Chance Vought/LTV History

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CHAPTER 1

CHANCE VOUGHT

The early history of Vought Aeronautics is in part the biography of its founder - Chance Milton Vought, pioneer pilot, aeronautical engineer, and aircraft manufacturer whose company bore his name.

Chauncey Milton Vought* was born February 26, 1890, in New York City to the well-to-do and socially accepted Vought family, known and respected for design and production of quality sailing and power boats.

Chance Vought's early education was in the New York City public school system. Upon graduation, he entered the Pratt Institute of Brooklyn, but transferred to New York University and later to the University of Pennsylvania in search of the best engineering courses.

In 1910, he left school and was hired by Harold F. McCormick of McCormick Reapers. Working in the Chicago office, Chance Vought soon became head of the Experimental Development Department. During his stay with McCormick, Chance Vought's keen interest in aviation grew even greater as McCormick was one of early aviation's enthusiastic supporters.

In 1911, the Lillie Aviation Company opened a flying school at nearby Cicero Field. One of their first students was Chance Vought who learned to fly at the controls of a Wright Brothers "Vin Fiz" biplane. Upon graduation, in August 1912, he received FAI License No. 156.

*As a young man he signed himself as C. Milton Vought and then C. M. Vought before deciding on Chance.

Chance Vought's redesign of an old Wright pusher-type aircraft into a more modern tractor-type aircraft so impressed Max Lillie, star pupil and loyal advocate of the Wright Brothers and Voughtfs recent instructor, that he asked Vought to join the Lillie Aviation School as aero engineer and pilot Chance Vought accepted the offer and also joined the Aero Club of Illinois which had its headquarters at the Cicero Field.

Leaving McCormick Reapers also meant that Chance Vought would have to leave the Chicago area as the Lillie Aviation School was moving to Fort Sam Houston, Texas, to assist in flight training of Army aviation personnel. During his stay in San Antonio, Chance Vought often instructed student pilots and was appointed by the Aero Club of America to act as an official observer during any attempts to set aviation records at the San Antonio Field.

In 1913, the Lillie Aviation School returned to Chicago and Cicero Field. When the School business began to decline,Chance Vought became consulting engineer for the Aero Club of Illinois. Then late in 1913, showing his versatility, Chance Vought became editor of an American aviation weekly magazine "Aero and Hydro." As editor, he learned of an opportunity to design an aircraft for William Mayo, president of the Mayo Radiator Works, a subsidiary of the Simplex Automobile Company, which was considering building an experimental aircraft.

Chance Vought became the design engineer for Mayo Radiator Works, and in 1914 the Vought-Mayo-Simplex, the first aircraft completely designed by Chance Vought, made its appearance. So well had Vought designed his first aircraft that after 200 flights, many of which tested the limits of the aircraft, not one single alteration to the original blueprint was found necessary.

The Vought-Mayo-S implex aircraft was sold to the British as an advanced training plane. In 1915, the Simplex Aircraft Company was formed to build more Vought-designed aircraft By August 1915, two other Vought-designed military biplanes were being constructed; both were single-seat tractor-scouts with a design speed of 110 miles per hour.

In the previous year, Chance Vought had also designed an aircraft for the Aero Club of Illinois that was to be an entry in the 1914Gordon Bennett Race. The race was later cancelled as a result of the growing threat of war in Europe.

When the Wright Company of Dayton, Ohio, merged with the Martin Company in 1915, the Wright-Martin Company was formed. In 1916, the new, expanding company purchased the Simplex Aircraft Company from the Simplex Automobile Company.

The former Simplex plant was to manufacture the Hispano-Suiza engine in the U. S., and Chance Vought was transferred to the Wright-Martin Dayton office to design a new trainer for this engine. Vought's subsequent design became known as the famous Wright-Martin Model V military biplane, and saw service as a trainer with the British.

When America entered World War I in February 1917, Chance Vought served as consulting engineer to the Bureau of Aircraft Production in Washington, D. C., and at the Engineering Division of the Army Air Corps at McCook Field, in Dayton, Ohio.

During these years, Chance Vought married Miss Ena Lewis of Pittsburg, Pennsylvania, who asked only that Vought design the aircraft and not fly them. When Vought gave up flying to accept his new responsibilities, his father-in-law, BirdseyeB. Lewis, offered to back Chance Vought in an aircraft company and put up the finances necessary for formation of the Lewis and Vought Corporation. The new Company was officially formed on June 18, 1917.

In 1918, the Bureau of Aircraft Production, under the leadership of John D. Ryan, asked the new Lewis and Vought Company to build a training aircraft better than the British Avro. Six months later, the first Lewis-Vought aircraft, the VE-7, was finished.

In 1922, the Lewis and Vought Corporation was dissolved and reformed as the Chance Vought Corporation with Chance's father George, President.

Chance Vought remained Chairman of the Board and his wife, Ena Lewis Vought, continued as the Company's secretary-treasurer.

By 1924, Vought had designed 12 different types of aircraft in nine years, and he was only 34 years old. 1 n 1925 or 1926, Frederick Rentschler, an executive of Pratt & Whitney, asked Vought's opinion of an aircooied engine. Vought's response was so enthusiastic that he spoke of designing an aircraft around the new engine and encouraged Rentschler in this project, pointing

out that Admiral William A. Moffett of the U. S. Navy and his engine section head, Commander Eugene E. Wilson, liked the idea of private industry supplying new designs to the services. Soon after came the development of the revolutionary air-cooled Pratt & Whitney Wasp engine which appeared simultaneously with the first Vought Corsair.

In July 1929, the Chance Vought Corporation was absorbed and made a subsidiary of the United Aircraft and Transport Corporation, bringing together such aircraft pioneering personalities as Chance Vought, Frederick B. Rentschler, William E. Boeing, Thomas F. Hamilton, and Igor A. Sikorsky. ,>

Recalling these years and others the former Navy Commander Eugene Wilson, who has been a President of both United Aircraft and Transport Corporation and Chance Vought Corporation, said this of Chance Vought:

"He was one of the foremost figures in American aeronautics. A pioneer pilot, he was strikingly successful, measured in terms of finance. He made outstanding contributions in the field of design.

"Chance Vought loved the theatre and the life of New York. He watched the city's passing show with amused tolerance, clearly recognizing the realities behind the scenes. Artistic by nature, he appreciated and loved fine technique in the shop, on the stage, or in sports. Frank and forceful in personality, he used picturesque language, particularly in exposition of hypocrisy and sham. In conflict he quickly sensed maneuvering behind the lines and won his battles by direct attack, in which his disarming frankness exposed his opponent's weakness.

"A host of friends loved him for his personality and admired his genius.

His closest friends had many proofs of his devotion and loyalty and were proud of his regard. Strong personal pride influenced his every act. He was that rare combination of outstanding ability and colorful personality which remains intensely human and real. When he died of septicemia in Southampton, Long Island, July 25, 1930, he left a niche in American aviation life which no one else could fill because there was none other like him. He was a man among men, loved and respected by his employees."

THE COMPANY, ASTORIA, NEW YORK

When the Lewis and Vought Corporation was formed in 1917, the facilities were located on the third floor of a building that was manufacturing women's shoes. The building was the Garside Building located on the corner of Webster and 7th Avenue, Astoria, New York. In 1918 the Lewis and Vought Corporation transferred to better facilities in Long Island City, New York.

Situated in Long Island City, New York, both the Lewis and Vought Corporation and its successor, the Chance Vought Corporation, established prominent positions in the American aircraft industry as outstanding manufacturers of two-place advanced training and observation aircraft for the services.

Among these aircraft, the Navy two-seaters, especially designed for catapult from battleships and scout cruisers as well as for operation from aircraft carriers, were most widely associated with the Vought name and reputation.

THE VE SERIES

The first aircraft built by the new company was the Model VE-7 produced in 1918, and known as the "Bluebird." It was an easy winner in the U. S. Army Aviation competition for training aircraft conducted that year. Comments made by aviation authorities of that period, and still on file today, are sufficient proof of the esteem in which the first Vought air-craft were held by the men who flew them.

Brigadier General William Mitchell, the famous first American prophet of air power, said: "This Vought machine, a training type, has all of the air qualities of the single-seater. . . machines and will out-maneuver the French Spad, the Nieuport, and the English SE-5".

Lieutenant Colonel V. E. Clark, a former technical head of U.S. Army Aviation, declared: "The VE-7 designed by the Chance M. Vought Company unquestionably is the finest training airplane yet produced and the only airplane ever designed to be a real production job."

The VE-7 was powered by the Hispano water-cooled engine. The aircraft construction was entirely of wood, fabric covered.

A number of VE-7s were delivered to the Army before the close of World War I and proved to be one of the most popular and widely used two-seater advanced training aircraft. With a machine gun mounted on the fuselage ahead of the cockpit, the VE-7SF served as a single-seat fighter. On October 17, 1922, the first air takeoff from an aircraft carrier was made by a VE-7SF from the converted collier USS Langley. Navy contracts for the VE-7 were eventually so heavy that the Long Island City plant couldn't meet demanding schedules and many models were built under contract at the Naval Aircraft Factory in Philadelphia.

A VE-8 single-seat fighter was tested at AAcCook Field, Dayton, Ohio, but proved too heavy for operational effectiveness. Two VE-8 aircraft were built; one was a static aircraft and the other was the flight test aircraft

The Navy version for the VE-7 underwent such extensive modification for development as a catapult seaplane that it was redesignated the VE-9.

The VE-9 model developed for the Navy was standardized for advanced training and gunnery purposes. It was further developed into the convertible landing type and used as the original catapult aircraft of the Navy for observation and gunnery-spotting. When the USS Langley was commissioned as the Navy's first aircraft carrier, it was equipped with VE-9s fitted with arresting gear for deck landings.

While the VE-9 was establishing records for reliability of operation and literally becoming the guinea pig for the proponents of carrier aviation, Chance Vought kept his engineers busy developing other new aircraft concepts. In 1919, Vought introduced his model VE-10flying boat.

It was a three-seater with many novel features. Developed as a postwar flying boat for sportsman, it was tested by the Navy for special purposes.

THE MYSTERY AIRCRAFT

The "Mystery Aircraft11 has often been mistakingly identified as a Vought-designed aircraft. Although the Chance Vought Corporation did assist in its manufacture, it was not a Vought design. In 1922, the Wright Aeronautical Corporation, one of the major builders of aircraft engines, produced to the orders of the Navy Department, an experimental monoplane which was the highest powered single-engined monoplane produced to that time. The aircraft was flown in the 1922 Pulitzer Race, where it was labelled the Navy "Mystery," since its characteristics were so carefully guarded.

The Navy "Mystery" was built, mainly to the designs of the Naval Bureau of Aeronautics, by the Wright Aeronautical Corporation in the factory occupied by the Chance Vought Corporation. It was intended as a flying laboratory for the new 650 horsepower Wright engine, to enable the Naval authorities to determine the aircraft's worth under the severe conditions of a high speed race.

The Navy-Wright, as the "Mystery" was later called, was a tractor monoplane which featured a small auxiliary wing just above the landing gear, called a "sesquiplane."

THE UO SERIES*

In 1923, the Chance Vought Corporation produced a new model - the UO-1, a U. S. Navy two-place observation aircraft equipped with a 220 horsepower Wright air-cooled engine, and convertible to either a landplane or seaplane. Of wood and fabric construction, the UO-1 served the Navy with conspicuous success. It was one of the first aircraft to be catapulted from a battleship and was the first to be issued in quantity to the U. S. Fleet. Between 1923 and 1926, various models of the UO-1 were in production and were powered with the latest Wright engines. One model, the UO-4, was manufactured for, and the first aircraft purchased by the U. S. Coast Guard.

Developed as a replacement type for the VE series, the UO-1 was adopted by the U.S. Navy as the exclusive two-seater seaplane equipment for the new catapult-equipped scout cruisers and the battleships of the Fleet. It was also used for deck-landing work on the USS Langley. The U. S. Naval Reserve air stations received UO-ls for advanced flight operations and special training.

The 15 first-class battleships of the battle fleets were each equipped with one or more UO-ls. In addition, two or more UO-ls were used aboard each of the new scout cruisers comprising the Navy's scouting fleets.

In July 1929, the UO-1 became the first aircraft in the U. S. to hook onto a dirigible in flight. Transporting passengers to and from dirigibles was not an uncommon mission for the UO-1. Later, Curtis Sparrow-hawks were stowed inside the dirigibles which operated as aircraft carriers in the sky.

Variants of the UO-1 were produced between 1922 and the early 1930s. In January 1927, a single-seat model appeared as the FU-1 training fighter. Ordered originally as the UO-3, the model designation was changed to FU-1 to conform to the intended tactical use. Late in 1928, 18 FU-ls were converted to two-seat FU-2 trainers and featured dual controls for better visibility during carrier operations.

Powered with a Wright J-4 engine, the UO-1 landplane had a top speed of 134 miles per hour at sea level. It could reach an altitude of 8,600 feet in ten minutes and had a service ceiling of 18,500 feet. Enough fuel was carried on board for a four-hour flight.

THE 02U CORSAIR

The original Vought Corsair- the 02U-1- was designed and built for the Navy in 1926 and proved to be one of the most useful and versatile military aircraft ever produced. Convertible as landplane, seaplane, or amphibians, the02U series aircraft gained a memorable spot in the history of military aviation. They established four world's records, were exported to 13 countries, and were the first aircraft ever used by an organized aircraft unit to conduct an independent and unsupported attack against fortified positions.

The incident took place at Chipote, Nicaragua in 1928. Here is the report filed by Major R. E. Rowel I, Commander of the U.S. Marine Air Squadrons: ".....three days after they (Corsairs) arrived,we had them over the front. They were a great success from the beginning. I have flown nothing else since they came. I have been hit five times by Sandino (the rebel commander) and once by a turkey buzzard, but the little ship still puts out. ...Sandino had from 1,000to 1,500 men, well armed and well led, dug in on an immense mountain over 3,000 feet high. They had plenty of machine guns and plenty of ammunition and it would have taken a full regiment of troops to carry the position and we would have suffered severe casualties in so doing. We had only four Corsairs available when I received the order to attack the position. We went after them with fragmentation and fifty-pound bombs, fixed and flexible guns, and then finished them with infantry hand grenades. I only planned the first attack as a preliminary affair, believing that the strength of the enemy and the small number of planes would require at least three attacks to finish the job. We made a swift approach from an unexpected direction, attacking in two columns without reconnoitering. I led the attack on the right flank and was met by a barrage of incendiary sky rockets. We came down with the front guns wide open and opened up with light bombs from about 600 feet. The rifle and machine gun fire / was heavy and most of us stopped some bullets. The planes following came in with the heavier bombs. After the second dive the enemy broke cover and there was a wild stampede. After that, the party was wild and furious, and when we got through the place was badly messed up. On the following day, the mountain was devoid of bandits. According to Sandino!s own statement, his entire army deserted him except for about 150 of his old reliables. It all sounds like a fantastic story, but is nevertheless true."

As a result of a later incident in the Nicaraguan Campaign, the first Medal of Honor to a Marine pilot was awarded Lt. C. F. Schilt for "repeatedly landing in the midst of enemy fire to evacuate wounded ground forces. " Lt. Schilt!s evacuation of 18 seriously wounded troops from Quilali, Nicaragua, took ten landings into a quickly prepared and very rough ; field that was only 70 feet wide and 300 feet long. The landings and the takeoffs were all under continuous fire from heavy

machine guns., Schilt's comment, "Only a Corsair could do it!", was to be echoed in the years ahead.

The Vought 02U-1 was the first service aircraft to use the 425 horsepower Pratt & Whitney Wasp air-cooled engine.

Several models of the early Corsair were developed. One, the 02U-2, was a jack-of-all-trades. It had a tactical flexibility which enabled it to be converted readily, almost overnight, to perform numerous functions. It could take off from an aircraft carrier as a defensive fighter; it could be catapulted from battleships and cruisers as an amphibian; and could land on the carriers for reservicing. It could be flown as an amphibian from carrier decks and operated safely at long distances from the carriers because it was capable of landing on the water. By simply removing the wheels from the float, it could be operated as a seaplane when desired. Thus, the usefulness of this aircraft was expanded and the demand for its manufacture was increased.

THE COMPANY, LONG ISLAND, NEW YORK

I n spite of the fact that aeronautical research and aircraft production activity was relatively moderate after the end of World War 1, the Chance Vought Corporation in 1926 was established as a successful and leading aircraft manufacturer.

Perhaps more than any other manufacturer, Vought conducted a steady business, yearly mounting in volume and consistently improving its facilities to anticipate America's military requirements.

In 1926, the Vought organization was conspicuous for advanced engineering design, for well trained personnel, and for quality products. The Corporation had an unusual record for continuity of production and consistent operation.

Vought management was constantly making product improvements and increasing plant facilities to further production capacity. Although the number of employees (150) had remained practically constant, the weekly aircraft production rate steadily increased.

The plant buildings and facilities were ideally suited to their purpose, they were equipped with the most extensive and modern machinery and tools then available for woodwork and metalwork. Good lighting, heating, and ventilation assured the best possible working conditions, and the personal pride which each man took in his work was reflected in the quality of the finished product.

During the years from 1926 to 1930, Corsairs produced in the Vought plant at Long Island City were one of the mainstays of U. S. Naval aviation strength. During 1927 and 1928, the total distance flown by Navy piloted Vought aircraft was 6,733,000 miles. Production emphasis throughout this period was on the 02U series, with the 02U-2, 02U-3 and 02U-4 being produced for the Navy. Ail models were similar to the original 02U-1 Corsair, except that each succeeding model performed better and possessed more modern equipment than its predecessor.

From a little group of a dozen men who used part of a loft floor, the company had grown until, in 1928, it was the second largest American producer of military scout aircraft, and in 1929 was the leading manufacturer of two-seat observation aircraft. Business was good enough to begin construction on a new plant in East Hartford, Connecticut.

In February 1929, the Chance Vought Corporation joined with other aeronautical organizations to form the United Aircraft and Transport Corporation, from which was later formed the United Aircraft Corporation.

Frederick B. Rentschler, President of United Aircraft and Transport Corporation and President of Pratt & Whitney Aircraft Company, was elected President of the Chance Vought Corporation at a Board of Director's meeting on August 6, 1930, succeeding Chance Vought who died on July 25, 1930. At this time, United Aircraft and Transport Corporation controlled or owned all common stock of the following enterprises:

(1) The Chance Vought Corporation

(2) Pratt & Whitney Aircraft Company

(3) The Boeing Airplane Company

(4) The Boeing Transport Company

(5) United Airport of Connecticut

(6) The Hamilton Standard Propeller Corporation

(7) Pacific Air Transport Company

(8) Stout Air Services, Inc.

(9) Northrop Aircraft Corporation

(10) Sikorsky Aviation Corporation

(11) Stearman Aircraft Company

(12) United Exports Inc.

(13) United Aircraft Company of California

(14) National Air Transport

CHAPTER II

THE COMPANY, EAST HARTFORD, CONNECTICUT

In 1930, the Chance Vought Corporation, a subsidiary of United Aircraft and Transport Corporation, brought with it to East Hartford a trained staff of creative specialists, several hundred skilled workmen of the finest caliber, and an annual payroll of approximately one million dollars.

The splendid new plant was designed in accordance with the suggestions of Chance Vought, whose sheer ability and dynamic personality had been responsible in large measure for the rapid early growth of the enterprise.

The plant was completed just before Chance Vought's death and had 175,000 square feet of floor space scientifically laid out for the most efficient production and equipped with the finest modern machinery. It was adjacent to the huge factory of the Pratt & Whitney Aircraft Company and the Hamilton Standard Propellers Corporation. The final assembly line fed directly onto the smooth expanse of Rentschler Field where flight tests and experimental flying took place.

At East Hartford, the Chance Vought Corporation continued its important contributions to military aviation. New and improved Corsair observation and scout aircraft were produced and went into regular operation aboard U. S. Navy aircraft carriers and battleships. Experimentation on other type aircraft was conducted with the result that the Corporation later entered the dive bomber and fighter fields with marked success.

In February 1931, Eugene Wilson was elected President of Chance Vought Corporation. He was also the President of Sikorsky Aircraft Corporation. On March 9, 1931, the Chance Vought Corporation received what was described at that time the "first large order for Naval aircraft placed in eight months." This was for 25 observation aircraft of the 03U-1 series at a cost of $400,455- a paltry figure when judged by present standards, but a substantial sum in a day when the nationfs industry and business were in the grips of an appalling depression.

The aircraft, a continuation of the Corsair line, were intended for observation work from battleships and cruisers and for scouting missions from carriers. On the battleships and cruisers, they were equipped with pontoons and operated from catapults.

On July 25, 1931, the Chance Vought Corporation announced production of a new airplane, the 03U-2. Development of the new aircraft brought to the Chance Vought Corporation a three-million-dollar contract in November 1931 when the U. S. Navy placed an order for 122 aircraft.

The Chance Vought Corporation's reputation as a manufacturer of superior aircraft spread. In September 1932, the Brazilian government ordered 23 V65B Corsairs. A few months later, Great Britain purchased the latest Corsair "to investigate the merits of the single-float airplane equipment and to acquire a representative sample of the best American aircraft constructed."

During the years from 1930 to 1935, the Chance Vought Corporation produced nearly 500 aircraft of the Corsair line. Although a large portion went to the U. S. Navy, many were

delivered to Argentina (V-65F), Cuba, Peru, the Dominican Republic, Mexico (V-99M and V-100), China (V-65C), Siam (V-93S), and Germany (V-85G), as well as those to Brazil <V-65B) and Great Britain (V-66E).

THE SU SERIES

The SU-1* biplane was developed from the original Corsair 02U series. During 1934, production models included the SU-2, SU-3, and SU-4 Corsairs powered by Pratt & Whitney Hornet engines, and the 03U-3 equipped with a Wasp engine. The latter type was readily convertible from landplane to seaplane and could be operated from land, water, catapult, or carrier.

For export, the company had in production the V-80 single-seater fighter, and the V-90, two-seater Corsair, both aircraft being of essentially the same design. Designed as naval fighters, they had an enclosed cockpit and interchangeable wheels and floats. Armament included four guns and four 116-pound bombs.

The Chance Vought Corporation reached a milestone in its career on August 13, 1933, when it completed a Corsair, the thousandth aircraft produced, since the company's founding in 1917.

A fighter version of the 02U series, known as the XF2U-1, was built in 1929, and lost a competition with the Curtiss F8C-1 Helldiver. In 1933, Vought engineers developed and offered another fighter, the XF3U-1. This Vought aircraft was redesignated before service into a new "SB" Scout Bomber category.

THE SB SERIES

In January 1935, the Chance Vought Corporation climaxed three years of research by producing a new scout bomber considerably faster than any aircraft previously built at East Hartford.

The new aircraft, designated the SBU-1, was the first aircraft of all-metal structure to be manufactured by the company and was also the first to be powered with the 700-horsepower Pratt & Whitney Twin Wasp Jr. engine.

On August 20, 1935, the first of 84 SBlHs under production for the Navy took off from Rentschler Field, East Hartford, on a test flight under the eyes of company executives and Navy officers. Chief Test Pilot Paul S. Baker was at the controls. The tests were described as entirely satisfactory, and the aircraft was later flown to Washington, D. C. for further trials for the Navy. Construction of the remaining 83 aircraft progressed favorably, and delivery was completed early in 1936. Designed and built to operate from Navy carriers, the SBU-1 had a top speed in excess of 200 miles per hour, the first of its type to attain such a speed. The aircraft differed in many respects from previous Corsair types. Particular attention was given to aerodynamic "cleanness" and to that end, the cabin was completely enclosed, and large wing and tail fillets were incorporated as well as "cuffs" on the struts. A later model was known as the SBU-2. An export model of this Vought scout bomber, theV-142, was sold to the Argentine Navy.

THE SB2U-1 VINDICATOR

While deliveries of the SBU-1 and SBU-2 were being made on schedule, Vought engineering and production was rushing to complete a new scout and dive bomber, a radical departure from all previous Vought designs.

The result was the XSB2U-1, an experimental low-wing aircraft designed for high speeds and built to carry machine guns as well as a 1,000-pound bomb along the fuselage centerline and smaller general purpose bombs under the wings. Powered with the 750-horsepower Pratt & Whitney Twin Wasp J r. engine, the aircraft was equipped with retractable landing gear and was the first monoplane built by Vought. It has the distinction of being the first low wing monoplane accepted by the Navy for carrier operations.

The XSB2U-1 structure was all metal except for fabric covering on the movable tail surfaces and on the aft portion of the wing and fuselage.

It was Vought's first production aircraft to feature folding wings.

The XSB2U-1 first test flight was at Rentschler Field on January 5, 1936, with Test Pilot Baker at the controls.

Chance Vought Corporation, with its SB2U series aircraft, made valuable contributions to development of the dive-bomber type aircraft. The XSB2U-1 was manufactured for the Navy under the designations SB2U-1, SB2U-2, and SB2U-3, which were used by the Navy and Marine flyers as carrier-based aircraft.

A biplane version was actually built, known as the SB3U-1, as complete faith had not yet been placed in the monoplane. The contract was cancelled when it became obvious that biplane bombers had no future.

One XSB2U-3, a reconfigured SB2U-1, was built. It was equipped with pontoons, making it a scout bomber, reconnaissance seaplane. It subsequently proved too heavy.

The SB2U aircraft produced for the U. S. Navy were given the name "Vindicator." Aircraft of substantially the same type, designated V-156F, were built for export to the French government. When Germany forced the French surrender, those V-156FS not yet delivered to the French were sold to the British and redesignated V-156B-L The British gave them the nickname "Chesapeake."

Vought Vindicators flown by U. S. Marine pilots played an important part in turning back the Japanese attempt to take Midway Island in 1942. Nine out of eleven returned. In contrast, a squadron of 12 V-156FS (French models) distinguished themselves in 15 separate attacks against the Germans in May and June of 1940. In 20 days of combat, the squadron was reduced to two aircraft.

Vought's attention during 1937 and 1938 was concentrated largely on the manufacture of these scout dive-bombers. Production of these aircraft was still in progress when, early in 1939, the company was transferred by United Aircraft and Transport Corporation from East Hartford to Stratford, Connecticut, to merge with the Sikorsky Aircraft Division.

CHAPTER III

THE COMPANY. STRATFORD, CONNECTICUT

When the Chance Vought Aircraft Division was moved from East Hartford to a larger plant at Stratford, Connecticut, it joined with the Sikorsky Aircraft Division to form a new organization, the Vought-Sikorsky Aircraft Division. Later, in January 1943, the two divisions were reconstituted, with Vought assuming its former title and Sikorsky moving to a new site in Bridgeport, Connecticut, to concentrate on helicopter development and production.

It was after the transfer to Stratford that Chance Vought Aircraft made its most rapid and extensive expansion. As the international situation became more ominous, plans for successive plant enlargements were rushed into completion. Floor area was expanded far beyond that formerly available, manufacturing improvements by the score were instituted, and at the outbreak of hostilities, Vought was prepared to swing its production into high gear.

This plant expansion played a major role in Vought1 s maintenance of increased output.

"Farming out" of Vought Aircraft subassemblies and other parts through a well-integrated system of subcontractors and vendors also contributed greatly to the continued production rise.

Within the plant, experience was proving to be an invaluable teacher as daily production problems were met and mastered by constant refinements in manufacturing techniques. Close cooperation was maintained among engineering and production so that changes, dictated by lessons learned in aerial combat, were effected with only minimum interruption of the accelerated production schedule made necessary by the urgencies of the war.

Modern manufacturing methods, including installation of a conveyor line system, resulted in vastly improved plant efficiency. Extensive use of spot-welding, a speedy process of which Chance Vought Aircraft was a leading exponent, is listed among hundreds of procedures which combined to keep Vought production on the upgrade.

VOUGHT-SIKORSKYDAYS

During the days of consolidation between Vought and Sikorsky, most of the business was in Vought designed aircraft. Aircraft of Sikorsky design that the Division worked on during the early 1940s included Sikorsky's famous S-43, popularly known as Pan American's "China Clipper." Two S-43 Clippers were built for Royal Netherlands Indian Airways and delivered in January 1941.

Development began in 1939 on the VS-44A, a commercial counterpart of the Sikorsky experimental XPBS-1 patrol flying boat.

The commercial derivative was designed specifically for American Export Airlines. The first aircraft was received in 1942. In 1964, a VS44A was still flying between Long Beach and Catalina Island for the Catalina Air Transport Company.

In 1941, a request was received from Pratt & Whitney for two single-engine, 4-place high altitude test aircraft. The aircraft were to be used primarily for testing larger aircraft engines, propellers, and associated accessories. They featured a pressure cabin isolated from the structure. The basic structure, except for the fuselage, was similar to the XTBU-L These aircraft were designated VS-326 and VS-326A.

The first helicopter ever flown successfully in the United States was the Vought-Sikorsky 300A. The VS-300A, a design by the father of the helicopter, Igor Sikorsky, first flew in 1939. It led immediately to a version for the U. S. Army designated VS-316 (XR-4) which was delivered in 1942.

THE OS2U KINGFISHER

Development, which was started in East Hartford, was progressing on one of the most rugged and dependable Vought aircraft ever produced, the OS2U-L * which was designated the "Kingfisher" by the Navy. A mid-wing monoplane, the Kingfisher was powered with a 450-horsepower Pratt & Whitney Wasp Jr. engine.

Behind the Kingfisher's wartime achievements stands another story -the engineering accomplishments which made it-all possible. In designing the Kingfisher, (A later similar design known as the XS02U-1, was equipped with a 12-cylinder Fairchild Ranger "Vee" in line, air-cooled engine. This aircraft featured stream line design. It never went into production.)Vought engineers had to meet certain basic design requirements to produce an aircraft which would do an observation-scouting job better than had ever been produced before. Among the goals sought were excellent vision (for tactical missions), limited size (for shipboard use), low landing speed (for rough water landings), excellent water handling (for serviceability), long endurance for special missions, and good all-around performance. That the job was well done is apparent from the Kingfisher's versatile record - a record which earned it the title "Workhorse of the Fleet."

Hundreds of these observation scout aircraft, as well as large numbers of the OS2U-2 and OS2U-3 models which followed, were delivered to the Navy and established superlative records in convoy duty, and rescue work.

Although intended almost solely for gunnery-spotting and routine observation tasks, the Kingfisher was adapted to these and other tasks. In the South Pacific, three teamed up to depth charge and destroy one of Japan's largest submarines and Kingfishers were constantly vigilant in anti-submarine patrol along most of the North American Coast, carrying enough bombs to do their own sinking of enemy undersea craft.

Convertible to either landplane or seaplane, the Kingfishers were called upon for a great variety of missions. In the initial assault against the Japanese based on Attu in the Aleutians, they were rigged as dive bombers with conspicuous success. In this action, they carried 335-pound bombs instead of the lighter bombs for which they were designed. They came through in characteristic Vought style.

The Kingfisher was designed specifically for catapult operation from battleships and cruisers. Previously, all aircraft used by the Navy for this type operation had been biplanes. The OS2U-1

was the first monoplane to be placed in catapult service. The ingenuity of Vought engineers, who developed special high lift and control devices, made this possible.

Based with the fleet, Kingfishers ranged far during World War 11 seeing action in widely scattered war theaters. The British Fleet Air Arm received 100 OS2U-3S with both float and wheel gear. 24 OS2U-3s were allocated to the Royal Netherlands Navy. Another 300 similar aircraft were built by the Naval Aircraft Factory under the designation OS2N-L

KINGFISHER-FISHER OF MEN

Kingfishers effected many of the war's thrilling rescues, putting into practical use the Navy's humane policy of doing everything possible to save men forced down or shot down at sea.

Just as all Americans followed the harrowing return from the moon of Astronaut James Lovell and his crew of Apollo 13, so in November 1943 did all Americans follow the search for Captain Eddie Rickenbacker and his crew. They had been given up as lost after 21 days in the South Pacific. After all others had quit, a Kingfisher made one final pass under the cloud cover and spotted their raft.

With Rickenbacker and two of his crew aboard, the two man Kingfisher proved its durability and worth by taxiing 40 miles in a rough sea to the nearest point of land.

A sequence of events began for Lieutenant John Burns and his radioman, Aubrey J. Gill, on April 30, 1944. They were patrolling Truk lagoon and saw another Kingfisher capsize during an attempt to rescue a downed pilot. Burns calmly landed his aircraft beside the disabled Kingfisher and helped the crew climb aboard. His aircraft overburdened, Lieutenant Burns was unable to take off and taxied to a rendezvous with U. S. submarine Tang which was assigned to lifeguard duty during the Truk air strike.

Having safely delivered the three men, Lieutenant Burns then soared off to search for three life rafts reported drifting off the eastern reef of the island. He spotted his first raft which belonged to a lone fighter pilot. For the second time that day, he successfully landed his Kingfisher on the lagoon surface and the downed pilot climbed aboard onto Radioman Gill's lap. After taxiing back and forth for two hours, Burns found the three-man crew of a downed torpedo plane. The Kingfisher, so small that she could carry only three men in a pinch, now bore six. A takeoff was out of the question.

As Burns was taxiing back to the Tang, he came across the third raft and three more downed fliers. According to one of these three, Radioman Joseph Hranek of Endicott, New York, "Burns told us to tie our raft to the main pontoon of the aircraft. He then taxied for three more hours before we rendezvoused with the Tang." The Kingfisher now had nine aboard.

"At first we stayed in the raft. But when Burns revved up the engine, we got a pretty good blast of water in our faces. So we climbed up onto the wing. Most of the time there were two men sitting on each wing to balance the aircraft, the others were hanging on to the fuselage," Joe Hranek continued. "The aircraft took a beating in the choppy sea and the main pontoon sprung a leak. We didnft sweat it too much, though; we were in radio contact with the sub."

When the Kingfisher reached the sub she was listing severely, nearly out of gas, and in short, about done. Lieutenant Burns said, "If we had to remain in the water much longer. . .," not finishing the sentence. The submariners helped the airmen off the battered and ruined Kingfisher and, according to the Tang's skipper, Lieutenant Commander Richard H. O'Kane, "We sent Burns below so he couldn't see and sank his plane with gunfire."

Operations such as this, and there were many, assured the Kingfisher a niche in naval aviation history. Few other aircraft can rival its wartime life-span.

THE ZERO?

American aircraft came out a poor second in early encounters with a Japanese fighter universally known as the Zero.

A commonly held belief is that the enemy had the best fighter because someone in the United States sold it to the Japanese in the pre-war years. The aircraft in question was the Vought V-I43 (originally designed by Jack Northrop, Vought purchased the rights in 1935). In 1935, Jack Northrop's aircraft was lost without a trace during a test off the California coast. This loss led to rumors that the test pilot had either flown to a Japanese carrier or to Mexico and there delivered the aircraft to the Japanese. Add to this the fact that the Vought V-143 (built from the Northrop plans) was purchased from Vought in 1939 by representatives of the Japanese government. In 1942, a Zero was captured off the Alaskan coast. A soldier in the area, who had previously been an engineer with Vought, at first sight remarked it was practically the same aircraft he had worked on in 1936. As the story goes, the U. S. government turned to Vought to build an aircraft superior to the Zero, because, who knew the Zero's capabilities better? In point of fact, there is little similarity between the two aircraft designs. The Zero was a full 1,000 pounds heavier, all dimensions larger, and had different wing and tail designs than the V-143.

The aircraft that people speak of as having been designed to put the Zero down was actually on the drawing boards three years before Pearl Harbor and a year before the sale of the V-143 to the Japanese.

CHAPTER IV

THE F4U CORSAIR

Although in 1938 and 1939 Vought's engineering and production problems concerned the scout bombers and observation scouts, they were looking into the future, preparing for the day when America's aerial forces would need a super-fighter.

It wasn't long before they came up with one of the world's truly great fighter aircraft - the XF4U-1, and the second Vought aircraft to bear the proud name "Corsair." The first flight of the XF4U-1 was on March 29, 1940 with Lyman A. Bullard at the controls.

In the blunt nose of the gull-winged terror was a 2,000-horsepower Pratt & Whitney Double Wasp engine with a two-stage super charger, the most potent powerplant ever placed in a fighter aircraft. The XF4U-1 was a sensation. From the beginning, it raced through the air at better than 400 miles per hour in tests. The first U. S. fighter to exceed 400 mph.

Hundreds were ordered, and the first production F4U-1 Corsair rolled from the Vought assembly line late in June 1942. First flight on this production F4U-1 was made by Boone Guyton, company test pilot. Thus was marked the successful completion of the difficult task of placing in production a new and complicated aircraft and at the same time maintaining rapid output of the Kingfisher series. Ahead lay the tremendous job of speeding up production week-by-week and month-by-month to keep pace with the tough, accelerated schedule demanded by the Navy.

Built around the big air-cooled Double Wasp engine, the Corsair not only was the U. S. Navy's first 2,000-horsepower fighter, it was also the first Navy fighter in the world with such horsepower. Performances of the aircraft in its combat engagements justified again the Navy's traditional faith in air-cooled powerplants as well as its confidence in the novel design features incorporated in the Corsair.

The Corsair was of rugged construction throughout to carry its powerful 2,000-horsepower engine and to withstand the grueling punishment of carrier landings. It was large as fighter aircraft go, with a wingspan of just under 41 feet, a length of more than 33 feet, and a tremendous three-bladed Hydromatic propeller swinging through an arc 13 feet 4 inches in diameter.

Conceived and developed by the Vought Engineering Staff under the direction of Rex B. Beisel, a veteran aeronautical engineer of more than a quarter century's experience, the Corsair aroused tremendous interest since the original experimental model first demonstrated its potentialities to the Navy.

Observers were quick to agree, on the results of flight tests, that the Corsair was fully capable of writing a new and significant chapter in fighter aircraft history. Months before the aircraft appeared in combat areas, Rear Admiral John H. Towers, then Chief of the Bureau of Aeronautics and later in command of all aircraft in the Pacific, described the Corsair as the fastest aircraft in the United States.

Navy pilots, speaking "off the record," praised the Corsair's performance and eagerly awaited the day when it would be ready to strike in force at the enemy, particularly against the vaunted Japanese Zero.

Vought engineers, describing the evolution of the Corsair, emphasized that the Navy gave them three requirements: 1 - Speed; 2 - Speed; and 3 - More Speed. To this end, they designed the smallest fuselage possible around the Double Wasp engine, with their ultimate purpose being construction of the cleanest possible aircraft with elimination of everything which would cause drag.

Achievement of this aim inspired for the first time the use of spot-welding and flush-riveting throughout the aircraft. Air-scoops and other protuberances were taboo; the landing gear, tail wheel, and arresting gear were not only retractable but completely faired in when in the "up" position.

One of the first problems encountered resulted from the designers' decision to make use of the largest possible propeller; decision reached when engineering realized that only a large propeller would enable the combination of a powerful engine and a cleanly designed aircraft to attain the high speed desired.

Investigation of methods to obtain sufficient ground clearance for the larger propeller resulted in the conception by Rex Beisel of the 'inverted gull-wing, a design feature which simultaneously solved other problems as well.

The gull-wing made possible the use of a shorter, lighter landing gear than would have been possible on a straight-wing aircraft and enabled the gear to fold readily aft within the width of wing available.

Another, and important reason for the inverted gull-wing, was an aerodynamic one. Experiments revealed that the most efficient relative position of the wing to the fuselage was the "normal" or right-angle attachment, the reason being that such a position offered the minimum interference drag between wing and fuselage. Thus a wing placed midway between the top and bottom of the fuselage resulted in less drag than if located at either top or bottom. The gull-wing maintained the right angle intersection of the fuselage-wing attachment with the angle being the same as in the case of the mid-wing method, yet still made possible a short lightweight landing gear.

Additional advantages stemming from the gull-wing were improved pilot vision because of the low-wing points on either side of the fuselage, and a lower overall height with the wings folded due to the low junction point of the center and outer wing panels, thus facilitating storage in underdeck hangars aboard carriers.

The fact that the Corsair was one of the world's fastest aircraft and yet could land in the limited space of a carrier, stamped it as one of the most remarkable fighter aircraft ever built. The Corsair proved its ability to outfight and outfly land-based aircraft, an unusual accomplishment for an aircraft designed specifically for operation from an aircraft carrier. The Corsair performance showed it to be a formidable weapon from sea level to extremely high altitudes, making practical its use as an interceptor, a medium altitude, or a high altitude fighter.

In November 1941, Brewster Aeronautical Corporation was named an associate contractor on the F4U-L Their models were designated the F3A-1. Brewster eventually built only 735 Corsairs and the company went out of business in 1944.

Goodyear Aircraft was also named an associate contractor on the F4U-1 in 1941. Goodyear models were designated the FG-1, FG-1A and FG-1D. Goodyear built 4,014 Corsairs.

On January 6, 1942, Chance Vought Aircraft responded to a request by the Navy for a night fighter. In January 1942, a mock-up of the aircraft, the F4U-2, was ready for Navy inspection. The pressure of the ever increasing workload at Chance Vought prevented the company from manufacturing the F4U-2. The Naval Aircraft Factory at Philadelphia converted 12 standard F4U-ls to the F4U-2 model, equipping them with airborne intercept radar and autopilots.

On June 14, 1941, the Navy asked Chance Vought Aircraft for a proposal on an XF4U-3, a high-altitude fighter equipped with a new two-turbo supercharger invented by the Turbo-Engineering Company of Trenton, New Jersey.

Chance Vought built only three of the XF4U-3s and used them for experimental work. In 1944, the Goodyear Aircraft Company planned to convert 27 aircraft to the new supercharger. The aircraft, eventually reduced in number to 13, were used for very high altitude operational test work until the project was abandoned in 1946.

While production and development work was going on at Chance Vought, the Navy carried on extensive flight tests with the F4U-1.

The long nose of the F4U-1, topped by its huge powerplant, made for poor visibility in the three-point attitude. (Much was done to remedy this situation by raising the cabin, starting with the 689th plane produced. The raised-cabin aircraft were designated F4LJ-1A. A bubble canopy also was installed in the "A" models.)

VOUGHT'S CORSAIR "TECH REP"

Early in the war, Charles A. Lindbergh joined United Aircraft in an engineering consulting capacity. Lindbergh never lost his interest in fighter aircraft. In Europe in the late thirties, he flew the best of the British and German aircraft, and his early reports to the late General Arnold warned of the shortcomings of our fighters and helped bring about much-needed changes in our own air services. Thus it was that Lindbergh was to be busiest at the Chance Vought Aircraft Division with the Corsairs.

Visitors in the pilots' room at Stratford in those hectic days grew accustomed to seeing his name on the ever-changing charts with those of other pilots making the flight tests of aircraft after aircraft. He was a constant member of engineering conferences. He visited the various naval air stations where pilots were learning how to land, fly and maneuver the fast, high performance Corsair fighter. He took part in maneuvers and mock combats. The story is still repeated, when Marines get together for "hangar flying," of one occasion on the West Coast when Vought's 41-year-old "tech rep" went up with two of the Marine's crack performers, and in a high-altitude gunnery contest "out-guessed, out-flew and out-shot" them both!

When Lindberg as a "tech rep" for Vought wanted to go to the

Pacific, the Navy was more than willing and agreed with him that his status should be exactly like that of any other technical representative.

His mission was to "study the performance of fighter aircraft under combat conditions" with a view to improvement in design and the design of new types... and he did just that. To his logical mind there was only one way to study a fighter aircraft "under combat conditions" and that was to fly on combat missions.

Some of the combat service people were a little incredulous at first. Old men of forty or more didn't fly combat missions in fighter aircraft — not because they didn't like to do it — but because physically they were too slow in their reactions. They were no longer rugged enough to take it. The doubters soon changed their minds. Lindbergh went on many missions in Corsairs, took part in strafing raids, flew cover for bombers and did some special bombing to show just what a Corsair could do.

Altogether he spent six months in the Pacific, made fifty combat missions, put in 178 combat hours, and returned to Connecticut with complete records on fighter aircraft, their performance and their problems.

CORSAIRS IN COMBAT

In early 1943, F4U Corsairs received their baptism of fire in the Solomon Islands area and the excellent reports which filtered back spurred Vought employees to even greater efforts.

With young Marine pilots at the controls, the fast, rugged Corsairs took the measure of the best the enemy could put forth and consistently came out on top. Reports were received of spectacular engagements in which Corsair pilots broke up Japanese bombing raids, blasting enemy aircraft from the sky with only minor losses to themselves. On one occasion, a band of four Corsairs returning from a strafing run attacked 40 Japanese bombers and escorting fighters, scattered them, and turned back the enemy raid.

Pilots added their voices to the story that their chattering guns were writing in the Solomons skies. "The Corsairs are better than anything either we or the enemy have - from every angle/1 said Squadron Leader Major Robert S. Fraser after the new F4LHs had shot down 15 to 25 Japanese Zeros in a series of running dogfights. "It's the best damned fighter in the world" asserted the pilot of an American torpedo bomber who had been saved when a Corsair "picked two Zeros right off my tail."

Added to the stories of the men who flew the Corsairs came praise from high Naval officials.

"Day-to-day fighting in the South Pacific has proven the Corsair decidedly superior to all models of the Japanese Zero," said Admiral Chester W. Nimitz in a telegram to Chance Vought employees in May, 1943.

Vice Admiral John S. McCain, then Chief of the Bureau of Aeronautics gave his praise in a telegram "to the men and women of Chance Vought Aircraft:

"In behalf of the Navy Department, I wish to extend thanks to all of you at Chance Vought for your splendid contribution to the striking power of our Naval air arm."

The Corsair continued to live up to these glowing words and proved itself the deadliest, most dependable fighter aircraft in action in the South Pacific.

One of the leading American aces of World War 11, First Lt Kenneth A. Walsh, 28-year-old Marine Corps pilot of Washington, D. C., who shot down 21 Japanese planes in the Solomons, accounted for every one of his victims while flying a Corsair. Other aces who made kills with Corsairs include Major Georgory "Pappy" Boyington, the Marines'top fighter ace (28 kills) and Joe Foss, the ace with the second highest number of kills (26).

"I'd attribute our low loss rate to the ruggedness and speed of the Corsair, itself," Lieutenant Walsh said upon his return to the United States.

The first Corsairs to appear in Britain arrived in November, 1943, and were turned over to the Royal Naval Air Force. Eight inches were clipped off each wing tip to allow storage in the lower headroom of British hangar decks.

By early 1944, British Corsairs were operating regularly from carriers - at least nine months ahead of the U. S. Navy.

Corsairs played a significant part in crippling attacks launched by the Royal Navy against the German battleship Tirpitz in Norway's Alten Fjord, April 3, 1944. Flown by British pilots, Corsairs also began appearing over the Indian Ocean and with the Royal Navy in the Pacific.

The New Zealand Air Force also began receiving Corsairs early in 1944. They were called Kiwi Corsairs.

THE CORSAIR AND THE CARRIER

Although Corsairs operated successfully from British carriers and were highly praised as a land-based weapon, the U. S. Navy was not ready to "buy" the F4U-1 as a carrier-based fighter.

In March 1944, the Chief of Naval Air Operational Training, Jacksonville, Florida, drafted a letter condemning the Corsairs from carrier operations. The prime reason for this: the F4Us, especially when in the hands of inexperienced pilots, tended to bounce on deck landings. Student pilot attrition rate was high. Had the letter actually been released, the Corsair probably would have been deleted for all time as a carrier-based fighter. But because of the efforts of Chance Vought's Jack Hospers, Captain John Pearson (USN Fighter Design Officer in the Bureau of Aeronautics), and Captain H. S. Duckworth (USN Chief of Staff, Fleet Air Jacksonville), the letter was held up.

"Program Dog" was instituted immediately.

The program, one of four that Vought engineers presented, took just 10 days to complete. It went right to the heart of the program -improving the oleo characteristics of the landing gear. By doing so, the "built-in bounce" of the Corsair was eliminated. Test flight results with the improved gear (made by Commander T. K. (Kip) Wright, USN and Lieutanent Colonel John Dobbins, USMC) were so successful that theaircraft was immediately endorsed by Commander, Fleet Air Jacksonville. All doubt concerning the Corsair's carrier landing characteristics was resolved aboard the carrier USS Gambier Bay in April 1944. Navy Squadron VF-301, equipped with F4U-ls which had the improved oleo struts, completed 113 landings with excellent results. As a result of the USS Gambier Bay trials, an order was issued to modify the oleo struts on all West Coast Corsairs. The Corsair was now completely acceptable for carrier duty.

MORE F4Us

On April 22, 1944, the Navy accepted the first Corsair equipped with twin pylons for carrying bombs or droppable fuel tanks. It was designated the F4U-1D, the first Corsair fighter-bomber.

The Navy ordered 200 Corsairs equipped with 20-millimeter cannon, August 30, 1943 (designated F4U-1C).

On January 25, 1944, Chance Vought Aircraft received from the Navy a letter of intent on a company proposal to build the XF4U-4. A production model of the aircraft made its first flight September 30, 1944, and was accepted by the Navy October 31, 1944.

Equipped with the new Pratt & Whitney R-2800-18W engine and a four-bladed Hamilton-Standard propeller (13 feet 2 inches in diameter), the new Corsair was rated as a 451-mile-per-hour fighter.

With a rate of climb of 4,400 feet per minute and a service ceiling of 40,200 feet, the F4U-4 was the Navy's answer to much-improved Japanese fighters that were arriving in the Pacific. The new F4U-4s had a gross weight (combat) of 12,310 pounds and, in the cannon version, carried four 20-millimeter cannons with 924 rounds each. (TheNavy, onJanuary 10, 1945, ordered 300 F4U-4CS - the cannon equipped version.) In addition to a new engine and propeller, the F4U-4 had a completely redesigned cockpit, a new canopy for improved bubble effect, a new armorplated bucket seat, and regrouped instruments. 1 mproved access to radio gear was also made possible by installing a folding seat. Adding rocket stations on the outer wing panels improved the Corsairs' capability as a fighter-bomber.

On March 4, 1944, the Corsair performed its first mission as a dive bomber in an attack on Milie Island, Mille Atoll, in the Marshall Islands. During the seven weeks following this baptism as a fighter-bomber, Corsairs dumped more than 200,000 pounds of bombs on Japanese installations in the Marshalls. British pilots used their Corsairs as bombers in the attacks on Java in April 1944. Scarcity of enemy air resistance was the main reason for the F4Us being used as a bomber in 1944.

On May 16, 1944, a Navy evaluation board, after a series of comprehensive comparisons between the F6F-3 Hellcat and the F4U-1D stated: "It is the opinion of the board that generally the F4U is a better fighter, a better bomber, and an equally suitable carrier airplane as compared

with the F6F. . . It is strongly recommended that the carrier fighter and/or bomber complements be shifted to the F4U type."

By the end of 1944, Chance Vought Aircraft was producing 300 Corsairs a month, or one complete aircraft every 82 minutes. A total of 5,380 F4Us were built during the year.

The final year of the war, 1945, was to see carrier-based Corsairs venture into the China Sea, fight at IwoJima, Okinawa, in the Tokyo Raids, and over the Philippines and Formosa.

Carrier-based Corsairs, flown by Navy and Marine pilots, opened the new year on January 3, 1945, with a slashing attack on Okinawa. Then, they moved on to the South China Sea to take part in the "Navy's greatest day of the war" — the January 12th raid on Saigon.

Operating both as fighters and fighter-bombers, theF4Us could claim at least a portion of the raids final tally of enemy ships sunk: 14 warships and 33 merchant vessels.

Corsairs, including 144 flown by carrier-based Marine pilots, next hit Tokyo in the diversionary raids preparatory to the invasion of Iwo Jima. THE SWEETHEART OF OKINAWA

Okinawa was invaded April 1, 1945, with Corsairs playing a main supporting role. The F4Us were kept so busy downing kamikaze suicide planes during the first few weeks of the operation that close air support was a secondary consideration. However, as the kamikaze threat diminished, the Corsairs were able to support ground troops with increasing quantities of rockets, bombs, and napalm.

In one action against kamikazes, Corsairs shot down 17 aircraft. One Corsair pilot was so hot on the tail of a kamikaze that he knocked one of the radars off the destroyer, USS Laffey, during the chase. The kamikaze knocked off one of the Laffey's yardarms. Both aircraft crashed into the water. The Corsair pilot was rescued.

Three Marines added a humorous note to carrier operations off Okinawa on May 1. On patrol in their Corsairs at 30,000 feet over Northern Okinawa, the three Marines wandered several hundred miles out to sea. They were soon lost and almost without fuel when the carrier USS Yorktown picked up their distress calls and directed them to land on her deck. None of the Marines had ever made a carrier landing before. One, after setting his Corsair down perfectly, asked: "What was the man doing waving those paddles down there?" "Brother," he was told, "he's the landing signal officer and he was giving you a waveoff!"

First Lieutenant Robert Klingman, another Corsair pilot, chased a fast Japanese reconnaissance aircraft more than 150 miles at 38,000 feet. When Lieutenant Klingman's guns froze in the severe cold, he knocked the Japanese aircraft down by ramming him with the Corsair's

big propeller. The Corsair, missing part of its propeller, and with parts of the Japanese aircraft shorn-off tail imbedded in its wings, brought Lieutenant Klingman safely back to base. Events like these were just a few of the hundreds that led Marine fighter pilots to dub their Corsairs, the "Sweethearts of Okinawa."

The Marine "Death Rattler" squadron, flying Corsairs, shot down 124-1/2 Japanese aircraft in a whirlwind tour of duty on Okinawa without losing one of their own.

Major George Axtell, who took the Death Rattlers into action, said of the Corsair: "It's the best fighter there is. It's rugged. It's a work horse. You can use it for anything, including dive-bombing, and it's effective. You can shoot anything off or out of that plane, and still it goes."

VALOR, COURAGE AND BRAVERY

In the closing days of the war, an old Vought veteran was to combine with the Corsairs1 final attacks against the Japanese mainland to produce a spectacular rescue.

Lieutenant (JG) Vernon T. Coumbe was shot down in the mid-morning of August 9 while bombing Ominato Airfield on the Japanese mainland. The Corsair pilot made a deadstick landing five miles off the coast. His raft was quickly driven ashore. He said: "I hid in a sparse clump of trees the rest of that day. All night long the Japanese failed to find me, and at dawn I heard the roar of planes. They proved to be Corsairs and I signaled and tried to paddle out through a small bay, but the surf was against me. At noon I saw two Kingfishers, with fighter escort, approaching, and 1 knew then my plight had been discovered."

Coumbe said one of the seaplanes landed in spite of wind-whipped seas. Shore batteries almost within his reach opened up on the rescue aircraft, augmented by anti-aircraft guns on the east shore of Ominato Bay.

The Kingfisher pilot, Lieutenant Ralph Jacobs, ignored enemy fire, made an expert landing and taxied to the edge of the breakers, not more than 50 yards offshore. Jacobs recalled: "1 saw that Coumbe couldn't breast the heavy surf so I stood up and tried to toss him a line. Then an unusually heavy comber shook my aircraft violently, tossing me from the cockpit into the water."

When thrown from the aircraft, Jacobs apparently hit the throttle and the Kingfisher raced crazily away from the two swimming airmen. Heavy and light Japanese ack-ack trailed the runaway aircraft.

Into those bullet-splashed waters then landed the other Kingfisher to transform stark tragedy into a recklessly heroic rescue.

This pilot, who dared almost certain death, was Lieutenant (JG) Almon P. Oliver, who was no newcomer to acts of heroism. He received the Air Medal for outstanding courage at Iwo Jima, where he stayed aloft, spotting enemy ack-ack batteries until they were knocked out.

Oliver thought at first the rescue had been affected. "When I came down just for a look-see, I was amazed to see that the cockpit was empty and the seaplane was simply running away under heavy enemy fire. At any other time, it would have been comical."

When he spotted the two swimming pilots he made what he called his "luckiest landing," when enemy fire was momentarily diverted to the runaway aircraft.

However, enemy anti-aircraft shells began to straddle his sitting aircraft as he pulled Coumbe and Jacobs aboard. Despite the added weight, Lieutenant Oliver managed a brilliant takeoff. Later, when the trio reached the carrier, Oliver told them he almost ran out of gas.

A Vought employee, Donald H. Russell, held the distinction of being the only civilian technician to be awarded the Silver Star for bravery in action during World War II. Russell began his career with Vought in January 1941 as a production mechanic and assembler on SB2Us and the OS2U Kingfisher. He later became a field service representative and was assigned to the carrier USS Franklin in February 1945, together with 72 Corsairs. It was aboard the Franklin, off the Japanese mainland in March 1945, that he helped fight a fiery holocaust ignited by Japanese bombs which hit the carrier deck. For his courage, the Navy recommended the Navy Cross but Russell was awarded the Silver Star because of his civilian status.

THE F2G

During World War 11 the increasing use by the Japanese of kamikaze suicide aircraft against the U. S. fleet prompted the Navy to ask the Goodyear Aircraft Corporation to develop a Corsair fighter to intercept the low-flying kamikaze aircraft. This series was known as the Goodyear F2G Corsair. It was the most powerful U. S. Navy prop-driven fighter ever built. The engine selected for this new fighter was the "3,000 horsepower Pratt & Whitney R-4360.

A standard FG-1 airframe had been modified to test the experimental installation of the Pratt & Whitney R-4360 engine. It was designated XF2G-1. In March 1944, Goodyear was awarded a contract for F2G-1 and F2G-2 aircraft.

The F2G-1 was intended to be used from shore-based installations and, therefore, had a fixed wing. The F2G-2 had folding wings for carrier use. The fuselage structure was beefed up considerably to make full use of the new 3,000 horsepower engine. A clean, bubble canopy was fitted to give all-around visibility.

The end of the Pacific War canceled further development, and only five F2G-1 and five F2G-2 aircraft were built. Five of these aircraft were declared surplus by the U. S. Navy in 1947. They were purchased by several ex-U. S. Navy pilots to race at the Cleveland air races. The Goodyear F2G racer won both the 1947 and 1949 Thompson Trophy races.

THE RECORD

Chance Vought Aircraft's outstanding production accomplishments received official recognition, when the company was awarded the Army-Navy "E" for Excellence.

Chance Vought Aircraft did not win the Army-Navy "E" easily and for that reason prized it highly. The transition from the Kingfisher observation-scout, which Vought was building when the Japanese struck Pearl Harbor, to the Corsair, a larger and radically different aircraft, was not an overnight job. It required all the engineering and manufacturing genius which Vought was able to muster. Once the changeover was accomplished, however, Vought concentrated all of its energies into the all-important task of reaching a high rate of production on the Corsair.

The record the Corsairs made in the Pacific from Guadalcanal to V-J Day showed: 2,140 enemy aircraft destroyed in air combat, with a loss of 189 Corsairs in air combat - a victory ratio of 11.3 to 1. Total action sorties by Corsairs amounted to 64,051.

At the close of World War II, the Corsair assembly line did not stop. The Corsair was still tops in its class and was the standard fighter-bomber for many Navy and Marine Air Squadrons. It was necessary to continue a schedule that would provide replacements for aircraft that had served so long and so well during the war years.

Continued improvements led to other versions of the Corsair which were to play their part in the cold war that followed.

CORSAIRS CONTINUE

On February 6, 1946, the Navy gave Chance Vought Aircraft a "Letter of Intent" on the company's proposal to build the F4U-5.

The XF4U-5 prototype, equipped with a new Pratt & Whitney "E" engine, first flew December 21, 1944, It was a high altitude fighter, designed to fight at 45,000 feet. The engine maintained greater power to a higher critical altitude than did its predecessor.

Production began in 1946 on an order for 328 F4U-5s. At this time, interest in night and all-weather fighters had grown to such an extent that the Navy ordered a large number of aircraft in the first group converted to night fighters (F4U-5NS). A subsequent order soon came for even more, equipped with search radar.

The F4U-5P was developed as a long-range photo-reconnaissance aircraft. It was equipped with a unique rotating camera mount.

There were few outward changes in the design of the aircraft during the evolution of the F4U from the"!11 series through the "5" series from 1942 to 1947.

CHAPTER V

THE XTBU-1 SEA WOLF

Although the Corsair was the most immediate and most pressing concern, Vought engineers, during 1941 and 1942, designed and developed still another formidable aircraft - a powerful torpedo bomber designed to increase the striking power of the U. S. Navy.

This new attack aircraft remained on the Navy's classified list for many months. Extensive test-flying of the prototype, the XTBU-1, was conducted by Vought test pilots and production was started before the Navy released any information to the general public.

Because Chance Vought's manufacturing facilities were taxed to the utmost by the Corsair production program, a decision was made to call upon an outside manufacturer, the Consolidated-Vultee Aircraft Corporation, to build the new aircraft.

The new aircraft incorporated all the experience gained from the use of torpedo bombers. It carried a crew of three - a pilot, gunner, and radioman-gunner. It was powerfully armed with machine guns and well armored. Its striking power included a full-sized torpedo, or a load of heavy bombs.

When the aircraft was placed in production in September 1943, at the Consolidated-Vultee Plant in Allentown, Pennsylvania, it was designated the TBY-1 and called the Sea Wolf, a name chosen by Vought employees. The first of the TBY-Is was delivered in November 1944 and the 180th, and last, in September 1945 when the contract was cancelled. None ever reached an operational unit.

THEXF5U-1, "FLYING PANCAKE"

The world's fastest and slowest-flying aircraft. The world's first vertical takeoff and landing aircraft. Both of these statements might have been used to describe an aircraft that was built but never flown, the little-known but incredibly shaped XF5LH "Flying Pancake" built by Chance Vought Aircraft in the middle 1940s.

The flight test model was built and was being ground tested at Stratford, Connecticut, when on March 17, 1947, the Navy, sponsor of the unconventional fighter, terminated the contract and ordered the aircraft scrapped. The jet age had arrived. The 500-mile-an-hour propellered fighter designed to take off and land vertically, was obsolete before it could be flown.

Behind the XF5U-1 lay 15 years of dreams, hopes, midnight oil, and money on the part of its inventor, Charles H. Zimmerman, who left a job with National Advisory Committee for Aeronautics (predecessor of the National Aeronautics and Space Administration) and joined United Aircraft's Chance Vought Division to bring his idea of a saucer-shaped aircraft into being. An aircraft that could land and take off like a helicopter and convert into a conventional flight. Pilot and passengers would be in a prone position, adjusting to an upright position during landing and takeoff. The two propellers would be linked by a common drive shaft to provide power to both propellers in case one failed.

However, before the XF5U-1 was built, a three-foot electrically powered model, the V-162 was built. A full-scale but lightweight flying model, the V-173, was also built to prove the design and was flown and demonstrated by Boone Guyton. Both were as successful as any experimental model could be and the Navy contracted for a static test XF5U-1 and a flight test model.

F6U-1 PIRATE

Having established an outstanding reputation with its propeller fighters, Vought turned its attention to a jet-propelled successor, the XF6U-L The design was not exceptional, but one new innovation was the use of Metalite skins, consisting of a balsawood core between aluminum skins. Vought was a leading exponent in the development of sandwich construction for use as a structural aircraft material.

The first flight of the XF6U-1 was made in 1946. Flight development led to a decision to use an afterburner in production aircraft and the F6U-1 Pi rate was the first U.S. Navy fighter with this feature.

Thirty F6lHs were delivered to the fleet. The Pirate was a first-of-a-kind aircraft for Vought and never went into large scale production.

CHAPTER VI THE COMPANY, GRAND PRAIRIE, TEXAS

In April 1948, the Chance Vought Aircraft Division was selected by the Navy to occupy the Naval Weapons I ndustrial Reserve Plant previously used by North American Aviation, Inc. to produce bombers, fighters, and trainers during World War 11. The plant was located just outside Dallas, Texas, in Grand Prairie.

This transfer of equipment, material, and personnel is believed to be the largest industrial move of its kind ever undertaken in the United States.

The move to Dallas offered Vought time and space to plan the most efficient operational pattern that could be conceived. The Grand Prairie plant, designed for manufacturing efficiency and resultant savings in time and money, had been organized specifically for straight-line aircraft production.

The move provided Vought with approximately twice the area of the Stratford plant. Located in a favorable climate region, it meant more flight test time from the excellent adjacent airport facilities.

During 1948, Vought continued production in both the Connecticut and the Texas plants of two Navy airplane models, the XF4U-5 Corsair andtheF6U-l Pirate.

In July 1949, Frederick 0. Detweiler, a veteran of 16 years with United Aircraft Corporation, became General Manager of Chance Vought Aircraft. THE F7U CUTLASS

The first new aircraft to go into production for Chance Vought at the Grand Prairie Plant was the F7U-1 Cutlass.

Taking advantage of German aeronautical research data which became available during 1945, Vought engineers created designs for a highly unconventional tailless fighter. The wing had a sweepback of 38 degrees. Like any delta-winged design, the Cutlass needed an unusually long nose gear to achieve the necessary angle-of-attack for takeoff.

The first production F7U-1 flew in March 1950 and a total of 14 were built. Difficulties with the engine and other problems led to an extensive redesign of the Cutlass as the F7U-3. The first of this model flew in December 1951.

A later version, the F7U-3M, was the first Navy aircraft to carry missiles. It carried four Sparrow 1 air-to-air missiles. A reconnaissance version, the F7U-3P, also went into production. Production of the F7U-3 variants totaled 288. The Cutlass served until the end of 1958.

TheF7U twinjet Cutlass was the first U. S. jet fighter designed from the outset to use afterburners; it was the Navy's first supersonic jet and the Navy's first swept-wing fighter. THE RETURN OF THE CORSAIR

The end of World War 11 and the advent of the jet spelled the end to most propeller-driven fighters. Not so for the Corsair.

From the end of World War 11 until 1950, Corsairs were the top fighters in the two big U.S. Fleets, the Sixth and Seventh. When the jets "came aboard," the Navy didn't eliminate the versatile Corsair -they just assigned them another equally important job: that of low altitude attack missions.

Vought produced Corsairs in quantity during all of the post-war years.

In 1950, the last line of F4U Corsairs produced for the U. S. Navy had a new beginning as the AU-ls (originally the F4U-6). An order was received for a number of these attack-type aircraft to meet the demands of close air support in Korea. The AU-ls joined six other models of the Corsairs engaged in the Korean fighting - F4U-4, F4U-4B, F4U-5, F4U-5N, F4U-5P, and F4U-5NL

Assigned primarily to the low-altitude, fighter-bomber phase of the action, the Corsairs were on familiar ground: flying close air support missions in support of ground troops, a function they helped pioneer in World War II.

Marine ground forces in Korea quickly came to accept the Corsair as a standard support weapon. Carrying bombs, napalm, rockets, and cannon, Corsairs operated from carriers and shore bases in support of allied ground forces.

Corsair night fighter models were assigned the job of heckling the enemy on after-dark missions.

Although most of the Corsairs operating in Korea were late-type models, with more horsepower and firepower than World War II models, some of the aircraft seeing action were, like their pilots, veterans of the last war. A number of Corsairs stationed aboard the carriers USS Essex and USS Bon Homme Richard in Korean waters fought at Okinawa and in the Tokyo raids.

All factors considered, the Corsair proved that it continued to pack plenty of wallop. Marine Fighter Squadron 323, flying World War 11 cannon-equipped F4U-4B Corsairs, set an all-time high effective combat record - 1,160 effective sorties in one month. Ninety-one sorties were flown in one day, with 100 percent availability recorded for the Corsairs. More than 120 tons of ordnance were dropped on the enemy in one day.

Like an old champion whose reflexes have slowed over the years, but who still packs a knockout punch, the Corsair remained a dangerous foe - even in the Korean combat arena with the dazzling young jets. The pilot of the Red MiG-15 that tangled with Captain Jesse Folmar, USMC, could vouch for that. Folmar and his wingman, Lieutenant Bill Daniels, were hunting enemy ground targets over Korea when they were jumped by five of the vaunted MiGs. Recklessly flaunting its speed, one of the jets launched the attack. Ridding his Corsair of its burden of bombs,

Folmar turned into the MiG. He caught the jet's yellow-trimmed tail in his sights. Clamping down on the trigger button, he laced 20-millimeter cannon shells into the MiG, just as it started a climbing turn. Grey smoke funneled from the enemy aircraft. Then black. The Corsair had scored a MiG kill!

A number of factors contributed to the value of the Corsair in Korea. . One was the ability to carry an exceptionally heavy bomb and rocket load for a fighter - records show that Corsairs lugged as much as 5,000 pounds of ordnance to their targets. . Another, the ability to stay on the target for extended periods -endurance of the aircraft was such that they could cover infantry troops for a length of time impossible for jets, which swill tremendous amounts of fuel. . Another, the ability to take punishment - toughness of the

Corsair had been proven in two wars. . And finally, operational availability - Corsairs established an outstanding record of being available for combat when needed (averaging as high as 95 percent in some squadrons). The last of the F4U Corsairs, the F4U-7, was delivered to the French Navy in early 1953, making it the last piston-engined fighter to be built in the United States. When the last Corsair rolled off the production line, it bore the number 12,571. The F4U Corsair was in production for 13 years. The Corsair fought in World War II, the Korean War, with the French in Indochina (1954) and Algeria (1961), and in the border conflict between San Salvador and Honduras in 1969.

Corsairs have been flying and fighting so long that a multitude of legends have sprung up about them. Among those verifiable in combat records are: Corsairs carrying a crew of two into combat, takingoff from water without pontoons, destroying an enemy installation without ammunition, shooting down an enemy aircraft without ever seeing it, kicking an unconscious pilot out of the cockpit and opening his parachute for him as he went out.

The crew of two incident occured in Minadanao, Philippines during World War II. An Army major, a former guerilla, was well acquainted with Japanese positions. He went aloft in a Corsair with a Marine pilot on his lap to fly the plane and strafe enemy concentrations as the major spotted them.

Marine pilot Kenneth H. Goodsell was the astonished pilot of the momentary amphibian Corsair. Badly overworked in the Korean combat the power plant sputtered and coughed. Goodsell tried for a water landing and made it. As the aircraft settled on the water, the engine got its second wind and carried the Corsair back into the sky.

The enemy installation destroyed without ammunition was a communication facility. Captain George Mouyakis, USMC saw some communications lines he wished to obliterate. He swept low,dropped his tail hook, and ripped out the enemy lines.

In World War 11 Lieutenant Danny O'Neill, taking off from Bougainville in the middle of the night climbed for an interceptor mission. He cleared his guns to check their operation. As he fired a burst of . 50-calibers, the amazed pilot saw a Japanese aircraft explode and careen out to sea.

Naval Cadet James Troup found himself in a spin. He unfastened his safety belt, removed the canopy, and preparing to bail out was knocked unconscious. His Corsair not only kicked Cadet Troup out, but caught his ripcord with one of the cockpit knobs and pulled it for him. Cadet Troup remembers only that when he came to, he was floating gently through the air.

The Corsair is the only aircraft ever to receive a citation from the United States Government. Corsair 122 of World War 11 demonstrated such endurance and required so little maintenance that it was awarded the unique citation for carrying bombs and bullets to the enemy "above and beyond the call of duty."

Truly, the F4U Corsair was one of the greatest aircraft in aviation history.

MISSILES AND THINGS

In 1946, the Navy asked for a missile that could goto sea in a submarine, be launched easily by Navy personnel from that submarine, and accurately deliver a nuclear warhead. Chance Vought Aircraft responded with the Regulus I, the forerunner to today's Polaris and Poseidon missiles.

The Regulus I was the Navy's first offensive guided missile. It could be fired from submarine, aircraft carrier, cruiser, guided missile ship, and land bases. A total of 514 were built.

The Regulus 11 was larger and faster than Regulus I. It flew at a speed greater than Mach 2. A total of 54 were built.

Other product developments while a part of Vought include the Fire, Ram, and Lance missiles and the LV-1 and Scout space launch vehicles. Space technology included a manned aerospace flight simulator, the astronaut maneuvering unit, and the propellant and oxidizer tanks of the Saturn IB Launch Vehicle. Development of the M-561, Gamma Goat, a multipurpose 6-wheeled amphibious vehicle, was also done by Vought.

When in 1954, to avoid antitrust problems, United Aircraft divested itself of its Chance Vought Aircraft Division, Chance Vought Aircraft, Incorporated was formed. Mr. Detweiler was elected President and Charles J. McCarthy, who joined Vought in 1926 and had served as general manager during the early war years, became Chairman of the Board.

THE F-8 CRUSADER

Early in the morning on March 25, 1955, Vought's XF8U-1 Crusader lifted off the dry lake bed at Edwards Air Force Base on its initial history-making flight. The slender, knife-winged PJavy fighter flew faster than sound in level flight and, in the words of a Navy officer: "took the Navy out of the third row and put it right up front!"

The specification to which the Crusader was eventually produced called for a maximum speed only slightly above Mach 1, but Vought engineers set their sights at almost twice that speed. This was one of the main reasons for the Navy selection of the Chance Vought candidate as the winner of a day fighter design contest in May 1953. J. R. "Russ" Clark, then an aeronautical engineer, played a leading part in the design and development of the Crusader. Russ Clark's history blends strongly with the company's. In 1941, he was chief project engineer on the VS-300 and then project engineer for the XF4U-1. He later became the chief executive at Vought. Design and construction of the prototype was completed in less than two years, and the first Crusader, designated XF8U-1, made its initial flight in the hands of chief test pilot John Konrad.

In the course of its first 52-minute flight, theXF8U-l exceeded Mach 1. Although using 42-degree wing sweep, the XF8U-1 reached supersonic speed by a combination of exceptionally low drag plus the thrust provided by its Pratt & Whitney J57-P-12 turbo-jet engine.

Equally important for its carrier role were the low-speed characteristics of the Crusader and, in many respects, their successful attainment was an even greater achievement on so sophisticated an aircraft. The Vought engineers devised a variable incidence wing that is one of the keys to the whole design approach to the Corsair. The Crusader wing represents a neat and simple solution to a host of engineering and aerodynamic problems.

Despite its complexity and sophistication, Crusader development was extraordinarily brief. Within six months of the prototype's first flight, the first production F8U-1 took the air, on September 30, 1955. The Crusader completed its carrier qualification trials on the USS Forrestal by April 1956. The U. S. Navy accepted the first F8U-ls on December 28, 1956, only 21 months after completion of the original mock-up.

Compared with the two prototype XF8U-ls, virtually no changes were required in production aircraft. In fact, the first prototype continued flying on development work for nearly six years, with well over 500 flight-hours, before being presented to the Washington Smithsonian Institute in 1961. One of the initial F8U-ls established the first American national speed record above 1,000 miles per hour. For flying a Crusader at 1,015.428 miles per hour over China Lake, California, on August 21, 1956, Navy Commander R. W. "Duke" Windsor was awarded the Thompson Trophy for that year.

Since 1911 the Collier Trophy honored "the greatest achievement in aviation in America, the value of which has been proved by actual use during the preceding year." It had gone to men like Orville Wright and General H. H. Arnold for legendary aircraft feats. Only once before in its 45-year history had the Trophy honored fighter aircraft.

I n 1956 the award was a joint one, to the Navy and to Chance Vought Aircraft... "for the conception, design and development of the first operational carrier-based fighter capable of speeds exceeding 1,000 miles per hour."

From March 21, 1957, production FSU-ls began flowing from the Vought factory directly to Fleet units. The production rate soon reached eight aircraft per month, although existing tooling was capable of producing up to 40 Crusaders per month. After 318 F8U-ls wereproduced, a minor alteration in radar equipment resulted in the appearance of the F8U-1E. From September 3, 1958, 130 F8U-lEs with their distinctively larger nose radomes followed on the assembly lines, to equip the steadily expanding number of U. S. Navy and Marine Corps Crusader squadrons.

A further F8U-1 development was its adaptation for reconnaissance missions. This involved replacement of the cannon and fire control equipment by a squared-off camera bay for vertical, oblique, and forward-facing photography. The first F8U-1P made its initial flight on December 17, 1956; a total of 144 aircraft were built.

The supersonic reconnaissance potential of the F81HP was decisively established on July 16, 1957, when a photographic Crusader flashed across the 2,445.9 miles from Los Angeles to New York in 3 hours 22 minutes to achieve the first transcontinental dash above Mach 1. The average speed of 723.52 miles per hour was achieved despite three subsonic in-flight refueling contacts at speeds below 300 miles per hour. The flight represented an overall equivalent speed of Mach 1.1. In addition, the F8U-1P achieved a continuous photo coverage over the entire route. The pilot was Marine Major John Glenn, who later became the first American astronaut to orbit the earth. In 1962, F8U-lPs on photo-reconnaissance missions helped give President Kennedy the evidence he needed to prove there were Russian missile sites in Cuba.

The F8U-2 (F-8C) was the first of the Crusader series to have twin ventral fins under the rear fuselage for improved directional stability, particularly at high speeds. Stability characteristics limited the Crusader to an effective maximum speed of around Mach 1.8, although it was flown to within a fraction of Mach 2 during flight development.

The first prototype F8U-2 flew initially in December 1957, with only the uprated engine to distinguish it from the earlier models, but the definitive version followed in January 1958. The first production F8U-2 followed on August 20, 1958. In all, 187 F-8Cs were built before production was completed on September 20, 1960. A photographic reconnaissance model, the RF-8B, was projected for all-weather surveillance, but none were completed.

The next production model was the F8U-2N, or F-8D, with limited all-weather interception capability through further improvements in electronic equipment, plus installation of a "push-button" Vought-developed autopilot for a higher degree of automaticity in defensive sorties.

With additional internal fuel, the F-8D retained its basic cannon armament, but Sidewinder stowage on the fuselage sides were doubled to four missiles. The ventral rocket pack was deleted at the same time. The first F8U-2N flew on February 16, I960, and production deliveries began on June 1st of the same year. Between June 1, 1960 and completion of the F-8D contract in January 1962, 152 F-8D Crusaders were produced.

In the meantime, further development had resulted in the F8U-2NE which, despite the small change in its original designation, represented a large degree of modification in both equipment and mission. The newer version, known later as the F-8E, received full all-weather interception capability. This increased the overall aircraft length by three inches, and also gave a more efficient intake shape. A separate blister was mounted at the base of the windscreen, housing the infrared scanner for use with the four fuselage-mounted Sidewinders. The F-8E was the first Crusader to introduce underwing attachment points for various external stores, and was able to carry up to 5,000 pounds of ordnance.

Early production F-8Es, which followed the prototype F8U-2NE after its conversion from the second F-8D and initial flight on June 30, 1961, did not have attack capability. But, following trials on the carrier USS Forrestal in mid-1963, the underwing attachment points were standardized on later Crusaders. Production of the F-8E started in September 1961, and more than 250 were built by the end of 1963, bringing the total number of Crusaders produced to more than 1,200.

Included in this total were two variants which did not reach production status, the F8U-3 and the TF8A. Although of generally similar Crusader configuration, the F8U-3 was virtually a new aircraft. Chief project engineer on the F8U-3 was Conrad "Connie" Lau who also played an important part in developing the aerodynamic characteristics and flight test program of the F8U-L

TheF8U-3, or Crusader II I, as it was called, retained the variable incidence wing, but the normal chin intake was raked forward in a modified Ferri supersonic design permitting, in combination with the extra thrust of the J75 engine, speeds in excess of Mach 2. For additional directional stability, two very large ventral fins were vertically mounted beneath the rear fuselage, and retracted hydrauli-cally to the horizontal position during takeoff and landing for ground clearance. The prototype F8U-3 flew for the first time on June 2, 1958, and two more prototypes of the total of five built reached the flight-test stage. These were subsequently turned over to NASA for high-speed research after the Phantom (F-4) had been selected for production in preference to the Crusader III. The Crusader III is one of the free world's few single engine Navy fighters ever to reach Mach 2.2, and it was built 13 years ago.

The only two-seat F-8 Crusader, theTFSA, built for the Navy by Vought is still flying at the Naval Air Test Center, Patuxent River, Maryland, where it is used to check out students attending the Navy Test Pilot School. Originally produced as the Number 74 F8U-1 Crusader, theTFSA, "Twosader," was subsequently rebuilt as a trainer and made its first flight February 1962. A second seat added behind the pilot's seat was raised 15 inches to provide better visibility. Both cockpits were equipped with flight controls, instrument panels, and ejection seats. The aircraft was powered by a Pratt & Whitney J 57-P20 engine and carried a parabrake for rapid deceleration after landing. In March 1963, the aircraft was ferried to Rota, Spain, aboard the carrier USS Saratoga and flown to the French base at Istres, where test pilot Robert E. Rostine made 37 demonstration flights for French Navy officials. The French later bought 42 F-8E (FN) Crusaders to replace its Aquilon (Sea Venom) interceptors and the battle worn, time-tested, gull wing Corsairs the French used in Indochina and Algeria.

Hundreds of stories have come from squadron ready-rooms about the Crusader and its unusual feats. One of the best was in August 1960, when a Navy pilot flew his F-8A from the Naval Air Facility at Naples, Italy, climbed to 5,000 feet, remained aloft 24 minutes and made a smooth landing - all with his wings folded!

For more than three years, Marine pilots flew Crusaders on combat operations in Vietnam. As the Crusaders approached the end of their fatigue life, a decision was made to extend the life of the "last of the gunfighters." The F-8 remanufacture program started in July 1966 to extend the service life of the Crusader through 1975.

Another entire new series of Crusaders went back to the Fleet. First to go through the face-lifting process was the RF-8A, which became the RF-8G. The F-8H is the modernized F-8D. The F-8E in turn became theF-8J. The F-8C became the F-8K, and the B became the L

In 1970, there were 15 models of the famed F-8 fighter in active service with the U. S. Navy, and the French still operate their model which has also received some modification.

Despite more than 15 years service, the Crusader is still the world's fastest, single-engine naval fighter. It has accounted for more than half the U. S. Navy A/liG kills in Vietnam.

In 1969, the Crusader was selected by NASA to test the "supercritical wing," a wing design that could, by the year 1971, boost subsonic aircraft cruising speeds.

In two wars 20 years apart, Vought aircraft have set numerous Navy combat records. In World War II, the F4U Corsair 11 to 1 kill ratio was tops, not only for the Navy but for all U. S. fighters. Ten different F4U Corsair models were built, more than 12,000 aircraft in all. They served a longer operational life than any other fighter in Navy history.

In 1970, the Crusader had the highest kill ratio over the MiG. There have been 12 different models manufactured, "A" through "L" No fighter has realized as much growth from the original airframe as the F-8. The F-8 flew, by mid-1970, over 2 million flight hours.

Between them, the Corsair and Crusader provided the Navy with a quarter-century of first-line fighter service.

CHAPTER VII

A TIME OF CHANGE

In 1958, cancellation of two government aircraft contracts just before Christmas created bad times for both the company and its employees. More than 6,000 employees were laid off at a time when everyone else was enjoying the seasonal spirit. A lesson was learned from this, and efforts were made during 1959 to diversify so as not to be totally dependent on defense contracts. These efforts led to the formation of a Chance Vought Aircraft subsidiary known as Vought Industries, Incorporated. Vought Industries soon became the nation's largest builder of mobile homes, with plants from Canada to Florida and from Pennsylvania to California. Vought Industries acquired a lumber company and two finance companies which supported the mobile home venture. Vought Industries, Incorporated diversified with factory built housing and began production of FHA-approved homes and motel units. Mobile homes were chosen as the product of Vought diversification efforts because it was felt that in a business dominated by small companies and poor business practices, a big company could develop and promote an integrity of business methods and products which could lead to a greater share of the market In 1960 Vought Industries, Incorporated had the largest sales of any company in the mobile home industry.

Continuing its plan of diversification, Vought formed two more subsidiaries: (1) Information Systems, Inc., which combined the efforts of a previously acquired Genesys Corporation and specialized in information-gathering and process control computer systems, and (2) National Data Processing which developed business data processing equipment. Four divisions were also organized, their titles indicating the product or service that was their specialty: (1) Electronics Division, (2) Range Systems Division, (3) Astronautics Division, and (4) Research Center Division. On December 31, 1960, the company name became Chance Vought Corporation.

In 1961, Vought purchased the Harbor Boat Building Company and Harco Engineering Company. Harbor Boat for many years did Navy contract work, building subchasers, PT boats, aircraft rescue boats, and other vessels. The firm also built commercial fishing boats and pleasure vessels. Harco Engineering did design work for the Navy and other government agencies.

The new companies, all long-term investments, had the immediate effect of lowering the value of Chance Vought stock. Thus, the stage was set for Ling-Temco Electronics, Inc.

The Ling-Temco battle for the control of Chance Vought gripped the interest of all the Dallas-Ft. Worth area. Rarely had so many individuals felt so personally involved in such a dramatic corporate struggle.

Essentially, the confrontation boiled down to a massive power struggle between two men, James J. Ling of Ling-Temco and Fred 0. Detweiler of Chance Vought.

Mr. Ling, the youthful president of Ling-Temco, was the acknowledged leader on the attacking side. For him, Chance Vought was the next step in an ambitious plan for creating a mammoth corporation covering virtually every phase of the electronics, aircraft, missile, and space technologies.

Mr. Detweiler, the president of Chance Vought, was the captain of the defending team. For him, the struggle was an effort to fight off the attack of a man whom he considered a corporate raider.

On each side there was a multitude of supporters - and detractors. All over Dallas, the arguments went on.

On the one hand, there were the men who fervently wanted to see Mr. Ling win. They argued that his aggressive nature was just what Chance Vought needed to strengthen it. They argued that the Dallas area, and Texas, needed the bigger company that Ling-Temco plus Chance Vought would be - big enough to get prime contracts from the government in competition with such giants as Douglas, Boeing, and General Dynamics.

On the other hand, there were others who wanted to see Chance Vought remain in the hands of the present management, who felt it would be tragic for Chance Vought, and for Dallas, if Mr. Ling succeeded in his effort. In March 1961, the Board of Directors for both companies announced a willingness to merge and in June the stockholders gave their approval. In August 1961, Chance Vought Corp. merged officially with Ling-Temco Electronics, Inc., to form Ling-Temco-Vought, Inc. Effective with the merger, Gifford Johnson became President of Chance Vought, but was soon followed by W. P. "Paul" Thayer when Mr. Johnson became President of LTV, Mr. Thayer had first joined the company as a test pilot in 1948. Mr. Thayer is today the Chairman of the Board and Chief Executive Officer of Ling-Temco-Vought, I nc.

The next few years saw much adjustment and reorganization. A new aerospace company, LTV Aerospace, was formed with the Vought Aeronautics Division as its base. W. P. Thayer then became president of LTV AC, while J. R. Clark became Vice President and General Manager of Vought Aeronautics. All the nondefense subsidiaries of Vought were sold as they had not been as profitable as expected.

The Vought Aeronautics Division of LTV Aerospace dominated the new company so that even as late as 1969, of a $600M sales figure, $400M was contributed by Vought activities.

Six of the eight companies making up LTV Aerospace were spin-offs from various department or projects of Vought Aeronautics.

In 1970 the company name was changed from Vought Aeronautics Division to Vought Aeronautics Company, a division of LTV Aerospace Corporation.

TEAACO (TEXAS ENGINEERING AND MANUFACTURING COMPANY)

The merger also added some new history to the company as the operation and experience of the Temco Aircraft Corporation (with the exception of its Garland, Texas facility) was absorbed into the newly formed Vought Aeronautics Division.

Founded in 1945 by Robert McCulloch and H. L Howard, Temco's first aircraft was the TE-1A Buckaroo, developed as a flight trainer and armed scout aircraft for small foreign countries, particularly Saudia Arabia. Their second aircraft was Model 33 Plebe, a primary trainer developed for a Navy competition. It went from drawing board to first flight in 75 days.

More than 4,000 military and commercial aircraft ranging from small personal aircraft to giant bombers were modified or reconditioned by Temco. * During the Berlin Airlift, Temco reconditioned more than 50 percent of the airlift C-54s. One unique project featured the design and manufacture of a two-seat P-51 Mustang.

Production of personal and executive aircraft included the Fairchild F-24, the Globe Swift, the Luscombe Silvaire, the Riley Twin, and the Riley'55.

*See Appendix V

The Temco organization joined the ranks of jet aircraft producers in 1956 by winning a Navy contract for a test quantity of theTT-1 Pinto, the first jet designed as a primary trainer. Temco also produced the Teal and Corvus missiles.

THE XC-142A V/STOL TRANSPORT

Vought Aeronautics, as a division of LTV Aerospace Corporation, was awarded an initial contract in January 1962, for five experimental XC-142A V/STOL (vertical/short takeoff and landing) aircraft. Ryan Aeronautical Company and Miller Aircraft Division of Fairchild Miller Corporation were principal subcontractors in the development of the aircraft.

Vought eventually became the most experienced U. S. builder of V/STOL aircraft, as the XC-142A accumulated more than 600 hours of flight time.

The first of the unusual aircraft was rolled out at Dallas June 17, 1964, and made its first flight September 29 of that year. On December 29, it performed its first full in-flight transition from vertical to horizontal flight.

The aircraft was tested by the Army, Navy, and Air Force to determine the operational characteristics of such vehicles.

The aircraft was capable of transporting 50-60 passengers or 9,000 pounds of cargo. It could takeoff straight up and, while still hovering, convert its wings to conventional horizontal position and fly at speeds of approximately 400 miles per hour.

The Air Force transferred the last flying model of the aircraft to NASA in May 1968, for exploration of V/STOL takeoff and landing operations at civilian airports. In May 1970, the XC-142A was received by the Air Force museum at Wright-Patterson, Air Force Base.

"The XC-142A may belong to an earlier era in the fast-changing American aviation picture, but like any successful program it leaves a legacy behind it," said Forbes Mann, 30-year Vought employee and President of Vought in 1970.

"I think this could be qualified in terms of people who remain and who are now experts in V/STOL and low-speed aerodynamics, as well as the corporate experience of having ventured into and completed a unique aircraft program."

Mann continued, ... "We feel sure the technology will not be wasted. We think it will find application in many other programs both now and in the future."

During its almost six years of operation, the XC-142A was operated off aircraft carriers and assault transports, in mountain and desert areas, and over water in simulated lifeboat rescues.

THE A-7 CORSAIR II

Today's major production at Vought Aeronautics is centered around yet another Corsair.

In 1926, Chance Milton Vought wanted an outstanding nickname for the versatile 02U-1 biplane his company was building for the Navy. He selected the name "Corsair" as being adventurous sounding. The words "Vought Corsair" were painted on the rudder of the 02U, probably the first Navy aircraft to have a nickname. In the years that followed, the 03U and SU biplanes built by Chance Vought Corporation, also carried the name Corsair. During World War II, the famous F4U gull-wing Navy fighter bore the name Corsair. Today, the third aircraft type to bear the name is the A-7 light attack bomber. The name "Corsair 11" was chosen instead of Corsair 111 as the Navy did not officially recognize the use of nicknames in the days of the 02U.

Prior to 1960, the Navy recognized the need for an improvement in the U. S. conventional warfare capabilities. Vought began their own research and development to prepare for the coming competition. Sol Love, then aeronautical engineer and now president of Vought, played a significant role in the design and development of the A-7. Under his guidance and direction as the top engineer, Vought Aeronautics entered and won the competition. Having been with the company since 1943, Sol Love did his part with two other Vought successes, the F4U and F8U.

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Other employees who contributed to the development success of the A-7 were Connie Lau and J. R. Clark. The contract for the A-7 was awarded in February 1964 Eighteen months later the A-7 made its first flight.

The A-7 carries more ordnance than a flight (3 aircraft) of World War 11 B-17s. Janes All the World's Aircraft lists the capacity of theB-17 Flying Fortress at 6,000 pounds. In 1969 an A-7 Corsair'11 left a carrier deck with 20,000 pounds more than the aircraft's own weight (18,500 pounds).

The A-7 Corsair 11 combined the endurance and load-carrying capabilities of its predecessor cousin propeller-driven Corsair with the power and simplicity of the fan-jet engine. It carries more than twice the bomb load of the aircraft it replaced.

Overall design characteristics were derived from the Crusader series but optimized for the attack role. The A-7 meets the specialized aircraft requirements for limited wars, such as the conflicts in Korea and Vietnam, for pinpoint bombing in direct support of ground troops, and for bombing missions over enemy territory where the U. S. maintains air domination. In addition, it substantially reduces the time required for maintenance, servicing, and turnaround. Production of the A-7A for the Navy was completed in 1967, and production of the A-7B was completed in May of 1969. Current production of this aircraft includes the advanced Navy model A-7E and the Air Force model A-7D.

Each A-7 model is capable of carrying virtually all of the air-to-ground weapons in its respective service inventory. In addition, it can defend itself with air-to-air missiles and rapid fire cannons. The advanced A-7 incorporates such advanced avionics as head-up display, computerized weapon delivery and navigation systems, and forward-looking radar. Future versions of the aircraft are being considered to meet the requirements of free-world nations.

The first outfit to start training for deployment explored the Corsair's performance capabilities under full-scale combat operations. Stateside maneuvers became increasingly realistic. In one instance, a replacement pilot inadvertently demonstrated the aircraft's durability while completing a simulated low-level bombing run against a Florida target. After landing at Cecil Field Naval Air Station, pine needles and woodchips, souvenirs of a lower than average pullout, were found imbedded in the Corsair's underside.

On a practice bombing run, using the computed mode of weapon delivery, a senior pilot was told by the instructor to release his weapons even though his target, an X in pine boughs in the snow, was visible far to his right front. Making a comment, "I released the weapons to demonstrate an obvious fault," the pilot blasted the center out of the target X despite the 50-knot crosswinds. He later observed he never would have known in his own mind when to release those bombs.

Squadron VA-147 was the first deployed to Vietnam's Tonkin Gulf in November 1967. Upon its return, the squadron commander, James C. Hill, observed the unit had not recorded "a single operational accident in almost 4,000 hours of combat flight operations during the worst months of Vietnamese winter weather." In fact, due to the Pueblo incident in Korean waters, the squadron had the opportunity to operate for one month, February, in the cold Sea of Japan area.

No major problems were encountered. This is a record unmatched by any newly introduced aircraft in aviation history.

During a press conference aboard the VA-147's carrier, the Ranger, Vice Admiral William F. Bengle, commander of the U.S. Seventh Fleet, stated: "the A-7 had made it possible for the Navy to put more bombs on targets in Vietnam more efficiently."

This was all hauntingly reminiscent of an earlier Corsair and another generation of pilots and observers.

The Corsair squadrons accepted a variety of mission responsibilities during the Vietnam war. They flew gunfire spotting missions, hitting shore batteries, identifying targets, correcting ranges, and appraising

results. The majority of the effort involved delivery of conventional ordnance. Armed route reconnaissance, rescue combat air patrol, flak suppression, close air support, and standard strike missions were flown throughout 1967, 1968, 1969 and 1970. Even photo missions were flown with specially equipped A-7As.

The A-7E, the Navy's latest and the most sophisticated Corsair II, saw combat duty just 18 months after its first flight and, according to the Navy, "delivered their ordnance with devastating accuracy using the A-7E's digital weapons computer."

ATI/VIE OF TRANSITION

1969 was the most successful year ever for Vought Aeronautics. Sales were at an all time high of 556.7 millions of dollars, employment was just under 24,000 and the success of the A-7 projected increased production.

Then in the summer of 1969 the stock market started a general decline and prime interest rates rose sharply. As a result Ling-Temco-Vought, Inc., which purchased the large Jones and Laughlin Steel Company just before the decline was left with stock valued at less than half the purchase price. To compound the problem the U. S. Attorney General's office filed an anti-trust suit against LTV. Criticism for the purchase of the steel company led to James J. Ling's being replaced by W. Paul Thayer, president of LTV's most productive company, the LTV Aerospace Corporation. The new president of LTV Aerospace was in turn the president of that company's most active division - Vought Aeronautics. When Forbes Mann became president of LTV Aerospace, Sol Love was made president of Vought. He faced serious problems. The government in an effort to stabilize the sliding economy reduced its defense spending. Aerospace companies were hardest hit and major companies announced mass layoffs.

In six months Vought's employment went from 24,000 to 15,000 employees.

The government reduced its spending further, canceling projected aircraft programs or postponing their funding.

Vought turned its attention to advanced design programs and once again started to diversify into non-defense markets.

THE COMPANY IN THE SEVENTIES

Vought engineers continue to design today for the needs of tomorrow. Research test programs for the Corsairs of the future are being conducted now. Studies are also being made for a renewed effort in diversification. General aviation and mass transit are being considered as Vought approaches a total transportation outlook.

The first step in this direction was the formation of Vought Helicopter Incorporated which markets the helicopters of the largest French aerospace company - Aerospatiale. These helicopters hold 22 international records and have been exported to more than 60 countries. In future years, Vought Helicopter will manufacture its own line of helicopters for commercial and military use. In 1970, Vought Aircraft Service Company was formed as a first entry into the general aviation business. Vought Aircraft Service Company services light aircraft and makes modifications for special purposes. It is expected that this company will provide a basis for eventual manufacture of light aircraft.

Vought's long history of superior products and technical innovation for aerospace needs furnishes the broad basis for an entry into the ground transportation field. During the past half century, Vought has developed several vehicular systems including four major missile systems, a launch vehicle system, three versatile land vehicles, an astronaut maneuvering unit, and more than 17 highly sophisticated aircraft systems. The helicopter and general aviation ventures add to Vought's credentials as a transportation company.

Plans and designs have already been made of tracked air cushion vehicles, people movers, multimode busses, monorails and other futuristic vehicles as Vought prepares to become a total transportation company.

Meanwhile, Vought Aeronautics will retain its tradition of more than half a century of designing aircraft today for the needs of tomorrow.

Among the modern tools that Vought employs to design and study advanced aircraft concepts are simulators.

Vought's Air-to-Air Combat Simulator measures the combat effectiveness of a fighter aircraft against various threat aircraft. The simulator features two domes, each of which has a single seat fighter type cockpit with controls reacting to pilot movements and generating an image on the wall of his opponent's dome. Airframe equations of motion and their characteristics over the flight envelope are programmed into a digital computer. Principal aircraft parameters such as thrust to weight, wing loading, variable wing-geometry, all within the control of the aircraft designer, can be varied to see how each influences the outcome of an air battle.

The Carrier Approach Simulator provides Vought Aeronautics with an effective evaluation of the flying qualities of an aircraft in the power approach configuration, in other words, its carrier suitability.

The pilot mans an instrumented cockpit on a moving base. He sees a realistic visual display of the night carrier landing scene in true color. Programmed as in the Air-to-Air Combat Simulator are the aircraft's specific equations of motion. In addition, the carrier movement, wind and sea states are also programmed. This design tool has proved so realistic the U. S. Navy has purchased two of them for training purposes.

The Weapons Delivery Simulator allows the weapons system designer an opportunity to evaluate the man in the loop of computerized delivery. Cues and symbology are evaluated against the pilot's responses for possible improvement Pilots fly bombing missions in a cockpit that is fully instrumented and has graphic representations in his forward field of view. Both the instruments and graphics are driven by the computer to respond to the pilot's interpretation of computer cues.

The largest Vought simulator is its most sophisticated. The Large Amplitude Moving Base Simulator (LAMBS) features a cockpit that has large motion amplitude so that the pilot feels the kinematics of flight, missing in most simulators. The visual scene presented to the pilot is more realistic than ever. Utilizing three-dimensional topographic landscapes and closed circuit television cameras mounted on tracks, the pilot is able to fly over any representative terrain in the world. This visual system can also be interconnected to the other simulators. LAMBS is used for studies in stability and control, configuration control, advanced gunsights and V/STOL and STOL.

One of the advanced concepts Vought Aeronautics will be refining in the 1970's is ADAM, a jet V/STOL design. ADAM is an acronym for Air Deflection and Modulation. Its shape seems to suggest a return to the biplane of old; actually its wing is called a propulsive wing and houses part of the engine. Simply stated, the power flow is deflected or vented by louvers which then position or vector the flow for the desired direction of movement. A closely related design concept is a VTOL fighter which like the catapult launched UO-1 would operate from ships other than the aircraft carrier.

Hypersonic propulsion system advances are leading Vought toward the development of advanced interceptors capable of operating at high Mach numbers with existing structural materials. From the bailing wire, glue pot, and fabric fuselage of early aviation to recent studies of hypersonic aircraft, Vought Aeronautics recalls its past with pride and looks to the future with confidence.

APPENDIX I

CHRONOLOGY OF VOUGHT AERONAUTICS AND ITS CHIEF EXECUTIVES

1917 Astoria, New York, Lewis and Vought Corporation, Chance M. Vought, President.

1917 Long Island City, New York, Lewis and Vought Corporation, Chance Vought, Chairman of the Board and President.

1922 Chance Vought Corporation, George Vought, President. Chance Vought, Chairman of the Board.

1929 Chance Vought Corporation made a subsidiary of United Aircraft and Transport Corporation and moved to Hartford, Connecticut.

1930 Chance M. Vought died. Frederick B. Rentschler, Chairman of

United Aircraft and Transport Corporation, elected President of Chance Vought.

1931 Eugene M. Wilson elected President of Chance Vought.

1935 Name changed to Chance Vought Aircraft, a division of United Aircraft Corporation.

1937 Rensselaer W. Clark named general manager of Chance Vought Aircraft and Sikorsky divisions.

1939 Vought merged with Sikorsky to form Vought-Sikorsky Division of United Aircraft at Stratford, Conneticut.

1940 C. J. McCarthy appointed general manager of Vought-Sikorsky Division.

1942 Rex B. Beisel became general manager of Vought-Sikorsky.

1943 Chance Vought Aircraft separated from Sikorsky with offices still in Stratford, Connecticut.

1948 Chance Vought Aircarft moved to Grand Prairie, Texas.

1949 Frederick 0. Detweiler named general manager of Chance Vought

1954 Chance Vought Aircraft separated from United Aircraft Corporation and became an independent company, Chance Vought aircraft, Inc., with Mr. Detweiler as president.

I960 December 31st the company name was changed to Chance Vought Corporation.

1961

1965

1969

1970

Chance Vought Corporation merged with Ling-Temco Electronics, Inc.; Gifford K. Johnson named President of Chance Vought Corporation a subsidiary of Ling-Temco-Vought, Incoporated. Johnson became President of Ling-Temco-Vought. W. P. Thayer became President of Chance Vought Corporation.

Vought Aeronautics formed as a division of LTV Aerospace Corporation, a subsidiary of Ling-Temco-Vought, Incorporated. W. Paul Thayer was made LTV Aerospace Corporation President. J. R. Clark named Vice President-General Manager of Vought Aeronautics Division.

Forbes Mann named President of Vought Aeronautics Division. Name changed to Vought Aeronautics Company, a division of LTV Aerospace Corporation.

Sol Love named President of Vought Aeronautics Company to succeed Mann who moved up to President of LTV Aeropsace Corporation. Mann succeeded Thayer, who became President of Ling-Temco-Vought, Inc.

APPENDIX II: VOUGHT AERONAUTICS AIRCRAFT 1917 - 1970

MODEL - VE-7

Name, Bluebird

Type, Trainer

1st Flight, 1918

Engine, Hispano-Suiza 8 Cylinder, Model A

Horsepower, 150

Top Speed, 110 mph

Span, 34 feet 3 inches

Overall Length, 24 feet 2 inches

Height, 8 feet 71/2 inches

No. Produced, 129

Later Models/No. Prod, VE-7, VE-8-2, VE-9

Remarks, VE7SF-a single seat fighter version, 51 built, 11 by Naval Aircraft Factory

VE-8 - a single-seat fighter, 2 built VE-9 - two-seat trainer

MODEL - VE-10

Name

Type, Flying boat

1st Flight., 1919

Engine, OX-5

Horsepower, 90

Top Speed, 80 miles per hour

Span, 36 feet 0 inches

Overall Length, 27 feet 0 inches

Height, 10 feet 5 inches

No. Produced, 1 or 2

Later Models/No. Prod, ?

Remarks Believed to have been designed in Vought's early days and revived and designated VE-10 MODEL - VE-11

Name

Type, Fighter or Pursuit

1st Flight

Engine

Horsepower

Top Speed

Span

Overall Length

Height

No. Produced

Later Models/No. Prod.

Remarks, Any information would be appreciated. There

are those who say it never got past design,

others who say it flew.

MODEL - UO-1

Name

Type, Observation, Seaplane

1st Flight, 1923

Engine, Wright J-l

Horsepower, 220

Top Speed, 130 mph

Span, 34 feet 1 inch

Overall Length, 24 feet 2 inches

Height, 10 feet

No. Produced 150*

Later Models/No. Prod., UO-2, UO-3 and Uo-4

Remarks, Probably includes other models of UO series, Uo-3 was a single-seat fighter redesignated FU-1

MODEL - FU-1

Name,

Type, Single-Seat fighter

1st Flight, 1925

Engine, Wright J-5 (R-790)

Horsepower, 220

Top Speed, 125 miles per hour

Span, 34 feet 4 inches

Overall Length, 28 feet 5-1/2 inches, 24 feet k-3/4 inches

Height, 8 feet 10-1/2 inches

No. Produced, 20

Later Models/No. Prod, FU-2

Remarks, FU-1 was originally the UO-3 redesignated FU-1, 18 RT-ls were converted to 2-seat FU-2 trainer MODEL - 02U-1

Name, Corsair

Type, Observation

1st Flight, 1926

Engine, Pratt & Whitney, Wasp R-1300

Horsepower, 425

Top Speed, 151 miles per hour

Span, 34 feet 6 inches

Overall Length, 28 feet 5-1/2 inches

Height, 10 feet ½ inch

No. Produced, 1

Later Models/No. Prod, ,02U-2, 02U-3, 80, 02U-4, 42

Remarks -

MODEL - 03U-1

Name, Corsair

Type, Observation

1st Flight, 1931

Engine, Pratt & Whitney

Horsepower, 450

Top Speed, 135 miles per hour

Span, 36 feet

Overall Length, 26 feet ¾ inch

Height, 10 feet 7-3/4 inches

No. Produced, 87

Later Models/No. Prod, 03U-2 - 29, 03U-3 - 75, 03U-!f - ?, 03U-6 - 32, V65C-1 - 41, V65F - 12, V99M - 10, 03U-2 with Hornet engine and 03U-3 with Wasp engine, 03U-U and 03U-6

Remarks, 03U-Us were redesignated into SU series, V65C-1 to China, V65F to Argentina, V99M to Mexico

MODEL - SU-1

Name, Corsair

Type, Scout, Observation

1st Flight, 1931

Engine, Pratt & Whitney R-1690C

Horsepower, 600

Top Speed, 165 Miles per hour

Span, 36 feet

Overall Length, 26 feet 2-1/2 inches

Height, 10 feet 8 inches

No. Produced, 85

Later Models/No. Prod., SU-2, SU-3 and SU-4, V65B - 15

Remarks, V65B to Brazil, SU-2 was originally the 03U-4. One was briefly the X03U -5, SU-4 was originally

The X03U-3 MODEL - SBU-1

Name,

Type, Scout, Bomber

1st Flight, 1935

Engine, Pratt & Whitney Twin Wasp, R-1535-82

Horsepower, 700

Top Speed, 207 miles per hour

Span, 33 feet 3 inches

Overall Length, 27 feet 9-3/8 inches

Height, 9 feet 11-1/2 inches

No. Produced, 121*.

Later Models/No. Prod., SHJ-2 - 40, V142A - 15

Remarks, Original 1y the XF3U-1, Vl42 went to Argentina

MODEL - SB2U-1

Name, Vindicator

Type, Scout Bomber

1st Flight, 1938

Engine, Pratt & Whitney Twin Wasp, Jr.

Horsepower, 825

Top Speed, 247 miles per hour

Span, 41 feet

Overall Length, 33 feet 11-3/4 inches

Height, 9 feet 9-1/2 inches

No. Produced, 53

Later Models/No. Prod., SB2U-2 - 58, SB2U-3 - 57, V-156F, V-156-B-1 -40

Remarks, V156 was exported to France. Those not sent because of French surrender were sent to the British and redesignated V156B-1 and given the name Chesapeake

M3DEL - OS2U-1

Name, Kingfisher

Type, Rescue Observation

1st Flight, 1939

Engine, Pratt & Whitney R-985-50

Horsepower, 450

Top Speed, 166 miles per hour

Span, 35 feet 10 inches

Overall Length, 33 feet 7 inches

Height, 8 feet 9 inches

No. Produced, 54

Later Models/No. Prod., OS2U-2 - 158, OS2U-3 - 1,006

Remarks, Some number of OS2Us were built by the Naval Aircraft Factory and called OS2N-1

Name, Corsair

Type, Fighter

1st Flight, 1940

Engine, Pratt & Whitney R-2800

Horsepower, 2,000

Top Speed, 425 miles per hour

Span, 40 feet 11 inches

Overall Length, 34 feet 4-1/8 inches

Height, 11 feet

No. Produced, 4,699

Later Models/No. Prod., See Appendix III

Remarks, In all 12,571 F4u Corsairs were produced

M3DKL - F6U-1

Name,

1st Flight, 1947

Engine, Westinghouse J34-WE-30A

Horsepower, 3200 pounds

Top Speed, 500 miles per hour

Span, 32 feet 10.03 inches

Overall Length, 37 feet 8.12 inches

Height, 12 feet 11.43 inches

No. Produced, 30

Remarks, Three prototypes were built

MODEL - F7U-1

Name, Cutlass

Type, Fighter

Engine, Westinghouse J34-WE-32

Horsepower, 3200 pounds

Top Speed, 600 miles per hour

Span, 39 feet 9-6 inches

Overall Length, 43 feet 9-5 inches

Height, 14 feet 10 inches

No. Produced, 14

Later Models/No. Prod., FAJ-3* - 290

Remarks, F7U-3 was larger and had a different nose design *F7U-3M - Missile, F7U-3P - Photo included in this total

MODEL - F8U-1

Name, Crusader

Type, Fighter

1st Flight, 1955

Engine, Pratt & Whitney J57-P-4 P-12

Horsepower, 10,000 pounds

Top Speed, Mach 1+

Span, 35 feet 8 inches

Overall Length, 54 feet 3 inches

Height, 15 feet 9 inches

No. Produced, 318

Later Models/No. Prod, See Appendix IV

Remarks, Originally designated YF-8A

MDDEL - A-7A

Name, Corsair

Type, Light attack

1st Flight, 1965

Engine, TF30-P-6

Horsepower, 11,200 pounds

Top Speed, 600 miles per hour

Span, 38.73 feet

Overall Length, 45.61 feet

Height, 15.98 feet

No. Produced, 199

Later Models/No. Prod, A-7B, A-7D for USAF, A-7E

Remarks, A-7B, -198; A-7E and A7D feature Allison/Rolls Royce Spey TF41 engine

OTHER AIRCRAFT PRODUCED

EXPERIMENTAL

XF2U-1 XOlHJ-1 XF3U-1

xcto-i

XC&U-2

X05U-1

XSBU-1

X03U-6

XSB2U-3

XSB3U-1

XSB3U-3

XOS2U-1

XS02a-l

XTBU-1

XF5U-1

XF6U-1

XF7U-1

XP8U-1

F8U-3

XC-1U2A

EXPORT

V-65

V-65B V-65C V-65F

V-66

V-66A

V-66B

V-66c

V-66E

V-70A

V-66F

V-65-C-1

V-80

V-80P

V-85G

V-92C

V-93S

V-99M

V-100

V-156F

V-173

F-8E (FN)

COMM

VS-YFA

VS-326

OTHER

VS-300A

VS-316

VS-50

X-27A

TEMCO

TT-1 TE-1A

Luscombe

Silvaire

Plebe-33

Riley '55

Riley Twin

F-2k Globe

Swift

MISSILES

SSM-N-8A

SSM-N-8

KDU-1

SSM-N-9

KD2U-1

Corvus

Teal

APPENDIX III

THE CHRONOLOGICAL DEVELOPMENT OF THE VOUGHT F4U CORSAIR

Model, Description

XF4U-1, Prototype

F4U-l, Production Model, Seat moved aft 3 feet

F4U-ID, Procured for RNAS

F4U-1C, Four 20 nun. cannon

F4U-1D, loO gal. aux. gas tank under belly

F4U-IP, Photo

XF4U-2, Special Night Fighter Gear. Two aux. fuel tanks

F4U-2, Night Fighter, automatic pilot, airborne intercept equipment

XF4U-3, Projected turbo-aupercharged version (see FG-3)

XF4U-3B, Planned procurement for RNAS

XF4U-4, New engine, propeller, new nose

F4U-2, Basic production model

XF4U-3, Procured for RNAS:

XF4U-3B, Four 20 mm. cannon

XF4U-4, Radar Equipment

F4U-4K, Experimental Drone

F4U-4N, Night Fighter

F4U-4P, Photo Corsair

XF4U-5, New engine, nose, and other extensive design changes

F4U-5N, Night Fighter, production model

F4U-5NL, Night Fighter, all weather, Korea

F4U-5P, Photo-Recon version

F4U-6, Redes ignated AU-1, air support for Korea

F4U-7, French Air Force for Vietnam combat

F3A-1, F4U-1 Mfg. by Brewster

F3A-1D, F4U-1D Mfg. by Brewster

FG-1, F4U-1 Mfg. by Goodyear

PG-1D, F4U-ID Mfg. by Goodyear

FG-1E, Radar equipment

FG-1K, Experimental Drone

FG-3, Turbo-supercharger version conv. from FG-1D

FG-4, Goodyear F^U-4

XF2G-1, R-4360 engine change on FG-1D

F2G-1, Production version. Four auxiliary tanks and featured bubble canopy

F2G-2, Projected carrier-based version

CORSAIR SPECIFICATIONS

ITEM, XF4U-1, F4U-1, F4U-2, F4U-4, F4U-5, F2G

Span 40, 41, 41, 41, 41, 41

Length, 30', 33' 4", 33'4", 33'8.25" 34'6.5" 33'10"

Empty Weight, 7,400, 8,982, 9,170, 9,336, 9,683, 10,249

Max. Gross Weight, 10,500, 14,009, 13,112, 14,020, 14,610, 15,422

Normal Gross Weight, 9,000, 12,039, 11,446, 12,526, 12,901, 13,346

Speed, 405, 417, 381, 425, 470, 431

At Alt., 9,600, 19,900, 24,500, 23,000, 26,800, 17,000

Rate of Climb, Sea Level Ft./min., 2,260, 2,890, 2,970, 3,340, 3,780, 4,400

Service Ceiling, 31,000 36,900 33,900 41,600 41,400 38,800

Range (Miles), 850, 2,220, 1,790, 1,620, 1,120, 1,000

APPENDIX IV: VOUGHT F-8 CRUSADER STATISTICS

F-6A (F8U-1)

Power plant, Pratt & Whitney, J57-P-1* and P-12, thrust 10,000 pounds. With afterburner 16,000 pounds.

Dimensions, span 35' 8", length 5*+' 3", height 15' 9".

Speed, Mach 1.5+

Range, combat radius 600 miles.

Armament, four 20 mm. cannon, rocket pack retractable in fuselage with 32 2.75" folding fin rockets. OVo Sidewinder missiles on fuselage pylons.

Special features, Vought-designed ejection seat, in-flight refueling probe, AN/APG-30 gunsight-ranging radar, two-position wing angled 7" up on takeoff.

Empty weight, 16,500 pounds, Notes: 318 F-8As built.

F-8B (F8U-1E, F-8L)

Power plant, speed, range and armament same as F-8A.

New features, new AN/APS-67 radar giving limited all-weather capability.

Notes: 130 F-8Bs built. Sixty-three were remanufactured, with wing stations for carrying bombs or rockets; redesignated F-8L.

F-8C (F8a-2. F-8K)

Power plant, P&W J57-P-16 with 500 pounds more military thrust. Armament, Sidewinders increased to four; other armament the same.

New features, improved radar and fire control equipment. Air intakes added to tailcone for afterburner area cooling. Ventral fins added for directional stability. Martin-Baker low-altitude ejection seat replaced Vought-designed seat.

Notes: 187 F-8Cs built. Eight-seven F-8Cs were remanufactured and redesignated F-8Ks.

F-8D (F8U-2H, F-8H)

Power plant, P&W J57-P-20, 10,700 pounds military thrust, 18,000 pounds with afterburner.

Armament, rocket pack removed from this model and four Sidewinders retained on fuselage pylons.

Speed, near Mach 2.

New features, improved AN/APQ-83 radar gave plane night fighter capabilities. Pilot relief auto pilot. Infrared scanner AN/AAS-15 installed in front of windshield for infrared detection. Internal fuel capacity increased for greater range. Approach power compensation computer added to provide better control during carrier landings.

Notes: 152 F-8Ds built. When remanufactured, 89 of these redesignated F-8H.

F-8E (F8U-2NE. F-8j)

Power plant, P&tf J57-P-20A.

Armament, four 20 mm. cannon, four Sidewinders.

Mew features, two wing pylons added, enabling plane to carry wide variety of bombs, rockets and missiles up to 4,000 pounds. Provision on F-8j for carrying extra fuel tanks to increase plane's fuel capacity by 600 gallons. Nose section of plane enlarged to accommodate bigger radar. Enlarged tail surfaces for better control on F8js, which also had boundary layer control and double-droop leading edges on the wings for improved landing characteristics.

Notes; 286 F-8Es built. 136 F-8Es scheduled for remamifacture, redesignated F-8J.

F-8E(FN) (French Mavy)

Power plant, P&W J57-P20A Increased thrust 700 pounds military over P-20 engine in F-8D.

Hew features, boundary layer air and double-droop leading edge incorporated on French Crusader wing, later adopted for remanufactured F-8js. Enlarged horizontal tail surfaces for better longitudinal control. Equipped to carry French Matra missile on fuselage pylons.

Notes: 42 built for French Navy after last of F-8Es produced for

U. S. Navy.

TF-&A

Two Seater

Power plant, derated PAW J57-P-20.

Notes: One F-8A was remanufactured into a two-seater Crusader for possible use as a trainer. Rear seat was 15 inches higher than front for better visibility. Controls and instruments in both cockpits. Both cockpits equipped with ejection seats.

RF-8A (F8U-1P, RF-8G) Photographic Crusader

Power plant, P&W J57-P-4A in RF-8A, J57-P-22 in RF-8G, 10,70O pounds thrust, 18,000 with afterburner.

Notes: RF-8A Crusader carries up to five cameras in various fuselage camera stations, no armament, 144 built, 73 remanufactured and redesignated RF-8Gfl. Ventral fins added to KF-8G for improved directional stability. RF-8G carries up to four cameras in fuselage camera stations and has added navigation and electronic equipment.

TOCAL CBUSADERS BUILT, INCLUDING TWO XF8U-1S — l, 26l (not included:5 F8U-3s)

TOTAL CBUSADERS REMANUFACTURED -- Mt8, plus one F-8A made into a TF-8A

Planes built:

XF8U-1, 2

F-8A, 318

F-8B, 130

F-8C, 18?

F-8D, 152

F-8E, 286

F-8E(FN), 42

BF-8A, 144

Total, 1,261

Planes remanufactured:

F-8L, 63

F-8K, 87

F-8J, 136

F-8H, 89

RF-8G, 73

Total, 448

APPENDIX V

AIRCRAFT VOUGHT AERONAUTICS MODIFIED, RECONDITIONED OR HELPED BUILD

A2D

A2F-1-

B-25

B-29

B-36

B-38

B-^7

B-50

B-52H

B-56G

B-57 B-58

XB-70

Bell HU-1A

Bell-204

Boeing 707

Boeing 747

C-l*6

C-47

C-51*

C-82

C-97

KC-97

C-121

C-123

C-130

Convair

D-18

DC-3

DC-4

DC-6

DC-10

KC-135

F-3A

F-3H

F-4H

F-100C

F-100D

F-101

RF-101

F-10U

F-105D

L-17

Martin 202

P2V

P3A

P5D

P-5M

P-Vf

P-51

R-5D

R-7V

S-3A

T-6

YC-125B

OTHER PRODUCTS MANUFACTURED

Engine deflectors for Ford, Buick and Chevrolet,

Engine parts for Pratt & Whitney

Popcorn machines

Aluminum suitcases

Soft drink dispensing machines

Farm tractors

Washing machines

Sheet pressing machine

Three seat water "bicycle

Go-carts

Dishwashers

Disposals

Minnow buckets

Components for following missiles

Sergeant

Hawk

Minuteman

Polaris

105

APPENDIX VI

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