEVELT* (CVB-42) seen in 1949 still sporting her wartime armament and a deckload of F8F Bearcats and Douglas AD-1 Skyraiders.

When the atomic bomb precipitously brought about the end of WWII, *MIDWAY* was in the final stages of being fitted out. *MIDWAY* officially commissioned 10 September 1945; the *FRANKLIN DELANO ROOSEVELT* following on 27 October 1945. Ironically, both missed the conflict that inspired their conception; joining the fleet just as it was about to undergo a massive postwar demobilization. Like the brides forsaken at the altar, the Navy had difficult finding the 4,000-man complements needed to man these new behemoths. Nevertheless, the navy emphasized their importance, proudly hailing *MIDWAY* and the “FDR” as the largest vessels ever

built for the United States; technologically surpassing any carrier afloat.

Indeed they did. However, the rules of the game had been forever altered by the advent of the guided-missile and atomic bomb.

THE JET AGE: A NEW DAWN UNDER CLOUDY SKIES

Few, except upper echelon career personnel, realized that naval warfare would shortly undergo a marked transformation; that most of America's awesome armada of warships and aircraft were outmoded even as the Navy victoriously steamed into Tokyo Bay. Already underway was a transformation that rendered obsolete many brand new aircraft like the twin-engine eight-ton Grumman F7F Tigercat fighter, specifically designed for the *MIDWAY*. Soon at hand were the first generation naval jets; McDonnell Aircraft having been awarded a development contract for the F2H Banshee on 2 February 1945. These were followed by orders for the North American FJ-1 Fury late in 1945, forerunner of the USAF's famed F-86 Sabre, and Grumman's F9F Panther - later acclaimed in the Korean War.



Banshee



Fury



Sabre



Panther

MIDWAY's Caribbean shakedown cruise lived up to all expectations, the only negative being a pronounced proclivity to drench the flight deck and the bow 40mm quad mount with green water in moderately heavy seas. Seriously over weight, *MIDWAY* quickly earned a

reputation as a 'wet' ship with her forward flight-deck, gun galleries and hanger spaces frequently awash.



USS MIDWAY in a gale.....a lot of 'rock & roll' and if on the flight deck....a free shower.

In late February 1946 *MIDWAY* became flagship for CarDiv 1, operating in the Atlantic where she commenced flight training exercises in earnest. A few months later *MIDWAY* participated in North Atlantic cold weather tests of new equipment. Deploying to the 6th Fleet in the Mediterranean for annual exercises in October 1947, *MIDWAY* commenced her long and distinguished career as a dominant extension of American air and seapower in the atomic age.

Within months CVB-42 also joined the fleet. Launched as USS *CORAL SEA* (CVB-42),



the second CVB was renamed the USS *FRANKLIN DELANO ROOSEVELT* on 8 May 1945.

During her shakedown cruise in February 1946, where she embarked a newly inaugurated Brazilian President for a short cruise. Fleet maneuvers and other training operations in the Caribbean preceded her first deployment to the Med in August. There her presence gave weight to the Greek's recent victory over the Communists. New Yorkers would bet their first opportunity to visit the much celebrated "FDR" when she participated in the Navy Day ceremonies late in October 1946. As with sistership *MIDWAY*, the "FDR's" career got off to an auspicious start showing the American flag in countless ports around the world.

Last of the *Midway*-class trio to commission (1 October 1947), the Navy's postwar downsizing served to delay the *CORAL SEA*'s completion. Leaving Norfolk on 7 June 1948 with nearly a thousand midshipman aboard, the *CORAL SEA* steamed on her shakedown cruise to the Mediterranean and Caribbean, returning to Norfolk in mid-August.

After minor repairs and refit she then left on her first deployment to the 6th Fleet on 3 May 1949. Joining her sisters in their vital role as guardians of the peace, *CORAL SEA* lent her impressive strength to a Navy rapidly learning the tenuous game of waging a 'Cold War' against Communist aggression.

END OF [PART I]