

Vultee V-1A, the “Pullman” Aircraft

By Alain Pelletier



Robust aircraft, the Vultee V-1A was designed to carry eight passengers comfortably at speed. This is c/n-15, NC14251, delivered to American Airlines. (Photo from the Gerald Balzer collection, AAHS)

When built in 1933, the Vultee V-1A was the fastest plane available in the commercial aircraft market, but the great career that presented itself ended up being too short. The appearance of several competing models and a change in air traffic regulation quickly terminated the yet promising prospects of this beautiful aircraft.

Born in Brooklyn at the turn of the 20th century, Gerard Freebairn Vultee, better known as Jerry Vultee, was 21 when he moved his family thousands of miles to California. He entered the very famous California Institute of Technology (CalTech) with the aim of decreasing the expense of obtaining an engineering degree in aeronautics, and then getting hired by one of the many aircraft manufacturers settled on the west coast. In 1923, diploma in hand, Vultee did not remain unemployed for long. It was Art Mankey, then engineering manager at Douglas Aircraft, who hired him as engineer in aircraft structures. This is where he met a certain John Knudsen Northrop



The single-engine Vultee V-1A expresses all its power in this low-altitude passage at full speed. (Photo from the Gerald Balzer collection, AAHS)



With few appendages that could disrupt the airflow around the airframe, the V-1A was one of the most modern airliners of its time. (Photo from the P.M. Bowers collection)

who, along with Vance Breese, was thinking about a single engine commercial monoplane project. At the time Douglas was focused primarily on several military programs and was not interested pursuing Northrop's design. As a result, a frustrated Northrop left Douglas with his project in hand.

Northrop was hired by Alan Loughead, whose business would soon take the name of Lockheed – easier to say. But Jack Northrop did not stay long and his position was filled by Jerry Vultee. Appointed as chief engineer of the young Burbank business, Vultee attacked, at the request of Charles Lindbergh, designing a new plane. This was the splendid Sirius with whom the winner of the Atlantic and his wife made several very prominent journeys. But these activities were not sufficient to ensure the sustainability of the business. In 1929, this situation resulted in the takeover of Lockheed by Detroit Aircraft Corp. Richard Von Hake then assumed the post of chief engineer, which Vultee had been holding. The displaced Vultee accepted



The Lockheed team during the Vega era with, left to right, John K. Northrop, Jerry Vultee (crouching in the fuselage), Bill Henry and Allan Loughhead. (Photo from Lockheed-Martin)



Jerry Vultee (center) in front of a Lockheed Vega fitted with floats with, to his left, Allan Loughhead and, to his right, pilot Joe Crosson. (Photo from Lockheed-Martin)

a temporary position of engineering professor of aeronautical engineering at the Curtiss-Wright Technical Institute, which he held until being appointed chief engineer of EMSCO (short for E.M. Smith Corporation) located in Downey, California.

At the same time, Errett Lobban "EL" Cord, president of a number of companies located on the west coast, was looking to expand his business holdings in the area of aeronautical construction.¹ Already owner of an airline (Century Airlines) that he sold at the beginning of 1933, Cord set out to find a new commercial aircraft to equip his airline with. He became aware of the Vultee and Breese's project and thought it had potential. With the financial support of Cord, Gerard Vultee was able to continue the development of his commercial aircraft project that he designated V-1 (for Vultee Number One). Management of this project was done through a specifically created company, the Airplane Development Corp. (ADC), of which Vultee became the vice president. Undoubtedly, the V-1 responded to a real market need – that of a very fast and very comfortable airliner. The V-1 immediately attracted attention of several airlines including American Airways, which announced its intention to acquire 10 copies as soon as possible with the lead aircraft to serve as the prototype.

The construction of the Vultee V-1 prototype in a Burbank hangar and the first flight, February 19, 1933, took place without any particular difficulty. Once completed, the first plane was loaned to American for its future exploitation. They could use it for a year on their routes so that the pilots could provide feedback on the design, many of which would be incorporated into the prototype. Among these modifications was the number of passengers, which went from six to eight. This modification led to modifying the distribution of luggage compartments. The wing span and length were increased respectively two feet and one and a half feet, and the landing gear track was widened by one foot eight inches. Thus modified, the following aircraft were designated V-1A (from No. 2 on).

Anatomy of a champion

Designed as a medium-haul transport aircraft with very high performance, the Vultee V-1 was an all metal airplane with a cantilever wing mounted flush with the lower fuselage. The large area split flaps extended from the ailerons to the bottom of the fuselage. The engine was one of the best available. It was a 9-cylinder radial Wright R-1820 F-2 developing 735 hp driving a three-bladed 9' 4" diameter Hamilton Standard propeller. The engine mount was attached to the firewall with large precision-ground bolts having conical heads. The mounts were built in accurate jigs and all connections and controls were standardized and quickly detachable. This made it possible to quickly exchange engine assemblies between Vultee V-1As.

The aeronautical press at the time noted that the structure of V-1A was particularly simple to construct, which helped keep manufacturing and maintenance costs remarkably low. The fuselage was a monocoque construction and devoid of longitudinal members. At equivalent external dimensions, this method of construction made it possible to free up a maximum of space in the structure. The cross-sectional dimensions also increased. The fuselage width and height were formerly 56"



Cars parked in front of the administration and design office buildings of the Airplane Development Corp. (ADC) factory. (Photo from the Gerald Balzer collection, AAHS)

and 62” respectively with the corresponding figures now 58” and 68” for the V-1A, allowing for a two-seat cockpit option to be fitted out. In doing so, Vultee complied requirements from the new Aeronautics branch of the Commerce Department.

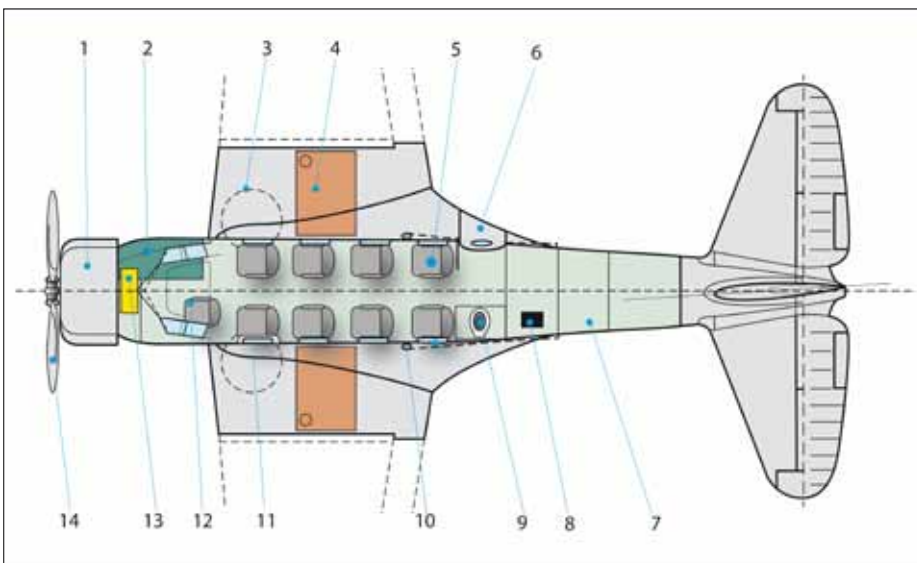
The sections that formed the fuselage had a modified elliptical section. They consisted of four portions of arc that tangentially connected together to form each cross-section. The structure of fuselage deserves special attention because of the exceptional benefits it brought in terms ease of manufacture, maintenance and reparability. The rectangular sheets in Alclad² were bent and arranged transversely to the plane axis in the long direction, each panel overlapping the panel coming after it. These flat sheets were relatively small and therefore it was not

necessary to use stamping presses and very expensive specific stamping tools to preform the pieces. This construction method was very easy to use and very economical.

The cantilever wing was set into the fuselage so that the bottom surface was tangent to the fuselage.³ The wing was designed in three sections: a center section integrated into the fuselage and two outer sections attached to the center section using bolts. The center section contained the landing gear and fuel tanks. The two outer panels were shell type consisting of three parts: leading edge, center and trailing edge sections. The center section was comprised of a corrugated upper and lower covering separated by a girder type front spar and a corrugated web-type rear spar. Smooth Alclad was riveted

Layout of the Vultee V-1 (Aero Digest from April 1933, © A. Pelletier)

- 1- Wright Cyclone F-2 engine of 712 hp.
- 2- Mail compartment (right side only)
- 3- Position of retracted wheels
- 4- 74-gallon fuel tank
- 5- Passenger seats
- 6- Passenger access door
- 7- Luggage compartment
- 8- Radio transmitter / receiver
- 9- Toilet
- 10- Light rocket launcher
- 11- Cabin emergency exit (left side only)
- 12- Pilot's seat (left)
- 13- Oil tank
- 14- Hamilton Standard three-blade propeller.





It is possible to see the thin panel sections that made up the V-1A's fuselage in this photo. This structural solution significantly reduced assembly time and maintenance costs. (Photo from the AAHS archives)

over the corrugated inner sheets. The leading edge contains the landing lights and was built as a single component attached to the front spar. The entire wing was accessible for inspection by the removal of the leading edge. The trailing edge section of the outer wing panels supported the flaps and ailerons.

One of the most original aspects of this airplane was its retractable landing gear. Jerry Vultee had sought to design a retractable landing gear system that was simple, robust and reliable, both in its design and use. This had resulted in a transmission system whose kinematics boiled down to simple rotation of a steel tube serving as a pivot and driven by a worm. This system was operated using a switch allowing the gear to be lowered in seven seconds. No attention was required through the use of limit switches for both retraction and extension. Ingeniously, Vultee used the same drive transmission for the flaps. The pilot could select one or the other by simply sliding a small gear to select either flaps or gear. If the electrical motor failed, a manual crank was provided allowing the gear or flaps to be cranked to position. Interestingly, it was possible to operate both flaps and gear simultaneously by using the electric motor to drive one while manually cranking the other.

The wheels retracted flat in the thickness of the wing. Doors completely covered the main landing gear in the retracted position, which made it possible to obtain a continuous and perfectly smooth lower wing surface. The tail wheel only retracted partially. It was driven in its movement by the main landing system.

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Pullman” Comfort

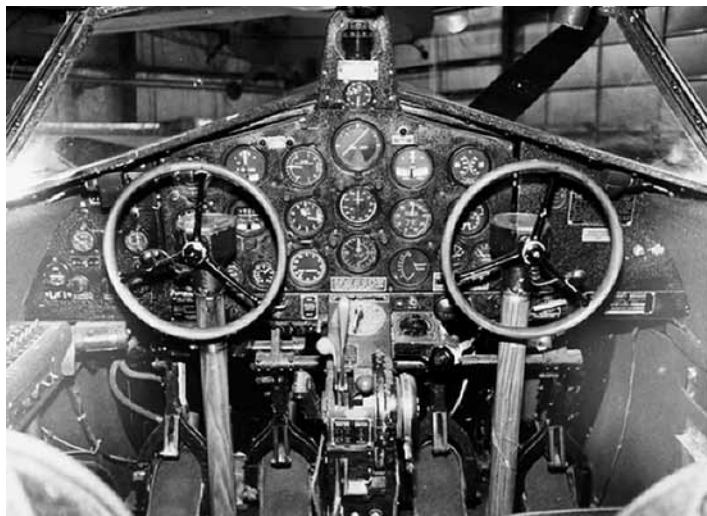
The eight passengers were seated two by two along a central aisle 12” wide. The seats were specially designed for V-1A and were adjustable with six positions. The cabin was 68” high and 58” wide, providing a volume of 170 ft³. These made the cabin as comfortable as possible. The main access door to the cabin was behind the last starboard-side chair. Opposite the entry door was a small cabin toilet. Right behind it was the luggage compartment and then the radio compartment. Western Electric’s acoustic engineers designed a cabin and a cockpit with extensive soundproofing. It seems that the noise level of the cabin was as low as a Pullman limousine and it was possible, in cruise flight at 200 mph, to talk to each other from one end of the cabin to the other without having to raise a voice. In addition to the use of different soundproofing materials, sound traps and noise filters were installed in all fans and ventilation nozzles. The sound level in the cabin was measured at 68 db.⁴ Comfort had been pushed to the limit – each passenger had a reading lamp, an ashtray and a comfortable leather armchair.

The cockpit had the same soundproofing as the cabin. As this aircraft was primarily designed for the serving domestic routes, the V-1A was also equipped for night flying and included a Western Electric radio transceiver.

The cockpit windscreen tilted forward, very in vogue at the time, and was very characteristic of this period. Vultee had designed it to eliminate parasitic reflections, in particular those coming from the ground, and ensuring excellent visibility towards the front, even in rainy weather.



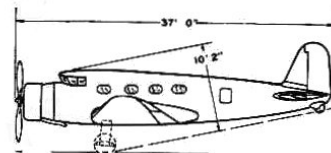
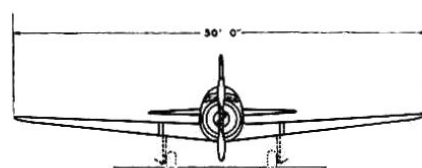
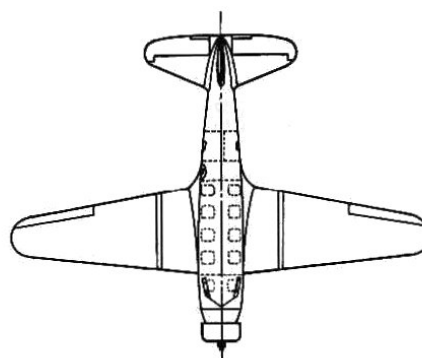
The cabin of the Vultee V-1A was particularly neat. The wing spar, placed very far forward, did not block the passage of passengers as on the Boeing 247. (Photo from the Gerald Balzer collection, AAHS)



The V-1A's cockpit was very well equipped, although a little cramped. Note the rather rustic appearance of the "broom handle" control columns. (Photo from the San Diego Air and Space Museum)

PASSENGER AND CARGO TRANSPORT

303



AIRPLANE DEVELOPMENT CORPORATION
Glendale, Calif.
MODEL V-1A — 9-10 PLACE
ENGINE: WRIGHT CYCLONE



The first production Vultee V-1A, NC13764, was acquired by American Airlines on July 18, 1934, entered service on the following September 19 and withdrawn from service two years later. (Photo from the Gerald Balzer collection, AAHS)

The small three-view shot that accompanied the presentation of the Vultee V-1A program in the Aircraft Yearbook, 1935.

In 1934, Congress approved the Air Mail Act, which was signed by the President on June 12, and according to the terms airmail service providers were prohibited from holding shares in any aeronautical company, with the exception of aerodromes. The result was that Aviation Corp. had to part with American Airways, and forced the restructuring of the E.L. Cord companies. Aviation Development Corp. thus became a division of AVCO and Gerard Vultee was appointed vice-president and chief engineer of the renamed Aviation Manufacturing Corporation.

American Airlines and the V-1A

In February 1934, the company had to reorganize its network after the Air Mail Act announcement in February 1934. The cancellation of airmail contracts which as a consequence the loss of several important contracts when the lines were opened again to tenders. American Airways reorganized the whole of its lines



Advertisement posted by Wright Aeronautical Corp. in the aeronautical magazine Aviation of February 1935, on the occasion of the transcontinental speed record broken by James Doolittle. (Wright Aeronautical Corp.)

in the form of an interconnected network (reducing connection times) and stood out by becoming the largest domestic airline with a network of some 6,800 miles in 1934. But it had no more than 9,200 miles of routes. The company took the name of American Airlines May 13, 1934.

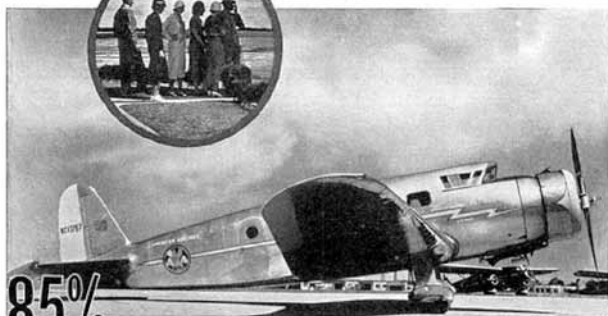
The loss of contracts following the cancellation of airmail links resulted in a drop very sensitive to its activity. With an average of 35,200 miles traveled daily by American Airlines in 1933, they only covered 27,950 mile per day during 1934. The V-1A was used exclusively on the Fort Worth-St Louis-Chicago line, from September 19, 1934, with TWA introducing Northrop 2D Gammas over this same route in October 1934.

Very early in 1935, American Airlines had a network employing 1,363 people, including 105 pilots, 66 copilots, 43 hostesses, and it served some 21 destinations across the United States. At the end of 1934,



This close-up of an American Airlines V-1A shows many interesting details such as the landing light in the landing gear well, the sliding side window and the three-bladed variable-pitch propeller. (Photo from Rayburn Ray collection, AAHS)

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TEXACO



In its advertisements, Texaco used the performance of the V-1A to praise the qualities of its fuels. (Texaco)

the company had 32 new aircraft in its fleet, all fitted with Wright-Cyclone motors, namely: 10 Curtiss Condor IIs (including 8 with bunks), 10 Vultee V-1As, two Stinson As and 10 Douglas DC-2s. These planes were immediately put into service: the Condor II on Fort Worth-Los Angeles May 5, 1934, V-1A on Fort Worth-St Louis-Chicago and the Stinsons As in April 1934. As for the Douglas DC-2, it was to enter service with the TWA, May 18, 1934, on Columbus-Pittsburgh-Newark route, with American starting to receive theirs in November.

In search of notoriety

Vultee's plane soon got noticed. The January 14 and 15, 1935, Maj. James Doolittle used a V-1A called "Special," c/n 8, NC13770, equipped with a Wright Cyclone 9 R-1820 F.2 developing under normal conditions 691 hp at 1,950 rpm at sea level and having a compression ratio of 6.4:1, to establish a new transcontinental speed record, flying at night, Los Angeles to New York, in 11 hours and 59 minutes, the average speed of 205 mph, which was recognized by the International Aeronautical Federation (FAI). Taking off from Union Air Terminal in Burbank to 5:27 p.m. Doolittle landed at Floyd Bennett Field

AIRWHEELS*?

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When you buy a new ship specify the Goodyear Airwheel and the new Goodyear Hydraulic Airwheel Brakes

Goodyear used the V-1A and its retractable landing gear to promote the merits of its tires. (Goodyear)



A satisfied James Doolittle appears in the cockpit of the V-1A with which he just broke the speed record between Los Angeles and New York in 11 hours and 59 minutes. (Photo from the National Air and Space Museum)



As of January 1, 1936, National Airlines had a network of slightly more than 7,000 miles in length. Here, V-1A, c/n-18, NC14252, flying over the plant in Downey, California. This aircraft continued its career in Mexico, being successively registered XA-DIL and XB-MEA. (Photo from the Gerald Balzer collection, AAHS)

at 8:34 a.m. the next morning. This aircraft was later sold to Harry Richman, of Miami Beach, Fla., who named her “Lady Peace” and used it on, August 26, 1936, for a crossing of the North Atlantic between Floyd Bennett Field (New York) and Llwynceilyn Meadow country from Wales) in 18 hours and 38 minutes, averaging 210 mph.

With the arrival on the market of the new twin-engine airplanes of Douglas and the limitations imposed on commercial use of single-engine aircraft, American was forced to restructure its fleet. While deemed modern, American operated the Vultee for only two years. They went on sale in November 1936, like the Stinsons that were withdrawn from service in September 1938. By the end of 1938 the American Airlines fleet was made up of only Douglas DC-2s, DSTs and DC-3s.

This decision was a boon for some, including small companies like Bowen Air Lines, which bought three V-1As, and EL Cord, who successively owned two V-1As (registered NC13771 and NC14256). Some scrap dealers seized the opportunity like Vilamert Co., Ltd. They saw a business opportunity for the Vultees in Russia. This is how two Russian pilots obtained a V-1A, which they had modified, including the installation of a pair of American EDO floats. With this seaplane Sigismund Levanevsky and Victor Levchenko took off from Santa Monica on August 5, 1936, and headed to Moscow for a 9,941-mile trip via Alaska and Siberia, a feat that earned them the equivalent of \$34,000.

Towards Spain

On September 24, 1936, speculator Charlie Babb, obtained an export license for nine of the Vultee V-1A he had just purchased from American Airlines. Babb intended to realize a significant profit by reselling and exporting the aircraft. He held the Vultees until the end of November, when he sold them to Rudolf Wolf, who, on December 3, got a new export license, not only for Vultees, but also for seven Lockheed Orions and three Consolidated Fleetsters. To complicate matters, Wolf died suddenly on the night of December 5, 1936, which had the immediate effect of canceling the export license. His wife then had the expediency to immediately ask for a new license for the aircraft to which was added a Northrop Delta. The situation changed once again December 16, when she requested the exchange of one Orion for the Vultee V-1, the prototype. This exchange was accepted and the nine Vultees (c/n 1, 2, 3, 6, 7, 10, 11, 17 and 19) were allowed to be embarked for Europe. The



The last surviving Vultee V-1A, c/n-25, christened Spirit of Pueblo had been equipped with several additional navigation instruments. Seen here in August 1976 at Oshkosh, Wisconsin. (Photo by Hayden Hamilton)



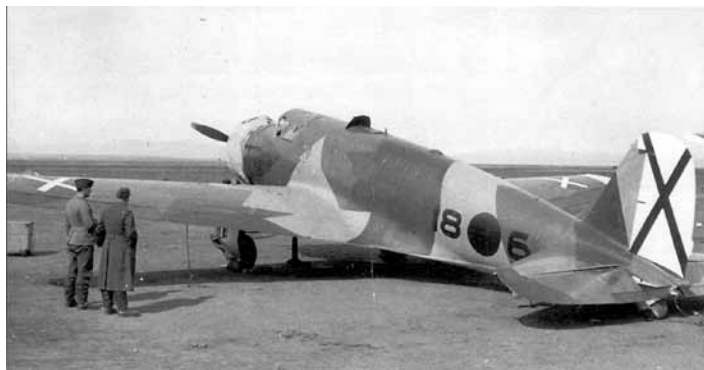
A photograph that reminds us of the atmosphere of American airfields in the early 1930s. With the engine running, a Vultee V-1A is about to leave the parking area of the legendary Grand Central Air Terminal in Los Angeles. (Photo from the Gerald Balzer collection, AAHS)



This Wright Cyclone GR-1820-GZ-powered Vultee V-1A was ordered by the Soviet Union in 1936. Equipped with EDO floats and a redesigned rudder assembly, it carried out its flight tests in the port of San Pedro, California. This seaplane, whose construction number is unknown, was registered CCCP L-208. (Photo from the Gerald Balzer collection, AAHS)



The identity of this V-1A is not known with certainty. Coded 43-12, it was part of the Nationalist air force and previously carried the code 18-2. (Photo from the Juan Arraez Cerda collection)



V-1A, c/n-15, coded 86-6, was sold to the Spaniards by the Wilmaert Company. It had previously been operated by the Lang Transportation Co. and the Oil and Gas Company. (Photo from the AAHS archives)

seven aircraft were loaded onto the Dutch freighter *Waalhaven* and two others on the American ship *American Traveler*. By the end of January, all these planes had been landed at Le Havre. They were then transported to the aerodrome of Bléville where Air France mechanics reassembled them with the help of two American technicians.

As for the first Vultee acquired by the Spanish Republic, these were embarked in New York aboard the cargo ship *Mar Cantabrico*, which set sail for Mexico January 5, 1937. After being loaded with weapons in Veracruz, it left three days later and heading for Spain. On the way, it was renamed *Newcastle* in order to pose as a British ship.

When the ship reached Cabo Mayor (on the north coast of Spain), it was intercepted by the cruiser *Canarias* and lead to El Ferrol naval base where its load was landed. On board was a Fairchild F-91, a Lockheed Electra, the Vultee "Lady Peace" (NC16099) and three other V-1As that were reassembled on the base of León and armed with a machine gun installed in the back. Their new "owners" considered making them bombers and under the codes 186 to 189⁵ they carried out a few missions alongside the Legion Condor before continuing their careers as

general service airplanes, at which time they were renumbered 4312 to 4315. V-1A, c/n 22, registered EC-42-E was the first to arrive in Spain.

On the other hand, those that had arrived at the Havre began to fly in late March 1937. On April 21, nine of them were in Bléville. Arriving in Spain, they were moved to La Rabasa (Alicante) where the headquarters of SAF-15 factory were located, and were armed with bomb racks as well as a machine gun in each wing and another in the back. August 19, 1938, following the collapse of the building that housed them, two V-1A were destroyed, along with three Polikarpov I-16s and two light aircraft. These planes formed one of the squadrons of Grupo 71 deployed to the Badajoz front. It turned out that the V-1A had a limited ceiling and they could not operate from dirt tracks in rainy weather.

Finally, the remaining V-1A joined Group 72 of coastal defense based in Carmolí (province of Murcia) where they remained until the end of the war. Two of them fled to Algeria where they were interned at the time of their landing at



One of three V-1As transformed into bombers by the Spanish Republicans at the Leon base. These planes were armed with three machine guns and bomb launchers under the wings. (Photo from the Juan Arraez Cerda collection)



Close-up of one of the three Vultee V-1As that were converted into bombers by the Spanish Republicans at the Leon base. These planes were armed with two machine guns in the wings and bomb racks under the wings. (Photo from the Juan Arraez Cerda collection)



The very first V-1A to arrive in Spain was initially intended for the airline LAPE (Lineas Aereas Portales Espanolas), created in 1931. (Photo from the Juan Arraez Cerda collection)

Oran-La Sénia. All surviving V-1As were then integrated into the ranks of the regular army in which a few were operated into the late 1960s.

The end of Vultees

Between 1936 and 1948, five Vultee V-1As flying under civil registration were involved in accidents. The first accident occurred January 29, 1936, when the American Airlines pilot of V-1A, c/n 5, NC13767 was looking to land in Denton, Tex., during a snowstorm. This accident cost life to one passenger of the six people on board. Six months later, the June 12, 1936, V-1AD, c/n 12A, NC14249, operated by United Gas Public Service Company, crashed in Ferris, Tex., for unknown reasons. No casualties were reported. August 15, 1937, an unidentified V-1A, but flying under registration civil, crashed at Le Bourget, North of Paris, when it had just taken off in the direction of Barcelona to join to nationalist forces.

On February 24, 1938, V-1A, c/n 14, NC14250, operated by the Examiner Printing Company, crashed at San Simeon, Calif., for unknown reasons and with no casualties. On March 20, 1948, V-1A, c/n 16, NC22077, its seven passengers and pilot crashed in Somerset, Penn., while enroute to St. Louis, Missouri. There was no survivors.

A final accident tarnished this phase of the Vultee adventure. Saturday, January 29, 1938, Gerard Vultee and his wife Sylvia Parker died in the crash of their Stinson SR-9C while returning home to California from a trip to the East Coast including Washington, D.C. The crash occurred in a snow storm during the final leg of their trip on a flight from Winslow, Ariz., to Santa Monica, California. Vultee was not experienced in instrument flying and is believed to have become disoriented in mountainous terrain after getting caught in the snowstorm.

Today only one Vultee V-1A has survived. It is a V-1AD Special, c/n 25, NC16099, kept in Shannon Air Museum in Fredericksburg, Virginia. →



This V-1A bearing the registration EC-48-E but whose serial number is unknown to date, was never delivered to LATE as planned. This photograph was taken at the La Rabasa base, near Alicante. (Photo from the Juan Arraez Cerda collection)

CHARACTERISTICS & PERFORMANCE OF VULTEE V-1A

Engine: Wright Cyclone R-1820 F-2,
735 hp at 1900 rpm.
Propeller: 9' 4" diameter, 3-bladed Hamilton
Standard

Dimensions

Wingspan: 50' 0"
Overall length: 37' 0"
Overall height: 10' 2"

Volumes

Cabin 170 ft³
Mail compartment 40 ft³
Luggage compartment 50 ft³

Weights

Empty: 5332 lb
Fuel (206 gal): 1836 lb
Oil (13.2 gal) 108 lb
Crew (2) 340 lb
Passengers (8) 1,360 lb
Luggage & mail 1,580 lb

Performance

Top speed 235 mph
Cruising speed 215 mph
Landing speed 60 mph
Range 1,000 miles
Initial climb speed 1,000 ft/min
Service ceiling 20,000 ft



The Vultee logo as it appeared on the front of a Vultee V-12 (AB-2), a military derivative of the V-1A. (Photo from the Gerald Balzer collection, AAHS)

Notes

- (1) These companies include: Stinson Aircraft Corp., Lycoming Manufacturing Co., Century Airlines, and Smith Controllable Pitch Propeller Company.
- (2) Alclad is a material developed in 1927 by Alcoa (Aluminum Company of America). It consists of a layer of aluminum alloy enclosed between two layers of pure aluminum.
- (3) Cantilever: cantilevered.
- (4) For comparison, the noise level inside a DC-1 in cruising flight was 70 to 75 db, depending on location in the cabin.
- (5) To date, the precise correspondence between American registrations and Spanish Republican codes is not known.

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Using the same wing and some other available sub-assemblies, the engineers at Vultee's design office created a family of military aircraft to meet potential needs such as this V-11GB that one would hardly believe came from a commercial aircraft. (Photo from the Gerald Balzer collection, AAHS)