

F-4 PHANTOM Role: Interceptor, fighter bomber. National Origin: United States Manufacturer: McDonnell Aircraft First Flight: 27 May 1958 Retired: 1992 (UK) 1996 (US combat use) 2013 (Germany) 2016 (US target drone) Status: In limited service Primary users: USAF USN USMC Produced: 1958 – 1981 Number built: 5,195 Unit cost: \$2.4 million (FYI 1965) GENERAL CHARACTERISTICS Crew: 2 (Pilot & Radar Officer) Length: 63' 0" (19.2 m) Wingspan: 38' 5" (11.7 m) Height: 16' 5" (5 m) Empty weight: 30,328 lb (13,757 kg) Max T/O weight: 61,795 lb (28,030 kg) Powerplant: Two GE J79-17A (with after burner) Max speed: Mach 2.23 Cruise speed: 584 mph (940 km/h) Combat radius: 367 nm (423 km) Service ceiling: 60,000' (18,000 m) (ORIGINAL MAY 2019)	F-14 TOMCAT Role: Interceptor, air superiority and multirole combat aircraft National origin: United States Manufacturer: Grumman Aerospace First flight: 21 December 1970 Retired: 22 September 2006 (USN) Status: In service Iran Air Force Primary users: US Navy & Iran Air Force Produced: 1969 - 1991 Number built: 712 Unit cost: \$38 million (1998) GENERAL CHARACTERISTICS Crew: 2 (Pilot & Radar Officer) Length: 62' 9" (19.1 m) Wingspan: spread 64' (19.55 m) swept 38' (11.58 m) Height: 16' (4.88 m) Empty weight: 43,735 Max T/O off weight: 74,359 lb (33,720 kg) Powerplant: 2 GE F110 (29K thrust) Max speed: 2.34 Mach (1,544 mph) Combat range: 500 nm (926 km) Service ceiling: 50,000' (15,200 m) ARMAMENT Gun: One 20mm, Vulcan (6 barreled Gatling cannon) Missiles: Phoenix; Sparrow, Sidewinder, Hawk Tarps: (Tactical Airborne Reconnaissance Pod System) Lantirn: Targeting pod. (ORIGINAL MAY 2019)
F-8 CRUSADER Role: Fighter aircraft National Origin: United States Manufacturer: Vought First Flight: 25 March 1955 Introduction: March 1957 Retired: 1976 (fighter US Navy) 29 March 1987 US Naval Reserve (photo recon.) 1991 Philippines Air Force 19 December 1999 France Reired completely in 2000 Status: Reired completely in 2000 Primary Users: US Navy USMC Philippine Air Force Number built: 1,219 GENERAL CHARACTERISTICS Crew: 1 Length: 54' 3" (16.53 m) Wingspan: 35' 8" (10.87 m) Height: 15' 9" (4.80 m) Empty weight: 17,541 lb (7,956 kg) Max T/O weight: 34,000 lb (15,500 kg) Powerplant: 1 J57-P-20A (18K thrust) Max speed: Mach 1.86 (1,225 mph) Combat radius: 450 mi (730 km) Service ceiling: 58,000' (17,700 m) ARMAMENT Guns: Four 20mm Colt Mk 12 cannons (ORIGINAL MAY 2019)	T-28 TROJAN Role: Trainer aircraft Light attack Manufacturer: North American Aviation First flight: 24 September 1949 Retired: 1994 Primary users: USAF, USN, Republic of Vietnam, French Air Force Produced: 1950-1957 Number built: 1,948 GENERAL CHARACTERISTICS Crew: 2 Length: 33' 0" (10.06 m) Wingspan: 40' 1" (12.22 m) Height: 12' 8" (3.86 m) Empty weight: 6,424 lb. (2,914 kg) Max T/O weight: 8,500 lb. (3,856 kg) Powerplant: Wright R-1820 9 cylinder air cooled radial engine.1,425 hp. PERFORMANCE Max speed: 343 mph (552 km/h) Ferry range: 1,060 mi (1,706 km) Service ceiling: 35,500' (10,800 m) Rate of climb: 3,540 ft/min (18.0 m/s) ARMAMENT Hardpoints 6 with a total capacity of 1,200 lbs. (540 kg) (ORIGINAL MAY 2019)

F-14 TOMCAT SNIPPETS

The Tomcat was developed for the USN after the collapse of the F-111B project. The F-14 was the first of the "Teen Series" fighters, which were designed incorporating air combat experience against MiG fighters during the Vietnam War. The F-14 began replacing the F-4 Phantom II in USN service starting in September 1974. The F-14 first kills in USN service was on 19 August 1981 over the Gulf of Sidra engaging two Libyan Su-22 "Fitters". USN F-14s once again were pitted against Libyan aircraft on 4 January 1989, shooting down two Libyan MiG-23 "Floggers" over the Gulf of Sidra in a second Gulf of Sidra incident. While the Tomcat was being used by Iran in combat against Iraq, in its intended air superiority mission in the early 1980s, the USN found itself flying regular daily combat missions over Lebanon to photograph activity in the Bekaa Valley. The participation of the F-14 in the 1991 Operation Desert Storm consisted of Combat Air Patrol (CAP) over the Red Sea and the Persian Gulf and overland missions consisting of strike escort and reconnaissance. The USN suffered its only F-14 loss from enemy action on 21 January 1991 when shot down by an SA-2 surface-to-air missile near Al Asad airbase in Iraq. Both crews survived ejection. The F-14 last kill in US service was an Iraqi Mi-8 "Hip" helicopter, with an AIM-9 Sidewinder.

Iranian ace Jalil Zandi is credited with shooting down 11 Iraqi aircraft during the Iran-Iraq War, making him the most successful F-14 pilot.

(ORIGINAL MAY 2019)

F-4 PHANTOM II SNIPPETS

In 1952, McDonnell Corp. concluded the USN had the need for a new and different aircraft type: an attack fighter. In 1953, the company began work on revising its F3H Demon with expanded capabilities and better performance. McDonnell designed an all-weather fighter-bomber with external hardpoints for weapons. The F-4 maiden flight was in May 1958 and carrier qualified in 1960. The F-4 external hardpoints have a capability of up to 18,650 pounds (8,480 kg) of weapons, including air-to-air and air-to-surface missiles, and unguided, guided, and thermonuclear weapons. Like other interceptors of its day, the F-4 was designed without an internal cannon. During the Vietnam war, the USN and USAF had high expectations of the F-4 but in confrontation with the more maneuverable MiG-21 it suffered losses. The USN F-4 Phantom scored 40 air-to-air victories at a loss of 7 Phantoms. USMC Marine F-4 pilots claimed 3 enemy MiGs at the cost of 1 aircraft. USAF F-4 Phantom crews claimed 107½ MiG kills (including 33½ MiG-17s, eight MiG-19s and 66 MiG-21s) at a cost of 33 Phantoms. F-4 pilots claimed a total of 150½ MiG kills at a cost of 42 Phantoms in air-combat. In air combat, the F-4 greatest advantage was thrust, permitting a skilled pilot to engage and disengage at will; it lacked the agility of its Soviet opponents and was subject to adverse yaw during hard maneuvering. Despite irrecoverable spins during aileron rolls, pilots reported the aircraft to be very communicative and easy to fly on the edge of its performance envelop. The F-4 was adopted by the USMC and USAF and by the mid-1960s became a major part of the armed services air arms. As of 2018 F4s remain in service in other countries.

(ORIGINAL MAY 2019)

T-28 TROJAN SNIPPETS

The T-28 was designed to replace the T-6 Texan. Following suitable tests at Eglin AFB, Florida, in June 1950, a contract was issued and between 1950 and 1957, a total of 1,948 were built. The T-28 Trojan is a 9 piston-engine military trainer aircraft used by the USAF and the USN beginning in the 1950s. After the T-28 was adopted as a primary trainer by the USAF, the USN and USMC adopted it as well. The USAF phased out the aircraft for primary pilot training by the early 1960s; however, the aircraft continued to be used as a primary trainer by the Navy, Marine Corps and Coast Guard into the early 1980s. The largest single concentration of this aircraft was employed by the USN in training naval aviators. The T-28s service career in the U.S. military ended with the completion of the phase-in of the T-34C turboprop trainer. The last U.S. Navy training squadron to fly the T-28 was NAS Corpus Christi, Texas, in early 1984. T-28s were supplied to the Republic of Vietnam Air Forces and widely used in VNAF, as well as in the Secret War in Laos. A T-28 was the first US fixed wing attack aircraft (non-transport type) lost in South Vietnam, during the Vietnam War. In 1963, a Royal Lao Air Force T-28 piloted defected to North Vietnam. Within six months the T-28 was refurbished and commissioned into the North Vietnamese Air Force as its first fighter aircraft. The USAF lost 23 T-28s to all causes during the war, with the last two losses occurred in 1968. Besides its use as a trainer, the T-28 was employed as a counter-insurgency, primarily during the Vietnam War. It has continued in civilian use as an aerobatics and Warbird performer.

(ORIGINAL MAY 2019)

F-8 CRUSADER SNIPPETS

In Sept. 1952 the USN announced a requirement for a new fighter requiring a speed of Mach 1.2 and climb rate of 25k ft. /min landing speed of no more than 100 mph (160km/h). In response Vought created the F-8 a single-engine, supersonic, carrier-based air superiority jet aircraft. The F-8 served principally in the Vietnam War. A F8U-1 set a U.S. National speed record in August 1956, of 1,015.428 mph (1,634.173 km/h) beating the previous record of 822 mph (1,323 km/h) set by a USAF F-100, but not the world record of 1,132 mph (1,822 km/h), set by the British in 1956. The Crusader became a "day-fighter" operating off aircraft carriers beginning on 23 October 1962 during the Cuban Missile Crisis, flying extremely low-level photo reconnaissance missions over Cuba. The Crusader was not an easy aircraft to fly, and was often unforgiving in carrier landings (poor recovery from high sink rates); poorly designed castoring undercarriage made it hard to steer on the deck. Safe landings required the carriers to steam at full speed to lower the relative landing speed. Oil-burning carriers belching thick black smoke, sometimes obscuring the flight deck, forcing the pilot to rely on the LSO radioed instructions. It earned a reputation as an "ensign eliminator" during its early service introduction. Of the 1,261 Crusaders built 1,106 were involved in mishaps. Despite the "last gunfighter" moniker, the F-8s achieved only four victories with cannons; the remainder was shot down with AIM-9 Sidewinder missiles. Use of missiles was partly due to the propensity of the 20 mm Colt-Mk 12 cannons feeding mechanism to jam under G-loading during high-speed dogfighting maneuvers. U.S. records indicate three F-8s lost in aerial combat, to MiG-17 cannon fire in 1966, but the North Vietnamese claimed 11 F-8s were shot down by MiGs. A total of 170 F-8s Crusaders were lost to all causes during the war - mostly ground fire and accidents.

(ORIGINAL MAY 2019)

S-2 TRACKER Role: ASW aircraft National origin: United States Manufacturer: Grumman First flight: 4 December 1952 Introduction: February 1954 Primary users: US Navy Royal Canadian Navy Argentine Navy Brazilian Navy Number built: 1,284 Unit cost: GENERAL CHARACTERISTICS Crew: 2 pilots, 2 ASW operators Length: 43' 6" (13.26 m) Wingspan: 72' 7" (22.12 m) Height: 17' 6" (5.33 m) Empty weight: 18,315 lb. (8,310 kg) Max T/O weight: 26,147 lb. (11,860 kg) Powerplant: 2 Wright R-1820 radial 1,525 hp. (1,137 kW) Cruise speed: 150 mph (240 km/H) Range: 1,350 mi (2,170 km) Service ceiling: 22,000' (6,700 m) (ORIGINAL MAY 2019)	S-3 VIKING Role: Carrier-based anti-submarine aircraft National origin: United States Manufacturer: Lockheed Corporation First flight: 21 January 1972 Retired: 2016 Primary users: United States Navy Produced: 1974 - 1978 Number built: 188 Unit cost: \$27 million (1974) GENERAL CHARACTERISTICS Crew: 4 (Pilot, Co-Pilot, and two ASW specialist). Length: 54' 4" (16.26 m) Wingspan: 68' 8" (20.93 m) Height: 22' 9" (6.93 m) Empty weight: 26,581 lbs. (12,057 kg) Max T/O weight: 52,539 lbs. (23,831 kg) Powerplant: 2 GE TF34 turbofans 9,275 lbs. (ORIGINAL MAY 2019)
F4F WILDCAT Role: Fighter aircraft National origin: United States Manufacturer: Grumman First flight: 2 September 1937 Introduction: December 1940 Retired: 1945 Primary users: USN, USMC, Royal Navy, Royal Canadian Navy Number built: 7,885 GENERAL CHARACTERISTICS Crew: 1 Length: 28' 9" (8.76 m) Wingspan: 38' (11.58 m) Height: 11' 10" (3.60 m) Empty weight: 4,907 lb. (2,226 kg) Loaded weight: 7,423 lb. (3,367 kg) Powerplant: P&W R-1830 double row radial 1,200 hp. PERFORMANCE Max speed: 331 mph (531 km/h) Range: 845 mi (1,360 km) Service ceiling: 39,500' (12,000 m) Rate of climb: 2,303 ft/min (11.7 m/s) ARMAMENT Guns: 4 50 cal. (12.7mm) Browning 450 rounds per gun Bombs: 2 100 lb. (45 kg) or 2 58 gal (220 l) drop tanks. (ORIGINAL MAY 2019)	TBF (TBM) AVENGER Role: Torpedo bomber National origin: United States Manufacturer: Grumman General Motors First flight: 7 August 1941 Introduction: 1942 Retired: 1960s Primary users: United States Navy Royal Navy Royal Canadian Navy Royal New Zealand AF Number built: 9,839 GENERAL CHARACTERISTICS Crew: 3 (Pilot, gunner, radio operator) Length: 40' 11" (12.48 m) Wingspan: 54' 2" (16.51 m) Height: 15' 5" (4.70 m) Empty weight: 10,545 lb. (4,783 kg) Loaded weight: 17,893 lb. (8,115 kg) Powerplant: Wright R-2600 Cyclone radial engine, 1,900 hp. PERFORMANCE Max speed: 275 mph (442 km/h) Range: 1,000 mi (1,610 km) Service ceiling: 30,100' (9,170 m) Rate of climb: 2,060 ft/min (10.5 m/s) ARMAMENT Guns: 1 30 cal. (7.62 cm) nose Browning machine gun 1 50 cal. dorsal Browning 1 30 cal. ventral Browning Ordnance: 1 2,000 lb. Mark 13 torpedo Up to 2,000 lb. (907 kg) bombs (ORIGINAL MAY 2019)

S-3 VIKINGS SNIPPETS

In the mid-1960s, the USN placed a requirement for a new ASW platform to replace Grumman S-2 Tracker. In 1968 a team led by Lockheed and Convair/Grumman developed proposals to meet the requirement; later Lin-Temco-Vought was added to the team. The consortium resulted in the S-3 Viking that was used by the USN primarily for anti-submarine warfare. Unlike many tactical jets which required ground service equipment, the S-3 was equipped with an auxiliary power unit (APU) capable of providing electric power and pressurized air for both aircraft cooling and engines starts. At the time it entered the fleet, the S-3 introduced an unprecedented level of systems integration for ASW. With the collapse of the Soviet Union and the breakup of the Warsaw Pact, the Soviet-Russian submarine threat was perceived as much reduced, and the Vikings had the majority of the antisubmarine warfare equipment removed. The mission of the aircraft changed to sea surface search, sea and ground attack, over-the-horizon targeting, and aircraft refueling. To reflect the new mission the Viking squadrons were redesignated to "Sea Control Squadrons". The Viking also provided electronic warfare and surface surveillance capabilities to the carrier battle group. Because of the characteristic sound of the engines, it was nicknamed the "Hoover" after the vacuum cleaner brand. On 1 May 2003, US President George W. Bush flew in the co-pilot seat of a Viking from NAS North Island, California, to *USS Abraham Lincoln* off the California coast.

(ORIGINAL MAY 2019)

S-2 TRACKER SNIPPETS

The S-2 Tracker was the first purpose, single airframe anti-submarine warfare (ASW) built for the USN. The Tracker was a conventional design propeller - driven twin radial engines, high wing and tricycle undercarriage. The S-2 replaced the Grumman AF-2S that required the use of two airframes one with the detection gear, and the other with the weapon systems. The Tracker combined both functions in one aircraft. The aircraft entered service in February 1954. Follow-on versions became the Grumman E-1 and Grumman C-1. The S-2 carried the nickname "Stoof" (S-two-F) throughout its military career; and the E-1 Tracker variant with the large overhead radome was colloquially called the "Stoof with a roof." The S-2 had an internal torpedo bay capable of carrying two lightweight torpedoes or one nuclear depth charge. There were six underwing hard points for rocket pods and conventional depth charges or up to four additional torpedoes. A ventrally-mounted retractable radome for AN/APS-38 radar and a Magnetic Anomaly Detector (MAD) AN/ASQ-8 mounted on an extendable rear mounted boom were also fitted. A 70-million-candlepower searchlight was mounted on the starboard wing. The engine nacelles carried JEZEBEL sonobuoys in the rear. The Tracker was eventually superseded in U.S. military service by the S-3 Viking. A number of Trackers live on as firefighting aircraft.

(ORIGINAL MAY 2019)

TBF AVENGER SNIPPETS

The USN torpedo bomber introduced in 1935 was obsolete by 1939 and bids were accepted from companies to replace it. The Grumman TBF design was selected. The Avenger first saw action at the Battle of Midway. Despite the loss of five of the six Avengers on its combat debut, it survived in service to become one of the outstanding torpedo bombers of World War II. The first major "prize" for TBFs was at the Naval Battle of Guadalcanal in November 1942, when Marine Corps and Navy Avengers helped sink the Japanese battleship Hiei. By 1943, Grumman began to slowly phase out production of the Avenger to produce F6F Hellcat fighters, and the Eastern Aircraft Division of General Motors took over production. Grumman delivered a TBF-1, held together with sheet metal screws, so that the automotive engineers could disassemble it, a part at a time, and redesign the aircraft for automotive style production. This aircraft was known as the "P-K Avenger" (P-K = Parker-Kalon, manufacturer of sheet metal screws). Besides the traditional surface role (torpedoing surface ships) the aircraft was one of the most effective sub-killers in the Pacific, as well as in the Atlantic claiming 30. Avengers were used during the sinking of the Japanese "super battleships": Musashi and Yamato. Future-President George H. W. Bush, flying a TBM from USS San Jacinto, was shot down over the Pacific island of Chichi Jima. Another famous Avenger aviator was Paul Newman, who flew as a rear gunner. He had hoped to be accepted for pilot training, but did not qualify because he was color blind. The TBF torpedo bomber was the heaviest single-engine aircraft of World War II.

(ORIGINAL MAY 2019)

F4F WILDCAT SNIPPETS

The F4F Wildcat was the end result of multiple designs by Grumman during the 1930s transitioning from bi-winged to monoplane fighters. The Grumman F4F Wildcat was first used in combat by the British in the North Atlantic. The Wildcat was the only effective fighter available to the USN and USMC in the Pacific Theater during the early part of WW2 1941 and 1942. The Wildcat was outperformed by the faster, more maneuverable, and longer-ranged Mitsubishi A6M Zero. However, the F4F ruggedness and self-sealing tanks, coupled with tactics such as the "Thach Weave", resulted in air combat kill-to-loss ratio of 5.9:1 in 1942 and 6.9:1 for the entire war. Lessons learned from the Wildcat were later applied to the faster F6F Hellcat. From 1943 onward, Wildcats equipped with bomb racks were primarily assigned to escort carriers for use against submarines and attacking ground targets, though they would also continue to score kills against Japanese fighters, bombers and kamikaze aircraft. In the Battle off Samar on 25 October 1944, escort carriers with F4Fs of Task Unit 77.4.3 and their escort of destroyers and destroyer escorts found themselves as the sole force standing between vulnerable troop transport and supply ships engaged in landings on the Philippine island of Leyte against a powerful Japanese surface fleet of battleships and cruisers. During the course of the war, Navy and Marine F4Fs flew 15,553 combat sorties (14,027 of these from aircraft carriers), destroying 1,327 enemy aircraft at a cost of 178 aerial losses, 24 to ground/shipboard fire, and 49 to operational causes (an overall kill-to-loss ratio of 6.9:1).

(ORIGINAL MAY 2019)

A4 SKYHAWK Role: Attack, fighter aircraft National origin: United States Manufacturer: Douglas Aircraft Company McDonnell Douglas First flight: 22 June 1954 Introduction: October 1956 Retired: USMC (1998), USN (2003) Israeli Air Force (2015) Royal New Zealand AF (2001) Status: In limited service with non-US Primary users: USN, USMC, Israeli Air Force, Argentine Air Force Produced: 1954 – 1979 Number built: 2,960 Unit cost: \$2.8 to 3.8 million GENERAL CHARACTERISTICS Crew: 1 Length: 40' 3" (12.22 m) Wingspan: 26' 6" (4.57 m) Height: 15' (4.57 m) Empty weight: 10,450 lb. (4,750 kg.) Max T/O weight: 24,500 lb. (11,136 kg.) Powerplant: P&W J52 9,300 lbs. PERFORMANCE Max speed: 673 mph, (1,083 km/h) Range: 1,700 nmi (2,000 mi, 3,200 km) Service ceiling: 42,250' (12,880 m) Rate of climb: 8,440 ft/min (43 m/s) ARMAMENT Guns: 2 20 mm (100 rounds/gun) Rockets: Four rocket pods Missiles: Air to air (AIM-9) Bombs: Conventional and nuclear. (ORIGINAL MAY 2019)	F11F TIGER Role: Fighter aircraft National origin: United States Manufacturer: Grumman First flight: 30 July 1954 Introduction: 1956 Retired: 1961 (Carrier ops) 1967 (Training) 1969 (Blue Angels) Primary users: US Navy Number built: 200 GENERAL CHARACTERISTICS Crew: 1 Wingspan: 37' 1.5" (11.31 m) Height: 13' 3" (4.0 m) Empty weight: 13,810 lb. (6,277 kg.) Max T/O weight: 23,459 lb. (10,663 kg.) Powerplant: 1 Wright J65-W-turbojet (thrust 7,400 lbf with burner, 10,500 lbf) PERFORMANCE Max speed: Mach 1.1 (1,170 km/h) Range: 1,275 mi (2,050 km) Service ceiling: 49,000' (14,900 m) Rate of climb: 16,300 ft/min (83m/sec) ARMAMENT Guns: Four 20 mm (125 rounds/gun) Rockets: Aero 6A Missiles: Aim-9 Sidewinder (ORIGINAL MAY 2019)
SH-2F SEASPRITE Role: ASW helicopter National origin: United States Manufacturer: Kaman Aircraft Corporation First flight: 2 July 1959 Introduction: December 1962 Retired: 1993 Status: Phased out of service Primary users: US Navy Royal New Zealand Air Force Produced: 1959-1969 Number built: 184 Unit cost: \$16 million GENERAL CHARACTERISTICS Crew: 3 (2 Pilots,1 aircrew) Length: 52' 2" (15.90 m) Rotor diameter: 44' 0" (13.42 m) Height: 13' 6" (4.11 m) Empty weight: 6,100 lb. (2,767 kg.) Max T/O weight: 10,200 lb. (4,627 kg.) Powerplant: 1 GE T58-GE-8B turboshaft, 1,525 shp (1,137 kW) Later upgraded to two GET58 – GE-8 turboshaft. PERFORMANCE Max speed: 141 mph, (278 km/h) Range: 582 nmi (1,593 km) Service ceiling: 17,400' (5,305 m) Rate of climb: 1,305 ft/min (2,204 m/min) (ORIGINAL MAY 2019)	FJ-2 FURY Role: Fighter aircraft National origin: United States Manufacturer: North American Aviation First flight: 27 December 1951 Introduction: 1954 Retired: September 1962 Status: Phased out of service Primary users: US Navy US Marines Number built: 741 GENERAL CHARACTERISTICS Crew: 1 Length: 37' 7" (11.45 m) Wingspan: 37' 1.5" (11.31 m) Height: 13' 7" (4.14 m) Empty weight: 11,802 lb. (5,353 kg.) Max T/O weight: 18,790 lb. (8,523 kg.) Powerplant: 1 GE J47 turbojet (6,000 lbf. (26.7 kN) PERFORMANCE Max speed: 587 mph, (1,088 km/h) Range: 860 nmi (1,593 km) Service ceiling: 46,800' (12,880 m) Rate of climb: 7,230 ft/min (2,204 m/min) ARMAMENT Guns: Four 20 mm (600 rounds total) (ORIGINAL MAY 2019)

GRUMMAN F-11F SNIPPETS

The F11F TIGER was the result of a privately funded 1952 Grumman concept to modernize the F9F Cougar by implementing the area rule and other advances as a complete design departure from the Cougar. The design potential of the F11F for supersonic performance and reduced transonic drag interested the USN. The new wing had full-span leading-edge slats and trailing edge flaps with roll control achieved using spoilers instead of ailerons. The F11F wings manually folded downwards for storage. The tailplane was all-moving for supersonic flight. The F11F Tiger is noted for being the first jet aircraft to shoot itself down. In 21 September 1956, during a test-firing of the 20 mm cannons, the pilot fired two bursts midway through a shallow high speed dive. As the velocity and trajectory of the cannon rounds decayed, the speeding F11F over took the rounds and ultimately crossed paths disabling the aircraft and forcing a crash-landing. The pilot survived. In service, the Tiger operated from eight carriers. The F11F lasted only four years in the fleet because performance was inferior to the F-8 Crusader and the J65 engine proved unreliable. Also, the range and endurance was found to be inadequate. The Tiger was withdrawn from carrier operations by 1961. The F11F continued in service in the Naval Air Training Command until the late 1960s. Students performed advanced jet training in the Cougar, and upon completing the advance syllabus, were given a brief taste of supersonic capability with the F-11F before transitioning to fleet fighters. While the F11F fighter career was short, the Blue Angels performed in the aircraft from 1957–1968.

(ORIGINAL MAY 2019)

A4 SKYHAWK SNIPPETS

The Skyhawk was designed by Ed Heinemann (Douglas Aircraft) in response to USN call to replace the AD Skyraider. The result was an aircraft that weighed half of the Navy weight specification; its wing are so compact no need to fold for carrier stowage. The diminutive Skyhawk received nicknames, "Scooter", "Kiddiecar", "Bantam Bomber", "Tinker Toy Bomber", and "Heinemann's Hot-Rod". The A4 was first with "buddy" air-to-air refueling; supply others of the same type, reducing the need for dedicated tanker aircraft. The A4 was also designed to make an emergency landing, on the two wing drop tanks that were usually installed. Skyhawks were well loved by their crews for being tough and agile. A4s were the U.S. Navy's primary light attack aircraft used over North Vietnam during the early years of the Vietnam War: they were later supplanted by the A-7 Corsair II. Skyhawks carried out some of the first air strikes by the US during the war and a USMC Skyhawk is believed to have dropped the last bombs on the country. Notable naval aviators who flew the Skyhawk included Lt. Commanders Everett Alvarez, John McCain and Commander James Stockdale. During the war, 362 A-4/TA-4F Skyhawks were lost due to all causes. The USN lost 271 A-4s, the USMC lost 81 A-4s and 10 TA-4Fs. A total of 32 A-4s were lost to surface-to-air missiles (SAMs), and one A-4 was lost in aerial combat to a MiG-17 on 25 April 1967. Lt. Commander Theodore R. Swartz, shot down a North Vietnamese Air Force MiG-17 with an unguided Zuni rocket as the Skyhawk only air-to-air victory of the Vietnam War.

(ORIGINAL MAY 2019)

FJ-2/3 FURY SNIPPETS

By 1951, the existing USN straight-wing fighters were inferior to the swept-wing MiG 15 used in the Korean War. Swept-wing fighters in the Navy development pipeline were not ready for deployment. The Navy ordered a direct development of the F-86 swept-wing as the FJ2, an interim solution. The aircraft featured folding wings, a longer nose landing strut to increase angle of attack upon launch and to accommodate a longer oleo to absorb the shock of hard landings on carriers. Outwardly, the FJ2 was hard to distinguish from an F-86, apart from Navy paint and the gun muzzles of the 20 mm cannon. Construction of the Fury was slowed due to demand for the F-86 in Korea; the FJ2 was not produced in large numbers until after the war concluded. In the end, the Navy preferred the lighter F9F Cougar due to superior slow-speed performance for carrier operations and the 200 FJ2 models were delivered to the USMC. The Marines made several cruises aboard carriers and tried to solve the aircraft carrier handling problems, but the FJ2 was never really satisfactory. In 1956, the Fury disappeared from front-line service. During the FJ2 development a version powered by Wright J65 was under way that became the FJ3 with 28% more power. The wings of the FJ3 had four stations for external loads, up to 1,000 lbs. on the inboard stations and 500 lbs. on the outboard stations. Because of the more powerful engine, the FJ3 was superior to most models of the F-86. In 1956 the Navy retro-fitted all its FJ3s with probe-and-drogue air refueling equipment, a long probe fitted under the left wing. An FJ3 was the first fighter to land aboard the new supercarrier USS Forrestal in 1956.

(ORIGINAL MAY 2019)

KAMAN SH-2 SEASPRITE SNIPPETS

During 1956, the U.S. Navy launched a competition to meet requirements for a compact, all-weather multipurpose naval helicopter. The Kaman Aircraft Corp. designed a conventional helicopter powered by a single GE T58 turboshaft engine which drove a 44-foot four-bladed main rotor and a four-bladed tail rotor that the US Navy selected. During 1962, the initial UH-2 operational service the U.S. Navy quickly determined that the helicopter's capabilities were greatly restricted by its single engine. Kaman was ordered to retrofit all Seasprites with a more capable twin-engine arrangement. With a pair of engines, the Seasprites was capable of attaining an airspeed of 130 knots and operating at a range of 411 nautical miles. The U.S. Navy operated a total fleet of nearly 200 Seasprites to perform a variety of missions, ranging from anti-submarine warfare (ASW) operations, search and rescue (SAR) and utility transport. Under typical operational conditions, several UH-2s were deployed on carriers to perform plane guard and SAR missions. The UH-2 was introduced in time to see action in the Tonkin Gulf incident in August 1964. The principal contribution of the Seasprite in the lengthy Vietnam War was the retrieval of downed aircrews, both from the sea and from inside enemy territory. The helicopter was increasingly relied upon to perform the retrieval mission as the conflict intensified, such as during Operation Rolling Thunder in 1965. During October 1966 alone, out of 269 downed pilots, helicopter-based SAR teams were recorded as recovering 103 men.

(ORIGINAL MAY 2019)

HUP-1 RETRIEVER Role: Utility helicopter National origin: United States Manufacturer: Piasecki Helicopter First flight: March 1948 Introduction: February 1949 Retired: 1958 US Army 1964 US Navy 1965 French Navy Primary users: US Navy US Army Royal Canadian Navy French Navy Produced: 1949 – 1954 Number built: 339 GENERAL CHARACTERISTICS Crew: 2 pilots Capacity: 4 passengers Length: 56' 11" (17.35 m) Rotor diameter: 35' 0" (10.67 m) Height: 13' 2" (4.01 m) Disc area: 1,924² (179 m²) Empty weight: 4,132 lb. (1,874 kg.) Max T/O weight: 6,100 lb. (2,767 kg.) Powerplant: Continental R-975 radial, 550 hp. (410kW) PERFORMANCE Max speed: 91 knots (105 mph, 169 km/h) Cruise speed: 70 knots (80 mph, 129 km/h) Service ceiling: 10,000' (3,050 m) Rate of climb: 1,000'/min (5.01 m/s) (ORIGINAL MAY 2019)	SH-3 SEA KING Role: Anti-submarine warfare, search and rescue and utility National origin: United States Manufacturer: Sikorsky Aircraft First flight: 11 March 1959 Introduction: 1961 Retired: 2006 US Navy Status: In service Primary users: US Navy Italian Navy Brazilian Navy Argentine Navy Produced: 1959-1970s Unit cost: \$6.4 million GENERAL CHARACTERISTICS Crew: Four (2 pilots, 2 ASW operators) Capacity: 3 passengers Length: 54' 9" (16.7 m) Rotor diameter: 62' 0" (19 m) Height: 16' 10" (5.13 m) Disk area: 3,019 ft² (284 m²) Empty weight: 11,8626 lb. (8,449 kg.) Max T/O weight: 22,050 lb. (10,002 kg.) Powerplant: Two GE T58-GE-10 turboshafts 1,400 shp PERFORMANCE Max speed: 166 mph (267 km/m) Range: 621 mi (1,000 km) Service ceiling: 14,700' (4,481 m) Rate of climb: 1,310 to 2,220'/min (400 to 670 m/min) ARMAMENT Torpedoes: Two Mk 46/44 Sonobuoys & pyrotechnic devise Nuclear depth charge: B-57 (ORIGINAL MAY 2019)
SIKORSKY H-34 Role: Utility helicopter National origin: United States Manufacturer: Sikorsky Aircraft First flight: 8 March 1954 Introduction: 1954 Status: Production completed, still in civilian use. Primary users: US Navy US Marine Corps US Army Produced: 1954 – 1970 Number built: 2,018 GENERAL CHARACTERISTICS Crew: Two Capacity: 12 (A model), 18 (C model) troops or 8 stretchers. Length: 56' 8.5" (17.28 m) Rotor diameter: 56' 0" (17.07 m) Height: 15' 11" (4.86 m) Disc area: 2,463 ft² (228.85 m²) Empty weight: 7,900 lb. (3,583 kg.) Max T/O weight: 14,000 lb. (6,350 kg) Powerplant: One Wright R-1820-84 radial engine, 1,525 hp (1,137 kW) PERFORMANCE Max speed: 173 mph (278 km/h) Range: 182 mi (293 km) Service ceiling: 4,905' (1,495 m)) Rate of climb: 1,100 ft/min (335.3 m/min) (ORIGINAL MAY 2019)	ESSEX CLASS AIRCRAFT CARRIERS CV-9 Essex CV-10 Yorktown CV-11 Intrepid CV-12 Hornet CV-13 Franklin CV-14 Ticonderoga CV-15 Randolph CV-16 Lexington CV-17 Bunker Hill CV-18 Wasp CV-19 Hancock CV-20 Bennington CV-21 Boxer CV-31 Bon Homme Richard CV-32 Leyte CV-33 Kearsarge CV-34 Oriskany CV-36 Antietam CV-37 Princeton CV-38 Shangri-La CV-39 Lake Champlain CV-40 Tarawa CV-45 Valley Forge CV-47 Philippine Sea (ORIGINAL MAY 2019)

SH-3 SEA KING SNIPPETS

The Sea King has its origins in efforts by the USN to counteract the growing threat of Soviet submarines during the 1950s. Introduced to service in 1961, it was operated by the United States Navy as a key ASW and utility asset for several decades. The SH-3 was the world first amphibious helicopter and one of the first ASW rotorcraft to use turboshaft engines, making it a landmark design. In late 1961 and early 1962, a modified U.S. Navy HSS-2 Sea King broke multiple helicopter speed records. Several Sea Kings, operated by the USMC HMX-1 unit, are used as the official helicopters of the President of the United States, for which the call sign "Marine One" is used. The main rotor blades and the tail section can be folded using an automatic system for storage onboard ships. The amphibious hull allows a Sea King to conduct water landings and to float for prolonged periods on marine surfaces. The armament fitted on a SH-3 varies. For anti-submarine missions, the SH-3 can carry up to four torpedoes or four depth charges. For anti-ship duties, some models are outfitted to carry one or two missiles. The Sea King could also be fitted to deploy the B57 nuclear bomb (9' 10" long; 500 lbs.). During the Vietnam War SH-3s rescued crews of downed aircraft at sea and land, typically being equipped with self-sealing fuel tanks, multiple machine guns and heavy armor. Due to the greater range and the safety of two engines, it was often used during rescue sorties into North Vietnam. The SH-3 was the primary helicopter for retrieving manned space capsules starting with Mercury and was the primary recovery vehicle for Apollo missions 8, 10, 11, 12, 13.

(ORIGINAL MAY 2019)

HUP-1 RETRIEVER SNIPPETS

The Piasecki HUP Retriever is a compact single radial engine, twin overlapping tandem rotor utility helicopter developed to US Navy specifications. The Piasecki design won against the Sikorsky XHJS-1. The design was for operations from ships including aircraft carriers, battleships, and cruisers. The HUP/H-25 was the first helicopter to be produced with an autopilot. The design featured two three-bladed, rotors in tandem that folded for storage; the relatively small rotor diameter allowed the aircraft to use aircraft carrier elevators with its blades fully extended. The tandem overlapping rotor configuration was a development by Piasecki and was used in future helicopter designs by the company and successors. To aid search and rescue operations, the aircraft was equipped with an overhead winch capable of lifting 400 lb (181 kg), which could lower a rescue sling using an electrically-operated door available after the copilot's seat was folded forward. During a flight demonstration of its capability to withstand high g-force, the demo ac became the first helicopter to perform a loop, albeit unintentionally. An improved HUP-2 was introduced with a more powerful engine and various minor changes in equipment; a sub-variant equipped with dunking sonar for anti-submarine warfare designated HUP-2S. The HUP-2 was the first production helicopter equipped with an autopilot. The US Navy also tested a system called Raydist that allowed an unmanned HUP-2 to be directed from a ground station and by radio signal to hover within five feet of a desired point. A large number of the former USN aircraft are now in the US civil registry.

(ORIGINAL MAY 2019)

INTRODUCTION & PROGRESSION of jet aircraft and systems to USN

1947 First jets – F1H Phantom

1949 Jets to Fleet in numbers.

1950 Korean War, jets go to war

1954 Almost 2,200 aircraft accidents 776 Aircraft lost 535 Fatalities

ISSUES: engine reliability and response time, swept-wing flight characteristics and man/machine interface.

1955-1956

CV-36 Antietam tests angle deck concept.

CV-19 Hancock test steam catapult

1949-1988

Navy and Marine Corps lost 12,000 a/c of all types and over 8,500 aircrew.

1955 – 1956

CV-36 Antietam tests angle deck concept

CV-19 Hancock test steam catapult

Buddy Store Heinemann introduced **A4B**

MLS is adopted (**Microwave Landing System**)

NATOPS is established 1961

RAGs (**Replacement Air Group**) is established

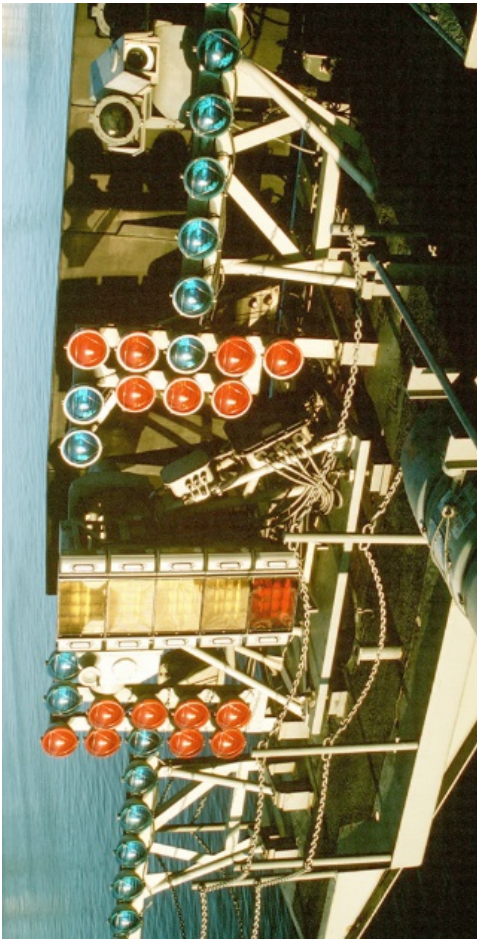
– now called **FRS** (**Fleet Replacement Squadron**)

(ORIGINAL MAY 2019)

SIKORSKY H-34 SNIPPETS

The Sikorsky S-58 was developed as a lengthened and more powerful version of the S-55, with a similar nose, but with a tail-dragger rear fuselage and landing gear. It retained the nose-mounted radial reciprocating engine with the drive shaft passing through the cockpit. The aircraft first flew on 8 March 1954 and entered in service for the USN initially designated HSS-1 Seabat (in its anti-submarine configuration) as HUS-1 Seahorse. Under the US Army & USAF aircraft designation system, the helicopter was designated H-34. Roles included utility transport, anti-submarine warfare, search and rescue and VIP transport. During the long Algerian War (1954 to 1962), the French Army Light Aviation used the H-34 (over 100,000 hrs.) in evacuation of 20,000 French troops from combat area. The use of armed helicopters during the Algerian War gave birth to some of the tactics of airmobile warfare used today. French evaluations on the reported ground fire vulnerabilities of the CH-34 may have influenced the U.S. Army's decision not to deploy the H-34. However, its higher availability and reliability due to its simplicity compared to the newer helicopters led Marines to ask for it by name. The phrases "give me a HUS", "get me a HUS" and "cut me a HUS" entered the U.S. Marine Corps vernacular, being used even after the type was no longer in use to mean "help me out". USMC H-34s were also among the first helicopter gunships used in theatre. The operations were met with mixed enthusiasm, and the armed H-34s, known as "Stingers" were quickly phased out.

(ORIGINAL MAY 2019)



Early Naval Aviation

- 17 Dec 1903** Wright brothers first flight.
- 14 Nov 1910** Eugene Ely, first flight off a ship. *USS Birmingham.*
- 18 Jan 1911** Eugene Ely, first landing on a ship, *USS Pennsylvania.* SF bay.
- 27 Jan 1911** Curtiss lands seaplane next to USS Pennsylvania, hoisted on and off, takes off from alongside.
- 28 Jan 1911** Lt. Theodore G. Ellyson, took off in a Curtiss "grass cutter" becomes the first naval aviator. Navy camp North Island, Birthplace of Naval Aviation."
- 1911** Aviation Camp Annapolis, MD established
- Jan 1914** NAS Pensacola established.
- 15 Jun 1917** First military detachment to France. ASW patrols in WW1
- 20 Mar 1922** Commissioning of CV-1 *USS Langley*, first Navy aircraft carrier.

(ORIGINAL MAY 2019)

USS HORNET SPECIFICATIONS

Builder: Newport News Shipbuilding
Laid down: 3 August 1942
Launched: 30 August 1943
Commissioned: 29 November 1943
Decommissioned: 26 June 1970
Struck: 25 July 1989

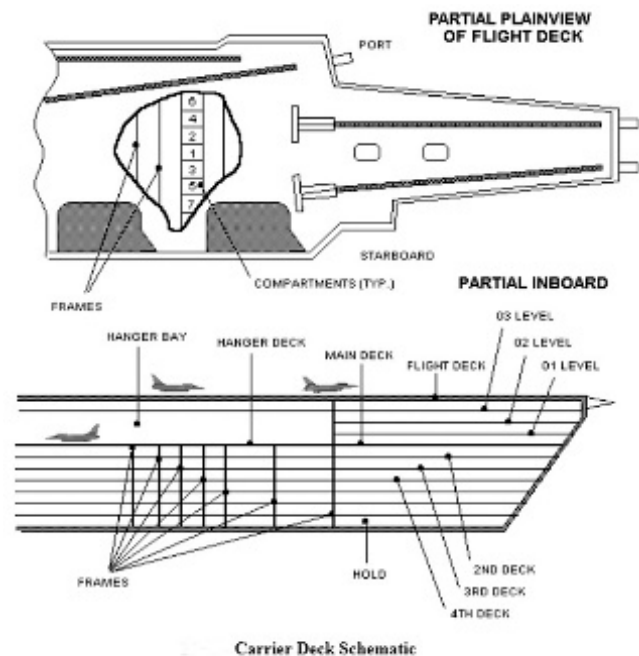
GENERAL CHARACTERISTICS

(including some mods)

Class and type: Essex-class aircraft carrier
Displacement: 27,100 long tons (27,500 standard tons)
Length: 820' (24.9 m) waterline
 872' (265.8 m) length overall
Beam: 93' ((28.3 m) waterline
Draft: 34' 2" (10.4 m) full load
Installed power: 8 Babcock & Wilcox boilers
 150,000 shp (110,000 kW)
Propulsion: 4 geared Westinghouse steam turbines
Speed: 33 knots (62 km/h; 38 mph)
Range: 14,100 nm (26,100 km) at 20 kts
Crew: 260 officers, 2,363 sailors 1943
 382 officers, 3,003 sailors 1945
Armament: 4 twin & 4 single 5" 38 caliber
 8 quadruple 40 mm AA guns
 46 single 20 mm AA guns
Aircraft carried: 91-103
Aviation facilities: 2 hydraulic catapults Mark 5
 3 aircraft elevators
Armor: Waterline belt 2.5" to 4"
 Flight deck 1.5"
 Hanger deck 2.5"
Original cost \$69 million (\$100,119 million 2018)

(ORIGINAL MAY 2019)

CARRIER DECK LAYOUT



(ORIGINAL MAY 2019)

AIRCRAFT CARRIERS IN SERVICE

CVN-68 USS Nimitz
CVN-69 USS Dwight D. Eisenhower
CVN-70 USS Carl Vinson
CVN-71 USS Theodore Roosevelt
CVN-72 USS Abraham Lincoln
CVN-73 USS George Washington
CVN-74 USS John C. Stennis
CVN-75 USS Harry S. Truman
CVN-76 USS Ronald Reagan
CVN-77 USS George H. W. Bush
CVN-78 USS Gerald R. Ford

CVN-79 USS John F. Kennedy
 Scheduled for (2020)

(ORIGINAL MAY 2019)



CV-12 versus CVN-78

HORNET (CV-12)

Displacement	27,100 tons
Electrical cables	267 miles
Lighting fixtures	14,210
Flight Deck Length	872 ft.
Catapults	2 HB Hydraulic
Cat power length	211 feet
Flight Deck width at	the angle 192 feet

Speed of ship	31.5 knots
Crew compliment	3,000(±)
Fresh water/daily	92,000 gallons
Propulsion	Steam Turbines
Steam generation	8 W&B oil burners
Draft	29.5 feet

GERALD FORD (CVN-78)

Displacement	100,000 tons
Electrical cables	Approx. 1,893 miles
Lighting fixtures	44,000
Flight Deck Length	1,106 feet
Catapults	4 EMALS
Cat power length	300 feet
Flight Deck width at	the angle 256 feet
Speed of ship	30+ knots
Crew compliment	4,600(±)
Fresh water/daily	400,000 gallons
Propulsion	Steam turbines
Steam generation	2 A1B reactors (Bechtel)
Draft	41 feet

(ORIGINAL SEP 2019)

HOW A SHIP IS COMPARTMENTED AND NUMBERED

Knowing how the carrier is compartmented is crucial for navigating the vast interior. Each compartment of the ship is stamped with a series of alphanumeric numbers, known as "bull's-eyes", which give information on where you are, and the function of the compartment. The information is given in the following order:

- ▶ Deck number
- ▶ Frame number
- ▶ Relation to the centerline of the ship
- ▶ Compartment usage

Each of the parts is separated by a hyphen. (On a carrier the Hanger Deck is the Main Deck and the reference point for numbering decks above and below.) Decks above the main deck are numbered 01, 02, 03, etc. and are referred to as levels. Below the main deck there are the 1st, 2nd, 3rd decks, etc. Frame numbers tell you where you are in relation to the bow of the ship; the numbers increase as you move aft. The third number identifies relationship to the centerline of the ship. EVEN numbers are to PORT and ODD to STARBOARD. The numbers increase as you move outboard. The last letter indicates the purpose of the compartment. The following are examples:

A Supply & Storage	L Living quarters
B Guns	M Ammunition
C Ship control	T Trunks & passages
E Machinery	V Void
F Fuel	W Water

Example: 3-75-4-M

3rd deck; 75th frame from the bow; 4th compartment from centerline PORT side; compartment used for ammunition.

(ORIGINAL MAY 2019)



SHIPS ON PIERS 1&2 AS OF MAY 2019

ADMIRAL W. M. CALLAGHAN

Year built – 1967, USA, twin gas turbine & screws, general logistic. Named after first Capt. of BB-63 *USS Missouri*. Roll on and off. Active in 5 days

CAPE ORLANDO

Built – 1981, Sweden, diesel 2 propellers. Roll on and off. Active in 5 days.

GEM STATE

Built – 1965 USA, two boilers, two turbines, single screw. Cargo container, crane ship. Named after State of Idaho (Gem State). Active in 5 days.

GRAND CANYON STATE

Built – 1965, USA, two boilers, two turbines, single screw. Cargo container, crane ship. Named after State of Arizona. Active in 5 days.

KEYSTONE STATE

Built – 1965, USA, two boilers, two turbines, single screw. Cargo container, crane ship. Named after State of Pennsylvania. Active in 5 days.

(ORIGINAL MAY 2019)

DOOLITTLE RAID FACTS

MARCH

- 05 CV-8 departed Norfolk, VA for Alameda, CA
- 31 CV-8 arrived and tied to Pier 1 Alameda NAS

APRIL

- 01 Fifteen B-25s loaded on CV-8
135 Army Air Forces personnel boarded.
Last minute sixteenth B-25 boarded for demo flt.
CV-8 moved to anchorage #9, near SF Giant's Pk.
- 02 CV-8 weighed anchor and departed for 180° 35N
CV-8 personnel told mission – Bomb Tokyo!
Demo flt cancelled and plane added to mission with a made up crew from personnel onboard.
- 13 CV-8 joined CV-6 at 180° 38 N, Halsey overall CO
- 18 07:44 Task Force stumbled on Japanese ship that radioed Task Force position to Tokyo.
08:20 First B-25 launched ten hours earlier than planned - last B-25 launched 09:19.
All 16 B-25s took off from same position on CV-8, rear of island, used less than 400 ft.

OCTOBER

- 26 Japanese sink CV-8 Battle at Santa Cruz Isl.

MISSION RESULTS:

- Japanese dismissed their patrol boat message.
- B-25s bombing total surprise, little to no air defense
- Bombing - minimal damage but big psychological effect on Japanese and USA populations.
- Fifteen B-25s continue to China, one to USSR
- Three B-25s made water landings on China coast
- Twelve B-25s out of fuel over China, crews jump.
- 3 KIA
- 8 POWs
- 2 Executed
- 1 Died in captivity

(ORIGINAL MAY 2019)

BOILER AND ENGINE CHARACTERISTICS

Firerooms

4 - two boilers per fireroom.

Boilers

8 - two boilers per fire room and engine.
8 stacks – smoke like LA smog.

Fuel

Bunker "C" stored at 150°F. Heated to 175° to 180°F to move the fuel. Sprayed at 100 to 300 PSI. Ideal flame is 6' long. Two days to cool.

Fire Box

10'X12' – two sections with 5,000 tubes. 1st section 489°F & 600 PSI; 2nd section 850°F 600 PSI. Driest steam extremely dangerous (broom stick).

Stm. Tubes

Blown twice/day to clean scale – steam cleaning agent. Wind to starboard – 30 min. procedure. Loss of 20% efficiency if not done.

Burner Tips

Cleaned every 4 hours. Twenty minutes to change.

Speeds

Cruise-15kts; Full-20kts.; Flank-25kts: Bendix-33kts. (Speeds greater than Flank require all burners and boilers.)

Boiler Crew

6 per watch.

Eng. Crew

6 per watch.

Screws

15' diameter, counter rotate left to right.

Shafts

Front-268' (13 sections). Rear-186' (9 sections). Outside dia. 20", Inside dia. 12.75" – 1.75" twist. Repair underway.

Electric

Siren-loss Lube Oil on shaft bearings.

4 1250KW generators, 450 volts/60 cycles. 2 1000KW emergency generators, diesel powered. Start with stored compressed air.

Rudder

1 400 sq. ft. weighs 35,000 lbs.

(ORIGINAL MAY 2019)

NATIONAL DEFENSE RESERVE FLEET SNIPPETS

The ships on Piers 1 & 2 are part of the Ready Reserve Force, administered by the USDOT – specifically, the MARITIME ADMINISTRATION and are part of the US Navy Military Sealift Command (MSC). There are reduced civilian crews on the ships and are available for activation within four, five, ten or twenty days.

MSC ships are made up of ships owned by the US Navy and others (90 plus ships positioned along USA coastlines) . Navy owned ships have blue and gold stack colors; therefore, the ships on Piers 1 & 2 are not owned by the US Navy. The ships are primarily civilian manned by either civil service mariners or contract crews as is the case of the special mission ships. Some ships may have Navy or Marine Corps personnel on board to carry out communication and special mission functions, or for force protections.

(ORIGINAL MAY 2019)

WW2 RECORD

CV-12 was in the Pacific Theater for 15 months, 20 March 1944 to 7 July 1945. During the 15-month period, the Hornet had best war record of any carrier. CV-12 participated in the following operations:

- Hollandia
- Marianas
- Western Caroline Island
- Western New Guinea
- Leyte
- Luzon
- Iwo Jima
- Okinawa

The battle record of the air wing and ship was:

- 688 Japanese planes shot down
- 742 Japanese destroyed on the ground.
- 73 Japanese ships sunk
- 37 Japanese ships probable sunk
- 413 Japanese ships damaged
- 1.3 Million tons of enemy ships sunk or heavily damaged.

Specific types of Japanese ships destroyed:

- 1 carrier
- 1 cruiser
- 10 destroyers
- 42 cargo ships

Curtiss Helldivers and Grumman Hellcats from CV-12 attacked Tokyo on 16 and 17 February 1945. The operation was the first attack by naval air assets on Tokyo since the Doolittle Raid, 18 April 1942.

Air wing on CV-12 assisted in the sinking of the Imperial Japanese Navy super battleship Yamato.

(ORIGINAL MAY 2019)

B&W BOILER SNIPPETS

The company was founded in 1867 in Providence Rhode Island by partners Stephen Wilcox and George Babcock to manufacture and market with one patent, Wilcox's patented water-tube boiler

B&W list of innovations and firsts include the world's first installed utility boiler (1881); manufacture of boilers to power New York City's first subway (1902); 1907 and 1909 powered Teddy Roosevelt's Great White Fleet; first pulverized power plant (1918); between 1941 and 1945 designed and delivered 4,100 marine boilers for combat and merchant ships, over half of the US Navy fleet was powered by Babcock & Wilcox boilers, 95 percent of the US fleet in Tokyo Bay at Japanese surrender were powered by B&W boilers; design and manufacture of components for USS Nautilus, the world's first nuclear-powered submarine (1953–55); the first supercritical pressure coal-fired boiler (1957); design and supply of reactors for the first U.S. built nuclear-powered surface ship, NS Savannah (1961).

(ORIGINAL MAY 2019)

DOOLITTLE RAID SNIPPETS

The genesis of the raid, FDR, told the JSF that Japan be bombed to boost public morale after Pearl Harbor. JSF was skeptical. The concept for the attack came from Navy submarine Captain Low, Assistant to the CNO (King); he thought twin-engine Army bombers could launch from a carrier. Lt. Col. Doolittle, military test pilot, civilian aviator and aeronautical engineer was selected to planned and lead the mission. 2 Feb '42 a successful test of two B-25Bs taking off CV-8 was made off the coast of Norfolk, VA. Doolittle settled on B-25s. A formal request to land at Vladivostok, USSR made. The Stalin denied the request but Chiang Kai-shek agreed to sites west of Shanghai despite the concern of Japanese reprisals. USAAF 17th BG was chosen to provide the volunteers to be recruited – the 17th had the most experienced B-25 crews. Air crews were told mission unspecified and "extremely hazardous" - 24 crews, planes and support personnel selected. Army personnel oversubscribed the mission. Short field takeoff training under Navy Lt. Miller conducted at Eglin AFB FL. B-25Bs heavily modified to increase fuel capacity/extend range. Norden bombsights replaced with "homemade" bomb sight – cost 20¢. Two broomsticks simulating guns mounted on tails with cameras to record mission. Mission launched ten hours early when a Japanese picket boat radioed Task Force position. Army pilots followed Doolittle on what, on paper, was a suicide mission – not enough fuel to reach China. After bombing Tokyo planes picked up an unanticipated tailwind that allowed them to reach Chinese mainland. Lost in rain and darkness 12 crews bailed out when fuel ran out. Three aircraft attempted water landings on China coast. One B-25B diverted to Russia (crew interned 13 months).

(ORIGINAL MAY 2019)