

Model Number : F7U
Model Name : Cutlass
Model Type: Fighter



The Cutlass was a “tail-less” Navy fighter that first flew in 1948. It was very innovative in that the conventional horizontal tail was eliminated to avoid the extreme nose-down forces experienced by conventional airplanes at speeds above Mach 0.75. The swept wing of the Cutlass had “ailevator” control surfaces on the wing trailing edge outboard of the two vertical fins. It was designed to operate at Mach 0.95 up to 40,000-foot altitude. The airplane was designed for aircraft carrier use, but lacked the forward visibility necessary for carrier landings because of the very high nose-up angle required for landing approach speeds.

Model Number : XF7U-1
Model Name : Cutlass
Model Type: Fighter

A Different Fighter

In mid 1945, Vought responded to a Navy Request for Bid on a 600-mile-per-hour fighter capable of 40,000 feet altitude and configured to a unique design. It was very innovative in that it had a swept wing and no horizontal tail. The horizontal tail was eliminated to avoid extreme nose down forces experienced by other airplanes of the day at speeds above Mach 0.75. The swept wing had “ailevator” control surfaces far out on the wing trailing edge beyond the vertical fin mid-mounted on each wing. These surfaces served as both elevator (pitch) controls and aileron (roll) controls. The airplane was designed for Mach 0.9 (plus) speed up to at least 40,000 feet altitude.



Upon Navy go-ahead for three experimental airplanes, Vought designed and built them at the Stratford, Connecticut Plant. The airplane was designed for U. S. Navy carrier operations, weighed 14,300 pounds and was powered by two Westinghouse XJ34-WE-32 afterburner-equipped turbojet engines. The armament was four 20-mm cannons. The wings

folded just outboard of the vertical fins for storage (spotting) on the carrier deck. Leading edge slats were provided on the wings for higher lift at low speeds to enhance carrier landing characteristics. The aircraft had tricycle landing gear with the two main gears stowed in flight in the lower fin structure.



The first X7FU-1 was barged to Patuxent River Test Center and first flown 29 September 1948 by Vought Test Pilot Robert Baker. This airplane and the #2 and #3 airplanes were all test flown at Patuxent River by company and U. S. Navy pilots and were flown without afterburners until they became available from Solar in late 1949. Continued testing in 1950 and 1951 was conducted to further evaluate the aircraft for carrier use.

The unconventional aircraft configuration required much development testing. The landing gear required experimentation to determine best extended positions for landing and take-off. The pressurized cockpit, pilot visibility, and pilot instruments needed evaluation. Aerodynamic performance had to be evaluated at all speeds and altitudes to determine suitability for the design fighter task.

Unfortunately, over the two years of XF7U-1 flight testing, all three airplanes were lost in accidents. The #2 airplane was lost in Chesapeake Bay with pilot William Millar. Pilot Paul Thayer survived a take-off crash of #1 and an engine fire ejection seat escape from #3 airplane.

Dimensions	
Wingspan	38.66 ft
Overall Length	39.58 ft
Height	11.83 ft
Weights and Capacities	
Empty Weight	12837 lb
Gross Weight	24000 lb
Useful Load	
Fuel Capacity	971 gal
Oil Capacity	10 gal
Powerplant Characteristics	
Type: Two Westinghouse J-34-WE-32 with Afterburner	
Rating Thrust	4900 hp
Displacement	
Weight	
Size (length X diameter)	
Performance	
Maximum Speed, Sea Level with afterburner	602 mph
Landing Speed, Sea Level	
Stall Speed, Sea Level	
Initial Rate-of-Climb with afterburner	15100 ft/min
Cruise Speed, Sea Level	
Range at Cruise Speed	975 miles
Service Ceiling	38000 ft
Absolute Ceiling	

Crew: 1	
Armament: Four 20-mm cannons	

Model Number : F7U-1
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The F7U-1 Cutlass was basically the same as the XF7U-1 airplane with changes resulting from the XF7U flight testing. The tail area was substantially enlarged, the landing gear positions for take-off and landing were modified, and two wing pylons were added which permitted carrying two 250-gallon external fuel tanks for extended range. Wing slat positions providing leading-edge flap slots for take-off and landing were maintained the same.



Production

Based on initial flights of the XF7U-1 airplane in 1948, the U.S. Navy ordered fourteen of the production versions of the airplane, the F7U-1. Powered by two J34-WE-32 engines with Solar afterburners, the production model incorporated several improvements. The vertical fins were extended to provide more area to eliminate directional “hunting” in high-speed flight. Two wing pylons were added, which permitted the carrying of two 250-gallon external fuel tanks. The main gear extension system was designed to permit a further forward wheel position for takeoff than the position used for landing. The nose gear was designed so the “oleo” could be fully extended for takeoff, providing 3 degrees of increased wing angle-of-attack for takeoff while the main gear aft extended position provided three-3 degrees of increased angle-of-attack for landing on the carrier deck



First flight on March 1, 1950 and delivery in June provided the Navy with the airplane for carrier suitability testing. This vigorous testing produced negative results which are as follows:

Pilot visibility was unsatisfactory in final carrier approach.

Wave-off characteristics for latter stage wave-offs were unsatisfactory.

The arresting hook assembly was so complicated that its practicability for service use was doubtful.

The carrier suitability testing, which was completed in August 1951, essentially doomed further production of the F7U-1 and led to the design of a completely modified F7U, the F7U-3. F7U-1's were used extensively for flight-testing and were flown briefly by the Navy Blue Angels Demonstration Team.



Model Number : F7U-3

Model Name : Cutlass

Model Type: Fighter

The newly designed U.S. Navy fighter F7U-3 was first produced in 1951 with the first flight December 12, 1951. To alleviate the shortcomings of the F7U-1, the airplane incorporated many changes. In addition to basic improvements in performance, visibility, armament, and range, the F7U-3 incorporated many structural, maintenance, and safety improvements. The early production airplanes had Allison J-35 engines without afterburners. These engines were later exchanged for Westinghouse J-46 engines with afterburner.



Based on the extensive testing of the XF7U-1 and F7U-1 airplanes, the U. S. Navy awarded Vought a contract for a bigger, faster, Cutlass with more thrust and pilot visibility. The planned powerplant, two Westinghouse J46-WE-8 engines with 6000 pounds thrust and afterburners, was not available for the first 16 airplanes. These first 16 airplanes were powered by two Allison J35-A-29 engines. The radar nose/cockpit design for these 16 airplanes still did not provide sufficient carrier landing visibility. Starting with the seventeenth airplane the radar nose was slanted downward and the cockpit was raised to provide better visibility. The two Westinghouse engines with afterburners, initially installed at that point, were downrated by the Navy to 3,960 pounds military thrust for better engine life. This became the basic configuration for the production F7U-3 airplanes.

The armament consisted of four Mk12 20-mm cannons which were mounted in the fairing above the engine duct and fired through ports in the duct lip. Venting changes were necessary early in the program to prevent engine flameout during gunfire. In addition, the F7U-3 carried a removable rocket pack on the



belly of the fuselage, containing thirty two 2.75-inch rockets.

The F7U-3 also had a pylon mounted under each inboard wing to which external fuel tanks or an external store up to 2,000 pounds per pylon could be attached. The wing and aircraft ruggedness were such that pilots were known to have pulled 9 g's in aerodynamic dive pull-ups (without external stores). Substantial maintenance improvement was made in this Cutlass by adding more and larger access doors for replacements and repairs of system components



Dimensions	
Wingspan	39.75 ft
Overall Length	43.16 ft
Height	14.50 ft
Weights and Capacities	
Empty Weight	17100 lb
Gross Weight	32500 lb
Useful Load	
Fuel Capacity	1320 gal
Oil Capacity	4 gal
Powerplant Characteristics	
Type: Two Westinghouse J46-WE-8 with Afterburner	
Rating Thrust	3800 hp
Displacement	
Weight	
Size (length X diameter)	
Performance	

Maximum Speed, Sea Level with afterburner	680 mph
Landing Speed, Sea Level	
Stall Speed, Sea Level	125 mph
Initial Rate-of-Climb with afterburner	14240 ft/min
Cruise Speed, Sea Level	
Range at Cruise Speed	800 miles
Service Ceiling	40600 ft
Absolute Ceiling	
Crew: 1	
Armament: Four 20mm cannons plus 32 - 2.75 inch rockets on two pylon mounts or 2000lb bomb load.	

Model Number : F7U-3M

Model Name : Cutlass

Model Type: Missile Carrier

A new variant, designated the F7U-3M, evolved from continued efforts to improve the Cutlass as an attack airplane. This version was basically an F7U-3 with the addition of a pylon on each outer-wing panel and with internal fuel tanks added to the outer panel. The airplane was capable of carrying four Sparrow 1 radar guided missiles, one on each pylon. The inflight refueling system and its probe on the nose of the airplane were not included in this model.



The Naval Missile Center at Point Mugu, CA was the test center for integrating the Sparrow 1 missiles with the aircraft, its radar system, and the fire control system. Also the Center integrated the Sidewinder missile carrying capability into the F7U-3 and -3M.

The deliveries of the production F7U-3M airplanes to the U.S. Navy were as follows: 1 in 1953; 47 in 1954; and 50 in 1955, for a total of 98 airplanes. These airplanes were integrated into fleet squadron service along with the basic F7U-3 airplanes during 1955, 56, and 57. They, too, were phased out-of-fleet service in late 1957.

Model Number : F7U-3P

Model Name : Cutlass

Model Type: Photo Reconnaissance

Because of the performance capabilities and flight-path stability of the F7U-3, it was selected for the photo reconnaissance



mission and designated F7U-3P. It was a modified version of the F7U-3 with all armament provisions deleted and the existing radar nose replaced. The new nose extended forward an additional 25 inches. This provided space for 9 photographic windows and 5 cameras with 2 primary camera racks capable of numerous oblique camera angles as well as vertical. A flare-ejector system in the "gun compartment" was computer controlled to eject flares synchronized with the camera photographs. The 20VF viewfinder system replaced the Aero 10D Armament Control System in these airplanes, providing photographic control for both low- and high-altitude photographs. The outer panel fuel tank system added in the F7U-3M model was also included in this model.

The cameras were difficult to service, install, and remove because their height above the deck required special ladders. This difficulty limited the use of these airplanes in the fleet.

Production deliveries to the U.S. Navy were: 6 in 1954 and 6 in 1955 for a total of 12 aircraft. These aircraft were variously assigned and used until 1959.