Convair F-106 Delta Dart

An extensively modified version of the F-102 Delta Dagger was developed during 1955 under the designation F-102B (Air Defense Weapon System WS201B) but the changes became so extensive that the designation was eventually changed to F-106. The delta wing remained substantially unchanged, but the fuselage was modified to accommodate the 50 per cent more powerful Pratt & Whitney J75 turbojet. Engine intakes were relocated behind the cockpit and closer to the engine; the cockpit was moved forward relatively, and the shape of the fin and rudder changed. A new undercarriage was fitted, including a steerable twin nose wheel, and provision was made for later weapons in the internal bomb bays. To obtain optimum engine performance at all speeds, variable intake ducts were adopted.

The F-106 was fitted with the Hughes MA-1 electronic guidance and fire-control system, which operated with the SAGE (Semi-Automatic Ground Environment) defence system.

The first F-106A (Model 8-24) was flown from Edwards A.F.B. by R. L. Johnson on December 26, 1956, and was built to a production contract placed earlier in 1956. Subsequent contracts kept the F-106 in production until July 1961, and many of the earlier production aircraft were returned to Convair during 1960 and 1961 to be modified to the latest standard with an improved MA-1, supersonic ejection seats and vertical display instrument panels (as Model 8-31). Deliveries of the F-106A to Air Defense Command began in July 1959 and the type entered service with the 498th Fighter Interception Squadron at Geiger A.F.B., Washington. Although plans had existed for production of sufficient F-106As to equip 40 squadrons, successive reductions cut this total to 14, to achieve which a large number of the early test aircraft had to be brought up to full operational standard.

A second version of the Delta Dart was ordered in April 1957 as part of the third contract for F-106s. This was the F-106B (Model 8-27), a two-seat combat trainer variant having the full operational capability of the single-seater, but with a new cockpit containing two seats in tandem. The first F-106B (57-2507) was flown for the first time, also at Edwards A.F.B., on April 9, 1958, and examples served alongside F-106As on all squadrons equipped. Early F-106Bs were eventually modified to tactical standard as Convair Model 8-32. Production totals were 277 F-106As and 63 F-106Bs, completed by December 1960. Between September 1960 and 1963, most F-106As and F-106Bs underwent three updating programmes, which added an infra-red search/track sight ahead of the cockpit, a new canopy offering thermal flash protection, and an upward rotational ejection seat. Later, TACAN and in-flight refuelling receptacles were added. Plans to produce an F-106C with Pratt & Whitney JT4B-22 engine and improved radar, did not proceed beyond the construction of two YF-106Cs, used as radar test-beds. The F-106D, a two-seat version of the F-106C, was also cancelled.

Although at various times from March 1968 onwards, four ADC squadrons of F-106s were deployed in the Far East, the Delta Dart saw no operational service in Vietnam but remained the mainstay of continental United States air defence, equipping 11 squadrons until 1972. By 1974, six ANG squadrons were flying F-106s alongside six ADC units. The last
examples were retired from the active Air Force in 1988, when conversion of surplus airframes to QF-106 drones began. ANG units continued to fly the last few F-106As and F-106Bs for a few months after the USAF had relinquished the type.

TECHNICAL DATA (F-106A)

MANUFACTURER: Convair Division of General Dynamics Corp., San Diego, California.

TYPE: Supersonic interceptor.

ACCOMMODATION: (F-106A): Pilot. (F-106B): Pilot and instructor or radar operator.

POWER PLANT: One 17,200 lb.s.t. (24,500 lb. with a/b) Pratt & Whitney J75-P-17 turbojet.

DIMENSIONS: Span, 38 ft. 3 3/4 in. Length, 70 ft. 8 3/4 in. Height, 20 ft. 3 3/4 in. Wing area, 697.8 sq. ft.

WEIGHTS: Empty, 24,315 lb. Max take-off, 39,195 lb.

PERFORMANCE: Max. speed, 1,327 m.p.h. at 35,000 ft. Initial climb, 42,800 ft./min. Service ceiling, 45,000 ft. Combat radius, 730 miles.

ARMAMENT: One AIR-2A or -2B Genie unguided air rocket and four AIM-4F or AIM-4G Falcon AAMs, stowed internally.

SERIAL NUMBERS:

F-106A: 56-451/467; 57-229/246; 57-2452/2506; 58-575/798; 59-001/148

F-106B: 57-2507/2547; 58-900/904; 59-149/165

Convair B-58 Hustler

The first supersonic bomber put into production for the USAF, the B-58 was developed from original Convair design studies which won an Air Force competition in 1949. This study showed the feasibility of a manned supersonic bombing system and design work continued until April 1952, when the MX-1964 contract called for development of a flyable bomber under the weapon system concept. The weapon system designations WS102A and WS102L were allotted to bomber and reconnaissance versions respectively.

Features of the B-58 design (Convair Model 4) were its delta wing with four podded engines, area-ruled fuselage and large-scale use of honeycomb sandwich skin panels for the wing and fuselage. To obtain the maximum in performance and mission flexibility, an external pod was adopted rather than internal weapon stowage. This pod contained fuel for the outward journey, and a nuclear weapon; the entire pod could be jettisoned after the target had been attacked. A later development of this idea was a dual pod, with fuel in the larger, lower compartment and a weapon, cameras, electronic countermeasures equipment or other special gear in the upper pod.

The first contract for B-58s was for 13 test aircraft, with 17 more test examples ordered later. The first of these (55-0660) flew for the first time without the pod, at Fort Worth on November 11, 1956, piloted by B.A. Erickson, followed by the second on February 16, 1957. The 30 trials aircraft were used for extensive flight testing, at first by the makers and then by the USAF B-58 Test Force comprising 6592th Test Squadron and 3958th Operational, Test and Evaluation Squadron at Carswell A.F.B. Only 55-0660 was designated XB-58, others in the test batch being YB/RB-58 or (No 10 onwards) YB/RB-58A. Early aircraft were powered by YJ79-GE-1 engines until the definitive -5 engines became available.

Production orders for a total of 86 B-58As were placed in 1959-61, the first of these flying in September 1959. On October 15, this aircraft flew 1,680 miles in 80 minutes with one refuelling, maintaining a speed of over Mach 2 for over an hour. The 43rd Bomb Wing at Carswell A.F.B. was selected as the first B-58 unit, and was activated on March 15, 1960; it was joined later by the