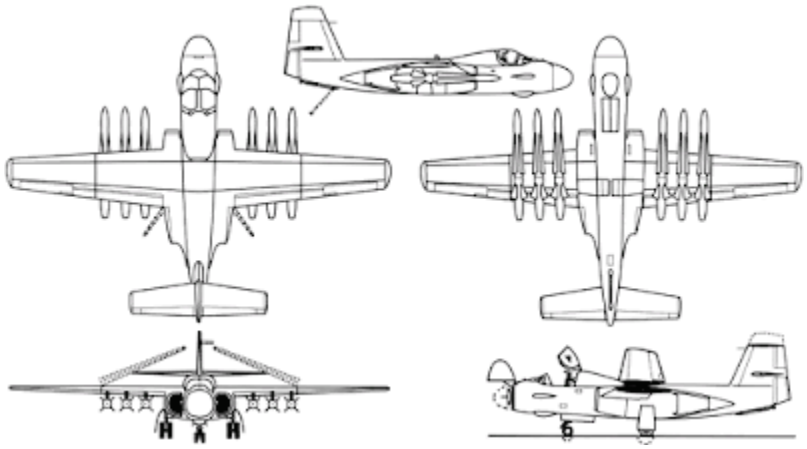
The Douglas F6D Missileer

The F6D Missileer's resemblance to the F3D Skyknight is apparent

In 1957 the US Navy issued a specification for carrier-based fleet defense fighter that could loiter for long periods of time at long distances from the carrier. In addition, the aircraft had to be able to engage enemy aircraft at 100 nautical miles with a powerful onboard radar and long-range air-to-air missiles. Under the assumption that enemy aircraft were to be destroyed at well beyond visual range, dogfighting capability was not necessary and the need for long endurance dictated a subsonic design. Six hours was the specified endurance for this fighter and in turn this meant a large fuel load. The complex radar systems planned called for a three-man crew, with the pilot and co-pilot on each side of the radar intercept officer, this way both of the flying crew man could share some of the same displays with the radar intercept officer (RIO).

There were four components to 1957 concept for fleet air defense that would be issued to industry for submissions. The first, of course, was for the aircraft itself, which was awarded to Douglas Aircraft Company in 1959 for what was designated the F6D Missileer. But in addition, a contract was awarded to Westinghouse for the AN/APQ-81 radar that would be used by the F6D to track and engage enemy

aircraft. The third component was a contract awarded to the Bendix Corporation for the large AAM-N-10 Eagle missile. What is little-known about the F6D program was the fourth component, for an advanced airborne early warning aircraft to search out targets for patrolling Missileers. This contract would go to Grumman Aircraft which resulted in the W2F Hawkeye (later redesignated E-2 Hawkeye) with its advanced AN/APS-125 radar which could scan an area 400 miles in diameter and cue several F6D Missileers.



Overall configuration of the F6D Missileer

The F6D itself resembled a scaled-up version of the Douglas F3D Skyknight twin-seat all-weather/night fighter. The nose section was quite bulbous to house the Westinghouse AN/APQ-81 radar and the three man crew were seated side-by-side in a cockpit that resembled that of the Grumman A-6 Intruder. Two non-afterburning Pratt & Whitney TF30 turbofans were mounted on each side of the fuselage just under the unswept wings. At the time, the use of a turbofan engine in a combat aircraft was a new concept and the TF30 was selected for its fuel economy. Since the Missileer didn't have to be supersonic, there was no need for a heavy and fuel-hungry afterburner.

The Westinghouse AN/APQ-81 radar would have been the most advanced radar of its day using pulsed-Doppler technology years before the first production pulse-Doppler radars would enter service. The radar had a maximum range against large aircraft of 120 miles and could track as many as eight targets at once. The radar could also send mid-course corrections to the Eagle missiles.

Overall configuration of the AAM-N-10 Eagle missile

The Bendix AAM-N-10 Eagle was the first of the four components from the 1957 fleet defense concept to be awarded. A large solid rocket booster would boost the Eagle to Mach 3.5 after launch on a loft trajectory for maximum range. After the booster was jettisoned, the Eagle's own sustainer motor ignited and further accelerated the missile to Mach 4.5. The use of a loft trajectory gave the Eagle missile a range of 160 miles and on final approach to the target, the missile's own onboard radar system (based on the radar used on the Bomarc surface-to-air missile) switched on. The Eagle could be armed with either a conventional or nuclear warhead.

Despite the advanced nature of the technology used in the F6D Missileer program, many quarters in the Navy fundamentally opposed the concept, arguing that once the Missileer had fired its six Eagle missiles,

it was left vulnerable and unable to defend itself as it lacked any other armament and its large subsonic size precluded any evasive maneuvers. Once firing its missiles, the Missileer faced a long return flight to the carrier to refuel and re-arm. In 1960, the building opposition within the US Navy won out and the F6D Missileer program was canceled along with the Westinghouse AN/APQ-81 radar and what was becoming an enormously complex AAM-N-10 Eagle missile. The cost of developing the missile itself was estimated to be more than the aircraft development cost.

However, the development of the Grumman W2F/E-2 Hawkeye continued and the aircraft is still in production today, albeit with more advanced radar systems, and is perhaps sole remaining legacy of the ambitious, but flawed, F6D Missileer program.

Source: *American X & Y Planes: Volume 2; Experimental Aircraft Since 1945 (Crowood Aviation Series)* by Kev Darling. The Crowood Press, 2010, p60-61. **Photos:** Wikipedia, various internet forums.