

**USS MIDWAY (CVB-41)** was the first of six planned carriers of a new design. Construction began during World War II. Toward the end of hostilities, three of the new carriers were cancelled. Upon delivery, the Midways were the mightiest aircraft carriers in the world.

## Evolution of Aircraft Carriers

# CVB'S: THE BATTLE CARRIERS

**'The life of the *Midway* also demonstrates the progress of our Navy; the accommodation of our ships to aircraft of high performance; the use of missiles; exploitation of electronics; the capability to employ a whole family of weapons unheard of when her keel was first laid. No other navy, no other service of any country, has a single military unit as powerful, as versatile and as mobile as this great ship.'**—VAdm. George W. Anderson, Jr., Chief of Staff, U.S. Pacific Command, 1957.

LIKE THE CVE's, the CVB's were a direct product of World War II needs and experience, though their missions were different. The former were to be most effective in providing close-in support of troop landings. The latter was designed to pit against the enemy the most potent aircraft carrier the world had yet seen.

The CVB's were to provide a solution to the problem of designing a tough rugged ship which would have good aircraft operating features as well as every possible characteristic that would enable it to both give and take punishment. Our early war losses were caused by our failure to adequately control damage sustained. It was obvious that we needed a much sturdier aircraft carrier than we operated in the early years of the war, one with an armored flight deck and improved compartmentation. The resulting design gave us a new breed of ship, battle-cruiser fast, battleship rugged, and with more aircraft operating capacity than anything we had known.

At the same time, aircraft design-

By Scot MacDonald

ers were producing larger, heavier types to be operated off sea-going carriers. These higher performance planes, heavier, faster, would place great demands on the flight decks of the proposed CVB's. The planes would require greater room, and these considerations added to the over-all weight of the constructed carrier.

On July 9, 1942, Congress authorized their construction. Already, the toll on both U.S. and Japanese carriers had been heavy. In January that year, the *Saratoga* was damaged by submarine torpedo and forced to a yard for repairs. In the Battle of the Coral Sea in May, the light carrier *Shoho* was sunk by U.S. carrier-based planes which, the next day, also damaged the *Shokaku*. In this battle, the *Yorktown* was damaged; the *Lexington*, ravaged by uncontrollable fires, sank. During the decisive Battle of Midway, the Imperial Japanese Navy lost the *Akagi*, the *Kaga*, the *Hiryu*, and the *Soryu*, *Yorktown*, already damaged at Coral

Sea, was hit again at Midway and on June 7 was sunk.

Midway was a significant victory for the Allied forces. While proving a turning point in the war, it again conclusively demonstrated the warfare potential and, in fact, superiority of carrier aviation. To commemorate the occasion, the escort carrier CVE-63 was named USS *Midway*, but on September 15, 1944, her name was changed to USS *St. Lo*, relinquishing her name to the first of a new class aircraft carrier then being built, USS *Midway* (CVB-41). This battle carrier was laid down on October 27, 1943. A sister ship, CVB-42, was laid down as USS *Coral Sea* on December 1, 1943, but upon the death of the President, was renamed USS *Franklin D. Roosevelt*. The third large aircraft carrier built, CVB-43, became USS *Coral Sea*.

Contracts for the new carriers were signed August 7, 1942, and by September 18, plans for them were well under way. On that date, the Chief of the Bureau of Ships wrote to the Commander in Chief, U. S. Fleet, to

the Vice Chief of Naval Operations and to several Bureau chiefs, discussing the proposed contract design:

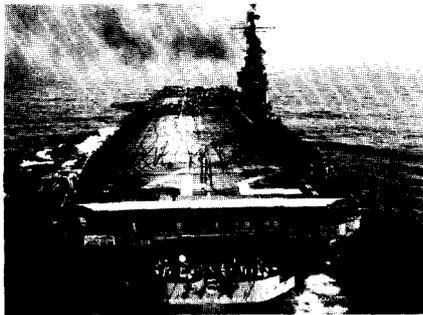
"It will be noted that the island is shown offset from the side of the flight deck to the maximum extent permitted by clearance for passage of . . . the Panama Canal," he wrote. "This location of the island has the obvious advantage that a straight fore and aft flight deck runway for airplanes is interfered with to the least possible extent. It gives a flight deck width in way of the island of 107 feet."

This was one of the last times the Panama Canal was a limiting factor in the construction of aircraft carriers. The "Canal block" was broken when it was later decided to construct a carrier not to go through it.

**Concerning the island structure, BuShips continued:** "Extensive wind tunnel model tests of the CV-9 class island with a large number of modifications involving various degrees of streamlining and attempts to reduce smoke nuisance on the flight deck caused by stack gases have been performed. These studies showed clearly that the details of island contour were of negligible importance in effect upon air-flow patterns as compared with the bulk of the ship and of the island itself. In view of these conclusions, attempts to streamline the various essential protuberances on the island and of the island itself were discarded in the case of the CV-9 class and, therefore, have not been incorporated in the present plans."

The island structure was the subject of considerable correspondence in the months and years following. There was an obvious effort by most bureaus to keep the island as small as possible. In this there was general agreement. Comment and discussion became extensive when locations of specific spaces in the island were brought up, as well as uses to which they would be put. Occasionally, proposed requirements threatened to bloat the island structure, but as alternate locations were found, it was possible to keep it to a reasonable size. In October 1942, for instance, the Chief of the Bureau of Aeronautics, RAdm. John S. McCain, noted:

"Location in the island of the following space, the functions of which do not necessarily require island space



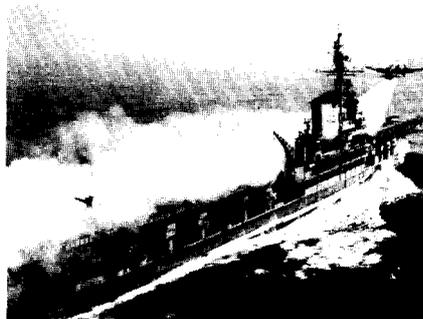
STERN VIEW of the FDR shows increased flight deck space and small island arrangement.

is noted: Pilot balloon room, two squadron lockers, repair I, flight deck crew, flight deck control, flight deck equipment, and one unassigned space. . . . This bureau considers that effort should be continued to reduce island size."

The original proposals called for the installation of two flushdeck type catapults capable of launching VT type aircraft and one double action type in the hangar, capable of launching fully loaded VSB type aircraft. But by October 1942, the General Board considered the complications involved in the installation of a hangar catapult and decided against it. Within the year, the decision was reached to eliminate hangar catapults from *Essex* class carriers, then either under construction or planned.

Hangar fires resulting from combat damage offered particular danger in both Japanese and U. S. aircraft carriers during the early days of the war. In designing the CVB-41 class carriers this danger was considerably lessened by the introduction of four bulkheads in the hangar, dividing it into three spaces connected by sliding doors.

Underwater subdivision of compartments and spaces was given considerable attention, in event of torpedo



JATO TAKEOFF is made by a P2V Neptune from the deck of USS Franklin D. Roosevelt.

or mine hit, and was described as "excellent." To provide additional protection, the flight deck was armored with 3½ inches of solid steel, and the deck side belt armor at the waterline tapered from 7½ inches to 3.

In 1943, the wave of war in the Pacific turned against the Japanese as Allied forces made a concerted offensive, capturing Rendova Island in July. The Japanese-held airfield at Munda in New Georgia island was taken by the Allies, who invaded Bougainvillea in October and landed on the Gilberts in November.

That same year, U. S. shipyards launched and the Navy commissioned 15 CV's and 24 CVE's.

In early 1944, the Marshalls were taken. On the first day of this operation, complete control of the air was obtained and maintained by carrier-based aircraft. The Marianas were invaded in June and Guam recaptured in August. Leyte was occupied in October-November, the opening blows struck by Task Force 38 under VAdm. Marc Mitscher. American shipyards, mass production well organized, launched 7 more CV's, 33 more CVE's.

March 18 to June 21, 1945, the Okinawa campaign raged. The desperate Japanese had already turned to the *Kamikaze* strikes and now introduced the *Baka* bomb, seriously damaging the carrier *Franklin*. Between May and August, carrier-based aircraft were launched against the Japanese home islands, destroying or immobilizing the remnants of the Japanese Navy. On September 2, the formal terms of surrender were signed and World War II was over. Eight days later, on September 10, USS *Midway* was commissioned, the first of the CVB's, Capt. Joseph F. Bolger commanding. In the following month, on October 27, 1945, USS *Franklin D. Roosevelt* (CVB-42) was commissioned. Construction on USS *Coral Sea* (CVB-43) was delayed, the ship finally being commissioned on October 1, 1947. Three additional CVB's, the 44, 56 and 57, were cancelled.

The *Midway* was a giant among aircraft carriers. She had an over-all length of 968 feet, an extreme beam of 136 feet at the flight deck, and had a standard displacement of 45,000 tons. *Midway* had a trial speed of 33 knots, four propellers and a shaft horsepower of 212,000. She was armed

with 18 five-inch, 54 caliber single double-purpose guns, and 21 quad 40mm A.A. mounts. Like the *Essex* class carriers, CVB-41 had a deck-edge elevator in addition to her forward and aft elevators. She accommodated 379 officers and 3725 enlisted.

These general characteristics held true for her sister ships. But there were subtle differences, especially in the case of the *Coral Sea*. Comments in correspondence during construction of the *Midway* indicated that a large



CAMERAMAN records the first takeoff from USS *Coral Sea* (CVB-43) December 11, 1947.

number of minor modifications, learned in the construction of the CV-9 class carriers, the *Midway* herself, and from wartime experiences, would be incorporated in the final design of CV-43.

*Midway* had her shakedown in November 1945. Her aircraft aboard consisted of 57 F4U-4 *Corsairs*, 59 SB2C-4E *Helldivers*, and 4 F6F *Hellcats*, totalling 120 aircraft, 17 fewer than her full complement of 137.

The carrier's nucleus crew came from a Carrier Aircraft Service Unit (CASU) under ComAirLant. Plane handlers were sent to Great Lakes where they boarded the training ships *Sable* and *Wolverine* for an approximate six-week period during which they learned basic carrier work. The February *Naval Aviation News* of 1946 described their later training:

**"The men then proceeded to a CASU, where they awaited shakedown of a carrier other than their own. Their own still was building. Most of the *Midway's* original crew leaders shook down on the USS *Antietam* and the USS *Charger*. On this shakedown, embryo plane handlers stood battle stations, observed the regular crew at work and finally assisted. They were supervised by a training officer from ComAirLant who expedited their progress.**

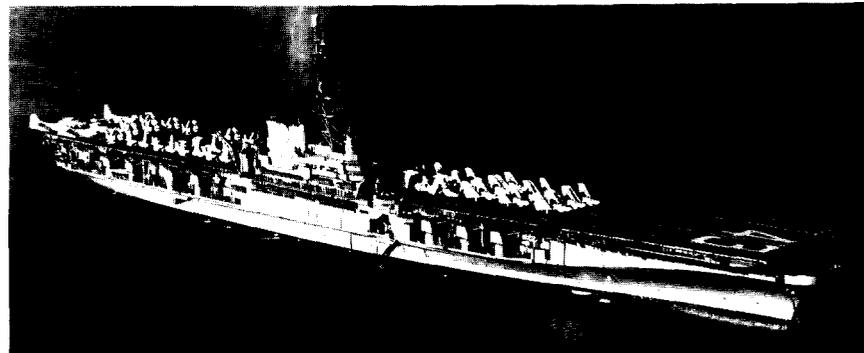


CORAL SEA is shown in Mediterranean waters during last tour before modernization work.

**"Following this shakedown, the *Midway's* nucleus crew returned to a CASU near where the ship was building. Here they were groomed in taxiing, spotting and parking aircraft. The work [was] accomplished on a runway painted to simulate a flight deck. Also, they familiarized themselves with the aircraft they would be using."**

*Midway* conducted her shakedown in the Caribbean, devoting 51 out of 57 days to air and gunnery operations, simulating all types of wartime conditions. Exercises included fueling escort ships at sea, damage control drills and problems, A.A. tracking and firing at towed spars and drones, emergency lube-oil drills for engineers, arming planes, gassing, and use of inert gas.

Air operations involved all types of flying and battle exercises, climaxing the tour with a two-day strike against the Caribbean island of Culebra—a well-pummeled three-mile tract of land used by U. S. warships for shakedown training at that time.



AT ATHENS, GREECE, USS *Coral Sea* makes an official visit in October 1956. Commissioned in October 1947, CVB-43 incorporated features learned in WW II and in other carrier construction.

USS *Franklin D. Roosevelt* also conducted her shakedown training in the Caribbean, under command of Capt. Apollo Soucek. After post-shakedown alterations in New York, she was shifted to Norfolk, where she became flagship of Adm. Marc Mitscher during the first large-scale training operations since the end of World War II. These maneuvers of the Eighth Fleet took place in the western Atlantic between April 19 and May 27, 1946.

In the following year, during Caribbean maneuvers, Sikorsky H03S helicopters were operated. Noted *Naval Aviation News* in June 1947:

**"It was not the first time a helicopter had operated off a carrier deck. Four (of them) were with the Byrd Antarctic expedition. . . . But the helicopter really proved its worth as a utility and rescue plane off the *FDR*, a showing which may have an effect on fleet operations of the future."**

Activity of the *FDR* in the early post-war years was typical of that of her sister ships. After an extended yard period between March 1947 and July 1948, she completed refresher training in the Caribbean before leaving for her second tour in the Mediterranean. At this time, the "Berlin blockade" was formed and the presence of CVB-42 in that area provided a "show of strength." This was her mission for the next five years, as the Berlin blockade was followed by crises in eastern Mediterranean countries and armed aggression in Korea.

In October 1952, the CVB's were re-designated attack aircraft carriers (CVA's). In 1953 the fleet modernization program was authorized. First aircraft carrier to undergo rework was the *FDR*. The ships were equipped with steam catapults, hurricane bows, and the angled-deck design of Project 110.