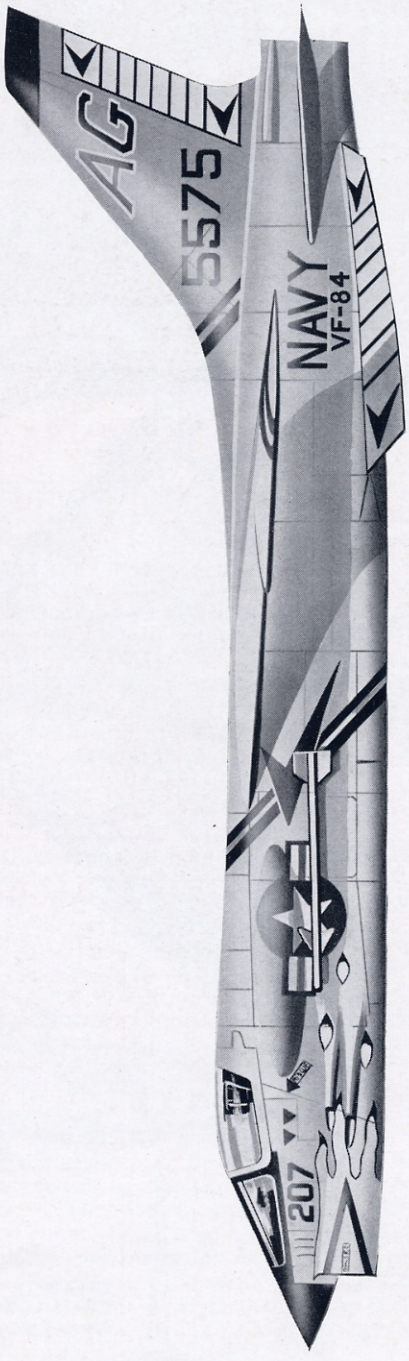
**PROFILE PUBLICATIONS**

# Chance Vought F-8A–E Crusader




**NUMBER 90**

**TWO SHILLINGS**


**CHANCE VOUGHT F8U-2 CRUSADER, 145575, of U.S. Navy fighter Squadron VF-84.**


VF-62.
VF-103.
VF-11.
Project Bullet.
VF-211.
F-8E Crusader, VF-11.
VMF-312 early scheme.
F-8E Crusader, commanding officer VMF-312.
VF-11.
F-8E Crusader, commanding officer VMF-312, late markings.
VMF-232.
VF-132.
C.O.VMF-122.
F-8E Crusader, VMF-122.
VMF-122.
VMF-251.
VU-2.
F-8A Crusader target tug, VU-5.
VF-162.
VF-51.
VF-174.
VF-191 standard scheme.
F-8E Crusader, VF-84, U.S.S. Independence. A/c of commanding officer, Air Group 8.
VF-191.
Service test N.A.T.C.
F-8E Crusader, commanding officer VF-191, U.S.S. Bon Homme Richard.
RF-8A Crusader, VFP-63, U.S.S. Coral Sea.
N.A.T.C.
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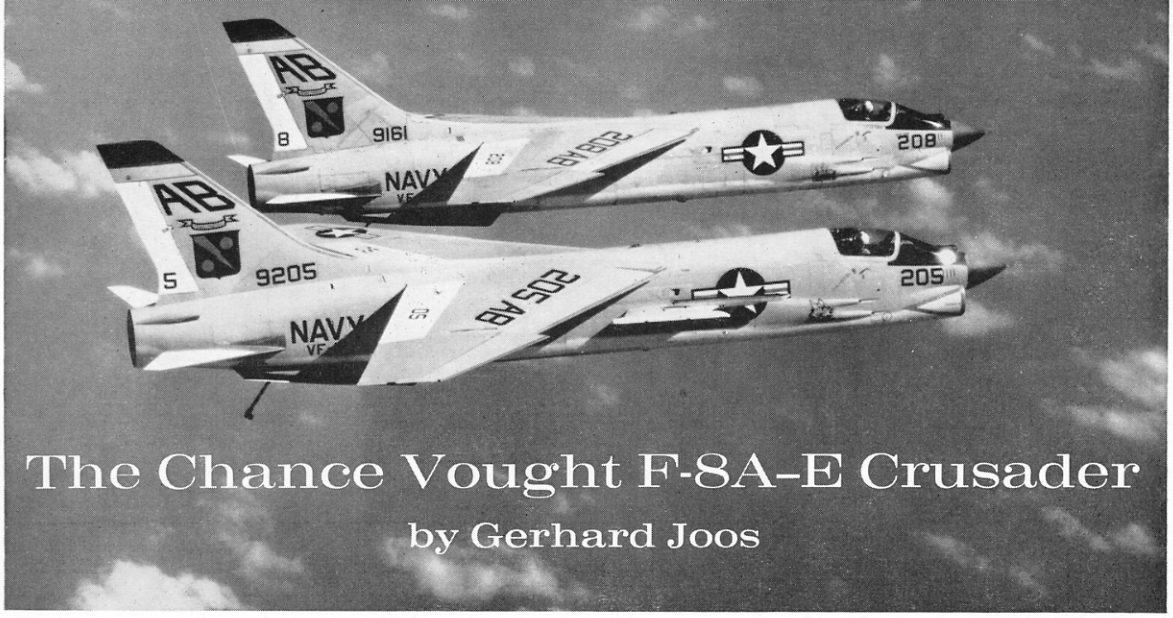



# The Chance Vought F-8A-E Crusader

## by Gerhard Joos

*Two F-8Es of VF-11; Bu. Nos.* 149161 *and* 149205. (Photo: U.S. Navy)

In September 1952 the U.S. Navy stated the requirements for a new supersonic day fighter concept, and eight aircraft manufacturers took part in the competition for the contract. The specification called for an aircraft which seemed almost impossible to build by the technical standards of that time. Besides the usual characteristics of a naval plane—rugged structure, folding wings, simplicity in handling and maintenance, resistance to open-sea weather conditions—a maximum speed of more than Mach 1 and a landing speed of about 100 knots was required. It took the Chance Vought engineers five months to prepare the basic calculations, as a result of which the Navy in May 1953 announced this company as being the winner; Chance Vought was then a member of United Aircraft Corporation but became independent soon after their design was approved. By doing so the new company staked their whole existence on the new design, but it was supported by the Navy, and today it is evident that neither partner has reasons to regret his decision.

When Chance Vought presented the first details of their new design it was clear that here was a revolutionary aircraft which should take the Navy a significant step forward and which would see a brilliant service career. On 29th June 1953 Chance Vought received an assignment to build two prototypes which were designated XF8U-1, and in February 1955 the first prototype was ready for its initial flight. This took place at Edwards Air Force Base, where it lifted off the dry lake early in the morning on 25th March, only 21 months after design work was started. It exceeded Mach 1 during this 52-minute flight, which was quite an achievement at that time, proving thereby that it was the first shipboard fighter aircraft capable of flying faster than the speed of sound in level flight. The prototype was powered by the Pratt & Whitney J57-P-11 turbojet developing 9,700 lb. static thrust and 14,800 lb. with afterburning.

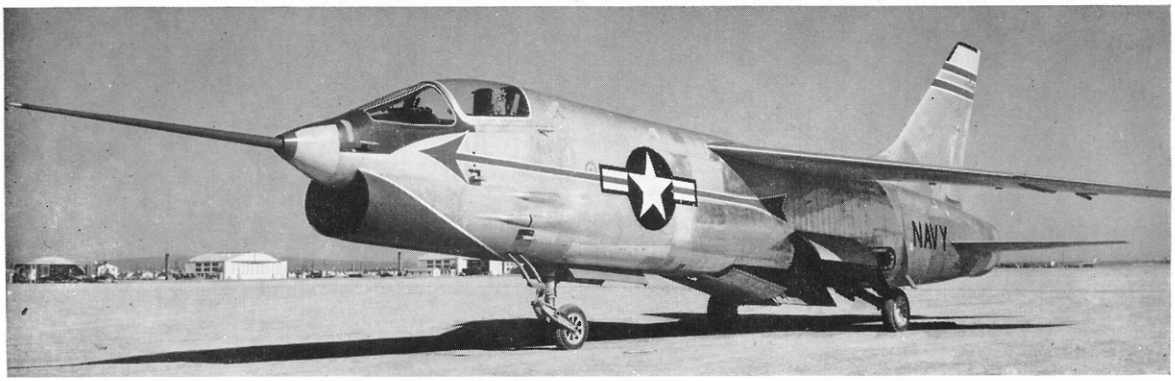
Exactly 67 months later, on 25th October 1960, this aircraft, Bu. No. *138899*, made its last landing at Washington National Airport, where it was presented to the Smithsonian Air Museum.

During those 67 months the Crusader, as it was named, had achieved an outstanding Service record for a carrier-based jet fighter aircraft: the Navy and Chance Vought had been awarded the Collier Trophy "for conception, design and development of the first carrier-based fighter capable of speeds exceeding 1,000 miles per hour". The Crusader set the first national speed record in excess of 1,000 miles per hour to win for the U.S. Navy its first Thompson Trophy. It was the first aeroplane to span the United States faster than the speed of sound. It also won the first Certificate of Merit ever awarded by the Bureau of Aeronautics.

### THE CRUSADER DESCRIBED

Many innovations were introduced with the Crusader in order to meet the demands of the specification. The most unusual feature, however, was the hydraulically operated variable incidence wing. When designing the Crusader the engineers were faced with the problem of finding a compromise between a high maximum speed and the ability of the aircraft to operate from the restricted space of a carrier deck, with good visibility during the approach. This was finally achieved by an astonishingly simple method: for take-off and landing the whole wing, pivoted on the rear spar, is raised 7 degrees by a hydraulic self-locking actuator, thus giving the wing a very high angle of incidence and thereby reducing the approach speed but keeping the fuselage in a near horizontal attitude, providing excellent visibility for the pilot. In addition to the variable incidence wing the ailerons and the whole leading edge are lowered automatically through an interconnection by 25 degrees to increase effective camber and consequently reduce approach and lift-off speeds even further. When the wing is raised the centre section protrudes into the slipstream, thereby acting as a large speed brake.

The wing itself has a sweepback of 42 degrees at one-quarter chordline and a total area of 350 sq. ft., the thickness/chord ratio is approximately five per cent, and anhedral to improve lateral stability is five degrees. The outer wings are hydraulically folded




*The first prototype, XF8U-1, Bu. No. 138899, now on permanent display at the Smithsonian Air Museum.* (Photo: Chance Vought)

vertically upward for carrier stowage and carry no control surfaces but still have the drooping leading edge, providing the so-called "saw-tooth", a chordwise extension to decrease instability when approaching the stall and to minimise the pitch-up tendency at high speeds. The inboard ailerons are fully hydraulically powered and have proved capable of providing sufficient control even at speeds below the original design minimum. Inboard of the ailerons (sometimes also called flaperons because of their drooping to provide extra lift) are small landing flaps extending about 5 degrees more than the ailerons. The wing unit is of multi-spar structure and forms an integral fuel tank, with the exception of the outer folding portions.

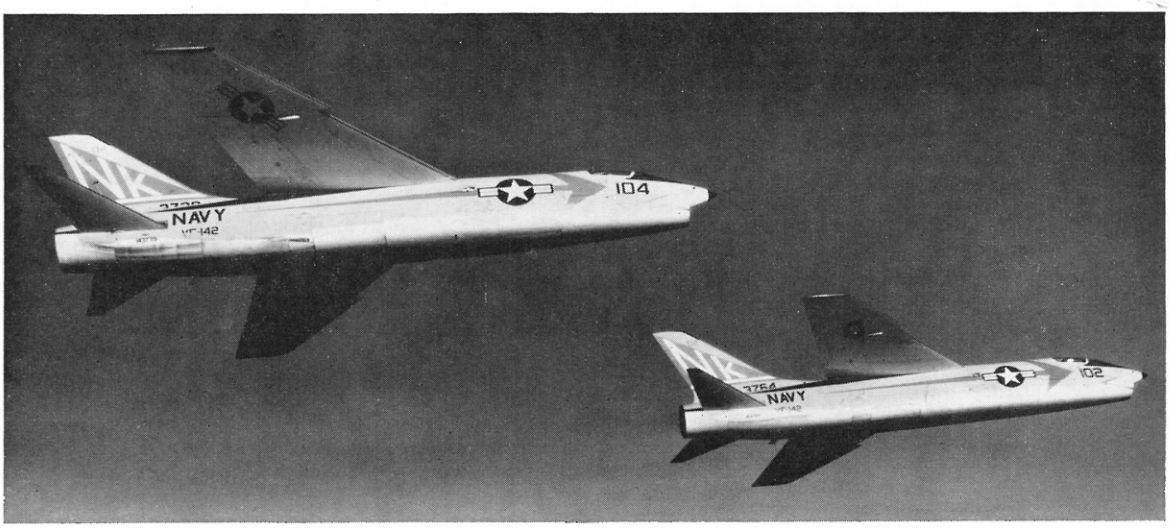
Titanium was used wherever possible. The rear fuselage around the afterburner is constructed of this as well as a large part of the central structure. Also magnesium alloy is used for about 25 per cent of fuselage and wing skins.

The fuselage is composed of the electronic section in the nose, followed by the cockpit area and armament bay. Fuselage fuel tanks are located around the forward engine bay and in the centre section, which also carries the wing unit. Below the fuel tanks are the bays for the main landing gear which could be kept unusually short due to the variable incidence wing. It is also of special lightweight structure and designed to absorb landings of up to 20·5 ft./sec. It is forward-retracting. The steerable nosewheel is rear-retracting into the fuselage. The rear portion of the fuselage contains the engine and afterburner, an extremely large fin and the all-flying tail plane, mounted low with slight dihedral. This is machined from solid metal. All control surfaces have fully duplicated hydraulic power systems. A Marquard-built ram air turbine mounted on a hinged panel on the starboard fuselage side can be extended into the slipstream to provide emergency hydraulic and electric power should the normal systems fail. In the fuselage bottom below the horizontal fin is the sting-type arrester hook which retracts flush with the fuselage. A new lightweight ejection seat was devised but has been replaced by fully automatic Martin-Baker F-5 seats, now installed in all Crusader models.

With wing and fuselage tanks, early Crusaders carried the amazing total of about 1,165 Imp. gallons, giving a maximum endurance of more than three hours. All models of the Crusader are equipped with an in-flight refuelling probe which the Navy made obligatory in September 1955. It is installed in the left forward fuselage and faired over with an elliptical blister except in the reconnaissance version, where it retracts entirely into the fuselage structure.

Four 20 mm. MK-12 Colt cannons are also faired

*Two F-8As,* 143739 *and* 143764, *of VF-142 over Miramar Naval Air Station. This unit was among the first to receive the new fighter.* (Photo: U.S. Navy)



in, two on either side of the fuselage just below the cockpit, with 144 rounds per cannon. Additional destructive power is given by a retractable rocket pack housing 32×2·75-in. "Mighty Mouse" rockets installed in the fuselage bottom in combination with the hydraulically operated dive brake (which retracts automatically when the wing is raised). On the fuselage sides, above and behind the cannon fairing, the Crusader carries launching rails for three types of Sidewinder missiles, primary armament for interception missions. Initially one missile could be carried on each rail but these have been modified on more advanced versions to take two Sidewinders. On early versions no provision was made to carry underwing stores.

## QUICK PROGRESS

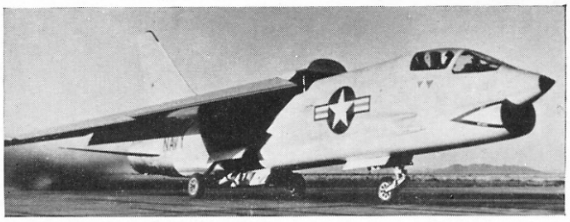
The extraordinary speed which marked the design of the prototypes was maintained for testing and evaluating the Crusader. The flight of the first production aircraft followed in remarkably short order on 30th September 1955, only six months after the first prototype took to the air. By April 1956 the Crusader had completed its carrier qualification trials aboard the U.S.S. *Forrestal*, and on 28th December 1956 the U.S. Navy accepted its first F8U-1, thanks to the fact that production models could be kept virtually identical to the prototype. F8U-1s were powered by the J57-P-4A engine, which delivered 10,200 lb. dry thrust and 16,000 lb. with afterburning.

Rapid development was also aided by the extensive use of a flight simulator which duplicated the full-scale control system of the Crusader, thus permitting early investigations of flight characteristics and development of a reliable control system and the power servo mechanism long before the "X-1" made its first flight.

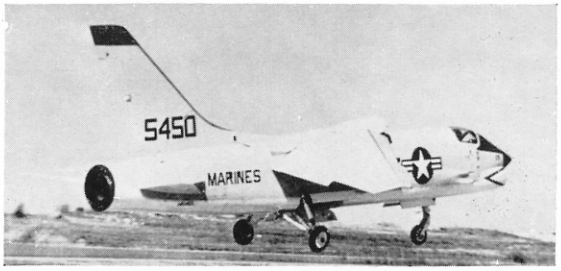
(It should be stated here that by the end of 1962 the U.S. Defence Department changed its aircraft designation system, whereby the F8U Crusader was redesignated F-8. In the following text therefore the old designation will be given in brackets, otherwise only the new designation will be used.)

Starting in March 1957, F-8As (F8U-1) started to flow off the Dallas production line at a rate of eight aircraft per month. After 318 aircraft of this version—a pure day fighter—had been built a new model was introduced, designated F-8B (F8U-1E). The first aircraft (*145318*, a converted F8U-1) flew on 3rd September 1958 and was equipped with a new radar scanner, externally distinguishable by the larger plastic nose cone. The improved electronic equipment gave it limited all-weather capability. Like the F-8A it carried Sidewinders, cannon armament and 2·75-in. rockets. 130 F-8Bs were built.

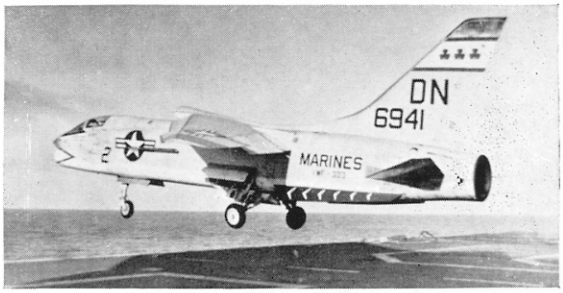
Late in 1958, a new and more powerful version, the



*Cdr. R. W. Windsor in the record-breaking F-8A before take-off for the 1,000 m.p.h. speed run which won the Thompson Trophy.*

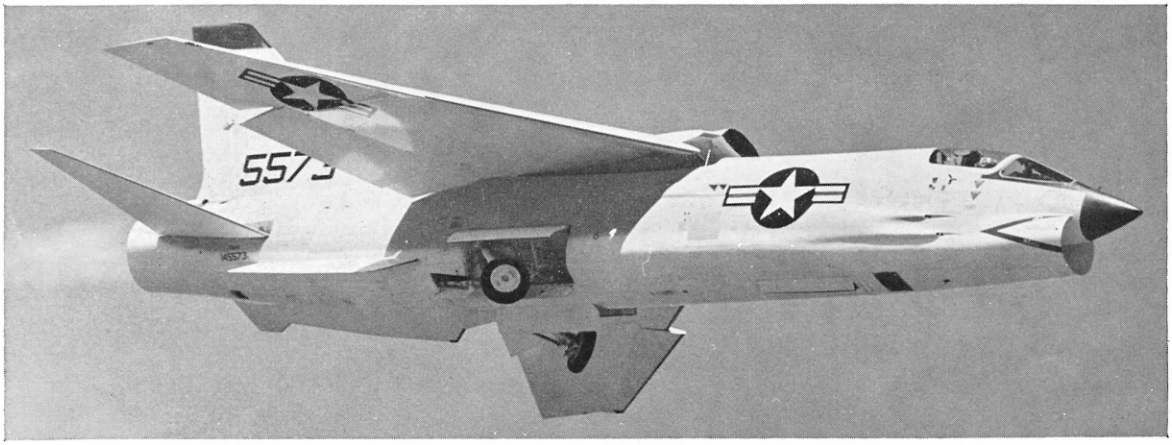


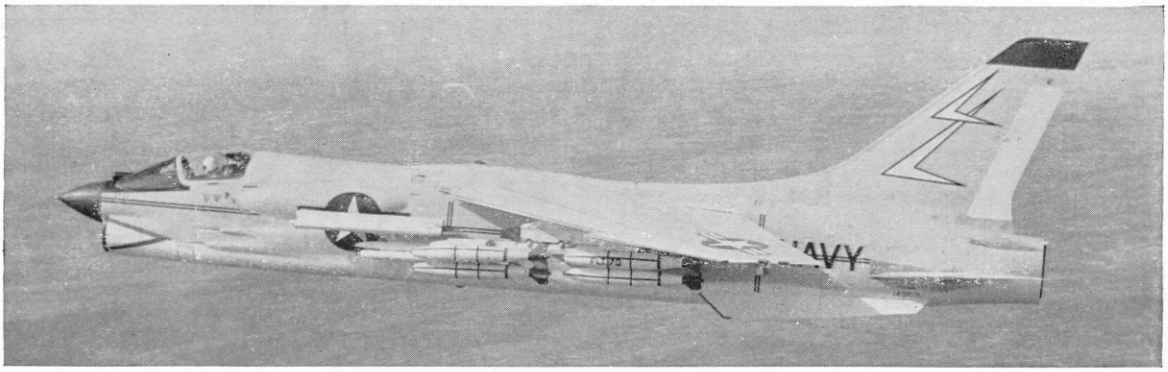

*F-8B*, 145450, *with the enlarged nose-cone, landing at CV's Dallas, Texas airfield.*




*An F-8C*, 146941, *of VMF-33 during launching by steam catapult from U.S.S.* Forrestal; *this photo was taken during the carrier qualification trials in the Atlantic.*

*F-8C* 145573 *during take-off.* (Photo: Chance Vought)





*F-8E* 149159 *with underwing bomb load and Zuni rockets on the fuselage stations.*

F-8C (F8U-2) completed its Navy Preliminary Programme. It was powered by a J57-P-16 engine providing 10,700 lb. static thrust and 16,900 lb. with afterburning. Also further improvements were made with the radar and fire control equipment. Externally it was distinguishable from its predecessors by the addition of two small air intakes on top of the tail cone for afterburner cooling and two ventral fins under the tail section for increased directional stability. Also the wing span was reduced by 6 in. to 35 ft. 2 in. The first prototype took the air in December 1957, this being merely F-8A (Bu. No. *140447*) with the new engine, followed by a second (Bu. No. *140448*) resembling more closely the new version in January 1958; the first true production F-8C flew on 20th August 1958. Performance was quite impressive, with a rate of climb of more than 25,000 ft./min. initially and a maximum speed of Mach 1·7, which was a limitation due to stability characteristics. During the test programme, however, it has been pushed up close to Mach 2. The last F-8C was delivered on 20th September 1960, bringing the total number built to 187.

The fourth Crusader version to see fleet service was the F-8D (F8U-2N), which was basically a direct development of the F-8C; numerous changes, both external and internal, had been incorporated in the new plane, such as improved electronic equipment, a company developed push-button autopilot which performs many of the pilot's routine tasks allowing him to concentrate more on his mission, and a more powerful engine, the J57-P-20, with increased afterburning thrust of 18,000 lb. Basic cannon armament was retained. The rocket pack, however, was deleted to provide space for increased fuel capacity (being now 1,348 gallons), but with the new Y-shaped missile rack

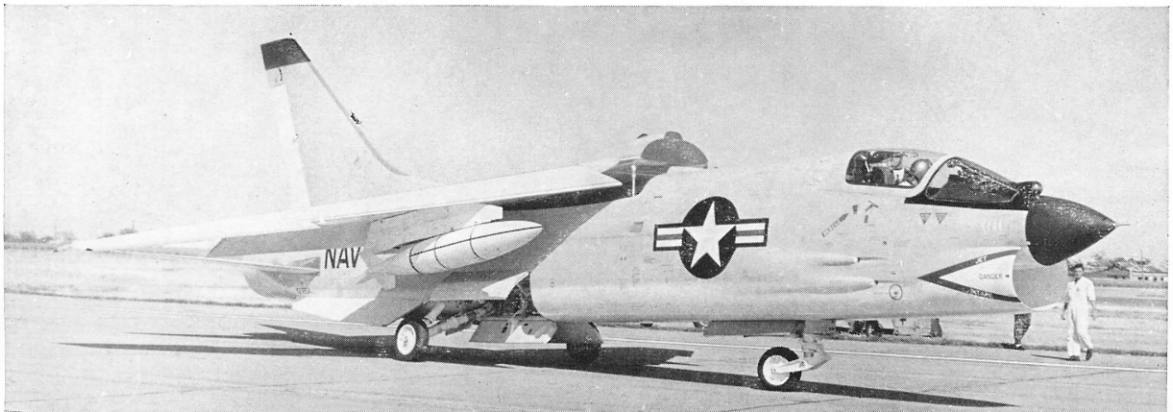

*F-8D*, 147921, *of VF-32, photographed here without fuselage Sidewinder racks.*

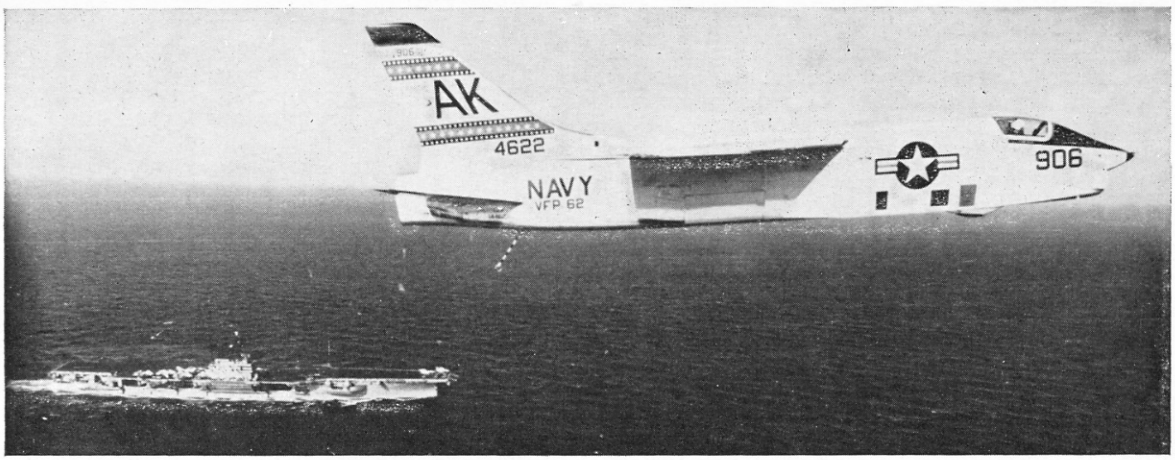
four Sidewinders could now be carried instead of the previous two. 152 F-8Ds were built by January 1962 when the last aircraft was completed. The first F-8D made its debut on 16th February 1960, with the first production aircraft delivered only three and a half months later, on 1st June.

Beginning in October 1960, early models already in service were returned to Chance Vought for modernisation. Under a $9·5 m. contract many of the improvements of the latest models were incorporated into these aircraft bringing them to a higher degree of efficiency.

Continuous development of the Crusader led to a new variant, the F-8E (F8U-2NE). The prototype flew initially on 30th June 1961, and introduced a considerable modification programme. A new and even larger search and fire control radar gave it improved all-weather capability and another innovation was the introduction of two underwing bomb attachment pylons for the ground-attack rôle, which can be removed rapidly permitting the aircraft to perform

*F-8E* 150854 *with 2,000-lb. bombs underwing.*






*An RF-8A reconnaissance aircraft, No.* 144622, *of Navy Squadron VFP-62. The machine is seen here in the landing pattern over the U.S.S.* Forrestal, *with arrester hook extended.* (Photo: U.S. Navy)

interceptor missions. The larger scanner necessitated an enlarged and slightly extended nose cone (increasing the overall length by 3 inches) which is surmounted by the housing for the Sidewinder infra-red scanner. Additional electronic equipment for control of AGM-12 Bullpup missiles is installed in a hump in the wing centre section. Besides the Bullpups the F-8E can carry a wide range of bombs, or wing pods containing 30 Zuni rockets each, within a total gross weight of 34,000 lb. The underwing pylons became standard on all current F-8Es after proving trials were held on U.S.S. *Forrestal* in 1963, since early production aircraft did not feature attack capability. A total of 286 F-8Es were built.

## RECONNAISSANCE CRUSADERS

Simultaneously with the F-8A a reconnaissance version, the RF-8A (F8U-1P) was developed. This version has the lower half of the forward fuselage squared off to enable the installation of three trimetrogen cameras and two vertical cameras for vertical, forward and side oblique photography. Photo-flash bombs for night photography can be carried internally whereas cannon armament, the rocket pack and fire control system are omitted. The upper fuselage was area-ruled to compensate for the increase in cross section which resulted in a slight "hump". Also the "blister" on the port fuselage side was eliminated since the air-refuelling boom retracts flush with the fuselage. The first Recce-Crusader flew initially on 17th December 1957 and production ceased in early 1960 after 144 aeroplanes had been built.

In 1963 five RF-8As were fitted with ventral fins and strengthened wings. In 1964 a conversion programme for more RF-8As was initiated under a new contract. This programme included modernisation of 53 RF-8As which were returned to the company for modifications such as strengthened wings, addition of wing pylons and ventral fins, fuselage structural reinforcements, and a new moulded harness electrical system. A new navigation system and provision for improved cameras are also incorporated. After modification these Crusaders continued their service career as the RF-8G.

One extremely promising tandem two-seat training version was built by modifying a single-seat F-8A, which incidentally was the seventy-fourth production aircraft which also served as prototype for the F-8E (Bu. No. *143710*). This aircraft, the TF-8A (F8U-1T), was fitted with a new forward fuselage which had a second cockpit, raised by some fifteen inches to provide the instructor with adequate visibility. Behind the front MB-ejection seat a wind-blast protection shield was installed to protect the rear seat occupant in case of canopy loss or ejection at high speed. Equipment formerly located behind the pilot's cockpit was moved to an area in the fuselage and access to all equipment was made possible through hinged or removable doors in the outer skin. Two cannons, some ammunition boxes and the rocket pack were removed from the

*The sole two-seater Crusader trainer made ready for launching on the port catapult of the U.S.S.* Independence. *Note "Dual Control" fin emblem.*

trainer version but provision to carry four Sidewinders was retained. Electronic equipment remained the same as for the F-8E and provision was made for additional installation of electronic navigation and weapon control systems. Powerplant was a J57-P-20 engine de-rated to match the performance of the F-8A's engine. Low-pressure tyres for rough field operations and a drag parachute to reduce landing distance were also installed. The first flight was made on 6th February 1962.

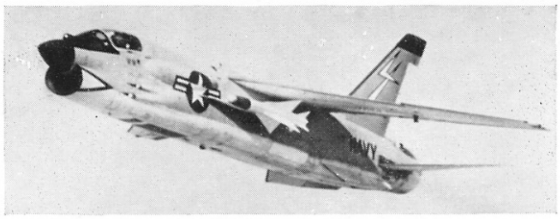
Although the TF-8A was developed under a Navy contract it did not go into production due to a cutback in the 1964 U.S. Fiscal Budget. After evaluation by the U.S.N. it was flown to Europe and offered in England to both services for attack and interception rôles as well as for training purposes. This led to a specification after which a new British version was projected. This specification was based on the trainer version using the second cockpit for an observer. It was to be powered with a Rolls-Royce Spey by-pass engine providing about 12,000 lb. st. thrust and 20,000 lb. with re-heat. All the advantages of this engine would have given the British Crusader a considerable boost-up in performance and an increased range of more than twenty per cent. For the wings the system of the French Crusader including B.L.C. was proposed. The project, which reached the stage of detail design, was dropped however in favour of the Spey-powered Phantom.

Some other Crusader variants were also projected but did not reach production status. These included the F8U-3 Crusader III, sometimes also called Super-Crusader, but this was virtually a new aircraft with only very little resemblance to the Crusader. Five aircraft were built but only three reached flight test stage and were later turned over to N.A.S.A. The project was cancelled in favour of the McDonnell Phantom.

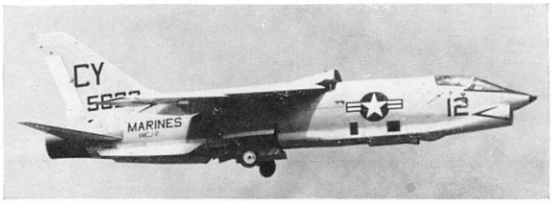
The sixth production F-8A was used for boundary-layer control trials which reduced the stalling speed by some ten knots. This, however, was not adopted by the U.S. Navy since the Crusader could comfortably operate from existing carriers, but the trials provided invaluable information for development of the latest Crusader version for the French Navy.

## AÉRONAVALE CRUSADERS

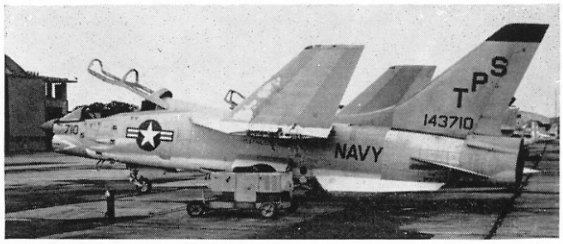
When the *Aéronavale* was looking for a replacement for its ageing Aquilons the choice fell on the F-8E primarily due to the relatively low initial cost,



*An F-8E in flight with the French Matra R-530 missile on the fuselage pylon.*




*A reconnaissance Crusader of VMCJ-2,* 145623, *with retro-fitted ventral fins.*

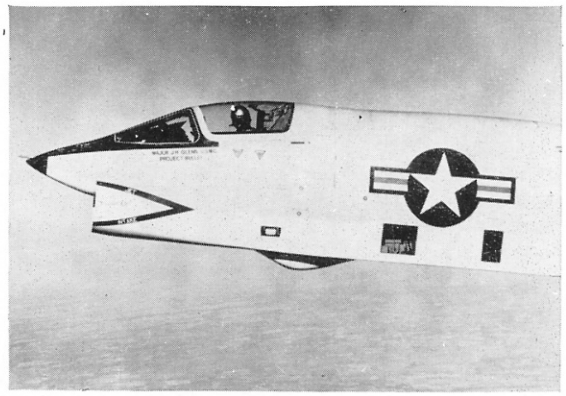


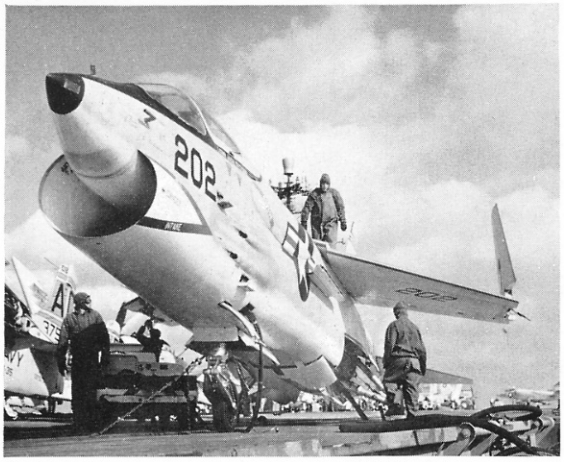

*Another view of the TF-8A trainer, pictured here at the U.S. Navy Test Pilot School.* (Photo: Joseph G. Handelman, D.D.S.)

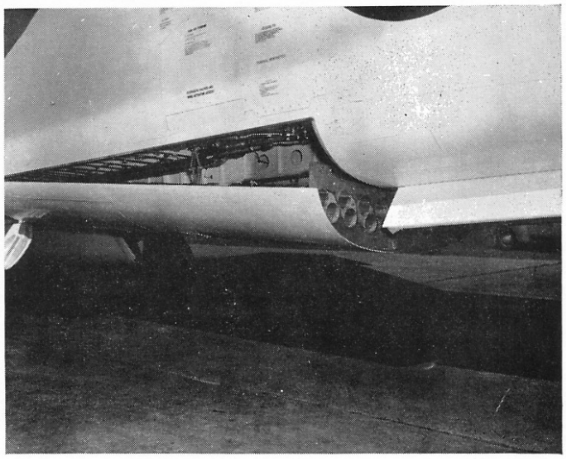
although slower approach speeds for the smaller French carriers were demanded. There the experience gained earlier with boundary-layer control tests paid off.

The drooping leading edges of the French Crusaders, designated F-8E (FN), were split into two sections over the full span, to be lowered 35 degrees for the front section and 8·9 degrees for the rear section, giving the inner leading edge a total droop of almost 44 degrees, nearly double the amount of camber of the American Crusader wing. The leading edges of the outer folding wing portions deflect 35 and 20 degrees respectively compared to 27 degrees on the original wing. The amount of extension of the ailerons

Left: *Detail view of extended in-flight refuelling probe which is standard on the Crusader.* Right: *Major (now Colonel) John Herschel Glenn, U.S.M.C., during his transcontinental record flight from Los Angeles to New York in RF-8A Bu. No.* 144608.





Left: *This photograph of an F-8A on the flight deck of the U.S.S.* Saratoga *gives a good view of the knife-edge air intake. Note also the retractable step and the gun-camera window in the side of the plastic nose-cone; later versions had this installation repositioned on the underside of the cone.* (Photo: Chance Vought.) Right: *Detail view of the "Mighty Mouse" 2·75 in. rocket pack installed in the F-8A, B, C, and D variants.*

and flaps is also doubled to 40 degrees. In addition, air from the engine's high-pressure compressor is led through nozzles in the wing and blown over the flaps to prevent separation of the boundary layer at low speeds. The wing incidence has been reduced by two degrees and the tail plane has been somewhat enlarged. The approach speed of the F-8E (FN) has been reduced thereby by some fifteen knots. These modifications were tested in an F-8D (Bu. No. *147036*), which flew initially on 27th February 1964 after conversion, but this aircraft crashed on 11th April 1964; the first production aircraft for the French Navy was used to complete the flight test programme, making its maiden flight on 26th June 1964. The F-8E (FN) is a multi-mission fighter and retains the standard cannon armament, but for interception missions provision has been made to carry the French MATRA R.530 air-to-air missile on the fuselage racks, although Sidewinders can also be used.

The French Navy has purchased 42 Crusaders, assigned to their carriers *Clémenceau* and *Foch* with the reformed *Flottilles* 12F and 14F which were equipped previously with another famous Chance Vought product, the F4U-7 Corsair. Each unit is operating twelve aircraft.

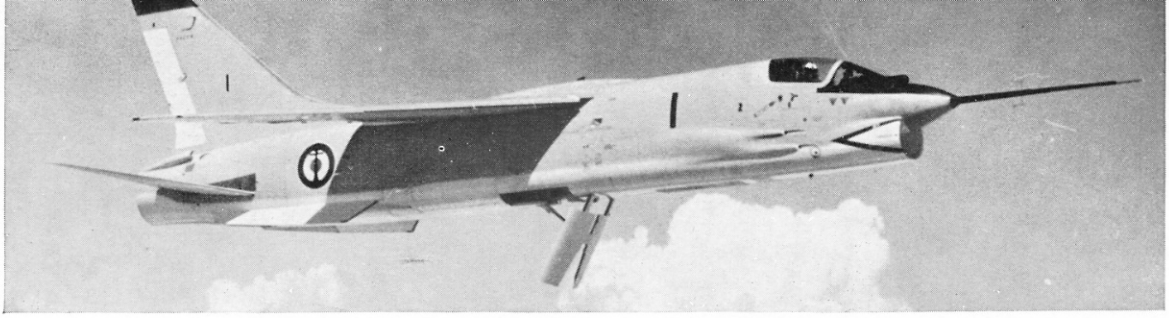
Initial flight tests were held aboard U.S.S. *Shangri-la* by U.S. and French Navy pilots. Then the aircraft were shipped on board the carriers *Arromanches* and *Foch* to the French Naval Base at Lann-Bihoué, whence some aircraft were despatched to the carrier *Clémenceau* in the Mediterranean for carrier trials; these were again made by three French and two American Navy pilots and successfully completed on 9th May 1965. These included tests on the effect of catapulting and arresting on operationally rail-launched MATRA missiles. The modifications applied to the F-8E (FN) permit landings at a nominal sink rate of 11 ft./sec. and arrested landings with less than 3·5 Gs, both lower rates than possible with the U.S. versions of the F-8.

## HIGHLIGHTS

The story of the LTV-Crusader (as it was named after Chance Vought joined the Ling-Temco-Vought group in late 1963) would be incomplete if tribute were not made to some of the highlights which have marked its outstanding Service life. On 21st August 1956 a standard production F-8A, piloted by Commander R. W. Windsor, U.S.N., flew over a 15 kilometre course at China Lake, California, to set a new national speed record of 1,015·428 miles per hour. The previous record was set by an F-100 C with 822·135 miles per hour. For this achievement Cdr. Windsor received the Thompson Trophy.

On 6th June 1957 came another "first". Two Crusaders flown by U.S.N. pilots Capt. G. Robert

*Crusader F-8E nose and tail detail.*

*The first production F-8E (FN) which was used to complete the test programme.*

Dosé and Lieutenant-Commander Paul Miller, Jr., lifted off the flight deck of U.S.S. *Bon Homme Richard* in the Pacific, refuelled in flight and landed after three hours and 28 minutes on the deck of U.S.S. *Saratoga* off Florida, thereby setting a new but unofficial speed record for a cross-country flight. It was also the first ocean-to-ocean flight between carriers in history.

Five weeks later, on 16th July 1957, an attempt was made to capture the coast-to-coast speed record from California to New York. Two Crusaders fresh from the production lines were set aside for "Operation Bullet", an F-8A and an RF-8A. The pilots were Lt. Charles Demmler, U.S.N., and the now famous astronaut, Lt.-Col. (then a Marine Major) John Glenn. Lt. Demmler unfortunately damaged his refuelling probe when attempting a refuelling rendezvous over Albuquerque, New Mexico, and had to land, but Glenn carried on to land at Floyd Bennet field, N.Y., setting a new record of three hours, 23 minutes and eight and four-tenths seconds, and this despite three refuelling contacts with AJ-2 Savage tankers which had to be made at 25,000 ft. at 350 m.p.h. His average speed was 725·55 m.p.h., equivalent to Mach 1·1 at 35,000 feet. During his flight Glenn had his cameras working at set periods and took a continuous photographic coverage of the terrain along his route. For this flight he received the Distinguished Flying Cross.

On 17th December of the same year the Collier Trophy, one of America's highest tributes, was awarded to the company and the Navy for their notable contributions to the science of aeronautics with the Crusader. In March 1958 the first Certificate of Merit ever awarded to an aircraft manufacturer by the Navy's Bureau of Aeronautics was presented to Chance Vought for the Crusader design, development and production.

Crusaders were very active during the Lebanon Crisis in 1958, when VF-32 flying from U.S.S. *Saratoga* accumulated 533 flying hours in July and 762 hours during 23 days in August.

During the Cuba Crisis in 1962 RF-8As were primarily involved with low-altitude reconnaissance, thereby bringing the evidence of communist missile bases established in Cuba which led to the Soviet "back-down". U.S.N. reconnaissance squadron VFP-62 and Marine squadron VMCJ-2 received Presidential Commendations and a number of pilots were awarded Distinguished Flying Crosses for their missions over Cuba.

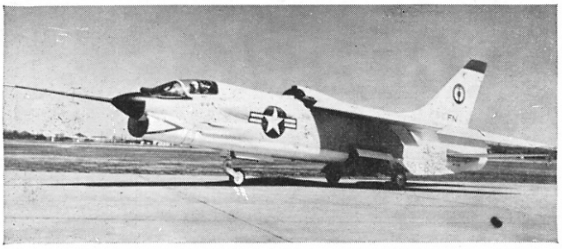
A Navy Reserve pilot flying a Crusader stayed in the air for three hours and 40 minutes without refuelling, quite a remarkable time for a single-engined supersonic fighter on internal fuel only.

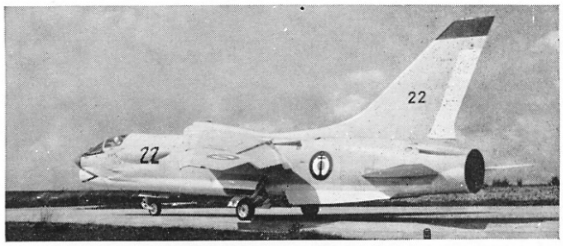
The most unusual story, however, came from Naples, Italy, where in August 1960 a Navy pilot took off in a Crusader from the Capodichino runway and climbed to about 5,000 ft. without noticing anything abnormal. He found, however, that an excessive amount of forward stick pressure was necessary to complete the level-off. Looking around for the cause he noticed that his wings were still folded up in carrier fashion. He then coolly decided to check the flight characteristics of this unusual configuration. So he kept on flying while dumping excessive fuel, and after 24 minutes he came in for a fast but uneventful landing. The speed—including final approach!—was kept at about 200 kts. After landing the pilot reported that no special handling difficulties were encountered during his flight. It is believed that this is the first case where an aeroplane took off, flew, and landed safely with upturned wings. Earlier similar events usually resulted in crashes.

## SUMMARY

Although early F-8 variants are already phased out of operational use and the F-8Es are gradually being replaced by the F-4 Phantom on the larger carriers at the time these words are written, Crusaders play an important part in the Vietnam conflict where they are used in all rôles; the type will certainly continue to see operational life for some years to come. The U.S.

Left: 147036, *the modified F-8D used as a test bed for the French Crusader programme.* Right: *The "double-droop" of the F-8E (FN) can be clearly seen in this view of the 22nd production machine of the batch.* (Photo: É. C. Armées)





*Head-on view of an Aéronavale F-8E (FN).* (Photo: É. C. Armées)

Navy will continue to operate Crusaders as first-line equipment on their smaller Essex-class carriers, which have some difficulty in handling the Phantom. This applies especially to the reconnaissance model, the RF-8G, which has just been modified to bring it to a modern standard and which without doubt will be extensively used for tactical reconnaissance for the next few years. The French Navy, presently in the process of bringing their Crusader squadrons to operational status, will use them into the early 1970s at least.

At the climax of its brilliant career about half of the U.S. Navy and Marine Corps squadrons used the Crusader which hence formed the backbone of U.S. naval aviation for some years. The many successes achieved by the F-8 and the total number of 1,261 built are proving the outstanding qualities of this aircraft which has earned its first-line place in aviation history beyond any possible doubt.



## SPECIFICATION

*Dimensions:* Wing span 35 ft. 2 in.; length 54 ft. 5¾ in.; height 15 ft. 9 in.; wing area 350 sq. ft.

*Powerplant:* One Pratt & Whitney J57-P-20 turbojet rated at 10,700 lb. static thrust and 18,000 lb. with afterburning.

*Armament:* Four 20-mm. MK-12 Colt cannon with 144 rounds per gun and four AIM-9 Sidewinder 1 infra-red homing air-to-air missiles (for intercept missions), twelve 250-lb. bombs, eight 500-lb. bombs or four 1,000-lb. bombs plus eight Zuni air-to-surface missiles, or two AGM-12A or AGM-12B Bullpup air-to-surface missiles (for attack missions).

*Weights:* Fully loaded without external stores 28,000 lb., max. overload 34,000 lb.

*Performance:* Max. speed 1,120 m.p.h. at 40,000 ft. (Mach 1·7); climb to 57,000 ft., 6 minutes; service ceiling 59,000 ft.; combat radius 600 miles; max. range 1,400 miles at 560 m.p.h. at 36,000 ft. (Mach 0·85).

## SERIAL NUMBERS

| Designation | Bureau Number | Total |
|---|---|---|
| XF8U-1 | 138899 & 138890 | 2 |
| *F-8A (F8U-1) | 140444–140448 | 5 |
| | 141336–141362 | 37 |
| | 142408–142415 | 8 |
| | 143677–143821 | 145 |
| | 144427–145415 | 123 |
| | | 318 |
| †F-8B (F8U-1E) | 145416–145545 | 130 |
| RF-8A (F8U-1P) | 141363 | 1 |
| | 144607–144625 | 19 |
| | 145604–145647 | 44 |
| | 146822–146901 | 80 |
| | | 144 |
| F-8C (F8U-2) | 145546–145603 | 88 |
| | 146928–147034 | 129 |
| | | 187 |
| F-8D (F8U-2N) | 147035–147072 | 38 |
| | 148627–148710 | 114 |
| | | 152 |
| ‡F-8E (§F8U-2NE) | 149134–149227 | 94 |
| | 150284–150355 (6) | 72 |
| | 150654–150683 | 30 |
| | 150843–150932 | 90 |
| | | 286 |
| F-8E (FN) | 151732–151773 | 42 |
| ‖RF-8G | | 53 |

**Notes:**

*F8U aircraft received the F-8 designation on 22nd October 1962.

†F8U-1 aircraft with AN/APS-67 radar redesignated F8U-1E on 25th June 1959.

‡First aircraft to carry F-8E designation upon delivery was the 142nd F-8E BU. No. 150331.

§F8U-2N aircraft with AN/APQ-94 radar redesignated F8U-2NE 25th June 1959.

‖Fifty-three RF-8A modernised with ventral fins, new reconnaissance gear, engine and wing pylons.

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