

A Tragic Accident

Although skies were clear, the night was dark over Connecticut and Rhode Island on October 19, 1944 because there was no moon. Two young Naval Reserve pilots from the Charlestown (R.I.) Naval Auxiliary Air Field were flying at an altitude of 6,000 feet, practicing a dangerous maneuver: night interceptions using a newly developed onboard radar system, in which one plane acted as the enemy target and the other tried to find it in the dark and then approach within firing range.

Ensign George K. Kraus and Ensign Merle H. Longnecker had been flying their Grumman F6F-5N “Hellcats” for about three and a half hours when something went wrong. Ensign Longnecker was acting as the pursuit plane and had sent the radio message “Splash!” at 11:13 p.m., indicating that he had approached Ensign Kraus’s plane close enough to target it and destroy it. That was the last radio transmission heard that night.



The two planes had collided. Residents of Norwich, Connecticut, heard an explosion in the Laurel Hill part of town. Local police and fire crews rushed to the scene, as did an ambulance from Backus Hospital and William H. Bryan, M.D., superintendent of the nearby Norwich State Hospital. A detail of state troopers from the Groton barracks also responded. Because the planes crashed in a heavily wooded area, it took the would-be rescuers about 25 minutes to hike to the impact area. Both pilots were dead, and the wreckage of the two planes, which came to rest about a quarter mile apart, were burning. Navy personnel from the auxiliary air base at Groton secured the area and removed the bodies of the two pilots the following day, taking them to the infirmary at the Quonset Point Air Field in Rhode Island. Salvage crews were sent to the site but found little worth saving. Reportedly, the Navy buried much of the wreckage in trenches near the impact points.

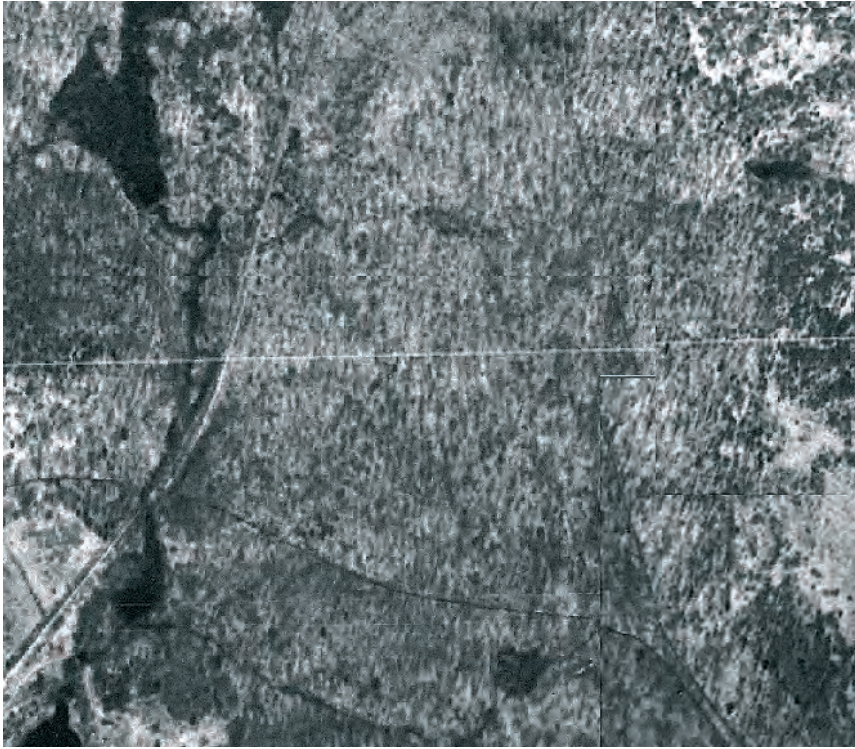
According to a local newspaper, the New London Day, eyewitness reports indicated that the two planes had scraped wings, then veered away from each other, and finally plummeted to the ground near the Norwich-Preston town line. The official Navy accident report speculated that the pursuit plane had misjudged the target’s speed and had overtaken it too fast. The planes were flying approximately 175 mph at the time.

Flight training was an inherently dangerous activity, since the goal was always to get as close to combat conditions as possible. The collision over Norwich was the third crash that week involving fliers from Charlestown. The previous night, a night-fighter Hellcat had crashed into a house in Groton when the pilot, experiencing difficulties, tried to ditch his plane in the Thames River. Miraculously, no one was seriously injured. A few days earlier, another Charlestown aircraft had crashed off Montauk Point, Long Island, where a passing fishing boat rescued the pilot.

F6F-5N night-fighter Hellcats of the type flown by ensigns Kraus and Longnecker on the night of October 19, 1944. (New England Air Museum)

The Aviators

The two Navy fliers killed in the collision were both trained pilots who were taking additional instruction in fighter tactics and radar interception at Charlestown. George K. Kraus, 22 at the time of the accident and unmarried, grew up in Wauwatosa, Wisconsin. After a year at the University of Wisconsin, he signed up with the Navy, went to flight school, and was commissioned an officer in January 1944. Altogether he had logged 683 hours as a pilot. One report said that the flight over Norwich and Preston was to have been his last before leaving for overseas duty.



*The two planes crashed in a heavily-wooded area. Although this part of Norwich and Preston had been in use as agricultural land in the 1800s, by 1934, when this aerial photograph was taken, it had become completely overgrown.
(University of Connecticut Map and Geographic Information Center)*



Ensign George K. Kraus, USNR



Navy pilots earned their distinctive gold-wing insignia after graduating from flight school.

Although Merle H. Longnecker grew up in New Rockford, North Dakota, a long way from any ocean, he too entered the Navy in 1942 and received flight training in Washington, California, and Texas. He was commissioned an officer at Pensacola in February 1944, and while in Florida, he married Blanche Lucy, a native of West Virginia. He then was sent to Rhode Island for night-fighter training. At the time of the accident, he had accumulated 466 hours of flying time.



Ensign Merle H. Longnecker, USNR

World War II Navy aviators, the comrades of ensigns Kraus and Longnecker, at Charlestown NAAF, where the motto was, "Through these portals pass the hottest pilots in the world." (National Archives)

Ensign Longnecker and his wife lived off-base at 67 Liberty Street in Westerly, Rhode Island. According to a story about the accident in the *Westerly Sun*,

he had become well acquainted with the people in the neighborhood, and his death came as a severe blow to all his friends, who had come to appreciate his quick smile and amiable ways.

His family remembered him as a young man who enjoyed checkers, cards, and boxing. Ensign Merle H. Longnecker was just eight days shy of his twenty-first birthday.



The F6F “Hellcat”

The type of plane flown by ensigns Kraus and Longnecker, the Grumman F6F Hellcat, was one of the most successful American aircraft of World War II. The more than 12,000 planes produced in the period 1942 to 1945 accounted for 5,155 confirmed “kills” of enemy aircraft. In achieving this success, only 270 Hellcats were lost in combat, a 19:1 ratio that has never been equaled. The vast majority of Hellcats saw service in the Pacific theater, either as Navy units stationed on aircraft carriers or as Marine units operating from island airfields.



F6F Hellcats lined up for take-off aboard the carrier Ticonderoga during World War II. The first two planes are radar-equipped night-fighters. (National Archives)

The Grumman F6F Hellcat was a single-seat, single-engine plane equipped with folding wings that allowed better storage on the hangar deck of aircraft carriers. The principal armament was a set of six .50-caliber M2 Colt-Browning machine guns mounted midway along the forward edge of the wings; later models substituted a pair of 20-mm cannons for two of the .50-caliber guns. Each machine gun had up to 400 rounds available, with 450 shells for the two cannons. Racks on the wings could accommodate 1,000-lb. bombs, and later models had the capability to carry six five-inch rockets. A rack under the fuselage, normally used for a 150-gallon external fuel tank, could alternatively be used to carry a bomb as large as 2,000 lbs.

Development of the Hellcat was already underway when the Japanese attacked Pearl Harbor on December 7, 1941. The Grumman Aircraft Engineering Corporation, started by Leroy Grumman in 1930, had developed the Navy’s then-standard carrier-based fighter, the F4F “Wildcat,” in the late 1930s. Although the Wildcat was capable enough for its day, the Navy was looking for a more powerful successor. Initially, it was hoped that the Vought F4U “Corsair” could take over the Wildcat’s duties, but the Corsair experienced problems with the prototype and delays in getting into production. In June 1941, the Navy asked Grumman to come up with an improved version of the Wildcat as a parallel plan. The decision proved prescient, as almost two more years went by before the Corsair was ready. In the meantime, Grumman decided to build an entirely new plane rather than simply improve the F4F. Although there was a family resemblance to the Wildcat, the F6F was more powerful, better armored, and equipped with more firepower. Within a year, Grumman had the prototypes ready for testing.

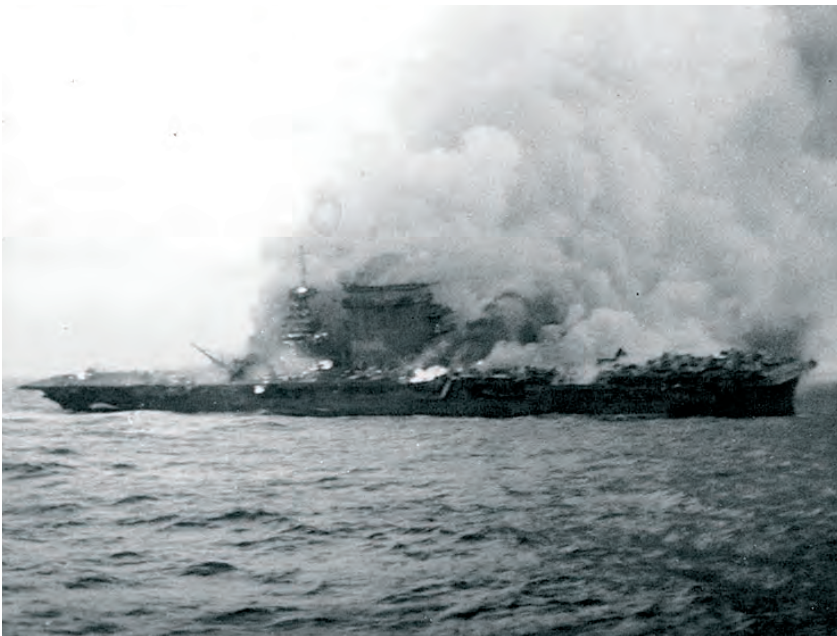
Satisfied with the performance of the two test planes, the Navy ordered the Hellcat into production. The company completed a huge new manufacturing facility in Bethpage, Long Island, using steel salvaged from the dismantling of New York City’s Second Avenue El, and got to work. On October 3, 1942, the first Hellcat rolled off the Grumman line. Production increased dramatically thereafter, from a few dozen units a month to over 400 units in November 1943.

The Grumman plant employed some 20,000 workers at its peak, a large proportion of whom were women.

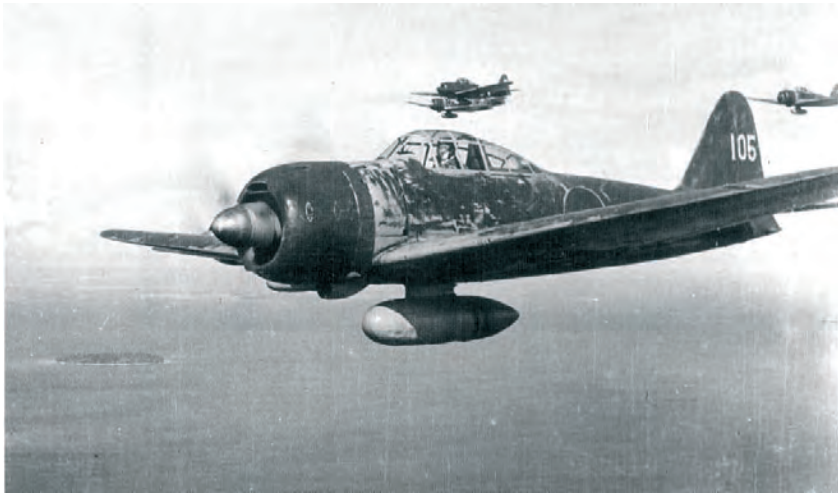


Hellcats as far as the eye can see at Grumman's Bethpage, Long Island, production line. (Northrop-Grumman)

The Hellcats arrived none too soon. With the Mitsubishi A6M "Zero" fighter, the Japanese had an aircraft that outclassed the Wildcat in almost every respect. It was faster, could climb more quickly, and had an exceptional range of 1,300 miles. The Zero, code-named "Zeke," was light and agile and so was excellent in one-on-one combat. Its only drawback was that it was more fragile than the Wildcat and could not sustain damage well. Despite valiant efforts by American pilots, the Wildcat's limitations became evident in the battles of Wake Island and the Coral Sea, and the Navy knew it needed much more power if its planes were to take control of the air.



The Battle of the Coral Sea, May 7-8, 1942, convinced the Navy it needed better fighter defenses for the fleet. Among the losses was the carrier Lexington (left), which sank with several dozen aircraft aboard, including Grumman F4F Wildcats (above), the Hellcats' predecessors. (National Archives)



The Mitsubishi A6M Zero, code-named "Zeke." More than 10,000 Zeros were produced during the war, making it the most common enemy aircraft encountered by the Hellcat. These Zeros are equipped with auxiliary fuel tanks for extra range. (WarBird Photos)

The first prototype Hellcat had a 1,600-horsepower Wright engine, but in order to get better performance, Grumman switched to the R-2800 Pratt and Whitney "Wasp," which turned out to be the most successful piston aircraft engine of all time. The R-2800 provided 2,000 horsepower and was exceptionally dependable. Variants of the R-2800 powered not only the Hellcat but many other celebrated World War II aircraft. The Wasp gave the Hellcat the power it needed. Although it still was not as maneuverable as the Zero, it had a similar climb rate and was substantially faster. Moreover, the Hellcat was far more rugged in combat. The pilot and vital systems were protected by armor, the windshield was fitted with bullet-proof glass, and the fuel tanks were self-sealing. The Hellcat also had more firepower: six guns to the Zero's four, firing bullets that were 66% larger.

The Navy experimented with Hellcats equipped with radar and searchlights for anti-submarine duty. (New England Air Museum)

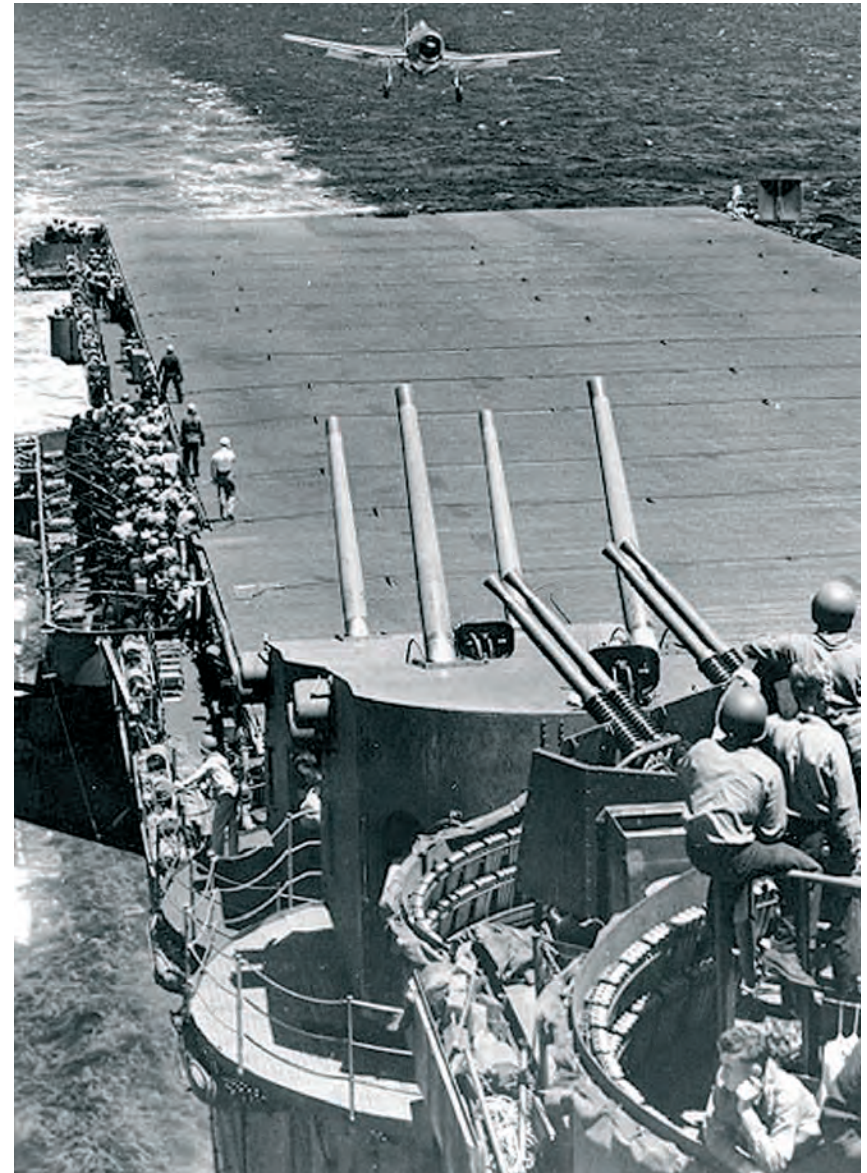
Two basic versions of the F6F Hellcat became operational. The F6F-3 was the first, with 4,403 units delivered from late 1942 to April 1944. After that, Grumman produced the F6F-5, the aircraft that ensigns Kraus and Longnecker flew. The F6F-5 incorporated a number of incremental improvements, some of which had been introduced on late-model F6F-3s. The engine had a water-injection system that developed more power in short bursts, allowing the aircraft to reach a top speed of 400 mph at 20,000 feet, compared with the -3's top speed of 388 mph (and the Zero's 350 mph). The fuselage was stiffened, permitting it to dive faster, and the ailerons had spring tabs, making control easier. The cowling and canopy were redesigned, and more armor plating was provided. The F6F-5 also introduced a new paint scheme, which substituted a glossy dark blue all over for the dark blue-light blue-white colors of the -3. The design changes and the new paint improved the aerodynamic drag factor enough so that the F6F-5's range increased by more than 200 miles over the F6F-3.

In addition to the basic fighter model, there were a number of special-purpose Hellcats. Those given the "P" suffix were equipped with aerial cameras intended to record the damage inflicted by air strikes. The largest group of specialty Hellcats were those equipped with radar for nighttime interception; the night fighters were designated with an "E" or "N" suffix, depending upon the type of radar. The Navy also experimented with arming the Hellcat as a torpedo bomber, but none became operational. At the end of the war, a few Hellcats were equipped for antisubmarine warfare with wing-mounted radar and searchlights. Finally, after the war, surplus Hellcats, given the "K" suffix, were converted to radio-controlled drones for target practice.



The Hellcat quickly became the Navy’s principal carrier-borne aircraft, at least until late 1944, when problems with the F4U Corsair were finally resolved. In addition to those assigned to American carriers, more than 1,000 Hellcats were provided to the British Royal Navy’s Fleet Air Arm. The first action involving F6Fs took place at the end of August 1943, when Hellcat squadrons from the carriers *Essex* and *Yorktown* helped destroy dozens of Japanese planes on the ground on Marcus Island; no Hellcats were lost. A few weeks later, the F6F turned in an even more impressive performance when Task Force 38 attacked the heavily defended harbor of Rabaul. Hellcats from the carriers *Saratoga* and *Princeton* escorted bombers through a swarm of dozens of Zeros. In addition to the destruction of shipping in the harbor, twenty-five Japanese planes were recorded as kills or probable kills, while only five Hellcats and five bombers were lost. The pattern was repeated over and over again as the Navy advanced from one island group to another. Although the Zero could still outfly a Hellcat in a one-on-one dogfight, the latter’s superior firepower, armor, and speed gave it a decisive advantage.

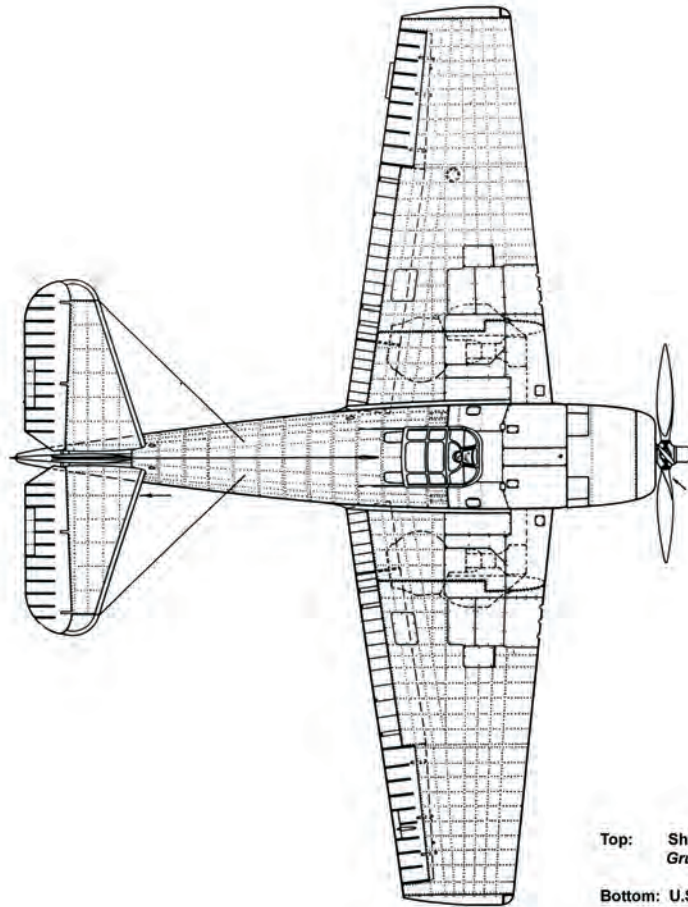
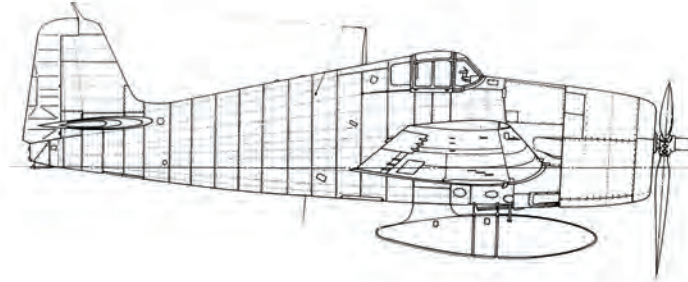
In June 19, 1944, the largest naval air battle ever fought effectively eliminated Japan’s air power off the Marianas Islands in the Philippine Sea. Sometimes called the “Great Marianas Turkey Shoot,” the battle pitted Vice Admiral Jisaburo Ozawa’s First Mobile Fleet against the American Navy’s Task Force 58, commanded by Vice Admiral Marc A. Mitscher. Although the Japanese had fewer ships, seven carriers to the Navy’s fifteen, the number of aircraft was about equal, a little over a thousand on each side. At the end of two days of fierce fighting, five Japanese carriers had been sunk or seriously damaged, and only thirty-five aircraft were left in operable condition. The Americans had lost no ships and only forty-nine planes, leaving them with more than 700 airworthy aircraft. History would have recorded it as a complete triumph, had not the necessity of returning from battle and landing on the carriers in the dark cost the Americans an additional thirty-eight pilots and eighty aircraft.



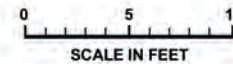
An F6F Hellcat lands aboard the (second) carrier Lexington during the Battle of the Philippine Sea, June 19, 1944. (National Archives)

Specifications of the F6F Hellcat

Length	33 ft. 7 in.
Wing span	42 ft. 10 in.
Weight (empty)	9,023 lbs. (F6F-3) 9,238 lbs. (F6F-5)
Weight (loaded)	12,415 lbs. (F6F-3) 12,483 lbs. (F6F-5)
Engine	2,000 hp. P&W R-2800
Propeller	3- blade Hamilton-Standard, 13 ft. 1 in. diameter, variable-pitch
Top speed (At 20,000 feet)	388 mph (F6F-3) 400 mph (F6F-5)
Time to 20,000 ft.	7 min. 0 sec. (F6F-3) 7 min. 30 sec. (F6F-5)
Service ceiling	35,500 feet (F6F-3) 36,000 feet (F6F-5)
Fuel capacity (internal) External tank	250 gallons 150 gallons
Range	1,085 miles (F6F-3) 1,300 miles (F6F-5)
Armament	six .50-cal machine guns <i>or</i> four .50 cal. machine guns plus two 20-mm cannons
Other ordnance	six 5" rockets, up to 4,000 lbs. in bombs
Manufacturer	Grumman Aircraft Engineering Corp., Bethpage, N.Y.
Total production	12,271



Grumman F6F "Hellcat"
(Model F6F-3 Shown)



Top: Shigeru Nohara drawing, from Nagura, Okazaki, and Hards, *Grumman F6F Hellcat*, 1996. Used with permission.

Bottom: U.S. Navy drawing (New England Air Museum)

Night Interception

The United States Navy hoped that radar-equipped fighter planes would solve what was perceived as a serious weakness: at night, it was easier for aircraft to find ships than it was for ships to spot aircraft. Even with radar, there was little that an aircraft carrier could do until a night intruder got within the range of its anti-aircraft guns. The threat was two-fold: carrier-based Japanese bombers could attack American ships under cover of darkness, but equally serious, they could radio in the Americans' position, speed, and heading, thereby giving enemy commanders a potential advantage. Planes shadowing the fleet at night, called "snoopers," were one of the quarryies that the night-fighter Hellcats were designed to hunt.



Night-fighters such as this F6F-5N were distinguished by the bulbous radar nacelle on the right wing. (National Archives)

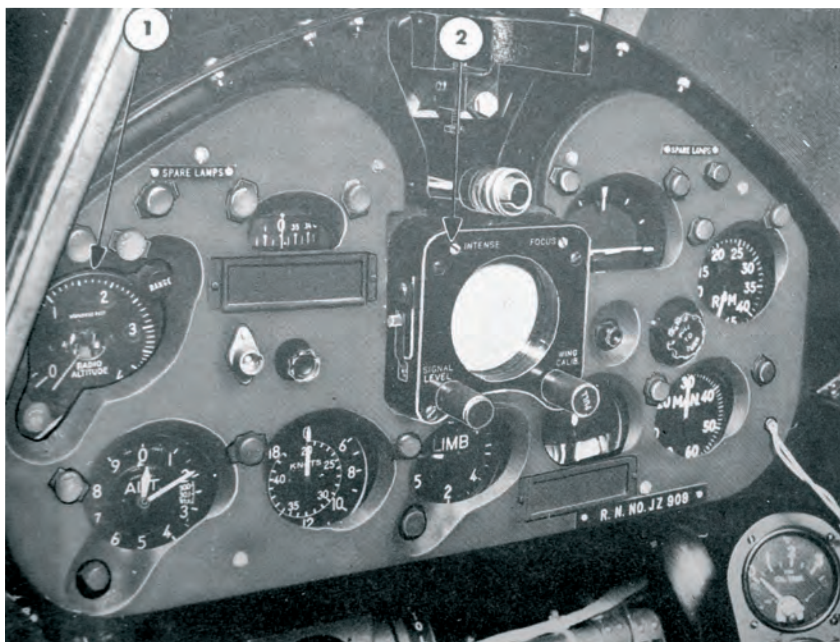
Headquartered at Quonset Point and initially called Project Affirm, the Navy's radar development program began in early 1942, using custom-built electronics made at the Massachusetts Institute of Technology installed in Vought F4U-2 Corsairs. The first operational radar system, the Army-Navy/Airborne Pulse Search, Version 4 (AN/APS-4) was deployed in three fighter squadrons, one of Corsairs and two of Hellcats. From this experience, the Navy concluded that the Hellcat, slightly slower but easier to land and a more stable firing platform, made the better night fighter.

Night-fighter pilots had to follow special procedures, including wearing oxygen masks on all night flights. They prepared for night flying by wearing red goggles for at least half an hour before taking off. (National Archives)



The AN/APS-4 unit weighed 180 pounds and was mounted in a pod on the starboard wing. Its operational range was about four miles. By early 1944, a newer version became available, the AN/APS-6, which had an aircraft search range of 5 ½ miles and could detect ships over 20 miles away. In addition to appreciating the greater range, pilots preferred the simpler controls of the newer version. The APS-6 also had the advantage of showing two blips on the screen, one for the enemy plane and one that indicated the altitude of the pursuing aircraft relative to the target. The equipment was provided by two manufacturers, Westinghouse and Philco.

Hellcats with the APS-4 units (mostly F6F-3s) were given the “E” suffix and Hellcats with the APS-6 system carried the “N” suffix. The F6F-5Ns flown by ensigns Kraus and Longnecker were equipped with Philco APS-6 units. The radar units added extra weight to the plane (250 lbs. for the APS-6), and the controls had to be trimmed to account for the extra drag on the right wing.



Navy training manual illustration of a Hellcat instrument panel as modified for night-fighting, showing radio altimeter (1) and radar screen (2). (New England Air Museum)

These early radar screen were very small; they were placed in the center of the cockpit instrument panel as close to eye level as possible, just below the gun sight, where the compass had been on conventional Hellcats. In addition to the radar screen, night-fighter Hellcats also had a radio-based altimeter, different cockpit lighting to take into account night flying, and a tail-mounted radar warning system that provided a field of about 60 degrees.

Night fighters were deployed both as entire night squadrons, often in tandem with radar-equipped torpedo bombers, and as four-plane detachments assigned to carriers with conventional planes. At first, the night fighters had only scattered successes, some of which occurred in daytime combat. But by the end of 1944 and the beginning of 1945, the planes were regularly performing their intended mission, shielding aircraft-carrier task forces from Japanese nighttime surveillance. When a Hellcat flown by Commander James S. Gray, Jr. shot down an enemy snooper on October 25, 1944, Admiral William F. “Bull” Halsey credited it with saving the Third Fleet from certain kamikaze attack. Hellcats also provided vital nighttime air cover for attacks on Iwo Jima, Kyushu, and Okinawa. In addition to the Navy units, five squadrons of Marine Hellcats saw action, using land-based airfields in the Philippines, Marianas, and Okinawa. Some 1,500 Hellcats with night-flying capabilities were produced during the war. They proved to be an effective deterrent against nighttime intruders, as well as an effective offensive weapon that could confidently attack under cover of darkness. Had Japanese naval aviation capability not been so thoroughly decimated by the time they were deployed, the “bats” would have undoubtedly engaged even greater numbers of enemy aircraft.

Night-time interceptions usually involved ground or ship-based control stations. The control station used its long-range radar to calculate an intercept vector, which was then radioed to the pilot. (National Archives)



Charlestown Naval Air Field

Charlestown Naval Auxiliary Air Field was the major center for Navy night-fighter training during World War II. Affectionately known as "Charlietown" by the aviators and technicians who served there, the facility was called an auxiliary field because it was part of a larger flight training operation headquartered at Quonset Point, Rhode Island. Other naval air fields associated with the Quonset flight training program were located on Cape Cod, Martha's Vineyard, Nantucket, and in Groton, Connecticut. Construction of the Charlestown field began in the first part

of 1943, with enough finished by August to allow training to begin. That fall, the aviators of several scout and torpedo-bomber squadrons trained at Charlestown, including George Herbert Walker Bush, who would later become the forty-first President.

Charlestown Naval Auxiliary Air Field, February 1945. Most of the aircraft lined up outside the hangar are F6F Hellcats. (National Archives)



Early in 1944, the Navy’s night-fighter training program was transferred from Quonset to Charlestown, where it became the base’s principal activity. The unit was known as the Night Fighter Training Unit (NFTU), and in addition to Charlestown, it coordinated activities at other air fields such as that at Westerly, Rhode Island, and several ground-control stations. Pilots were not the only ones who trained at Charlestown; the airfield was also home to Carrier Air Support Unit 27. CASUs were maintenance units, responsible for keeping the aircraft’s mechanical and electrical systems at the highest state of readiness. CASU-27 (pronounced “Cashew-27”) had an especially challenging mission, since in addition to all the other systems, it was responsible for the complex radar units aboard the night-fighter Hellcats. At its height, there were 1,500 officers and men at Charlestown.



Above: CASU-27 technicians service an APS-6 radar unit aboard a Hellcat night fighter at Charlestown during World War II. The unit had a rapidly rotating antenna that required frequent attention. The rear fairing of the radar nacelle can be seen on the ground at the left. (National Archives)

Far left: Night-fighter training at Charlestown was carried out under the control of several ground stations like this one on Conanicut Island. Left: interior of the ground-control station. (National Archives)



When George Kraus, Merle Longnecker, and the other young Navy aviators came to Charlestown, they had already earned their wings and had logged hundreds of hours of flying time. They came to Charlestown to receive combat training in the specific aircraft they would use in the Pacific, and they trained as organized VF(N) night-fighter squadrons (though in reality the Navy constantly reorganized squadrons and detached individual aircraft to other units). Ensigns Kraus and Longnecker were training as part of VF(N)-108. Shortly before their accident, the squadron was decommissioned and folded into CASU-27.

Classroom instructors at Charlestown used audio-visual aids to help their students visualize combat maneuvers (below). The training unit also used large-scale topographical models (right). (National Archives)



At Charlestown, the aviators divided their time between classroom instruction and practice in the air. Among the subjects covered were gunnery, combat tactics, and advanced navigation. In addition to learning how to out-maneuver and shoot down enemy aircraft, the pilots practiced strafing the ground and attacking ships and other targets. Some of the strafing, bombing, and rocket practice took place at night, with the targets briefly illuminated by flares dropped from other planes.



Another challenge for the pilots at Charlestown was learning to take off and land from aircraft carriers. For this purpose, a full-length wooden “deck,” complete with catapult, was constructed on the ground next to Runway 22 so that the aviators could perfect their technique before having to land on an actual aircraft carrier.



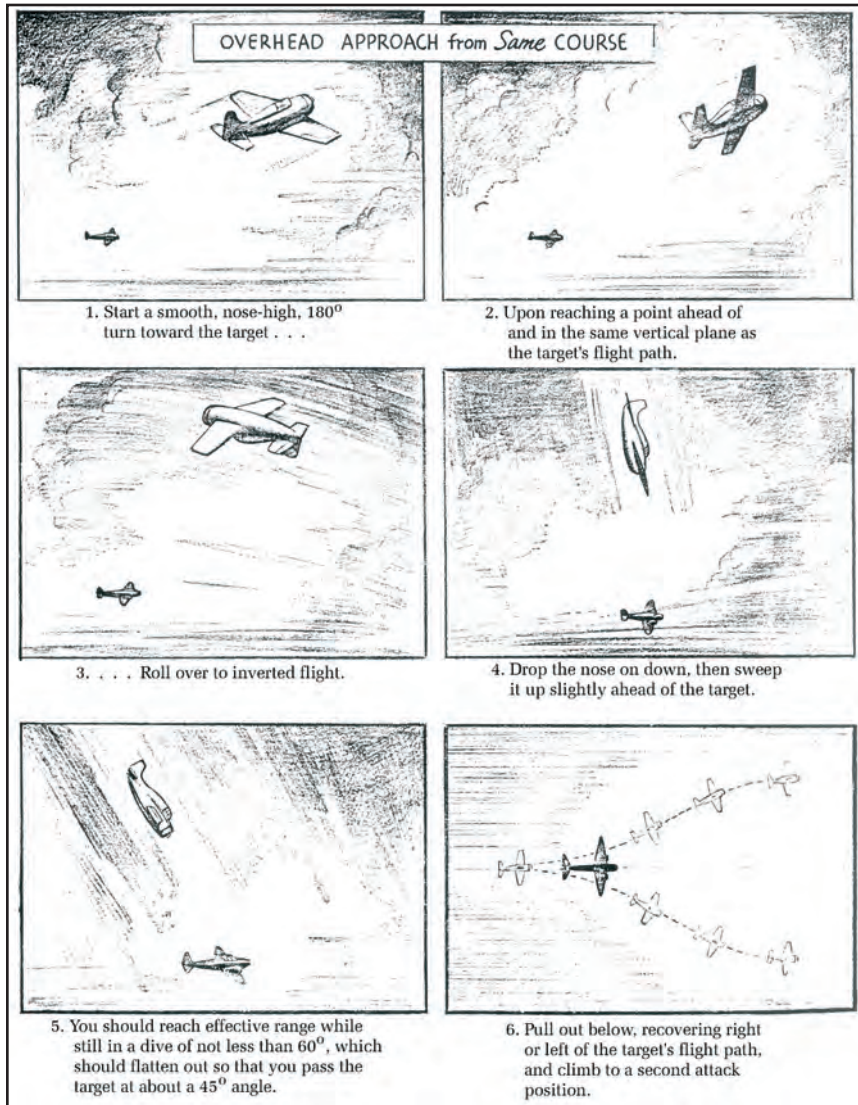
Aerial view of Charlestown Naval Auxiliary Air Field, 1945. The structure adjacent to Runway 22 (arrow) may be the wood deck built for catapult and carrier-landing practice. (National Archives)

Night-fighter advanced training was a 29-week course. In addition to learning the combat and aircraft-handling skills learned by all fighter pilots, those chosen for night-fighter training had to be especially good at instrument flying. Without visual clues, human senses and instincts are at best useless and often counterproductive. The pilots learned to have complete faith in their instruments and to respond with split-second decisions when flying in the dark.

Nighttime interception exercises formed a major part of the training at Charlestown. A pair of pilots would take off and then separate. While one pilot flew a course intended to simulate that of an enemy aircraft, the other pilot would attempt to find him and approach to within 250 to 300 yards, the optimum range for the Hellcat’s .50-caliber machine guns. A ground-control officer supervised the exercise, and the pursuit pilot received basic vectoring information via radio from a ground-control station (in combat, the control functions would be performed from a radar-equipped aircraft carrier or other vessel). Once within a few miles of the target, however, the pilot had to rely on the blips on the small radar screen to complete the intercept. The pilots would practice these maneuvers over and over. Ensigns Kraus and Longnecker had already successfully completed five interceptions on the night of the tragedy.

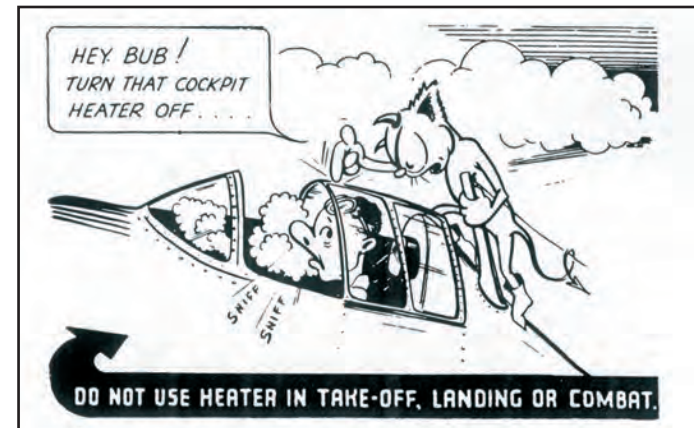
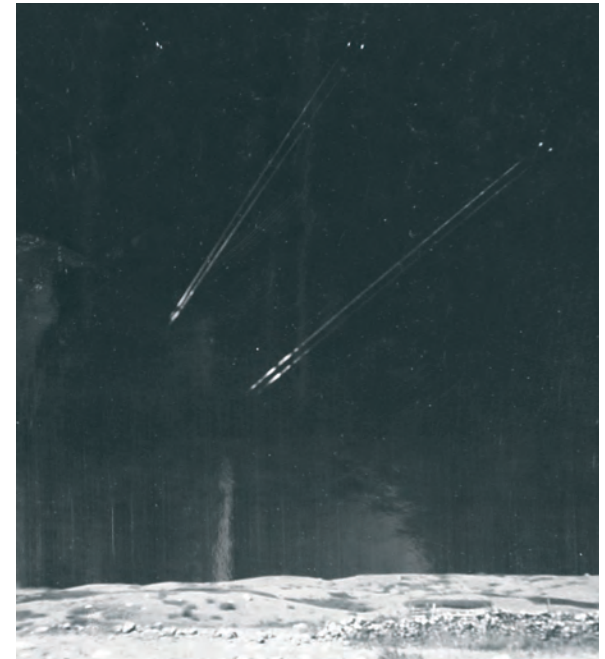


An F6F-5N night-fighter Hellcat flying above the coast of Rhode Island during World War II. The plane is thought to be lettered for VF(N)-107, a squadron that was training at the same time as ensigns Kraus and Longnecker’s unit, VF(N)-108. (National Archives)



"Orders for Gunnery Exercises" (excerpt, above) was one of the basic Navy textbooks that ensigns Kraus and Longnecker would have studied during their training.

Aviators were also trained in the use of the F6F's offensive weapons. Charlestown pilots (right) practice a nighttime attack, firing five-inch wing-mounted rockets. (National Archives)



The Navy's F6F Pilots Handbook used a cartoon "Hellcat" (above) to remind aviators of important safety procedures. The heater was supposed to be turned off to save power at critical times. (New England Air Museum)

Some 20 squadrons of about thirty aircraft each trained at Charlestown during World War II. During the war, forty-eight aviators, nearly all of them from night-fighter units, died in training. Today the airfield is a public park, and there is a memorial honoring those who lost their lives in training.



*The Charlestown Naval Airfield Memorial, Charlestown, Rhode Island.
Inset: the names of ensigns Kraus and Longnecker on the monument.*

The Night Fighter Blues

by

*Jim Loveridge, VF(N)-90**

*Now listen to me brother
'Cause I'm an old night fighter
Who has been away out to sea*

*I've got the blues and
They are the loneliest blues
That any man can have*

*Now the skipper has asked for
Volunteers to be over Tokyo
I said "Lord, Lord, Skipper
I don't want to go"*

(I've got the blues . . .)

*Now it's black as hell out there
As black as it's ever been
I wish I were at home
With a great big quart of gin*

(I've got the blues . . .)

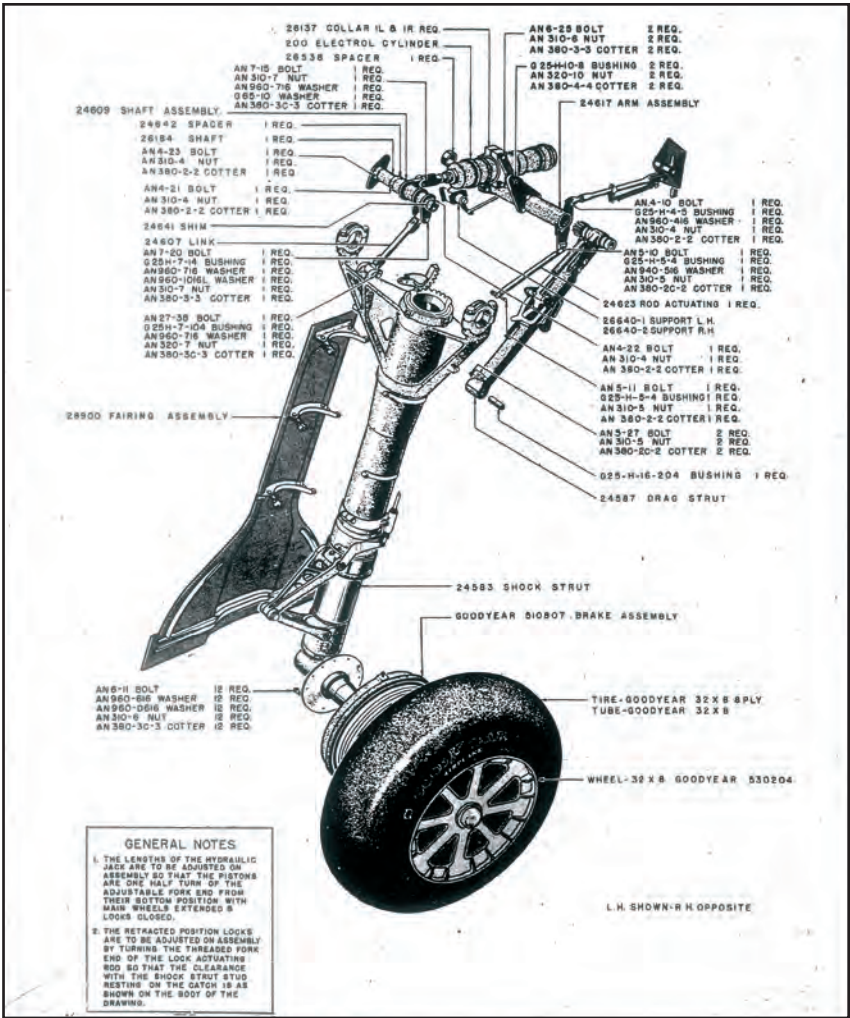
* VF(N)-90 was one of the Hellcat squadrons that trained at Charlestown

Investigating the Sites

The Hellcat sites in Preston were well-known to aviation enthusiasts and local residents, but they did not come to the attention of professional archaeologists until the Connecticut State Historic Preservation Office, known as the SHPO, began considering the archaeological implications of the State of Connecticut divesting itself of the 500-acre property formerly associated with the Norwich State Hospital. The SHPO requested that a complete archeological survey be made of the property to determine what prehistoric and historic resources might be impacted by the State's decision. In addition to inventorying dozens of prehistoric sites (i.e., Native American sites) and the site of a Revolutionary War period tavern, the archaeological survey recommended that the two Hellcat sites be considered eligible for the National Register of Historic Places based upon their historical associations and potential information value.



Visible wreckage at Site 114-137 (Ensign Longnecker Site): one of the landing gear struts embedded in the ground.



Schematic of the landing gear, a portion of which remains as visible wreckage at each crash site, from the Navy's F6F technical manual. (New England Air Museum)

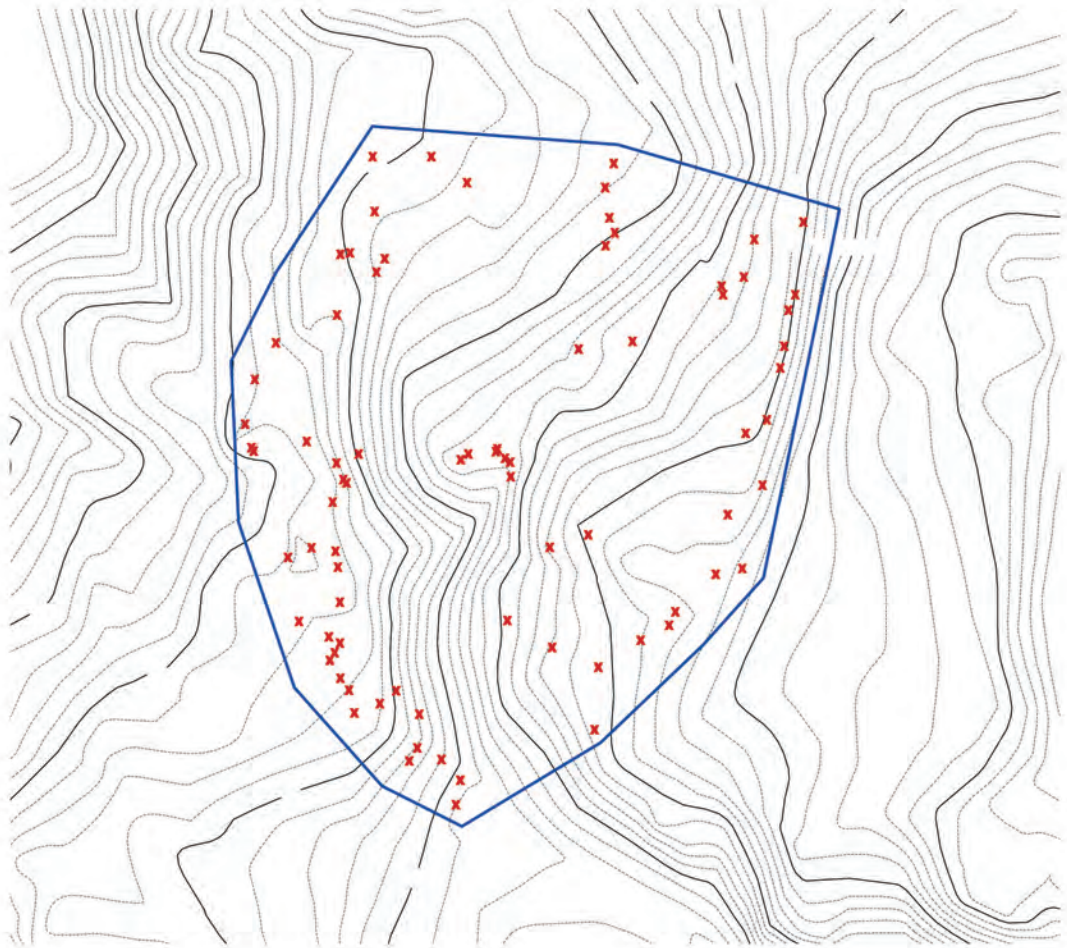
Each site has at its center a visible piece of wreckage from the aircraft that crashed there. The place where Ensign Longnecker’s plane hit the ground includes a landing-gear strut embedded in the earth. The Ensign Kraus site also includes a landing-gear strut, as well as a piece of the immediately adjacent air-frame. A bright metal hook attached to the frame was where the catapult cable was attached for launching the plane during carrier-deck takeoffs.

Below: portion of the plane’s frame and left-side landing gear visible at Site 114-138 (Ensign Kraus Site). Inset: detail of catapult hook. Right: catapult launch of a Hellcat, showing attachment of Y-cable (arrow) just inboard of the landing gear. (National Archives)



Site 114-137

Metal-Detector Survey of Debris Field



100 0 100 Feet

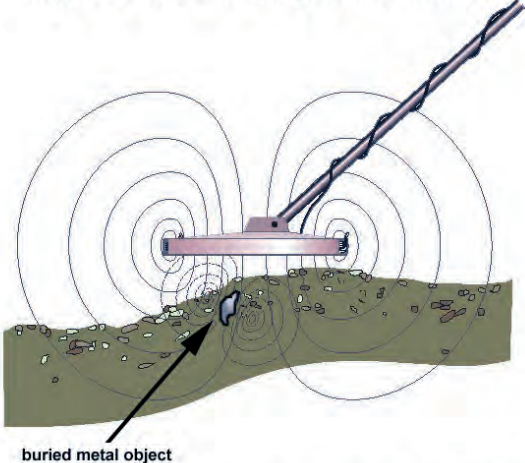


Legend

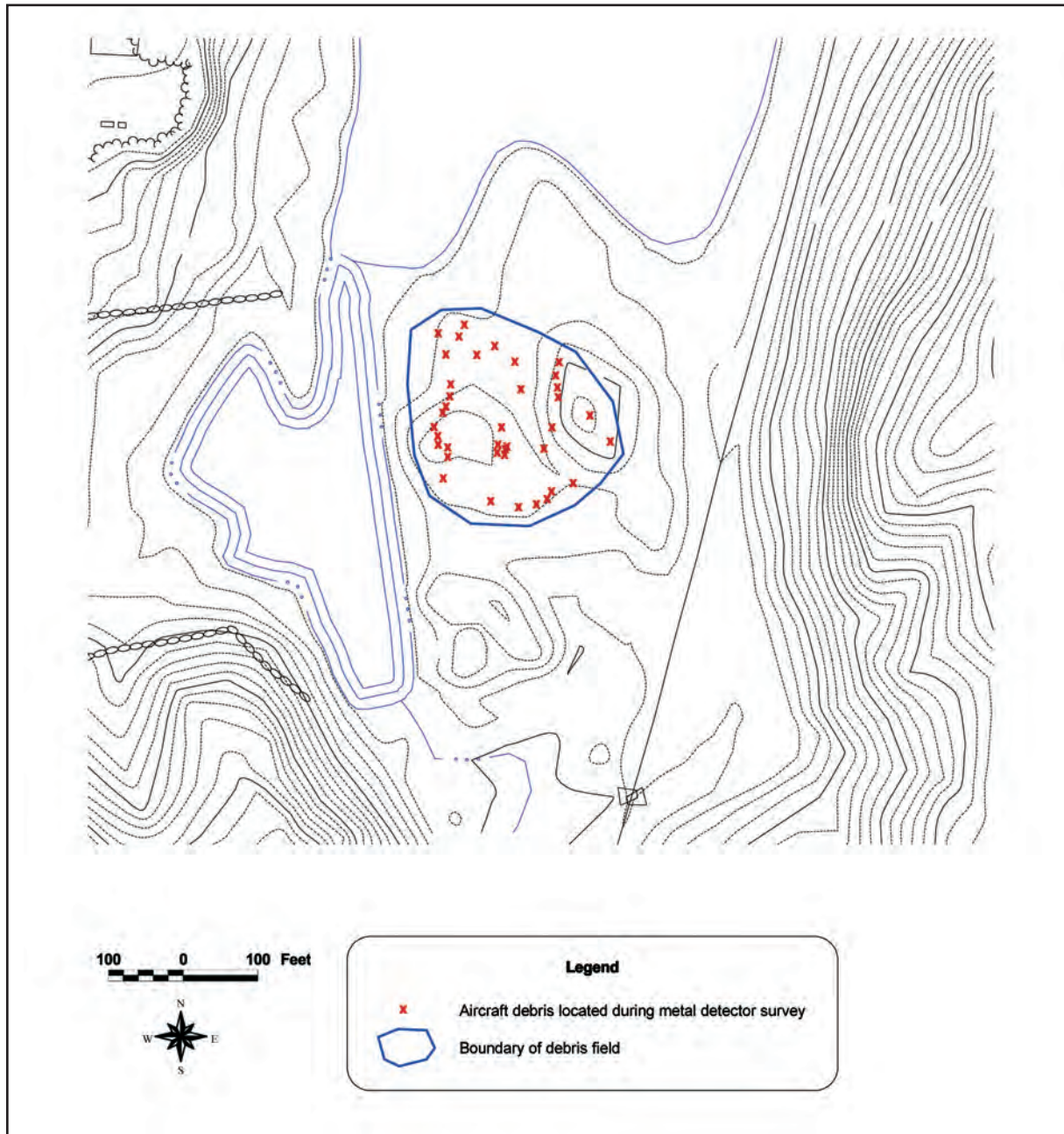
- Aircraft debris located during metal detector survey
- Boundary of debris field

How Metal Detectors Work

1. Electrical coil in metal detector sets up magnetic field, which penetrates the ground
2. Magnetic field induces current in metal object, which in turn emits another magnetic field
3. Electronics in metal detector pick up object's magnetic field and analyze its characteristics



*Adapted from drawing by James Trevelyn
University of Western Australia*



Site 114-138

Metal-Detector Survey of Debris Field

Metal-detection technology allows archaeologists to investigate the presence of artifacts with minimal disturbance of the site.



The archaeologists excavated a limited number of test pits to confirm that the apparent trenches were in fact where much of the debris from the aircraft was buried. No material was removed from the site, and no other subsurface disturbance was necessary to ascertain the sites' historical significance. Instead, the location of the visible remains were mapped using precise Global Positioning System (GPS) equipment. The archaeologists photographed the visible remains and their surroundings from all sides, and then completed a State of Connecticut Historic Resources Inventory - Historic Archaeological Sites form for each so that the two sites could be added to the statewide database of archaeological sites. The Ensign Longnecker site was designated Site 114-137 and the Ensign Kraus site, Site 114-138. (Preston's town number is 114 in the state's archaeological database.)

In order to create a reasonable boundary for each impact site, the archaeologists conducted a metal-detector survey, starting with the visible wreckage as the center. Metal-detectors work by creating a magnetic field that penetrates into the ground. The field then causes metal objects in the ground to emit their own magnetic field, which the metal-detector senses. Modern metal detectors can discriminate among different types of metal based upon the characteristics of their emitted magnetic fields. Aircraft such as World War II Hellcats were built with aluminum skins over a steel frame, so one would expect that a severe crash would scatter metal over a large area.

This proved to be the case. Working outward from the visible debris, the archaeologists encountered constant "hits" with the metal detector, chiefly small fragments of sheet aluminum. After a certain point, the hits dropped off sharply, defining an edge to the debris field. This edge was then followed in each direction so as to create a perimeter for the site. The resulting perimeter for the Ensign Longnecker Site, Site 114-137, encloses an area of 9 acres, while the Ensign Kraus site, Site 114-138, is 1 ½ acres in extent. These perimeters were used to define the boundaries for the State Archaeological Preserves.

Many other parts of the aircraft, including the engines and parts of the fuselage and the other landing gear, are believed to have been removed from the site by aviation-history collectors.

The Future of the Sites

Preserving these two World War II sites for future generations will require everyone's cooperation. Their designation as State Archaeological Preserves makes it illegal to remove any material from the sites either through surface collection or digging. Beyond the threat of incurring legal consequences, however, the public should treat these sites with respect because of their importance as memorials to two young men who gave their lives for their country. Although it might seem interesting to take away a small piece of metal that was once part of an ill-fated World War II aircraft, a little further consideration will show how thoughtless such an action would be. Just as one would not deface a war monument that was located in a highly visible location, so too one should not damage the Hellcat sites by digging or removing material. If everyone who hikes here in the woods treats the crash sites respectfully, the sacrifice made by ensigns George Kraus and Merle Longnecker will long live on in our collective memory.



A night-fighter Hellcat flies above the waters off Rhode Island on a moonlit night. (National Archives)

For Additional Information . . .

Books and Magazine Articles:

Anderton, David A. *Hellcat*. New York, NY: Random House, 1984
Illustrations by Rikyu Watanabe.

Andrews, Hal. “F6F Hellcat,” *Naval Aviation News*, September-October 1988, 16-17.

Bowles, Adam. “Unearthing the Past: An Archaeological Dig at the Norwich Hospital Site Brings Back Reminders of a Tragedy,” *Norwich Bulletin*, November 20, 2004.

Dann, Richard S. *Walk Around F6F Hellcat*. Carrollton, TX: Squadron/Signal Publications, Walk Around No. 9, 1996.

Kinzey, Bert. *F6F Hellcat In Detail and Scale*. Carrollton, TX: Squadron/Signal Publications, Detail and Scale Vol. 49, 1996.

Nagura, Shigeru, Nobuhiko Okazaki, and Scott T. Hards. *Grumman F6F Hellcat*. Tokyo, Japan: Dai Nippon Kaiga Co., Ltd., Aero Detail 17, 1996.

“Navy Fliers Killed in Crash Lived Here,” *Westerly Sun*, October 22, 1944.

Pilots Handbook of Flight Operating Instructions for Navy Models F6F-3, F6F-3N, F6F-5, F6F-5N Airplanes. Appleton, WI: Aviation Publication, reprint, n.d., Originally issued by U.S. Navy, 1944.

Sullivan, Jim. *F6F Hellcat in Action*. Carrollton, TX: Squadron/Signal Publications, Aircraft No. 36, 1979.

Tillman, Barrett. *Hellcat: The F6F in World War II*. Annapolis, MD: Naval Institute Press, 1979.

“Two Navy Fliers Killed When Fighter Planes Collide at Norwich,” *New London Day*, October 20, 1944.

“Two Planes Crash and Burn in Woods in Laurel Hill Section,” *Norwich Bulletin*, October 20, 1944.

Vernon, James W. *The Hostile Sky: A Hellcat Flier in World War II*. Annapolis, MD: Naval Institute Press, 2003.



Night-fighter Hellcats silhouetted against the clouds above Rhode Island, 1945. (National Archives)

Videos and DVDs:

Grumman F6F Hellcat, Vol. 10 of the Roaring Glory Series. Entertainment Programs, 1998. 48 minutes. Includes flying scenes of a restored Hellcat and dramatization of the true story of Marine night-fighter pilot Bruce Porter.

The Fighting Lady/Carrier Ops DVD. Zeno's Flight Shop. 60 minutes. A fictionalized account of an Essex-class carrier with actual World War II footage of Hellcats and other Navy aircraft. Includes two additional Navy flight-deck films.

The Grumman F6F Hellcat DVD. Zeno's Flight Shop. 55 minutes. Includes three U.S. Navy F6F training films plus the pilot's manual.

Kill that Zero! The F6F at War. BCI Eclipse Video, 1992. 40 minutes. Based on official U.S. Navy and Japanese Imperial Navy footage.



Fighter-plane contrails trace the progress of the Battle of the Philippine Sea in the skies above the deck of the U.S.S. Birmingham, June 19, 1944. Hellcats played an important role in this engagement. (National Archives)

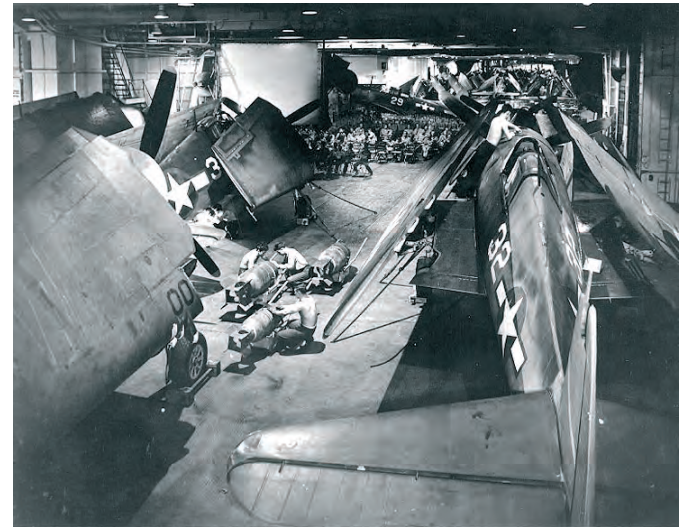
Archival Sources:

New England Air Museum Library, Windsor Locks, Connecticut. In addition to published works on the F6F Hellcat, the museum's library has copies of the official pilot's handbook and maintenance manuals and a small number of photographs.

U.S. Navy, Navy Aviation History Branch, Washington, D.C. Located in the Washington Navy Yard, the branch's holdings include a manuscript history of CASU-27 (the maintenance unit at Charlestown) and copies of the official accident reports for the two Hellcats that crashed in Preston.

National Archives, Still Pictures Branch, College Park, Maryland. The archives maintains an extensive collection of official U.S. Navy World War II photographs, indexed by place and type of aircraft.

National Archives, Records of the U.S. Navy, Bureau of Aeronautics, RG 72, College Park, Maryland. The collection, organized by aircraft type, preserves several items of official correspondence regarding the accident in Preston, including the ground controller's report.



Ordnance technicians working amid Hellcats on the hangar deck of the carrier Yorktown, 1943. (National Archives)

Museum Collections

There are about twenty Hellcats still in existence, including some that are airworthy. The following museums have F6Fs on display; those that are still capable of flying are marked with an asterisk:

Air Museum “Planes of Fame,” Chino, California (F6F-3*)

Air Zoo, Kalamazoo, Michigan (F6F-5*)

Cradle of Aviation Museum, Garden City, New York (F6F-5)

Evergreen Aviation Museum, McMinnville, Oregon (F6F-3)

Fleet Air Arm Museum, Yeovilton, Ilchester, Somerset,
United Kingdom (F6F-5N)

Lonestar Fight Museum, Galveston, Texas (F6F-5*)

National Air and Space Museum, Washington, D.C. (F6F-3)

National Museum of Naval Aviation, Pensacola, Florida
(F6F-3, F6F-5)

New England Air Museum, Windsor Locks, Connecticut (F6F-5)

Palm Springs Air Museum, Palm Springs, California (F6F-5N*)

Patriot’s Point Naval and Maritime Museum, Mount Pleasant,
South Carolina (F6F-5)

San Diego Aerospace Museum, San Diego, California (F6F-3)

Southern California Wing, Commemorative Air Force, Camarillo,
California (F6F-3/F6F-5 composite*)

Yanks Air Museum, Chino, California (F6F-5*)

In addition, the Naval Air Facility-Washington at Andrews Air Force Base in Maryland has an F6F on display, and the Fighter Collection of Duxford, England, flies an F6F-5 at air shows. The Quonset Air Museum, North Kingstown, Rhode Island, is raising money to restore an F6F-5N that was discovered in shallow water off Martha’s Vineyard in 1993; it had crashed in April 1945 during a training mission originating from Charlestown NAAF.

Carrier-deck landings were extremely hazardous. This Hellcat crash-landed onto the deck of the carrier Enterprise in November 1943, rupturing the auxiliary fuel tank. A flight-deck officer climbed up to assist the pilot, who was not seriously injured. (National Archives)

