

plans for a like number of F-106As to equip a total of 40 squadrons. However, the apparent success of the aircraft during its earlier flights was not borne out during Category II flight testing. After more than 70 test flights of the first two aircraft, the Category II final report stated that both the aircraft's acceleration and maximum speed were below Convair's estimates. Specifically, under standard conditions, the F-106A took almost 270 seconds to accelerate from Mach 1 to Mach 1.7, and another 150 seconds to accelerate to Mach 1.8. This consumed 2,000 pounds of fuel in seven minutes. Because of this sluggish performance, the aircraft was not considered "tactically usable" at speeds greater than Mach 1.7.



**A walk-around three-quarter front view of the third F-106A at Edwards AFB. The initial test flights of the early Block One aircraft took place during the first half of 1957.** (Convair via Author's collection)

To rectify these shortcomings, Convair engineers proposed a series of upgrades. These included modifications to the inlet duct cowling and charging ejectors to maximize airflow to the J75-P-9 engine and boost speed as well as acceleration. Meanwhile, the project was also running behind schedule because of production delays with the J75-P-9 itself.

In parallel with the engine issues, one of the first major weaknesses to be noted with the F-106A was a fuel starvation problem that led to the possibility of a flameout, which was rather high on the scale of concern when it came to defects.

Based on the Category II recommendations of Capt. Kincheloe and Project Engineer Willie Allen, Convair engineers proposed solutions, and the Air Force signed off but, in the meantime, new dilemmas were cropping up in the cockpit. There were development problems with the ejection seat, which the Category II findings determined to be inadequate for use at supersonic speeds. Attempts to redesign it led to the overly complex Upward Rotational Ejection Seat, which were left unsolved until most F-106As had been delivered. The two-seat system required for the F-106B took even longer than that for the F-106A because of the dual timing system. (If two people ejected simultaneously, they would probably hit one another.) Indeed, rocket sled tests did not get underway until the middle of 1960.

Next, there was the control stick. The idea of moving the stick to the side so that the pilot could better see the Horizontal Situation Indicator had seemed like a good idea on paper, but in reality it was not so good. The Air Force had decided that the stick should be



**Continuing the walk-around to a three-quarter rear view of the third F-106A, parked on the bone-dry lakebed at Edwards AFB.** (Convair via Author's collection)

relocated to the center of the cockpit as it is in most fighter aircraft. It was moved, and also redesigned in the shape of the yoke used on transport aircraft, with flight control on one side and radar control on the other. This decision to center the stick, while being the correct one, only caused further delays, and resulted in cost overruns. Coincidentally, the side-mounted stick concept would be revisited again a generation later in another General Dynamics product, the F-16 Fighting Falcon.

Within the cockpit, such complexities and difficulties, as large as they were, paled by comparison to all that was involved in the Hughes MA-1 AWCS electronic control system. Reliability remained elusive as technicians battled to troubleshoot an electronic system that was so new and so sophisticated. The MA-1 comprised many things beyond just fire control, including automatic direction finding, the communication receiver and transmitter, countermeasures systems, and the gyrocompass. It was officially referred to as “the most complex, sophisticated, and completely integrated automatic weapon control system,” yet designed for an aircraft of this type. Comprising 170 “black boxes,” it weighed about 1,800 pounds. Naturally, the same computing power today would fit in the palm of your hand, but in the late 1950s this was at an extreme forward place within the state of the art.

All of these delays and difficulties would consume most of 1958 to resolve and Category II testing would not be concluded until June 1959. During this time, the aircraft was tested in conjunction with its fully integrated weapons system, including the MA-1 AWCS, at Holloman AFB in New Mexico. During these flights, inert Genies, as well as GAR-3A and GAR-4 Super Falcons, were test fired by Delta Darts. The first shutdown of another flying machine by a Delta Dart

came in a demonstration at Holloman AFB in May 1960, when F-106A pilot Maj. J. D. Fowler splashed a TM-61 Matador surface-launched cruise missile using a pair of GAR-3A Super Falcons. Other such “aerial victories” were to be scored in subsequent encounters throughout the Delta Dart’s career, although the F-106A would never achieve a “true” aerial victory over an actual enemy aircraft.



*The first F-106A, in its light gray Air Defense Command war paint, during an early test flight. (Convair via Author’s collection)*



*A helicopter hovers over the first F-106A, painted in overall light gray Air Defense Command livery and parked on the paved ramp at Edwards AFB. (Convair via Author’s collection)*