

AIRCRAFT PART 3

THE AIRCRAFT TYPES

There follows a listing of the aircraft types identified as having connection to Panama and the Canal Zone during World War 2.

Despite the fact that, by the mid-1930s, some 20% of the US Army Air Corps (USAAC)¹ establishment was based in the Canal Zone, with units there among the few that maintained 100% of their authorised strength,² the equipment based there by the outbreak of war in Europe in 1939 could not be considered to be of the highest standard – indeed, much was plainly obsolete.

An effort was made to boost its air defences, with large numbers of the more modern P-36 fighters, and then its P-40 development, being rushed to Panama. Subsequently, the P-39 became the most numerous fighter type, despite misgivings about its suitability, and which encountered problems in dealing with the operational limitations of many airfields in Panama. As early as 1941, the Army in Panama had decided that the twin-engine P-38 Lightning would be the obvious and best choice for the region, but it would be late in 1944 before the type reached Panama – long after any obvious threat had receded.³

¹ The USAAC became the US Army Air Forces (USAAF) from 16 June 1941 following a reorganisation. Further changes would see the creation of the independent US Air Force in 1947.

² *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

³ The USAAF then facing, firstly, the problem of having more P-38 than it could handle and, secondly, having to dispose of them as surplus after VJ-Day. Having campaigned to get the P-38, from 1946 it was replaced by another single-engine type, the P-47 Thunderbolt, which would turn out to be the last propeller-driven fighters to serve in the Canal Zone.

Alongside the fighters, the main aircraft of the armed forces that played a significant role in Panama and the Canal Zone were bombers and patrol flying-boats, both of which served in the maritime patrol and anti-submarine roles – with other less suitable types, including the fighters and even observation types, also being pressed into use against the U-boat threat.⁴

It was envisaged that the bombers and flying-boats would provide early warning of any approaching attacking force, particularly any aircraft carriers. With the Pacific approaches to the Canal lacking the screen of islands and bases past which any attacker must pass, the USAAC/USAAF and US Navy maintained long distance patrols from bases in neighbouring Central American states, the Galapagos Islands and Ecuador and Peru. No hostile vessel was encountered on any of these patrols.

Until later into 1942, the obsolescent B-18 Bolo bomber was the main bomber type available in Panama, and this performed an important role throughout the Caribbean combating the U-boat threat during the worst of the German campaign during that year.

Prior to the Pearl Harbor attack in December 1941, and through the wartime, the standard and quality of the aircraft types based in Panama and the Canal Zone improved considerably. The new types included the long-awaited P-38, the long-range B-24 Liberator and the C-47 Skytrain transport.

The patrol flying-boats were those of the US Navy, supplemented later in the war by some land-based patrol bombers. Such was the inter-service rivalry, a wartime agreement with the USAAF had to be brokered in August 1943 whereby the Army agreed to turn over all anti-

⁴ Other countries in Central and South America, from Mexico to Brazil, also used a wide variety of, often unsuitable, aircraft on anti-submarine patrols.

submarine operations to the Navy to allow the latter to operate the land-based patrol bombers⁵ that were found essential for the patrol, convoy escort and anti-submarine roles.^{6 7}

Military transport aircraft were primarily those of a single USAAF transport squadron, though supplemented, as required, by using bombers and patrol flying-boats as *ad hoc* transports. There were also commercial airliners, primarily those of Pan American Airways.⁸

By April 1939, the air defences of the Canal Zone consisted of a total of 71 tactical aircraft of all types, either in commission or in temporary storage, split more-or-less evenly between France Field and Albrook Field, at either end of the Canal. These consisted of 33 of the B-18 and B-18A Bolo, 15 Northrop A-17 single-engine attack bombers (all of which were assigned to the Albrook Field-based 74th Attack Squadron) and 24 obsolete P-26A Peashooters. In fact, if an enemy attack had been mounted on the Canal Zone in September 1939, official records said that the resident 19th Wing would have provided little worthwhile opposition.

⁵ Such as the long-range B-24 Liberator, which became the PB4Y with the US Navy.

⁶ A conflict over the use of land-based aircraft dated from the late 1920s, when the US Navy began stationing torpedo-bombers at land bases in Hawaii and the Canal Zone. The resolution of the resulting dispute in 1928, described as “ambiguous” (leaving the question of responsibility for aerial coastal defence unresolved into the 1930s), authorised the Navy to base some strike aircraft ashore if the primary functions of these planes were scouting and patrol: but it also recognised the Army’s chief responsibility in resisting attacks on the coasts of the US and its possession: <https://media.defense.gov/2010/Sep/24/2001330068/-1/-1/0/AFD-100924-038.pdf>

⁷ For much more on pre-war planning by the USAAC, including the inter-service rivalry with the Navy, see *Foulois and the US Army Air Corps 1931-1935* by John F Shiner (Office of Air Force History, USAF. Washington DC, 1983).

⁸ Pan American and other airlines (such as TACA and Braniff) used Albrook Field. There were two commercial airfields in the Republic – at Paitilla Point, close to Panama City, and David in Chiriqui Province in the south-west of the country. However, in early 1939, Paitilla Point was thought suitable only for emergency landings, and David had only an unimproved (not paved) runway and was used mainly by Pan American Airways: <https://www.afhra.af.mil/Portals/16/documents/Studies/51-100/AFD-090601-032.pdf>

At the end of August 1939, it was announced that expansion of the 19th Wing (which included a doubling of its fighter strength by January 1940) would be greater than originally planned, would include a new airfield in the Canal Zone at Bruja Point (which would become Howard Field),⁹ and to be completed by 30 June 1941.¹⁰

At the time, the problems in obtaining sufficient numbers of the most modern and effective types were not limited to the Canal Zone. Everywhere the USAAC was encountering difficulties and, in mid-1941, it continued to be burdened with a great number of obsolete or obsolescent types. Even the most modern fighter types that would be widely used by the USAAF, the P-39 and P-40, did not match the performance and fighting capabilities of some of the equivalent types used by the Axis countries, in particular in terms of performance at higher altitudes.¹¹

At least in terms of numbers of fighter aircraft, matters were in hand to provide an adequate defence, and by 18 January 1943, the USAAF had 159 fighters on hand in Panama and the Canal Zone, comprising P-39 and P-40 (though seven P-26A still lingered on the strength). Even the P-39 and P-40 might not be a match for the best enemy aircraft – though, of course, it was extremely unlikely they would meet such a foe – and

⁹ This third airfield for the Canal Zone opened in 1939, on the other side of the Pacific entrance to the Canal, i.e. on the South American side, on the Canal Bruja Point Military Reservation, and on 1 December 1939 this airfield, originally called Bruja Point Airfield, was renamed Howard Field. Hosting both fighters and bombers during the war, from 1941, it was deactivated in 1950 and the property (which had by then become a USAF site) turned over to the US Army:

<https://ufdc.ufl.edu/AA00022175/00001/pageturner#page/43>

¹⁰ *Air Defense of the Panama Canal, 1 January 1939 – 7 December 1941* (Army Air Forces Historical Office), January 1946:

<https://www.afhra.af.mil/Portals/16/documents/Studies/1-50/AFD-090602-096.pdf>

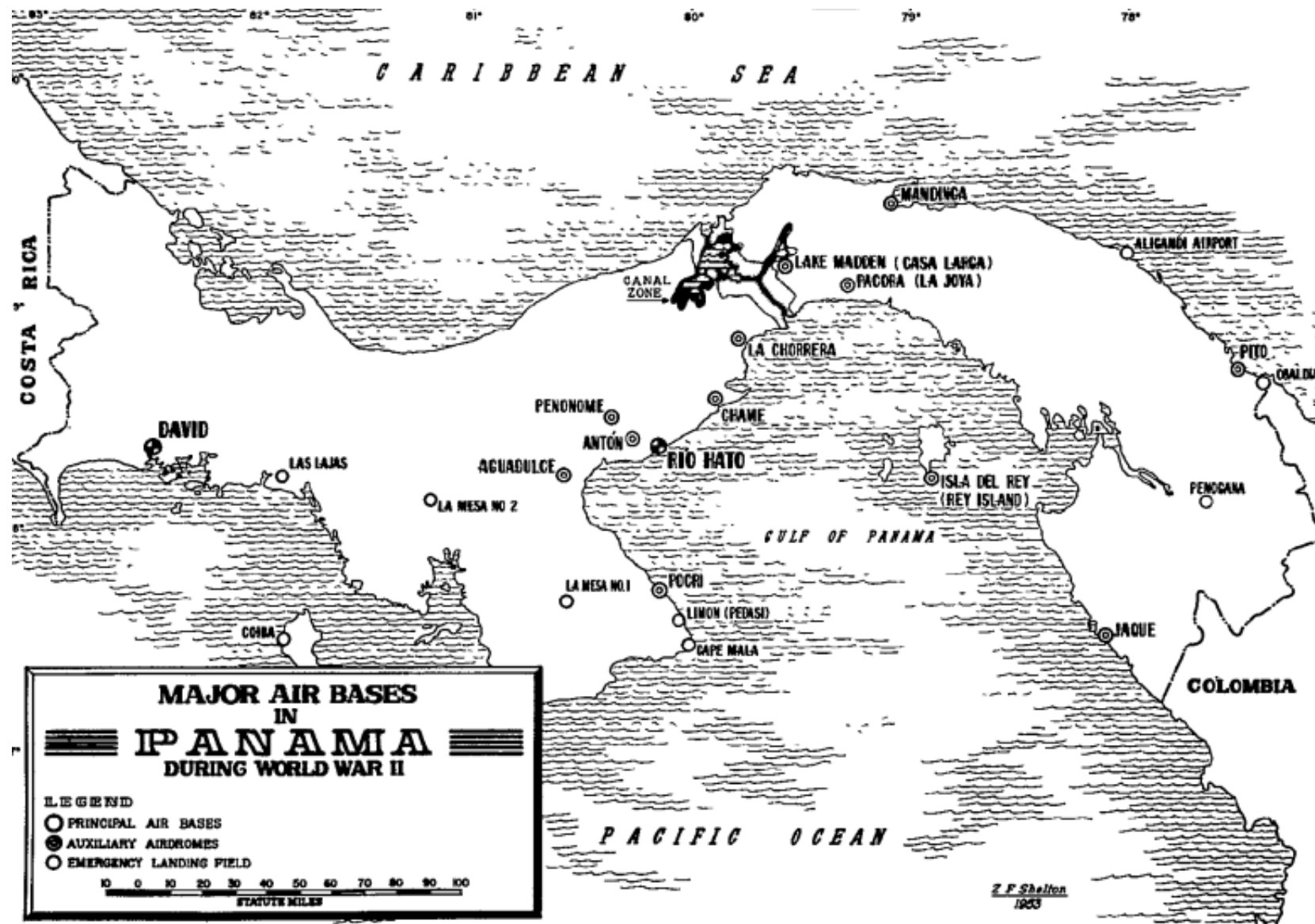
¹¹ <https://media.defense.gov/2010/Nov/05/2001329891/-1/-1/0/AFD-101105-019.pdf>

the radar and ground fighter control system at the time did not match that which had existed in Britain at the time of the Battle of Britain. In fact, late in the war, one pilot reported that he had managed to fly the length of the Canal without being fired upon or even challenged.

In 1940, USAAC headquarters demanded that pre-war colours and markings should be removed if they might detract from the effectiveness of an aircraft's camouflage – some pre-war types having sometimes having quite garish colour schemes. However, camouflaging aircraft with the required olive drab presented problems for the Panama Air Depot (PAD) at Albrook Field, given a shortage of the requisite paint. PAD attempted to resolve the problem by making its own mix (using paint intended for latrines), applied in some instances by mops - with mixed results, with a patchy finish, in part due having to stretch the supply of paint.¹² New-build types arriving, such as the P-40 and P-39, would come pre-painted by their manufacturers (in a basic colour scheme of olive drab over neutral grey). However, by 1945, camouflage of combat types had once more given way to non-camouflaged, all “natural metal” finishes.¹³

¹² *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

¹³ *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).



A-17 A-17A	Northrop	Single-engine two-seat attack bombers	A photograph of a Northrop A-17 attack bomber, a single-engine, two-seat biplane, parked on a dark asphalt runway. The aircraft is painted in a dark blue or black color with a red nose. It has a high-wing configuration and a tail-mounted engine. The background shows a clear blue sky and some distant structures. Even before the US entry into the war, the A-17 had been taken out of frontline service with the USAAC and largely relegated to training roles, but some remained in use in Panama.¹⁴ As the standard USAAC attack bomber, the first A-17 went to Panama to equip the 74th Attack Squadron, this unit being redesignated from a pursuit squadron on 1 September 1937.¹⁵ The A-17 and the following A-17A differed in that the latter had a more powerful version of the Pratt & Whitney R1535 Twin Wasp Junior radial engine and a fully-retractable undercarriage. The A-17A had four forward-firing 0.3-inch machine guns, plus another in the rear cockpit, in addition to a 400 lb (181 kg) bombload. In the Canal Zone, in 1939, the 19th Wing had 14 of the A-17, with a handful in use by other, pursuit (fighter) units, and it was (like other types) used for anti-submarine patrols in 1941-42. As late as 1944, at least one RA-17 (the “R” denoting it was an obsolete type or “Restricted”) was in use as a “hack” by the 24th Fighter Squadron. Eight A-17 were to survive as station hacks into 1943-44, the first 16 having arrived in August 1937 to re-equip the 74th Pursuit Squadron (which redesignated an Attack Squadron as a result).¹⁶
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¹⁴ Ordered by the RAF, and in service with RCAF as a trainer and target-tug, it was called Nomad.

¹⁵ <https://media.defense.gov/2016/Mar/17/2001481634/-1/-1/0/PAGES%20FROM%20AVIATION%20IN%20THE%20US%20ARMY%201919-1939.PDF>

¹⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			The A-17 and A-17A series of two-seat single-engine attack bombers were the backbone of the USAAC attack aircraft strength during the late 1930s. The design was derived from the Gamma transport aircraft of the early 1930s, and the first version was delivered for testing to the USAAC (as the Gamma 2F) in 1934. It entered service in 1936, but in 1938 the USAAC decided that all future attack aircraft should have twin engines. The last examples in the USAAF were retired in 1944. It was well-armed, had a good performance, was reliable and dependable, and was widely exported¹⁷. Like many 1930s designs, although a fairly advanced design when it first appeared, the A-17 was rapidly eclipsed by advancing technology and soon became obsolescent.
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Northrop A-17 in pre-war USAAC markings over Rio Hato Gunnery Camp¹⁸



A-17 of 74th Attack Squadron over the Canal Zone in 1939



A-17A on Galapagos Islands

¹⁷ The type was built for export as the Model 8A, with 10 for Peru (supplemented by 13 ex-Norwegian examples later). 18 ex-Norwegian examples sold on to Peru were embargoed and taken over by USAAF in 1942 as the A-33. Others went to Argentina, Sweden, the Netherlands and Iraq. On order for Norway, these proved too late for delivery there and were used instead for training in Canada.

¹⁸ <http://www.czimages.com/CZMemories/Photos/photoof172.htm>

A-18	Curtiss Shrike	Twin-engine attack bomber	The Model 76 was a rare type, only 13 having been built for the USAAC in 1936-37. It was developed from the prototype A-14, and was a twin-engine attack bomber, with two Wright R2600 Cyclone radials, ordered in 1936 but with only the 13 service-test examples produced. It was armed with five 0.3-inch (7.62 mm) machine guns (including one in the rear cockpit) and carried part of its 600 lb (272 kg) bombload in its wings. It did prove the worth of twin-engine attack bombers, paving the way for the Douglas A-20, but was retired from frontline use in 1940, being then used as an operational trainer – although two were reported as having been used for anti-submarine patrols in Panama. Records do show that at least one A-18 was present with the 108th Observation Squadron in the Canal Zone, but was transferred to the Tow Target Squadron at Howard Field on 28 February 1943. This was said to be the only A-18 to serve operationally.
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YA-19	Vultee	Single-engine two-seat attack bomber	 The USAAC acquired seven examples of the successful export V.11¹⁹, an attack bomber version of the V.1 single-engine, low-wing light transport, for evaluation as the YA-19, these being designated as the Model V-11GB by its manufacturer. It flew in 1935 and the trials included evaluating it versus twin-engine attack types. It was armed with six 0.3-inch (7.62 mm) machine guns, a 1,080 lb (490 kg) bombload, and had a Pratt & Whitney R1830 Twin Wasp radial engine. At least one example was with the 53rd Fighter Squadron when it formed at Albrook Field on 1 January 1941. Delivered in 1939, it was reportedly sent to Panama as a utility type after initial trials and a limited period of use in California, and others were used by attachés serving overseas, but the type saw no combat use.
			The USAAC acquired seven examples of the successful export V.11, an attack bomber version of the V.1 single-engine, low-wing light transport, for evaluation as the YA-19, these being designated as the Model V-11GB by its manufacturer. It flew in 1935 and the trials included evaluating it versus twin-engine attack types. It was armed with six 0.3-inch (7.62 mm) machine guns, a 1,080 lb (490 kg) bombload, and had a Pratt & Whitney R1830 Twin Wasp radial engine.

¹⁹ The V.11 had been exported to such places as Brazil, China (which used them in its war with Japan) and Turkey. It was also sold to the USSR, where it was called the BSh, and the later PS-43 high-speed transport version. A refined V.12 development was adopted by the Chinese Nationalists and was licence-built in China by CAMCO and, later, in India by Hindustan Aircraft.

A-20	Douglas Havoc	Twin-engine light bomber	 In 1941, the A-20A-equipped 59th Bomb Squadron (Light) deployed to Panama but, after their nearly one year working-up period at Rio Hato, they were deployed elsewhere following the Pearl Harbor attack²⁰. Subsequently, in 1944, a number of RA-20²¹ appeared on the list of “excess” aircraft awaiting disposal by the Sixth Air Force²².
			This was a twin-engine light bomber, the P-70 night-fighter version (see above) of which also operated in small numbers in Panama during the war. The A-20 was a high-performance twin-engine low- to medium-level light bomber which first flew in 1939. It was designed to meet a USAAC requirement for an attack bomber, but it was ordered by France for the <i>Armee de l’Air</i> before the USAAC had decided it would also meet their requirements. The USAAC was in the process of introducing the A-20 into service at the time of the Pearl Harbor attack in 1941, but it was 1942 before the A-20 saw action with the USAAF, in North Africa during Operation <i>Torch</i>. Over 6,000 A-20 of all versions were built for the USAAC/USAAF (also being supplied to the US Marine Corps as the BD), including a number by Boeing. It was also supplied to Allies, including the RAF²³ and the USSR. Most of the surviving A-20 were disposed of by the USAAF before the end of the war, as replacement by

²⁰ American Aviation Historical Society Journal, Winter 2016.

The A-20A version was the first production model, appearing in 1939. It lacked superchargers and saw no combat use, being redesignated RA-20A as “restricted” (obsolete) in 1942.

²¹ The “R” prefix denoting that they were “Restricted” (obsolete). These were likely former A-20A, reclassified in 1942.

²² <https://jewelscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content> p.32

²³ Which called it the Boston.

			the more capable A-26 Invader had already begun in 1944. The few surviving examples were to be redesignated as B-20 by new USAF in 1948. However, some CA-20H transport conversions survived to the 1960s.
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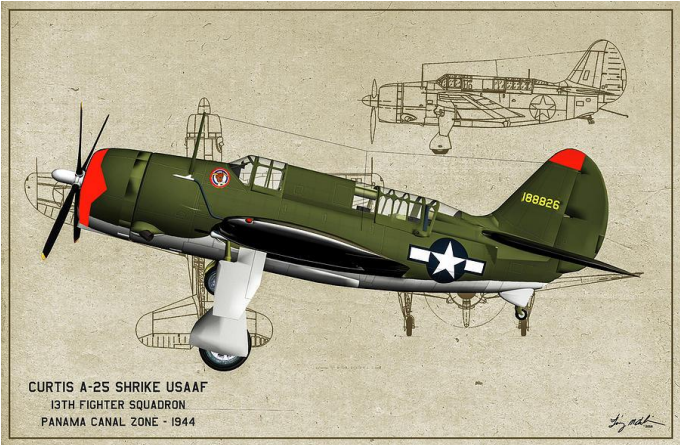
In May 1941, the A-20A equipped 59th Bombardment Squadron (Light) deployed to Panama but, after their nearly one year working-up period at Rio Hato, they deployed to Aruba and Curacao after Pearl Harbor.²⁴ In all, it is said that only 13 A-20A were deployed to Panama, these arriving in May 1941 for the 59th Bombardment Squadron (Light), then still largely existing on paper as a unit.²⁵

A-25	Curtiss Shrike	Two-seat dive-bomber	 In October 1944, the Sixth Air Force was advised that 20 RA-25A would shortly be allotted to the command – a type that had not been requested, and which was apparently being assigned responding to a much earlier request that had been made for a dedicated, high-speed tow-target tug. This is said to have placed the command in a difficult position, as it had no existing organisation that could absorb these high-maintenance (and unwanted) aircraft. As a result, when received from December 1944, when 18 A-25A (subsequently redesignated RA-25A, denoting their “restricted” status) were received²⁶ they were sent to New France Field, parked, and very seldom flown. Unconfirmed reports are that they were bulldozed off into the scrub at the east side of the field at the end
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²⁴ American Aviation Historical Society Journal, Winter 2016.

²⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

²⁶ American Aviation Historical Society Journal, Winter 2012.

			of the war, and may well remain there in the silt.²⁷ The 13th Fighter Squadron is reported to have had at least a single A-25A. 
			This was the USAAF version of the US Navy SB2C Helldiver dive-bomber and was ordered in 1940 (with 3,000 originally planned),²⁸ flying in 1942 and being built to 1943. However, by the time it was delivered the USAAF had decided it no longer required dive-bombers and it was never used in combat, but was instead relegated to second-line roles. Nevertheless, 900 were built. All were designated A-25A and it was reclassified as obsolescent in 1943 as the RA-25A.²⁹

²⁷ Ibid.

²⁸ The early success of the Ju 87 Stuka in Europe had helped convince the USAAC that it needed a similar precision weapon.

²⁹ The "R" standing for "Restricted".

A-28 RA-29B	Lockheed Hudson	Twin-engine light bomber	 Two A-28A were assigned to the 2nd Photo Mapping Squadron and 1st Mapping Group, operating out of Albroom Field into South America August 1942 to January 1943. These same units would later operate a number of “repossessed” Lend Lease RA-29B in Latin America, though not necessarily in Panama.³⁰
			The A-28 and A-29 were military versions of the Model 14 Super Electra airliner, originally ordered for the RAF as maritime patrol bombers. Both types were acquired by the USAAF for Lend Lease supply to Britain, but reduced some A-28, and more A-29.

AT-6 BC-1 BC-2	North American Texan	Advanced trainer	 This type was present in Panama from before the war, with six BC-1 being shipped to the Canal Zone in October 1938, and when activated on 22 December 1939, the 37th Pursuit Group included two BC-1 Texan in its inventory. As the USAAC made the gradual transition from a primarily biplane-equipped force to monoplanes, five brand-new BC-1 were flown down to Albroom in 1938 to aid the transition from biplanes. Later in the war, in 1944, the
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³⁰ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			24th Fighter Squadron is shown as having at least one AT-6 on hand in March 1944 and March 1945, and the 20th Transport Squadron also reportedly had at least one. During the war, 21 AT-6 served in Panama and the Antilles, and AT-6 used in Panama were most likely for proficiency flights, instrument training and for general duties.³¹ Two of the BC-2 version, of which three were assigned the US Military Missions in Latin America from 1940, ended up back in the Canal Zone in 1945, apparently in use as station hacks.³²
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³¹ North American AT-6D and AT-6F Texans and at least one Vultee BT-13A Valiant, all tandem two-seat basic trainers, were assigned to the Sixth Air Force to provide additional blind-flying and instrument training – as pilots operating the Panama region required more training than the Air Training Command had provided.

³² *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			 Other incidents did not end so happily for the 24th FS. Here, Captain Bohn and Lt. Messenger prepare to launch in the squadron North American AT-6D, unit number "101" to drop a wreath over the lonely spot at sea where Lt. Robert C. Murphy disappeared in P-38J 44-23107 off Portobello on April 10, 1945. Similar wreath-drops were made from the unit Vultee BT-13A, unit number "102". The AT-6D actually had the unit insignia on the starboard side of her nose. (USAFHRA)
			The classic US and Allied trainer aircraft of World War 2, the Texan (or Harvard to British and Commonwealth forces) was a great and long-lived success, and over 21,000 of all variants were built - including over 10,000 as AT-6 or BC-1 advanced trainers. It was also used by the Navy (as SNJ), RAF and other Allied air forces. It had its origins in the 1935 Model NA.16, which became the basic trainer BT-9 Yale with a fixed landing gear. The NA.26 development with a Pratt & Whitney R1340 Wasp radial engine was designated BC-1 in the USAAC "Basic Combat"

			advanced trainer category, won a 1937 competition and had optional armament³³. It was a more powerful, advanced trainer version with a retractable landing gear. When the “BC” category was dropped in 1940, the type was then redesignated as AT-6 in the “Advanced Trainer” category (it would be again redesignated by the new USAF in 1948 as the T-6). Over 2,000 were still on USAAF charge at the end of the war, and in the postwar period 2,068 USAF and US Navy examples were rebuilt as the T-6G - 97 also seeing use in the forward air control (FAC) role during the Korean War. It was finally phased out of USAF service in 1958 in favour of the T-28. It was also licence-built in Canada, Sweden and Japan; and a wartime development was built as a fighter (the Boomerang) by Commonwealth Aircraft in Australia.
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AT-6F Texan (Harvard to British users) of the Sith Air Force USAAC



AT-6D in Panama

³³ Intended to prepare pilots for operating the new, high-performance monoplanes then entering service.

AT-7	Beechcraft Navigator	Twin-engine trainer	 This was the navigation trainer version of the Beech 18 light transport (see C-45). Six AT-7 served with the Sixth Air Force, not as trainers but converted in Panama to the transport or photographic roles, being assigned to the Military Intelligence division of the Caribbean defense Command, and in a number of Latin American countries – including low-key surveillance of remote areas and airfields. The first two arrived in November 1942, but the only example actually assigned to the Sixth Air Force as such was taken on hand at the Panama Air Depot (PAD) in January 1945, although it had been operation for the Military Intelligence division from mid-1943.³⁴
AT-19	Stinson Reliant	Single-engine utility type	 Only one AT-19 is known to have been assigned to the Canal Zone during the war, being at Albrook Field in May 1943. However, a number of the UC-81 utility transport version of the design, all being impressments from civilian owners, were used in Puerto Rico and Trinidad.³⁵
			The V.77 was a militarised version of the five-seat civilian SR.10J Reliant with strengthened airframe and other minor changes. There is no record of the type

³⁴ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

³⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			actually being used for any training role by the USAAF, though the AT-19C were used for photo-survey work. Only 500 AT-19 built as such, the remainder of orders redesignated as L-9A/L-9B, and reportedly turned over for use by the Civil Air Patrol in coastal patrol duties.
B-10	Martin	Twin-engine medium bomber	 In Panama, the B-10 served with the 6th Composite Group in the Canal Zone. They arrived in April 1936.³⁶ As late as early 1939, the 19th Composite Wing still had 28 B-10B, but by the following June they had been replaced by the slightly more modern B-18 (see below).

³⁶ The first monoplanes were nine new B-10B which arrived in March 1936 (and initially confusingly assigned to the 44th Observation Squadron). Eventually the nine B-10B, as well as 34 B-10BM would be received.

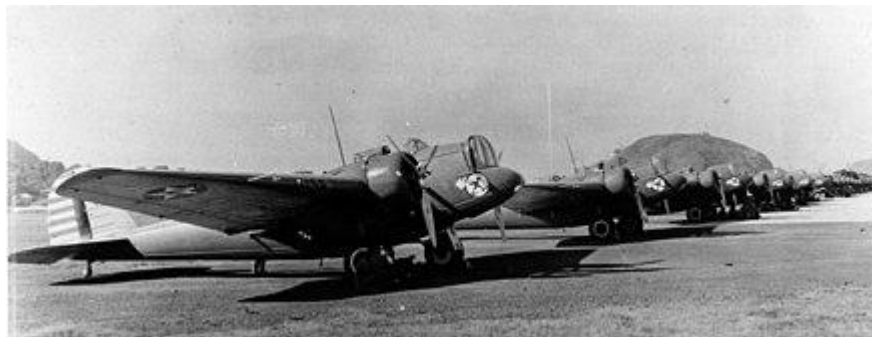
Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command by Dan Hagedorn (Turner Publishing, 1995)

			 <i>Bad landing at France Field</i>
			Although obsolete by the outbreak of World War 2, the all-metal B-10 monoplane bomber had been considered a very modern, innovative design when it appeared in the mid-1930s, with its internal bomb-bay, retractable landing gear, enclosed cockpit and rotating gun turrets. The 121 ordered by the USAAC in the mid-1930s had been its largest procurement of bomber aircraft since the end of World War 1, and it is regarded as the first “modern”, all-metal monoplane bomber to be produced in quantity. When it first flew in 1932, it proved to be 50% faster than contemporary bombers and as fast as contemporary biplane fighters. The four-man Martin 139 had begun as the private-venture Model 123 in 1932 and, following testing, the type was ordered by the USAAC as the modified Model 139, with contracts for 18 in four differing models placed during 1933-38.

			The B-10B version, as used in the Canal Zone, was armed with three 0.3-inch (7.62 mm) machine guns and a 2,260 lb (1,025 kg) bombload. Operational with USAAC from 1935, it was to be replaced by the B-18 and then the B-17 from the late 1930s and, from 1937, the B-18 began to be deployed. By the time of the entry of the US into World War 2, the B-10B had been relegated to second line roles, such as target-towing (although some B-10 were present in the Philippines when the Japanese attacked in December 1941).³⁷
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As late as 1935 the 6th Composite Group in the Canal Zone had B-2 Condors such as these in use



Martin B-10, 25th Bombardment Squadron, Panama Canal Zone

³⁷ Others, used by the Netherlands East Indies Air Force and China saw combat against Japan.



B-10A in the Canal Zone in 1930s

B-17	Boeing Flying Fortress	Four-engine heavy bomber	 On 7 December 1941, VI Bomber Command in the Canal Zone had just two B-17 on its strength. The first example of the type in the Canal Zone, a B-17B (which had first flown in 1939), had arrived for the 7th Reconnaissance Squadron in June 1941³⁸, was followed by four more in November. After the Pearl Harbor attack, the squadron saw its B-17B deployed elsewhere (mostly to Guatemala City Airport) for
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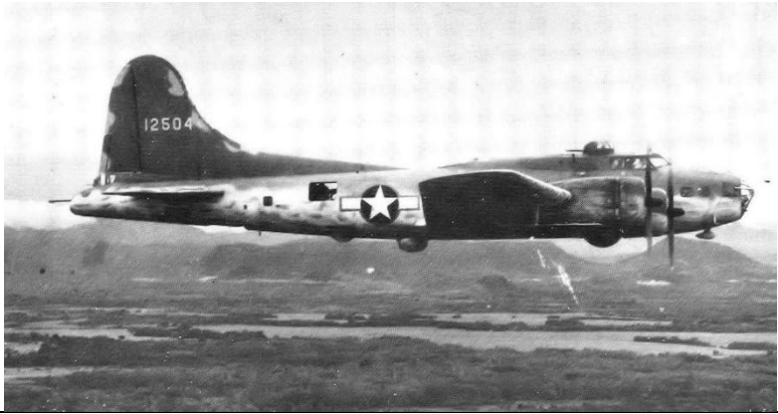
³⁸ Some sources say March 1941.

			use in patrols of the Pacific approaches to the Canal from January 1942. Although obsolescent as a bomber, the B-17B was still capable in the long-range maritime reconnaissance, and the aircraft retained its defensive machine guns. About 30 B-17 of various models (B-17B, D, E and F) operated with the Caribbean Air Command or Antilles Air Command during the war. The 9th Bombardment Group had deployed to the Canal Zone in 1940 to use its B-17 on anti-submarine patrol, but in October 1941 it transferred to Trinidad (and to the US in 1944)³⁹. The 6th Bombardment Group also used the B-17, alongside the B-18 and B-24, but disbanded in Panama in November 1943, reforming in the US in March 1944, and training on B-17 before re-equipping with B-29 and being deployed to Tinian in the Pacific.⁴⁰ In Panama, initially it was examples that would be designated RB-17B and RB-17D (the “R” denoting “Restricted” as obsolescent) that saw use, mostly based at Rio Hato (with some at Albrook Field)⁴¹. Later, B-17E/B-17F models were acquired as replacements. The aircraft were also used as <i>ad hoc</i> transports for long-distance flights. However, in Panama, the B-17 only saw relatively limited use, being more needed elsewhere, and overshadowed in the maritime patrol role by firstly the B-18, and then the B-24. The total of B-17 included the B-17D <i>Swoose Goose</i>, the personal transport of Commanding General, General Brett. It is reported that the F-9 photographic-reconnaissance version of the B-17 was also a frequent visitor to the region, on aerial survey and mapping missions with
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³⁹ http://www.historyofwar.org/air/units/USAAF/9th_Bombardment_Group.html

⁴⁰ Ibid.

⁴¹ On 12 November 1939, the first B-17 landed at Albrook Field, when the seven B-17B of the General Headquarters Air Force Good-Will Mission to Brazil completed a leg of their 6,000-mile flight from Langley Field *en route* to Rio de Janeiro.

			the 1st Photographic Group, USAAF. 2 F-9B were attached at various times to the Sixth Air Force.⁴²  <i>An early-model B-17E Flying Fortress over Panama in 1942⁴³</i>
			Remembered as “the” US bomber of the war, most famous for the daylight bombing raids over Germany. With its heavy defensive armament, it was dubbed the “Flying Fortress” by Boeing even before the Model 299 prototype flew in 1935. The design was begun in 1934 by Boeing, after the USAAC announced a competition for a multi-engine bomber for an anti-shipping role,⁴⁴ the Model 299 being financed wholly from company funds. All its would-be rivals, such as the B-18, were twin-engine types. Delivered from 1935, it became operational the same year. Early models were soon obsolescent, as the type improved and its armament increased – although

⁴² *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

⁴³ <https://www.nationalmuseum.af.mil/Upcoming/Photos/igphoto/2000571940/>

⁴⁴ With the Canal Zone being one of the main intended bases – together with Alaska and Hawaii. The strategic bomber was not part of the US military doctrine at the time and the role of the aeroplane was primarily limited to ground support for the army and coastal defence – both of which being an Army responsibility.

			the initial production model, the B-17B, was the highest-flying and fastest bomber in the world when it first flew. Famously, a flight of B-17 were approaching Pearl Harbor on the day of the attack, and when spotted on radar the Japanese attack force was mistaken for these aircraft.
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Nine B-17B were the first to be formally assigned to the Caribbean Air Force in June 1941. These were dispersed throughout Panama and the Caribbean for training purposes. However, at times leading up to the Pearl Harbor attack not a single example remained airworthy in Panama.⁴⁵

B-18	Douglas Bolo	Twin-engine medium Bomber	 The Panama Canal Department started receiving B-18 in late 1937. By June 1939, the B-10 used in Panama had been replaced by 30 of the (slightly more modern) B-18 bombers, the first having arrived in July 1938 – being seen at the time as an “ultra-modern” type. On 7 December 1941, the total personnel complement of the VI Bomber Command was 1,183 officers and enlisted men, and its assigned aircraft included 25 B-18 Bolo, together with just two B-17B Flying Fortress and one other aircraft. The 6th Bombardment Group at France Field saw the B-17B (and some of the improved B-17E) having to be given up, with the unit continuing to use the B-18 for its anti-submarine patrols.
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⁴⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

			The B-18B was used to patrol the Caribbean, sinking two U-boats. It was later replaced in this role by the B-24 in 1943. The B-18 had been chosen for the role merely because it was available and a patrol aircraft was needed immediately to counter the German U-boat threat off the coast of the US and in the Caribbean. There were also a handful of dedicated transport conversions (as C-58), but in Panama the B-18 was itself used as an <i>ad hoc</i> transport on occasion. In all 34 would serve the Sixth Air Force. 42 of the modified B-18B would serve with the Sixth Air Force or Antilles Air Command. These modified aircraft had a MAD detector and a bulbous radar dome in the nose to improve their capabilities against submarines. By December 1942, there would remain only three B-18 and two unmodified B-18A in Panama. At least three aircraft had been modified to become B-18C.⁴⁶ Perhaps surprisingly, at the very end of the war, on 28 August 1945, three B-198 and five B-18A remained on the inventory of the Sixth Air Force or Antilles Air Command.⁴⁷ Despite their obsolescence, the B-18 performed a vital role in anti-submarine patrols over the Caribbean, particularly during the worst of the U-boat threat, between February and August 1942.
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⁴⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

⁴⁷ *Ibid.*

			 <i>President Roosevelt at Albrook Field with B-18 bombers in 1940</i>
			This bomber was developed to a 1934 USAAC requirement for a B-10 replacement⁴⁸ and won the contest for a multi-engine, coastal defence bomber⁴⁹ – defeating the Boeing 299 that went on to be produced in huge numbers as B-17. The original Model DB.1 was derived from the DC.2 airliner, having similar wings (but in a mid-wing, rather than a low-wing, layout) and tail, but a new fuselage with a glazed nose. It had the same Wright R2600 Cyclone engines as the DC.2 (and the B-17), and six crew, including three gunners. The Model DB.2 version introduced a powered nose turret, and later acquired a taller, DC.3-type tail, and featured a more streamlined fuselage. It also had a revised nose which placed the bombardier's station ahead and above the nose gunner position. The B-18 was ordered into production in 1936, and became operational in 1940. However, it was already considered obsolete by 1942, and was therefore mainly used in support roles during the war – despite being the most numerous US

⁴⁸ The DB.1 competed against the Martin 146 and Boeing 299. The Boeing cost \$99,620, whereas the DB.1 cost only \$58,500.

⁴⁹ The strategic bomber was not part of the US military doctrine at the time, and the role of the aeroplane was primarily limited to ground support for the army and coastal defence – both of which being an Army responsibility.

			bomber available at the outbreak of war⁵⁰, a total of 352 having been delivered to the USAAC. Douglas delivered the first B-18 to Wright Field in Ohio for testing in Autumn 1936, and the USAAC began receiving production B-18 in mid-1937, replacing the B-10 and its B-12 variant. When war broke out in Europe, the B-18 was the standard bomber of GHQ Air Force, the USAAC main force in the Continental US.⁵¹ The shortcomings of the B-18 bomber, in terms of range, speed, bombload, and particularly in defensive armour and armament, soon became apparent to the USAAC. The USAAC admitted that the aircraft was obsolete and totally inappropriate in the role in long-distance bombing⁵². The original Model DB.1 became the B-18 in USAAC use, with 134 ordered in 1936. The Model DB.2A became the B-18A with a modified dorsal turret and a revised, more pointed nose. 217 B-18A were built 1937-38, being redesignated RB-18A as obsolete in 1942. The 122 B-18B were modified B-18 and B-18A with SCR-517 radar and a MAD tail⁵³ from 1942 - with some fitted with “retro” bomb-racks for depth charges,⁵⁴ being replaced by the B-24 in 1943. The final bomber version was the B-18C, which comprised just two modified B-18A.
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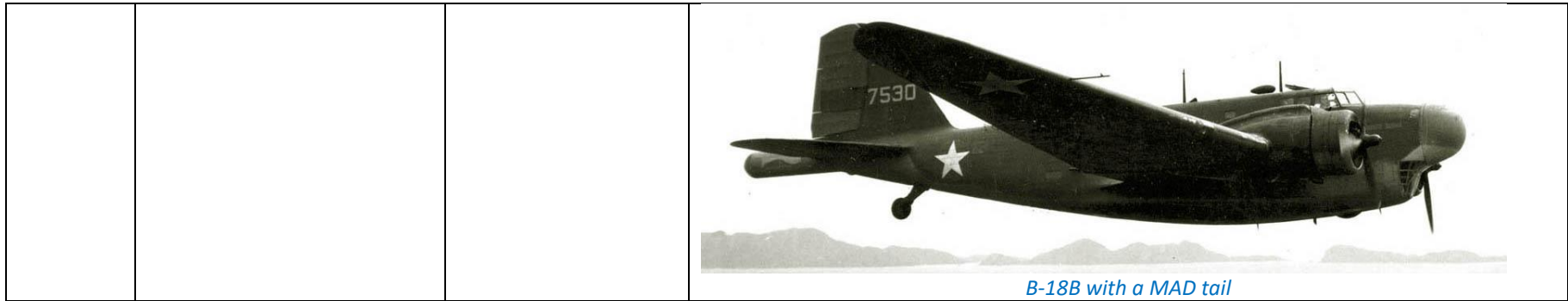
⁵⁰ 33 were at Hickam Field at the time of the Pearl Harbor attack.

⁵¹ <https://media.defense.gov/2016/Mar/17/2001481634/-1/-1/0/PAGES%20FROM%20AVIATION%20IN%20THE%20US%20ARMY%201919-1939.PDF>

⁵² https://www.wikiwand.com/es/Douglas_B-18_Bolo

⁵³ Magnetic Anomaly Detector – used to detect submarines through distortions in the magnetic field.

⁵⁴ These had a propelling charge to slow the speed of the depth charge through the air, so that they fell vertically – because the MAD gear could only detect a U-boat when directly overhead.



B-18B



*27th Reconnaissance Squadron B-18A
over San Juan, Puerto Rico*



A B-18A on an airfield at Aguadulce in Coclé Province

Between 7 December 1941 and the end of the war, 28 B-18 would be lost, mostly in accidents of some type, with four having disappeared altogether without the circumstances being known – though the fact that the original B-18 model simply could not fly on one engine could not have helped. 16 survived to be returned to the US.⁵⁵

B-24 LB-30	Consolidated Liberator	Four-engine heavy bomber	It appears none of the PB4Y naval version of the design were based in Panama. However, the USAAF deployed versions of the B-24, and LB-30 variant. Its exceptional range proved useful, particularly in patrols on the Pacific approaches to the Canal. The LB-30 was a variant of the B-24 originally ordered by the RAF, but with 75 being requisitioned for retention and use by the USAAC following the Pearl Harbor attack⁵⁶. It was the first fully combat-ready version of the design and was produced to a British specification. Like all B-24 models it had a very long-range capability. In US use, it had its 0.303-inch (7.62 mm) machine guns replaced by 0.5-inch (12.7 mm) ones, the British-built dorsal turret was replaced, and the powered tail turret was replaced by a manually-operated twin machine gun position. Between 3 February and 13 March 1942, the LB-30 in use in Panama were flown to Fairfield Air Depot at Patterson Field, Ohio, where ASV radar sets, British-designed and Canadian-built, were installed. Other modifications carried out included installation of a Martin-built gun turret in the mid-upper fuselage (where provision had been made at the factory to install a UK-built Boulton Paul turret once the aircraft had been delivered to England), and a single,
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⁵⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

⁵⁶ 140 were produced, and of the 75 commandeered by the USAAC, 23 were later released to the RAF during 1942, and another in 1943. All the LB-30 used by USAAF continued to carry RAF serial numbers during US service: American Aviation Historical Society Journal, Spring 1970.

			magazine-fed 0.50 calibre machine gun in the nose, in each waist position, and in the lower entry hatch, or "tunnel", position. Additional ¼-inch (6.35 mm) armour plate was added at the tail gun position, and a variety of other changes were made to "Americanise" the aircraft. As the modifications were completed, the aircraft left for Albrook Field, and then were routed to their duty stations. Five were flown to Albrook by Ferrying Command crews and the remainder by the crews that would fly them operationally. All were on station by 26 April 1942, with their parent unit being the 6th Bombardment Group.⁵⁷ By the end of 1941, the USAAC had 75 LB-30 available, and 17, fitted with British-made ASV radar, would be allocated for delivery to Panama.⁵⁸ Other modifications included installation of a Martin-built gun turret in the mid-upper fuselage. These arrived in March/April 1942. In 1944, the 13 survivors were returned to the US, for conversion into C-87 transports.⁵⁹ The LB-30 engines, commercial versions of the Pratt & Whitney R-1830 Twin Wasp radials, were not interchangeable with the versions of the same engine used on the B-24 models, so periodically each of the aircraft had to fly back to the San Antonio Air Depot in Texas to have its engines removed, overhauled and reinstalled. The Curtiss Electric propellers, another unique feature of the LB-30, did not perform well in service and had a tendency to "run away" on take-off. Adequate maintenance manuals were scarce, as were maintenance personnel themselves. In spite of these handicaps, in two years that the LB-30 were operated on the patrols of the Pacific approaches to the Canal not a single one was lost at sea.⁶⁰ Another problem the B-24 and LB-30 encountered during their Pacific patrol missions was that the airstrip at Salinas in Ecuador was right at the ocean's edge, and to control the salt spray problem each aircraft was frequently flown to Talara in Peru for washing.
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⁵⁷ American Aviation Historical Society Journal, Spring 1970.

⁵⁸ Under Project *Mercury*, the code name for reinforcement of Panama and the Canal Zone.

⁵⁹ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

All seven were subsequently assigned to duty with Consairways, the Pacific contract transport service operated by Consolidated for the Air Transport Command. American Aviation Historical Society Journal, Spring 1970.

⁶⁰ Ibid.

			From September 1942, Panama would receive a total of 42 B-24D. The first B-24D arrived at Howard Field on 31 October 1942, and by 28 February 1943, the Sixth Air Force had no less than 13 LB-30⁶¹ and 22 B-24D on charge. As mentioned, they would be equipped with British-developed ASV Mk II radar⁶² for maritime and anti-submarine patrol. In 1944, the Sixth Air Force began receiving the more advanced B-24J⁶³, and at least eight B-24L⁶⁴, and at the end of the war some B-24M⁶⁵ were received. They were all assigned to the 6th Bombardment Group, consisting of the 3rd, 29th, 74th and 397th Bombardment Squadrons. The first of a total of 29 B-24J model Liberators arrived in March 1944, with the essentially similar B-24L, starting to arrive in October. In June 1945, far too late to make any meaningful wartime contribution, the first 12 of the definitive B-24M model arrived.⁶⁶ For example, the 29th Bombardment Squadron received its first three B-24D on 17 April 1943 and used them on maritime patrols to the bases in Peru and Ecuador. It moved to Howard Field on 10 April 1944 and re-equipped with B-24J and B-24L. In May 1944, the surviving seven LB-30 were flown back to the Consolidated facility at Nashville, Tennessee, where they were completely overhauled and converted to the C-87 transport configuration, except for one which, although converted to carry cargo, was not given the new designation. All seven were subsequently assigned to duty with Consairways, the Pacific contract transport service operated by Consolidated for the Air Transport Command.⁶⁷
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⁶¹ However, the commander reported that the LB-30 had inadequate armament, unreliable bomb-racks, radio and radar that could not operate simultaneously, unreliable communication and electrical systems and other problems: *B-24 Liberator Units of the Pacific War* by Robert F Dorr (Bloomsbury) 2012.

⁶² With antennae below the outer wings and in the dorsal position.

⁶³ Developed from the B-24H, this had the nose turret and improved tail turret of that model (though early models lacked the latter or the improved waist gun positions). It was built by Ford, Douglas and North American, as well as Consolidated.

⁶⁴ A variant of the B-24J with a new tail gun position designed to reduce weight. The majority were built by Ford.

⁶⁵ Another variant of the B-24J, and the last production model from 1943. New lightweight tail turret. Built by Consolidated and by Ford.

⁶⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

⁶⁷ American Aviation Historical Society Journal, Spring 1970.

			It is thought that there were no encounters between the B-24 or LB-30 with any Japanese vessels during their patrols of the Pacific approaches.⁶⁸  The 7th Radar Calibration detachment also operated two B-24D from Panama.⁶⁹
			Together with the B-17 Flying Fortress, this was the classic wartime US heavy bomber, although it proved more versatile, also excelling as a very long-range maritime patrol aircraft, and as a transport aircraft and was produced in far greater numbers (in fact, more B-24 were built during the war than any other US aircraft design. Though overshadowed during the war by the B-17, it served US forces for a longer time, with some variants serving with the US Navy into the 1960s). More B-24 were built during the war than any other US aircraft design. It had a shoulder-mounted, high-aspect ratio Davis wing⁷⁰, with a tricycle undercarriage and twin fins. The design had been begun in 1939, in response to a request from the USAAC in

⁶⁸ *B-24 Liberator Units of the Pacific War* by Robert F Dorr (Bloomsbury) 2012

⁶⁹ Ibid.

⁷⁰ Thicker and with lower drag than most contemporary designs, it allowed high speeds and lift even at high angles of attack. Its use ended almost immediately following WW2. It had already been used successfully on the Consolidated Model 31 flying-boat.

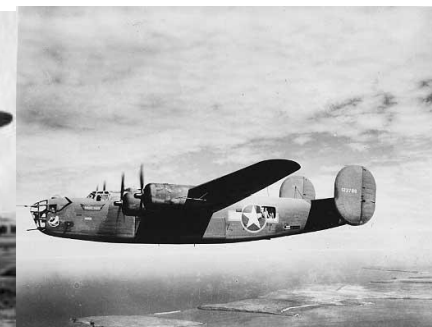
			1938⁷¹; it became operational in 1941 and most (those in the bomber role) would be withdrawn in 1945 by the USAAF. The first mass-produced model was the B-24D⁷², and later the US Navy (after a 1943 agreement allowing for the use of land-based bombers by the Navy, overriding a pre-war direction by Congress – see below) acquired a share in the production run, designating its examples PB4Y⁷³. It was licence-built by three other companies in addition to Consolidated, and was supplied to the RAF, RCAF and other allies.
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LB-30 "Jungle Queen" of 397th Bomb Squadron in the Canal Zone



LB-30 "Princess Sheila" of 397th Bomb Squadron



B-24 based on the Galapagos islands

⁷¹ Consolidated had been asked to build the B-17, but developed its own type instead – the Boeing design then already being four years old. The new type had improved high-altitude performance and a longer range. A mock-up was built within two weeks, and a contract was awarded in 1939.

⁷² All but 10 of the nearly 3,000 built were made by Consolidated. It initially only had dorsal and tail turrets (and no nose turret), but with ventral guns and even a ventral ball turret in late production. It had up to 10 crew and a 5,806 kg (12,800 lb) bombload.

⁷³ The first PB4Y were delivered in Summer 1942, with a slow build-up, and by 1943 all USAAF B-24 used for anti-submarine patrols had been transferred to the Navy and a new Anti-Submarine Command.



B-24D Liberators over Rio Hato in 1944



6th Bomber Group aircraft in Panama in 1943

NOTE

THE USN/USAAF AGREEMENT OVER LAND-BASED PATROL AIRCRAFT

Inclusion of torpedo planes in the US Navy's program for Panama and Hawaii in the 1920s violated an Army-Navy agreement limiting the Navy to scouting and patrol planes. The Navy informed the Army that the types involved in the program were of the scouting or patrol type, or of the so-called "three-purpose" type normally used for scouting and patrol but which might be used incidentally for bombing. The Joint Army and Navy Board reported on 16 August 1928, that it found no duplication. However, in 1929, the General Staff discovered the Navy's program contained torpedo and bombing as well as scouting and patrol aircraft for Panama and Hawaii. The General Staff believed the matter serious enough to require resolution by the President and, in February 1930, the Secretary of War requested President Hoover to halt the Navy's procurement of land-based aircraft and development of air stations, but the situation and accompanying dispute continued. It was only after General Douglas MacArthur became Chief of Staff in November 1930 that he and the Chief of Naval Operations reached agreement on employment of aircraft. Under this agreement the naval air forces would be based on the fleet and move

with it as an important element in performing the essential missions of the forces afloat. The Army air forces would be land-based and employed as an element of the Army in carrying out its mission of defending the coasts, both in the homeland and in overseas possessions.⁷⁴

During the war, however, these rules forbidding the Navy land-based combat aircraft were gradually modified, as the Navy sought greater control over all aspects of naval warfare, and the Army needed all its units for combat operations in Europe and the Pacific. In August 1943, the US Army and US Navy came to an agreement, and in mid-1943, the Army agreed to turn over all anti-submarine operations to the Navy.

B-25	North American Mitchell	Twin-engine medium bomber	 In December 1943, the 10th Bomb Squadron (Medium) replaced its B-18B and B-18C, which had been used for anti-submarine patrols in the Caribbean, with brand-new B-25G Mitchells. However, these aircraft spent only a short time with the Sixth Air Force, as the squadron was ordered back to the US in May 1944. The five-seat B-25G had appeared to be, on paper, a suitable anti-submarine aircraft, but proved in practice to be less effective than the B-18B and B-18C they replaced. A development of the B-25C bomber, the B-25G had a solid nose in which was mounted a 75mm cannon⁷⁵ and 0.5-inch (12.7 mm) for use against shipping targets. Its gun armament was in addition to a 3,000 lb (1,650 kg) bombload. In operations, many B-25G had the 75 mm gun replaced by additional machine guns, the cannon not proving to be a success. At least one was written off in an accident at New France Field before the squadron left.
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⁷⁴ <https://media.defense.gov/2016/Mar/17/2001481634/-1/-1/0/PAGES%20FROM%20AVIATION%20IN%20THE%20US%20ARMY%201919-1939.PDF>

⁷⁵ This gun was, in fact, the standard US Army field gun.

			Also introduced into Panama were the B-25D version, a standard bomber version also with five crew, and a glazed nose, external wing bomb-racks. It could be fitted with additional fuselage-side machine guns. It was produced in far greater numbers than the more specialised B-25G. On 3 April 1944, CDC directed that all but six of the B-25 in the theatre should be used for training, leaving only the six dedicated to anti-submarine work, illustrating the reduced submarine threat, and four of the B-25G in the Antilles were transferred to the Sixth Air Force.⁷⁶ Also present was a “stripped” B-25D used by the Army Airways Communications System until replaced by a new C-47A in June 1945.⁷⁷ There is also evidence that the B-25J model was also present in Panama, in at least one was used in trials of aerial spraying of DDT to counter the mosquito threat.⁷⁸
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⁷⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

⁷⁷ *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

⁷⁸ <https://achh.army.mil/history/book-wwii-malaria-default>

			 <i>Armourers load 250 lb depth charges into a B-25 in Panama</i>
			The B-25 had begun as the Model NA.40 in 1938, as a three-seat attack bomber designed to meet a USAAC attack bomber requirement in a contest won that was by the Douglas A-20. The first prototype was lost after only two weeks, but the design was developed further into the NA.62, which evolved into one of the most successful Allied medium bombers of the war. It was a mid-wing design with anhedral on its outer wing panels, twin tails and tricycle undercarriage. It was also the only USAAC/USAAF type to be named after a specific person, General Billy Mitchell.⁷⁹ Ordered into production in 1939, it achieved fame as the bomber used in the 1942 Doolittle raid on Tokyo, and postwar became well-known from such movies as “Pearl Harbor”, “Catch-22” etc.

⁷⁹ <https://www.britannica.com/biography/William-Mitchell>



B-25D at Old France Field on the hangar line. Unarmed and with what might be an Army Airways Detachment emblem on its nose, this may be an example modified for transport use.⁸⁰



B-25 spraying a DDT oil solution over the jungle in Panama

TB-26C	Martin Maruder	Twin-engine medium bomber	 The 23rd Tow Target Squadron was based at Howard Field and equipped with the TB-26C, a trainer variant of the B-26 medium bomber, and in use to tow targets for fighter pilot training, fitted with a C5 tow target windlass and related gear. Shortly after VJ-Day in 1945, the squadron exchanged these aircraft for three Beechcraft CQ-3⁸¹ and moved to Albrook Field.
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⁸⁰ American Aviation Historical Society Journal, Winter 2012.

⁸¹ Redesignated DC-45F in 1948, these were a version of the Beech 18 twin-engine light transport (see UC-45F above) designed as a director aircraft for target drones.

			The first arrived at Howard Field in October 1944, with one being based on the Galapagos Islands, and three being passed on the Antilles Air Command, leaving four remaining in Panama. ⁸²
			The TB-26C (originally designated AT-23B as an advanced trainer, a crew trainer version of the medium bomber version) were former B-26C bombers, some 350 being delivered to the USAAF from 1943 for training of B-26 crews. Whilst many B-26 of various models were used without any change of designation for multi-engine transition training, this designation covered aircraft stripped of armament, armour and bombing gear, and with turret openings closed over, and equipped with target C5 windlass gear in 1943, for the target-tug role.⁸³ Widely used during the war, including by the RAF and other Allied air forces, the B-26 (and in particular the first B-26A version, it had a reputation as a “hot ship” (even being nicknamed as the “<i>Widowmaker</i>”).
B-34 B-34A	Lockheed-Vega Lexington	Twin-engine medium bomber	 USAAF Lexingtons were never officially on the strength of the Sixth Air Force, those RB-34

⁸² *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

⁸³ During the war, gunnery schools at training facilities in the US were getting feedback from combat theatres that gunners in the field were often unable to fire accurately at enemy aircraft when at high altitudes. This was traced to a lack of adequate training in high-altitude gunnery. At the time, the USAAF had no target tugs that could operate at altitudes above 10,000 feet (3,048 metres), and since ballistics are quite different at high altitudes, it was felt that a high-altitude target tug was necessary.

			used for photo-mapping would be attached to it when operating in its area. ⁸⁴
			The Lockheed Model 37 was originally developed as a bomber type for the RAF from the Model 18 Lodestar airliner, with the first orders placed in 1940. Built by the Vega Division of Lockheed, it flew in 1941 and it was also used by the USAAF as the B-34 and later B-37 (both named Lexington), and the first US Navy PV-1 were ex-USAAF B-34 and included some examples ordered for the RAF under Lend-Lease but then requisitioned by the USAAF. The PV-1 entered service in 1942 and became operational in 1943, with 1,600 being delivered (see below). Powered by two Pratt & Whitney R2800 Double Wasp radials, it carried a 3,000 lb bombload. It had a greater fuel load than the B-34, an ASD-1 search radar and reduced forward defensive armament.
BC-1 BC-2	North American Texan	Advanced trainer	See AT-6 above.
BT-2 A-4	Douglas	Aerial target	 While not appearing on any Caribbean Air Force order of battle, at least seven of these target aircraft were based at Rio Hato by March 1942. These consisted of three BT-2BG, a BT-2BR, and a single BT-2CR (which was not a target, but the controller of the target aircraft).

⁸⁴ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			These had the exclusive purpose of providing “live” targets for Rio Hato’s coast artillery batteries, which had responsibility for training the Canal Zone’s anti-aircraft defences.⁸⁵ In fact, the first example had arrived in Panama in August 1939, and then from December 1940 a total of 14 of various marks were shipped to Panama.⁸⁶
			The BT-2 biplane had begun as a basic trainer version of the two-seat O-32 observation biplane of 1929 (itself derived from the earlier O-2), and resulted from a change in USAAC pilot training that introduced a new basic trainer category of aircraft. After the first modified example flew in 1930, all of the existing 30 O-32A were modified from 1931 to become BT-2 trainers, with another 166 new-build. They thus became the first purpose-built basic trainers for the USAAC. From 1940, many of the now ageing, and surplus⁸⁷, aircraft were modified further to become radio-controlled targets, designated BT-2BG and BT-2BR. The target aircraft were later redesignated to become A-4 in the 1940-41 USAAC category for “powered targets”. They were fitted with a new, fixed tricycle undercarriage, with a steerable nose wheel and its mainwheels set well back to facilitate ease of control on the ground.

⁸⁵ American Aviation Historical Society Journal, Winter 2016.

⁸⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

⁸⁷ While replaced by the USAAC, a few soldiered on with the National Guard for a time.

BT-13	Vultee Valiant	Basic trainer	 By March 1944, a single Vultee BT-13A Valiant basic trainer had also been added to the strength of the 24th Fighter Squadron, to augment the instrument training programme. One was still on the books in March 1945⁸⁸. 12 BT-13A were said to have been present in Panama during the war, from March 1943, following a call from the CDC for an aircraft to be used to improve new pilots' navigation skills. It is notable that at least seven were lost.
			The Valiant family outnumbered all other basic trainer ("BT") types during World War 2 and was a docile, low-wing, fixed-gear type with tandem seats and a glasshouse hood. It was originally developed as the private-venture Model V.54 advanced trainer (which had a retractable undercarriage and a Pratt & Whitney R1340 Wasp), tested as the BC-3⁸⁹ in 1938. The lower-powered BT-13 version saw 300 ordered in 1940 – in what was then the largest trainer order ever placed by USAAC.⁹⁰ Production ended in 1944, as the USAAF began to wind down new pilot training. The USAAC/USAAF received nearly 8,000 BT-13, of the total 11,537 built. The Navy also the type as the SNV. All versions were soon retired by US forces postwar – the last being an SNV-2 in 1946.

⁸⁸ North American AT-6D and AT-6F Texans and the BT-13A Valiant, all tandem two-seat trainers, were assigned to the Sixth Air Force to provide additional blind-flying and instrument training – as pilots operating the Panama region required more training than the Air Training Command had provided.

⁸⁹ The "BC" denoting "Basic Combat", for advanced training.

⁹⁰ It was also used by the Navy as its SNV.



BT-13 at Howard Field in 1945



BT-13A in Panama

C-27	Bellanca Airbus	Single-engine utility transport	 Three of the sturdy and reliable C-27A (at least one of which was later redesignated to become a C-27C) served the 19th Wing between 1935 and 1940 and were the primary means of quick transportation between the Canal Zone and Rio Hato during most of the that period⁹¹. One C-27C was lost in a crash in August 1937, killing its six occupants.
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⁹¹ American Aviation Historical Society Journal, Winter 2016.

			This was a high-wing, single-engine light transport with interlinking struts forming a W-shaped wing/strut arrangement that contributed to lift. It had a humped fuselage, long nose, cargo doors and fixed gear. It was an adaptation of the civil Model P.200 of 1930 for use in the military passenger/cargo role. The C-27A version for the USAAC in 1934 had an uprated Pratt & Whitney R1860 Hornet radial engine and a redesigned interior for three more passengers (making 15 in all), and 10 were delivered. The C-27C modification of most C-27A, including at least one of the several C-27A in Panama, involved replacing the original R1860 Hornet with a Wright R1820 Cyclone in a new NACA cowling (as in photo above) in 1934.  <i>C-27 at France Field in 1939</i>
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C-33 DC.3	Douglas DC.2	Twin-engine transport	When the 20th Transport Squadron became operational in March 1941, its first aircraft was a single Douglas C-33 (the other having been written off in Managua in a forced landing, having flown there to recover parts of crashed B-18 bombers),⁹² a version of the DC.2 airliner, making daily flights between France Field and Albrook Field, and then on to Rio Hato. Subsequently, by war's end the squadron standardised on the C-47. <i>The two C-33 at Albrook Field in 1940 (with a third, visiting C-33 from Texas in the background).⁹³</i>

⁹² *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

⁹³ *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

			The DC.2 airliner was a commercial success⁹⁴, and was also the forerunner of the legendary DC.3/C-47 (see below). A 16-passenger airliner, with two Wright R1820 Cyclone radial engines, it was one of a new generation of airliners of the 1930s, and was itself derived from the original DC.1, initially for TWA, as a larger and more powerful development, with the first delivered in 1934. The DC.2 was evaluated by the USAAC as the XC-32⁹⁵, with 18 production cargo transports then being ordered as C-33, and all delivered before the war. The C-33 had a strengthened floor, a larger (DC.3-type) tail and double cargo doors. It could accommodate 12 passengers or 6,000 lb (2,721 kg) of cargo. The cabin floor was fitted at an angle, so that it was parallel to the ground when the aircraft was parked – to facilitate loading and unloading. The aft fuselage also had three reinforced mount points for a tripod hoist assembly which could be fitted to the aircraft on the ground and used for loading and unloading cargo when a forklift or flatbed truck was unavailable. The C-33 was nicknamed the “DC.2½” due to the tail. Following the Pearl Harbor attack, as with the DC.3, various civilian models of the DC.2 were also impressed by the USAAC in 1942.
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⁹⁴ And copied without a licence in the USSR as the ANT-35. It was also licence-built in Japan by Nakajima.

⁹⁵ In Spring 1934, a policy review board, dubbed the Baker Board was formed to review USAAC organisation, aircraft procurement plans, areas of responsibility (with the Navy), missions, etc. The board was formed, in part, in response to the disastrous use of USAAC aircraft and crews to fly the Air Mail in 1934. Several aircraft were lost and it became obvious that the aircraft, equipment and training of commercial airlines and pilots was far better than the USAAC. One of the recommendations of the Baker Board was to encourage the USAAC to evaluate commercial cargo/transport aircraft for use in military missions rather than procure strictly military types which up to that point were greatly inferior to commercial aircraft. The first example of this involved the XC-32/DC.2.



In May 1940, 25 pilots and 29 aircrew from the 19th Wing flew to the US. They were to take part in a reinforcement exercise, this involving four B-18A (for which six B-18 had been exchanged at the San Antonio Air Depot) and two C-33, together with a number of O-47A. They then flew to the Canal Zone, via stops en route, in June. One C-33 was then assigned to Albrook Field and one to France Field (the first twin-engine Douglas transports to be based in Latin America). These C-33 greatly improved the transport capabilities of the Department, a great improvement over the Dolphins chiefly used in the past.

UC-43	Beechcraft Traveler	Single-engine cabin biplane	 It is reported that the 20th Transport Squadron in Panama had at least one UC-43 on its strength.⁹⁶ This is thought to have been for a short time, around May 1943 (being an impressed former civilian Model F17D).⁹⁷
			Aka “Staggerwing”, the Beechcraft Model 17 was a streamlined cabin biplane with retractable tail undercarriage and wings with backward stagger (hence its alternative name of “Staggerwing”). It was company’s first product and was built for the civil market 1932-49. Of mixed construction, it had a steel-tube fuselage and wooden wings. It was evaluated by USAAC in 1939, and was also used by the USN. The first three evaluated by USAAC were then allocated to Air Attaches in London, Paris and Rome prewar. During the war it was used as a 4/5-seat utility type in the communications role, being ordered new-build from 1942. The 273 new-build for the USAAC/USAAF included 132 from USN stocks. 177 impressments included 63 that ended up diverted to the USN.
C-45	Beechcraft Expeditor	Twin-engine light transport	In 1945, records showed that the 24 th Fighter Squadron had a UC-45F assigned to the Squadron to serve as a conversion trainer to twin-engine equipment (the P-38).

⁹⁶ *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

⁹⁷ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

			At least two UC-45 were assigned to Panama in May 1942 (with one serving with the US Mission in Ecuador until at least October the following year). Later seven C-45A (including a field conversion of an AT-7), one each of the UC-45B and UC-45C models, and at least 25UC-45F. Later in the war, UC-45F were used to replace UC-78 that had been used as <i>ad hoc</i> conversion trainers for P-38 pilots. By the end of 1944, 14 were so assigned. In addition, as with the AT-7 version of the same design, numbers undertook military intelligence duties in Latin America. A number of CQ-3 (see below), conversions to drone-directors for use with radio-controlled targets also saw service in Panama.⁹⁸
			 This low-wing light transport had a retractable tail undercarriage and twin fins, and was a great commercial success, being produced by Beechcraft between 1937 and 1969 in various models and a wide variety of roles. It was used by all US forces during the war and for many years postwar. It began as the Model 18 commercial light transport of 1935, an all-metal six-to-eight seat type. It also spawned military variants, in the form of the AT-7 Navigator and AT-11 Kansan trainers.

⁹⁸ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

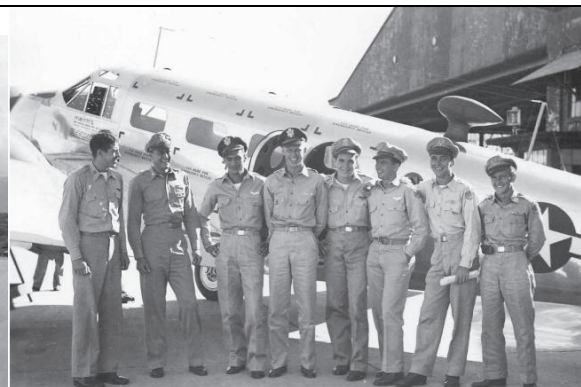
			It was first ordered by USAAC in 1939. In 1943, the designation was changed from C-45 to UC-45, to recognise its utility transport role, and the RAF name of Expeditor was adopted. Over 5,000 were produced for US forces during the war, and there were also many impressments of civilian examples. The C-45 had a long career with US forces after the war, with many being rebuilt in the 1950s for continued service.
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UC-45 at France Field c.1945



UC-45 and UC-78 at Chame



UC-45F at Old France Field, early 1945

C-46	Curtiss Commando	Twin-engine transport	 In January 1944, the 20th Transport Squadron was redesignated as the 20th Troop Carrier Squadron (Special), and 1944 also saw some increased standardisation of types used, with the C-47A and some of the larger C-46A
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			transports being received from March 1945, when the first four arrived.⁹⁹ Postwar, war surplus C-46 were a common sight in Latin America¹⁰⁰. A number were also acquired via Panama in the late 1940s for supply to Israel, serving with its air force and the airline El Al¹⁰¹. It also continued to serve in diminishing numbers with US forces, and by the CIA front company, Air America - so that in 1967, a USAF C-46A (built in 1944) crashed after take-off from Howard Air Force Base in the Canal Zone, killing all nine crew aboard.¹⁰²
			Despite being overshadowed by the smaller C-47¹⁰³ (see below), the C-46 was to be an important aircraft for the US forces during the war and afterwards. It saw widespread use during World War 2, in the Korean War and was supplied to US allies postwar. It was derived from a 1930s design intended as 16-berth or 30-seat airliner with a low wing and retractable tail undercarriage, using a “double-bubble” fuselage design that allowed the wing spar to pass below the cabin. The original CW.20T prototype flew in 1940 with twin fins, but the production C-46, powered by two Pratt & Whitney R2800 Double Wasp radials, had a single fin. It had a spacious fuselage that could accommodate up to 40 troops, 33 litters or 15,000 lb (6,804 kg) of cargo. Production examples lacked the cabin windows of

⁹⁹ *Alas Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹⁰⁰ Panama’s first international cargo airline, AVISPA, used a leased Colombian C-46 when it was created in 1951:

<https://www.aeronautica.gob.pa/recursos/index.php?c=historia>

¹⁰¹ <https://www.israelairlinemuseum.org/el-al-fleet/el-al-fleet-historic/el-al-fleet-historic-curtiss-c-46-aircraft/>

¹⁰² <https://www.baaa-acro.com/crash/crash-curtiss-c-46d-10-cu-commando-howard-afb-9-killed>

¹⁰³ The C-46 was around a third larger.

			the prototype. It was first ordered by the USAAC in 1940, and delivered from 1942 (also being used by the US Navy as its R5C). It featured large cargo doors, folding seats and an hydraulic cargo winch.
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First of the four C-46A in Panama in 1945



An example of continued postwar use in Latin America, a C-46A of Inair Panama in 1971

C-47 DC.3 C-49	Douglas Skytrain	Twin-engine transport	 Its use in Panama included, of course, the locally-based 20th Transport Squadron. By later in 1944 the unit had largely standardised on the C-47 and some of the larger Curtiss C-46 (see above). C-49 were also used by the squadron, the first arriving in March 1941 – and in in October 1941, it was joined by a C-49C, five C-49D and, in November, a C-49B. The latter was to be the personal transport of the Caribbean Air Force commander,
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			Brigadier General Johnson. In November 1941, the squadron also began using the new Howard Field – with six C-49 sent there to work exclusively with the newly-arrived 501st Parachute Infantry Battalion. Following the Pearl Harbor attack in December 1941, aircraft were despatched to Trinidad and Puerto Rico. These detachments would only be recalled in December 1944. In March 1942, the unit suffered its first wartime loss when a C-49C was wrecked at Veracruz, Mexico (though it was later repaired and returned to the US). Another was lost on take-off from Howard Field in June 1943, killing all five aboard.¹⁰⁴ The surviving C-49 were replaced during 1944 by more C-47.¹⁰⁵ In early 1941, two new C-39 were received to supplement the 20th Transport Squadrons first C-33, and were joined by two more in August 1941. Like the C-49, they provided sterling service until replaced by more C-47 in 1944. It is recorded that the 20th Transport Squadron also had a single example of the “rare” C-68 version of the DC.3 design. This designation covered a pair DC.3A airliners impressed on the production line in 1941 as C-68, having a 21-passenger interior.¹⁰⁶ It is also recorded that the 20th Transport Squadron also had a single example of the “rare” C-68 version of the DC.3 design. This designation covered a pair DC.3A airliners impressed on the production line in 1941 as C-68, having a 21-passenger interior.¹⁰⁷
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¹⁰⁴ *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

			In Panama, the C-47A also saw used by the Army Airways Communications System (replacing a stripped-down B-25D in June 1945), and the Tropical Weather School.¹⁰⁸ In 1944-45, C-47 (and B-25J) were used in aerial spraying of DDT to counter the mosquito and malaria threat.¹⁰⁹ As well as normal passenger or cargo transport, during the war it was also used for parachute troops, and as a glider-tug, among other things. The DC.3 airliner version was also used in Panama by the airlines Pan American (which received its first in 1937) and Braniff. In early 1941, two new examples of the hybrid C-39 were received to supplement the 20th Transport Squadrons first C-33, and were joined by two more in August 1941. Like the C-49, they provided sterling service until replaced by more C-47 in 1944. C-49 were also used by the squadron, the first arriving in March 1941 – and in in October 1941, it was joined by a C-49C, five C-49D and, in November, a C-49B. The latter was to be the personal transport of the Caribbean Air Force commander, Brigadier General Johnson. In November 1941, the squadron also began using the new Howard Field – with six C-49 sent there to work exclusively with the newly-arrived 501st Parachute Infantry Battalion.
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¹⁰⁸ *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

¹⁰⁹ <https://achh.army.mil/history/book-wwii-malaria-default>

			Following the Pearl Harbor attack in December 1941, aircraft were despatched to Trinidad and Puerto Rico. These detachments would only be recalled in December 1944. Yet another DC.3 variant, the C-53D Skytrooper troop transport version, was used by Antilles Air Command in Puerto Rico. This single example returned to the US in 1944, but did serve in the Canal in the immediate postwar, from February to October 1947.¹¹⁰
			First flying in 1935, the DC.3 was a larger development of the preceding DC.2 airliner (see above) and over 10,000 were built in the US (with others produced in the USSR and Japan). A long-lived design (examples were still flying in Colombia into the 2020s¹¹¹, and with new engines with the South African Air Force), it saw the first USAAC order in 1940, but with none delivered before the Pearl Harbor attack took place in December 1941¹¹². After the attack, like other airliners and smaller aircraft, many other examples were impressed from civilian airlines for use by the USAAC and US Navy (which designated it R4D). The first Skytrains used by the USAAC were, in fact, impressed ex-airline DC.3, designated C-49¹¹³. These C-49 were on hand by the time of the Pearl Harbor attack. The type was also widely supplied to allies, and the RAF adopted the Dakota name for it. Another variant of the design were designated C-39, and Douglas built 35 C-39A and delivered them to the USAAC in 1939. It was a hybrid, being a variant of the C-33 (the DC.2) but with a DC.3-type aft fuselage and tail, first flown as a prototype

¹¹⁰ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹¹¹ The Colombian AF had 6 AC-47T in 2021, these being stretched turboprop-powered mods based on the Basler BT-67 conversion, the first being completed in 1993 and nine being built. In 2026, one used by a US company operating on anti-narcotics patrols was still based at the former Albroom Field.

¹¹² Although the USAAC had received its first of the design as the C-41 in 1939, this being a version of the Douglas Sleeper Transport (DST) variant.

¹¹³ The C-49 designation covered 51 impressed DC.3 airliners, plus 87 taken direct from DC.3 production line.

			modification as the Y1C-38. It also used a DC.3 centre-section and B-18 undercarriage. There was no direct civil equivalent.
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A Panagra DC.3



Braniff Airways DC.3 at Dallas-Love Field, c.1946



COPA airlines ex-USAAF C-47 in 1947

C-59 C-60	Lockheed Lodestar	Twin-engine transport	 A sole retained example was assigned to the Canal Zone in January 1942, and was assigned to VI Bomber Command as a staff transport in May. However, in November 1944 it was reportedly returned to the US, although other sources say it remained in the Canal Zone until March 1947.¹¹⁴ The C-60A version was intended as a fast paratroop transport, and two were assigned to the Caribbean area during the war. One went to the Antilles Air Command in 1944, and the other to the Sixth Air Force in Panama.
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¹¹⁴ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			The Model 18 Lodestar was, like the Model 14 Super Electra (see A-28 etc), adapted for military use during the war. As well as PV and B-34/B-37 bomber versions (see above), it was also adopted as a military transport. A low-wing, twin tail type with a tail gear, the USAAC had ordered a number as C-59, with all but one of these being supplied to Britain under Lend Lease.
UC-61	Fairchild Forwarder	Single-engine utility type	In 1943, the 20th Transport Squadron received its first UC-61. The Caribbean Air Force had made calls for support aircraft, and the USAAF diverted 10 UC-61 intended for Lend Lease supply to Britain. These arrived on 17 December 1941 and were distributed around Panama. In February 1942, 3 of those UC-61 assigned to France Field were sent on to Dutch Guiana, and later Trinidad. By the end of February 1943, only six UC-61 were left in Panama.¹¹⁵
			This version of the Model 24, a single-engine four-seat civilian utility aircraft, was mainly used by USAAF as a staff and utility transport, more than 1,000 being delivered. It had a high, braced wing with fixed tail undercarriage, a fabric-covered steel-tube fuselage, wooden wings, and used various powerplants.

¹¹⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			It was produced for the USAAC/USAAF from 1941¹¹⁶, with many civilian examples also being impressed. It was built by Kreider-Reisner Aircraft, a division of Fairchild Aviation Corporation, and remained in production from 1932 to 1948, essentially as the same airframe but with various powerplant and configuration enhancements. Postwar Temco produced another 280 for the civil market.
UC-64A	Norduyn Norseman	Single-engine utility transport	  In January 1945, the first UC-64A Norseman to arrive in Panama was assigned to the 15th Base Headquarters and Air Base Squadron, at long last filling the need for a courier and small-parts supply vehicle. <i>UC-64A of XXVI Fighter Command in May 1945. In August 1945, it was wrecked in an accident.¹¹⁷</i>

¹¹⁶ And supplied to the RAF, which called it the Argus.

¹¹⁷ American Aviation Historical Society Journal, Winter 2012.

			The Norseman was a Canadian-built STOL utility transport, a high-wing type with fixed tail undercarriage and optional ski and float gear, designed as a “bush” type for use in the Arctic and northern Canada. Powered by a single Pratt & Whitney R1340 Wasp radial engine, it had 10 seats and was produced 1935-59 (latterly by Canadian Car & Foundry). The USAAF adopted it as a light transport in 1942, with 762 being delivered 1942-44, the USAAF versions having extra fuel tanks. 749 of those delivered were UC-64A. Originally designated C-64A/C-64B, In 1943 the USAAF reclassified it as a utility transport type as the UC-64A and the UC-64B.
UC-67	Douglas	Twin-engine transport	 The UC-67 was a modified B-23 Dragon medium bomber used as a transport. The B-23 had been developed from the B-18A, and incorporated many features of the successful DC.3 airliner, including its wings, together with a new, more streamlined fuselage. It was briefly operational 1939-40, never saw combat, and only 38 were built for the USAAC. Originally designated C-67, only 12 such conversions were produced, with the work undertaken by Pan American Airways, and one of these was assigned to the Headquarters Squadron of the Sixth Air Force in October 1944. It would be handed over to the CDC Panama Canal Department Flight Section in January 1945, adding to its stable of VIP transports. Transferred back in May, it survived to be sold to a civilian buyer in December 1945.¹¹⁸

¹¹⁸ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

C-68	Douglas DC.3	Twin-engine transport	It is recorded that the 20th Transport Squadron also had a single example of the “rare” C-68 version of the DC.3 design. This designation covered a pair DC.3A airliners impressed on the production line in 1941 as C-68, having a 21-passenger interior. ¹¹⁹
UC-70	Howard	Single-engine light cabin monoplane	 Three UC-70 were shown as assigned to the Sixth Air Force, but lack of USAAF records suggest that these were, in fact, former US Navy GH Nightingales (the Navy designation and name for its ambulance use of the type). In any case, in June 1944, the Sixth Air Force was reported to have three UC-70 for “immediate disposition”.¹²⁰
			This designation covered various prewar light cabin monoplanes built by the Howard company and impressed by the USAAC in 1941. It was a single-engine type with a fixed undercarriage with 4-5 seats. They were used as staff transports and air ambulances.

¹¹⁹ *Douglas DC-3/C-47 in Latin American Military Service* by Dan Haggerhorn and Mario Overall.

¹²⁰ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

UC-78	Cessna Bobcat	Twin-engine light transport	The Sixth Air Force had been desperately short of light transport and communications aircraft from the start of the war, but in March 1943 it received the first of 10 UC-78 light transports (described as being “weary”) – though only five were allocated to Panama (the others went to Puerto Rico, where there was a similar shortage). More followed, and filled a gap until the better, and new, Beechcraft UC-45F (see above), also a twin-engine light transport, arrived in April-July 1944. These twin-engine types were used to check out fighter pilots, in preparation of the arrival and use of the P-38. A directive required pilots to have completed at least 10 hours in the twins before being approved for the P-38. As the UC-78 was widely used for twin-engine training in the US, it was preferred for the role and it was thought desirable that at least three to five hours of the 10 hours required should be on type.¹²¹ In Panama, it is known that the 24th Fighter Squadron had at least one UC-78, being on squadron strength by March 1945, and the photo below shows at least one with 30th Fighter Squadron fighters in 1943. The 53rd Fighter Group based at Chame Airfield is also reported to have one or more UC-78, with one being recorded as being written off there following an accident on 6 August 1944¹²².
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¹²¹ *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

¹²² <https://aviation-safety.net/wikibase/99858>

			30th <i>Fighter Squadron P-40 at Aguadulce Army Airfield, 1943. Note the single Cessna UC-78 twin- engine light transport on the flight line</i>
			This was Cessna's first twin-engine design, having a low wing and a retractable tail undercarriage, and had been first offered on the civil market in 1939. Mainly of wooden construction, it was nicknamed the "<i>Bamboo Bomber</i>", although it actually had a steel-tube fuselage. It was chosen in 1940¹²³ for evaluation by USAAC as an advanced transition trainer¹²⁴, being adopted as the AT-8 and AT-17. In 1942, the USAAF decided the type would also be a useful light transport, ordering it as the C-78, with a number of civilian T.50 also being impressed for the same purpose. In the end, the USAAF received over 1,300 UC-78 (as it was reclassified as a utility transport in 1943), plus

¹²³ Cessna's first military contract.

¹²⁴ Also being adopted by RCAF for the same role as the Crane.

			17 impressed T.50, and over 2,000 AT-17 orders were delivered instead as UC-78 utility transports. All UC-78 were declared surplus in 1945, and only a few remained in service with the new USAF in 1947-48, with survivors declared obsolete in 1949.
C-79	Junkers Ju.52/3m	Three-engine transport	 A single example of this three-engine monoplane transport was impressed by the USAAC, having belonged to the Brazilian airline, <i>Sindicato Condor</i>. It was in Panama in 1942 and, like many other civilian types at the time, it was impressed into military service by the USAAC, which allotted the designation C-79. However, by December 1943, the urgent need for transport aircraft, and particularly for a unique type like the C-79, had passed and the aircraft was disposed of in a transfer to the US Public Roads Administration in Costa Rica in 1943 (or 1944). Some steps were taken to replace some of the original equipment of the C-79 with US parts, this including replacement of the original BMW engines with US-built Pratt & Whitney R1690 Hornets, as used on the Douglas DC.2 airliner. The C-79 had begun life as the German-registered of Deutsche Lufthansa, before being transferred in 1937 to <i>Lufthansa Südamerika</i> for use on an Andes route and christened "<i>Aconcagua</i>". On 11 September 1939, it was transferred to the Brazilian airline, <i>Sindicato Condor</i>, and then to <i>Lufthansa Sucursal Peru</i> on 29 November 1940. <i>Sindicato Condor</i> subsequently leased it to <i>Sociedad Ecuatoriana de Transportes Aeroes</i> (SEDTA) on 25 April 1941. It was confiscated by the Peruvian

			Government on 5 September 1941, before being acquired by the USAAC in Panama on 13 May 1942. The Ju 52/3m was also operated across the border by the Colombian Air Force (<i>Fuerza Aerea de Colombia</i>) between 1933 and 1950. It had three floatplane bomber examples, plus two transports, as well as one as the first presidential transport in Colombia.
			The Ju 52 had begun as a single-engine, low-wing monoplane, flying for the first time in 1930. It featured a fixed tail undercarriage and the corrugated skin common to Junkers all-metal types. A version with three engines flew in 1932, and this was developed into the Ju 52/3m main model, as a 17-seat airliner. It was also used as a military and paratroop transport during the war, and as bomber – the Colombian Air Force used three Ju 52/3m as floatplane-bombers in the Colombia-Peru war of 1932-33, and it was also used as a bomber by the Luftwaffe in the Spanish Civil War.
UC-89 H.47	Hamilton Metalplane	Single-engine transport	 Some of the early equipment of the 20th Transport Squadron in Panama in 1941-42 included an assortment of aircraft, with single examples of obsolete and/or former civilian types. These included a single Hamilton H.47 Metalplane, which the USAAF designated C-89 (then UC-89 in 1943, it being reclassified as a utility transport)¹²⁵.

¹²⁵ In USAAC parlance, “C” stood for Cargo or Cargo carrying, and denoted a transport aircraft, whilst the “U” prefix denoted a “Utility” type – usually a smaller aircraft, and not a full-size airliner.

			The H.47 was an eight-seat single-engine, high-wing monoplane that had belonged to a Panamanian company, Transportes Aereos Gelebert¹²⁶. Impressed from its civilian owner in December 1942, it was found to be unsuitable for military use and struck off charge in August 1943 – which was the fate of all of the original assortment of non-standard types. As with the Junkers Ju 52/3m (see C-79 above), this was the only example of the type taken over by the USAAC.
			The H.47 was a version of the earlier H.45, both of which first flew in 1928¹²⁷, with a slightly longer wingspan and a more powerful engine. It had a high wing and fixed tail undercarriage; and featured a corrugated aluminium skin and patented Junkers metal construction.

¹²⁶ During 1930, Isthmian Airways had used it as a floatplane in its service linking the Atlantic to the Pacific between Cristóbal, Colón and Balboa, describing the 30-minute flight to be the "fastest transcontinental service in North America". Founded by a Ralph Ernest Sexton, the first flight (from Balboa to Colón) took place on 5 May 1929. The fare was \$10, or \$14 return (the fare dropped to \$3 in 1932-33 during the Great Depression). The company also provided tourist flights to Taboga and Las Perlas. The Canal Zone Government cancelled the airlines contract in 1936 and Sexton sued: https://www.tvn-2.com/variedad/Aerolinea-Isthmian-Airways-Panama-ayer_0_5012498722.html

¹²⁷ The Hamilton Metalplane Company merged with Boeing in 1926.



UC-89 in Panama



A H.47 as a floatplane with Isthmian Airways in 1930, the airline offered a trans-isthmus service in the 1930s until put out of business, apparently by Pan American

UC-90 UC-90A	Luscombe Silvaire	Single-engine light cabin monoplane	Another of the assorted types impressed for use in 1942 by the 20th Transport Squadron in Panama, two examples of this high-wing light cabin monoplane were taken on charge with the USAAF designation C-90A (becoming UC-90A in 1943).¹²⁸ Like the UC-89 and UC-92, these were the only examples of the type impressed by the USAAF.
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¹²⁸ “U” for cargo-carrying (i.e. a transport) and “U” for utility.

			The aircraft impressed in Panama consisted of two different sub-types– the UC-90 being a Model 8A Silvaire Master two-seater, and the UC-90A a Model 8B, also a two-seater, but designed as a primary trainer. Unlike both the UC-89 and UC-92, the UC-90 were to survive the war in USAAF service, only then being struck off charge and sold onto the civil market in 1945.¹²⁹ Light aircraft such as these were used as “hacks”, for liaison work including as courier and communications aircraft operating between the various airfields in Panama and the Canal Zone. They would also be used to maintain basic pilot proficiency.¹³⁰ The UC-90 was being operated in Panama by Captain Marcos A Gelebert of the <i>Transportes Aereos Gelebert SA</i> (owners of the UC-79 – see above). Powered by a 65 hp Lycoming O-145, the aircraft had been on the US register until sold to its new owner in Panama. They were impressed on 14 August 1942 and held at the Panama Air Depot. Its last recorded USAAF use is recorded as being with the Headquarters Squadron, Sixth Air Force at Albrook Field. It was transferred to the Foreign Liquidation Commission for disposal on 26 December 1945. Sold to a Panamanian company, it was damaged beyond repair on 18 October 1947 (probably at Patilla Point Airport). Note that this aircraft carried the nickname “Junior” on its nose.¹³¹ The UC-90A was impressed on 14 August 1942 from its civilian owners and also held at the Panama Air Depot. On 4 December 1942, it crashed during an emergency forced landing, but with no injuries reported and the aircraft being repaired. Its last use in USAAF service is recorded as being with the 350th Base
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¹²⁹ http://cfiamerica.com/Military_Luscombe_UC-90A_and_UC-90.html

¹³⁰ Ibid.

¹³¹ Ibid.

			Headquarters and Air Base Squadron at Rio Hato. On 8 October 1945, it was transferred to the Foreign Liquidation Commission for disposal, being initially sold to a private owner in Panama¹³².  <i>Unknown airman alongside the UC-90 in 1945</i>
			First flying in 1937, about 6,000 of this popular design were built by various manufacturers 1938-42, 557 having been delivered by the time the US entered the war, and continuing in production postwar to the 1960s. It had a semi-monocoque fuselage, fabric-covered with metal-framed wings, and a fixed tail undercarriage.¹³³
UC-91	Stinson SM.6000A Trimotor	Three-engine transport	 A trimotor monoplane transport, not unlike the Ju 52/3m (see C-79 above), and like that aircraft the UC-91¹³⁴ was to be the only example of its type to serve with the USAAF in the war. Also like the C-79, it was one of a group of impressed

¹³² It eventually ended up in Costa Rica, where it reportedly crashed in 1962 (although it is said not to have been recorded on the country's aircraft register for 1957 or 1958).

¹³³ Ibid.

¹³⁴ "U" for cargo-carrying (i.e. a transport) and "U" for utility. The type was reclassified from C-91 to UC-91 in 1943.

			types acquired for use by the 20th Transport Squadron, but disposed of when more suitable aircraft became available. It was acquired from the same Panamanian company Transportes Aereos Gelebert, as the impressed C-79. Few details are said to be available on the use and the disposition of the UC-91, though one source suggests that it operated from Albrook Field. In any case, by January 1943 it was grounded due to lack of spares, and was transferred to PAD in June.¹³⁵
			The SM.6000 was a US-built high-wing, 3-engine monoplane with fixed tail undercarriage and had first flown in 1930 – one of a group of designs, including the Ford Trimotor, that immediately preceded the more modern airliners (like the Boeing 247, DC.2 and DC.3) that were to appear during the 1930s. It had a steel-tube fuselage, with wooden wings and tail surfaces. 53 were built 1930-32. It could carry nine passengers or 2,930 lb (1,329 kg) of cargo.
UC-92	Akron-Funk B.75L	Single-engine light cabin monoplane	 This was another of the assortment of various types that the 20th Transport Squadron had on its strength in 1941-42. It was also the only example of this aircraft type impressed by the USAAF during the war.

¹³⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			Given the designation UC-92 (the C-92 originally, becoming UC-92 in 1943)¹³⁶, it was impressed in 1942, but soon disposed of in 1943, being sent to storage at PAD. In June 1945, it was sold to a US resident in Panama as surplus under the Foreign Economic Administration (FEA).¹³⁷
			A two-seat, high-wing light cabin monoplane with a fixed tail undercarriage, it resembled the more famous Piper Cub. It was derived from the original Funk Model B of 1934, with the Akron company established in 1939 to produce it as the B.75L – production continuing until the US entered the war, and resuming in 1946-48 with it called the Bee, with a total of over 300 being built¹³⁸.
UC-95	Taylorcraft Grasshopper	Single-engine light cabin monoplane	See also L-2. At least one example of this militarised version of the pre-war Plus D light cabin monoplane was used in Panama. A photograph of one having crashed in the surf is of an L-2F, a civilian impressed aircraft, previously on the Panamanian civil register.

¹³⁶ “U” for cargo-carrying (i.e. a transport) and “U” for utility.

¹³⁷ Established in September 1943 to coordinate between different US agencies and departments operating overseas. This was said to have involved a merger of all or parts of 43 different agencies. It was wound up by the Truman administration after the war. Its organiser was said to have merged 14 agencies into four and created two bureaus, the Bureau of Areas and the Bureau of Supplies. In general, the Bureau of Areas was in charge of determining the needs of the various regions of the world, while the supply side was then responsible for fulfilling those requirements.

https://fraser.stlouisfed.org/files/docs/historical/martin/54_01_19440925.pdf

Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command by Dan Hagedorn (Turner Publishing, 1995)

¹³⁸ <http://www.funkflyers.com/history>

			Two Model BL.65 civilian aircraft were impressed in Panama, and were being processed at PAD in August 1942, being designated as L-2F and L-2L.
XC-105	Boeing Model 294	Four-engine transport	 In August 1938, following the completion of tests, the single XB-15 was given to the 2nd Bombardment Group. It was used in providing humanitarian relief after an earthquake in Chile in 1939, and in April 1939 undertook bombing tests in the Canal Zone. It was also used for secret tests in Panama in 1940, practising bombing attacks on the Canal locks, and operating from Albrook Field¹³⁹. The aircraft was then used during the war as an <i>ad hoc</i> transport, having been converted and redesignated as the XC-105 on 6 May 1943, fitted with a pair of cargo doors and an internal hoist system. It had a crew of six (reduced from the 10 of the XB-15) and served in this transport role until 18 December 1944. During its use by Sixth Air Force, it carried 5,300 passengers, 100,000 lb (45.359 kg) of freight and 50,000 lb (22,679 kg) of mail. In June 1945, the XC-105 was stripped, abandoned and eventually buried at Albrook Field.

¹³⁹ The aircrew included a Captain Curtiss LeMay as navigator, this being the future chief of the US bomber force against Japan and the latter commander of the postwar Strategic Air Command.

			Designed to a 1933 USAAC requirement for a very long-range bomber as the XBLR-1¹⁴⁰, the Model 294 first flew in 1937 as the prototype XB-15 bomber¹⁴¹, and was then the largest aircraft ever built in the US. However, it proved to be seriously underpowered (it used four Pratt & Whitney R1830 Twin Wasp radials, the intended engines not being available¹⁴²) and remained only a one-off experimental prototype. The following, successful B-17 was much smaller.
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The XC-105 at Bolling Field, Washington DC in 1940



In Panama in 1943

¹⁴⁰ USAAC designation “Experimental, Bomber, Long Range”.

¹⁴¹ A video is available on You Tube showing its first flight: <https://www.youtube.com/watch?v=KSu4s9JiXl0>

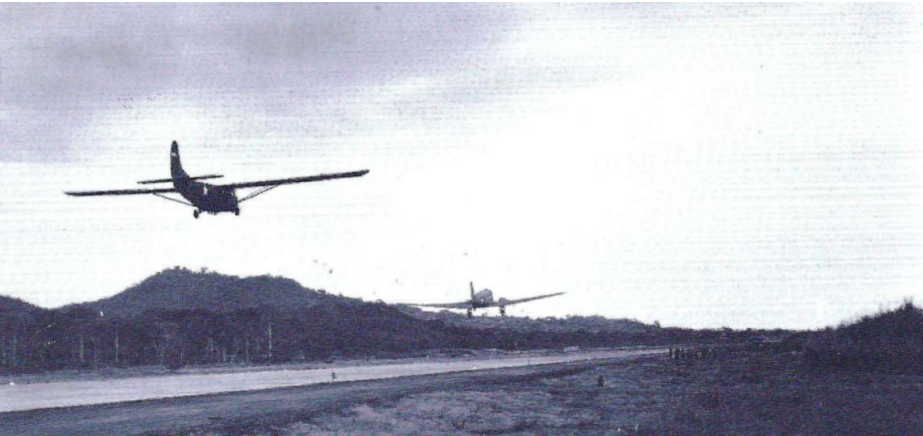
¹⁴² It was intended to use the Allison V3420 (which were two V1710 engines linked as one unit).

CG-4	Waco Hadrian	Transport glider	 The 1st Observation Squadron (redesignated the 1st Reconnaissance Squadron in July 1943) in Panama is reported to have on its strength an unknown number of CG-4 cargo gliders in 1943. In Panama, an Army major had been undertaking experimental jungle landings of troop-carrying gliders in Panama using the CG-4A in 1943-44, and was to attract the attention of officers seeking to establish a new Air Commando organisation, inspired by the Wingate Chindit operations in Burma¹⁴³. Calzada Larga in the province of Panama is said to have been used 1942-44 for the training of glider transport pilots.
			The CG-4 was the most widely-used troop-carrying and cargo glider of the war, used by both the US and British forces (it was the latter that named it the Hadrian), with more than 13,000 built. It was built of wood and metal and was fabric-covered, had two crew and could carry 13 troops, or a Jeep, light artillery or other equipment. In Panama it would usually be towed by a C-47 transport aircraft.

¹⁴³ For more details, see <https://wordpress.com/post/raytodd.blog/40175>

The Long Range Penetration Groups of the British and Indian Armies undertook operations behind enemy lines in Burma 1943-44, depending on air supply and air evacuation of sick and wounded. They had been the idea of Brigadier Orde Wingate, who died in an air crash in 1944.

Experiments in Panama appear to have involve a troop-carrying glider assigned to the 1st Reconnaissance Squadron in 1943, which would be towed by a Douglas C-47 Skytrain transport of the 20th Troop Carrier Squadron. This was believed to have been the only known glider operations undertaken by the USAAF in the Central American/Caribbean region during the war. One former pilot with the Sixth Air Force based in Panama is quoted as saying that the prospect of “*landing the CG-4A someplace in Panama was unthinkable*”.¹⁴⁴ At the time, Panama, including the Canal Zone, was much less developed than now, when there remains extensive areas of dense jungle and, combined with the mountainous regions and the dangerous animals in the wild areas (including crocodiles and jaguars, not to mention the snakes and insects), once can see his point.



C-47 of 20th Troop Carrier Squadron towing an CG-4A at Howard Field

CQ-3	Beechcraft	Drone director	This was a “drone-director” conversion of the UC-45F (see above) used to control radio-control target aircraft.
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¹⁴⁴ *Alae Supra Canalem: Wings Over the Canal* by Dan Hagedorn (Turner Publishing, 1995).

			Near the end of the war, Culver PQ-8 target aircraft became available in Panama ¹⁴⁵ and three CQ-3 were received for use by the 23 rd Tow Target Squadron, but did not reach Albrook Field until the war had ended, arriving on 21 September 1945. ¹⁴⁶
F-2	Beechcraft	Photo-survey aircraft	This was another aircraft type based on the C-45 light transport, adapted for non-combat photo-survey work. They were fitted with trimetrogon camera equipment. The F-2B would be identical to standard UC-45F, except for the camera ports. Two F-2B were assigned to the Sixth Air Force by April 1945, although they are reports that at least one of the examples were mainly used as a transport.¹⁴⁷
F-5G	Lockheed Lightning	Reconnaissance	See P-38, this being a dedicated photo-reconnaissance version. In 1946, 10 F-5G were allocated to the Foreign Liquidation Commissioner (FLC) in the Canal Zone for salvage or surplus action.

¹⁴⁵ Such radio-controlled targets replaced towed target drogues.

¹⁴⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

¹⁴⁷ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

JF J2F	Grumman Duck	Single-engine utility amphibian	The photo of Santa making a delivery proves that at least one Duck amphibian was present in the Canal Zone, and would have been based at Coco Solo, if attached to the Fleet Air Base. It is unclear from the photo whether the aircraft was a prewar JF or a wartime example. <i>A J2F-6 Duck (not in Panama)</i>
			The three-seat amphibian could also carry a stretcher or two passengers. It was delivered from the US Navy from 1934 under the JF designation, and during the war it operated from land bases and from aircraft carriers. Its roles included air-sea rescue, as well as being used as a target-tug, for photo-survey etc. The J2F variant was introduced in 1937, and Columbia also began licence-manufacture of the J2F in 1942, though the planned JL designation was not used. It was a single-engine biplane with a large integral central float and outriggers, also having a glasshouse hood and retractable tail undercarriage. It was widely used during the war, with over 600 of all models produced.

L-1 O-49	Stinson Vigilant	Single-engine liaison monoplane	On 7 December 1941, this type was in use with the 39th Observation Squadron (alongside older O-47A types). There were no more than 17 O-49 and two O-49A in the Caribbean during the war at any time. In January 1942, the 72nd Observation Group arrived in Panama, bringing with it nine O-49. <i>L-1 in December 1944 at Howard Field</i>
			This newer design had first flown in 1940 and had been developed by the Stinson company¹⁴⁸ and was a high-wing, two-seat lightplane with a fixed tail undercarriage and a Lycoming R680 radial engine. It represented a different approach to the observation role than the O-47, and one that became the rule during the war. It marked the transition between heavier and larger observation aircraft used by the USAAC in the 1930s and the lighter liaison "Grasshopper" type aircraft represented by the "L" designation series during World War 2.

¹⁴⁸ But, for whatever reason, was always referred to as a "Vultee Vigilant", even though built in the Stinson works (albeit it having been absorbed by Vultee in 1940).

			It was designed to a 1938 USAAC requirement, ¹⁴⁹ winning over 11 rival designs and being ordered into production in 1939. It was redesignated from O-49 to L-1 (the “L” denoting a “Liaison” role) in 1942.
L-2	Taylorcraft Grasshopper	Single-engine liaison monoplane	 At least one example of this militarised version of a pre-war light cabin monoplane was used in Panama (as evidenced by a photo of the remains of an L-2F model in the surf). The L-2F in question was a civilian impressed aircraft, previously on the Panamanian civil register. In Panama such types were generally used as “hacks” for general communications work. Two Model BL.65 civilian aircraft were impressed in Panama, and were being processed at PAD in August 1942, being designated as L-2F and L-2L. Some sources say that it was this L-2L that was the aircraft seen in the surf, whereas the other impressed exemplar lasted until December 1944, when based at Chame.¹⁵⁰

¹⁴⁹ The specification being revised after the German Fiesler Storch was demonstrated in the US in 1938.

¹⁵⁰ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			 <i>This L-2F crashed while attempting to land on a beach west of Tranquilla on 6 December 1944</i>
			The USAAC had evaluated the Plus D, alongside similar Piper (see L-4 below) and Aeronca types, for the “liaison” role, for direct support of Army ground operations, such as artillery spotting – all of which light aircraft shared the “Grasshopper” name. It was a high-wing two-seater with a fixed tail undercarriage was designated L-2 in Army service, and was ordered into production for the USAAC in 1941, with over 1,000 acquired (including civilian impressments). The L-2F designation covered seven impressed examples of the earlier Model BL.65 version (the Model B was the immediate predecessor of the Model D) with side-by-side seating.

L-4	Piper Grasshopper	Single-engine liaison monoplane	In 1942, the first L-4A arrived in the Canal Zone and assigned to the Howard Field-based 108th Reconnaissance Squadron and gave the station its first, limited liaison aircraft capability, which was in great demand, due to the difficulties of transiting the Canal Zone because of the huge increase in the number of personnel and wheeled traffic. On 8 March 1944, the 24th Fighter Squadron was reported to have an unknown number of (possibly just one) Piper L-4 on its strength, together with a handful of other assorted types, in addition to its fighter complement. There were likely a sizeable number of L-4 and similar types in Panama during the war. It is reported that no fewer than 55 L-4A, 1 L-4B, 4 L-4F, 1 L-4E, and 2 L-4C (the L-4F, E and C all being former civilian aircraft that had been impressed).¹⁵¹ From June 1945, the surviving 25 L-4A and a single L-4C were scrapped, or sold using the FEA, the last being sold in December.¹⁵²
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¹⁵¹ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹⁵² *Ibid.*

			 <i>L-4 on Galapagos islands</i>
			The L-4 (originally designated O-59 by the USAAC) was the military versions of the highly successful two-seat Piper J3 Cub high-wing light cabin monoplane.¹⁵³ Like all such lightplane observation types during the war, it was called a Grasshopper. Ordered for evaluation in 1941, the L-4 was one of several types that marked a move by the US Army to the use of smaller, lighter types for the observation role. Between 1941 and 1945, the USAAC/USAAF procured almost 6,000 Pipers. Such Grasshoppers performed a wide variety of functions throughout the world such as artillery fire direction, pilot training, glider pilot instruction, courier service and front-line liaison. In addition, to production for the Army, over 100 civilian examples of the Cub were impressed by the USAAC/USAAF.

¹⁵³ The Cub was originally developed for the civilian market by Taylor Bros, with Piper buying out the remaining Taylor shares in 1935, when the company was renamed Piper. The J.3 model was introduced in 1937 as a tandem two-seater.

O-1E	Curtiss Falcon	Single-engine biplane observation type	 Records suggest some remained in use with the 7th Reconnaissance Squadron in 1939 – being used in the search for the three missing P-36A in September 1939.¹⁵⁴
			This was a tandem two-seat, open cockpit biplane which had its origins in a 1923 prototype and was still in production in 1933. The original Model 37 prototype was designed as a replacement for the British-designed, World War 1-vintage De Havilland DH-4. First ordered by the USAAC in 1925, there were many variants, not just for the observation role, with attack variants beginning with the A-3 of 1927. There were also US Navy and US Marine Corps variants. The O-1E was the major production model, with 37 being built, powered by a Curtiss V1150 D.12 water-cooled engine.

¹⁵⁴ According to a mention in *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021), “O-17E” were used in the search. However, no such model of the Consolidated O-17 existed, and I believe this to be an error, and the aircraft involved were more likely the O-1E version of the more common Curtiss Falcon.

O-19	Thomas-Morse	Single-engine biplane observation type	 <i>O-19 of the 6th Composite Group based in the Canal Zone in 1935</i> This was a typical between-the-wars two-seat reconnaissance/observation biplane which first flew in 1929. With tandem open cockpits and a metal airframe, but fabric-covered wings and tail surfaces. The USAAC received 71 of the O-19C model, ordered in 1930 and the version used in Panama. The O-10C model featured a ring cowling around the engine, surrounding the exposed cylinder heads of the Pratt and Whitney Wasp engine, and a tail wheel One of several similar types used by the USAAC, as late as September 1939, a number were still operational with the USAAC in the Philippines.
O-47A O-47B	North American	Single-engine observation type	 In Panama (as in California) this saw limited use early in the war on anti-submarine patrols. Later in the war they were used in the target-tug role. At the time of the Pearl Harbor attack, 13 O-47A were operational in the Canal Zone.¹⁵⁵

¹⁵⁵ <https://www.laahs.com/latam-anti-submarine-campaign/>

			On 7 December 1941, the type was in use with the 39th Observation Squadron (alongside the later O-49 type, see below). 18 O-47A and three O-47B arrived in the Canal Zone in early 1942 with the 72nd Observation Group. In addition to service in Panama and the Antilles, O-47 were also dispersed to bases on foreign territory throughout Latin America, including the Galapagos Islands, Peru, Nicaragua, Guatemala, etc.¹⁵⁶ The last obsolete-designated RO-47A in Panama were six “salvaged” in October 1945 (although two more survived in Puerto Rico until the following January).¹⁵⁷
			This was a pre-war, mid-wing three-seat observation type, with a long glasshouse-type hood, tandem seating, a Wright R1820 Cyclone radial engine and a retractable undercarriage. It also featured windows in the lower fuselage for use by the observer. The prototype, built by General Aviation before its absorption by North American Aviation, flew in 1935, and 235 were supplied to the USAAC, replacing the previous biplane types. During the war, such “heavy” observation types were replaced by versions of lightplanes, using the “L” (for liaison) designation. When the O-47A appeared in 1935, the USAAC operated observation squadrons dedicated solely to reconnaissance missions, and the type was designed specifically for this role. It was ordered into production in 1937, becoming the standard USAAC and National Guard observation type up to the time of the Pearl Harbor attack in December 1941, but saw no operational use in combat – except when caught at overseas bases in the Pacific theatre. It was also used as a trainer and in other secondary roles¹⁵⁸.

¹⁵⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹⁵⁷ *Ibid.*

¹⁵⁸ Trials in 1941 demonstrated its shortcomings, and demonstrated that for the army co-operation type light aircraft types were the more suitable.

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In 1999, the wreckage of an O-47 was found in the mountains of western Panama, having been lost without trace on 8 June 1941.¹⁵⁹ It was excavated in 2002 (and the crews' remains recovered). The three men had departed France Field in an O-47A of the 39th Observation Squadron, bound for Rio Hato. When the aircraft failed to arrive, a search was initiated by both air and ground forces but they were not found.¹⁶⁰



O-47A (37-276) of the 1st Observation Squadron in 1942¹⁶¹



O-47A on Galapagos Islands



A pair of O-47A target tugs in Panama

¹⁵⁹ <https://ww2aircraft.net/forum/threads/north-american-o-47.42542/>

¹⁶⁰ <https://www.af.mil/News/Article-Display/Article/133043/remains-of-missing-world-war-ii-airmen-returning-home/>

¹⁶¹ <https://www.laahs.com/latam-anti-submarine-campaign/>

O-52	Curtiss Owl	Single-engine observation type	 The 108th Observation Squadron had at least one O-52 at Howard Field at the start of the war – not documented apparently, but later recalled by members of the squadron. However, 10 saw use in the anti-submarine role with the 2nd Reconnaissance Squadron for in-shore patrol role from Losey Field, Puerto Rico and Waller Field, Trinidad.¹⁶²
			The O-52 flew in 1941, and was a single-engine monoplane observation type, all-metal and with a parasol wing. With a Pratt & Whitney R1340 Wasp radial engine, it was of the “heavy” observation type, soon to be superseded by “liaison” types based on light aircraft designs, lightplane types being considered more suitable following trials in 1941. The O-52 was not used in combat, but was used in training, though a few had been sent overseas to Pearl Harbor and the Philippines. It drew heavily on the US Navy designs from the company in the 1930s, even using the landing gear from the BF2C Goshawk fighter-bomber, and the collapsible rear turtledeck structure from the SOC Seagull and SO3C Seamew scout-observation types – which provided a good field of fire for the dorsal gun. It was ordered without a prototype in 1939, being the last of the “heavy” observation types (like the O-47 above) for the USAAC. It was armed with a fixed and a dorsal 0.3-inch (7.62 mm) machine gun.

¹⁶² <https://www.laahs.com/latam-anti-submarine-campaign/>

			The USAAC had acquired 203 O-52. 10 saw use in the anti-submarine role with the 2 nd Reconnaissance Squadron for inshore patrol role from Losey Field, Puerto Rico and Waller Field, Trinidad. ¹⁶³
ZOA-4C	Douglas Dolphin	Twin-engine amphibian	 One OA-4C Dolphin amphibian, assigned to Panama in 1936, remained in use at Albrook Field on 7 December 1941, designated ZOA-4C (denoting it being regarded as obsolete), and remained in use throughout the war, only being finally condemned at PAD on 15 October 1945.¹⁶⁴
			The Dolphin design had begun as a “flying yacht” called the Sinbad in 1930, a high-wing amphibian with its two engines mounted on struts above the wing. Originally ordered by the USAAC as a navigator and rescue aircraft to accompany bombers, it was later reassigned to transport and observation roles (as well on anti-smuggling work during Prohibition). The “OA” designation of the OA-4C denotes the type being both an observation type and an amphibian. ¹⁶⁵

¹⁶³ <https://www.laahs.com/latam-anti-submarine-campaign/>

¹⁶⁴ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹⁶⁵ Ibid.

Y1OA-8	Sikorsky Baby Clipper	Twin-engine amphibian transport	 The 7th Reconnaissance Squadron (later the 397th Bombardment Squadron) had on its strength a single OA-8. In May 1941, the 37th Pursuit Group received a single OA-8, disposing of it in due course to the airfield support squadron at France Field.¹⁶⁶ It is recorded as being lost on 26 July 1941, during a landing on water near Chame Point.¹⁶⁷
			The USAAC only obtained five OA-8, a parasol-wing, twin-engine amphibian with a retractable tail undercarriage, which had completed its acceptance tests in 1937. They were allocated to the Military Transport Service, with seats that could be removed to carry cargo. The OA-8 was a modified version of the civilian S.43, itself a scaled-down version of the S.42 Clipper, a 25-passenger amphibian used by Pan American Airways¹⁶⁸ (and later turned over to subsidiaries, including <i>Panair do Brasil</i>). It was also used by the Navy and US Marine Corps as the JRS.

¹⁶⁶ https://military-history.fandom.com/wiki/37th_Operations_Group

¹⁶⁷ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹⁶⁸ In August 1937, a Panagra S.43B crashed near Coco Solo, killing all 14 on board: https://www.wikiwand.com/es/Sikorsky_S-43

OA-9	Grumman Goose	Twin-engine utility amphibian	 In August 1939, four OA-9 (the designation denoting the type being an observation amphibian) were assigned to Panama, and sent to Albrook Field and France Field. However, by the time of Pearl Harbor, only one remained after accidents. In 1942, a further example was assigned to the Sixth Air Force, to answer an urgent need for support for remote Aircraft Warning Stations.¹⁶⁹ Two were lost in Panama during the war, and one was damaged during a search for the lost three P-36A fighters in 1939. In 1948, the new USAF redesignated the type A-9. However, most had been disposed of as surplus at the end of the war. A single example of the OA-13A type, based on the G.21A Goose model, was also nominally assigned to the Sixth Air Force. However, serving with the 16th Photographic Squadron, it seemingly operated everywhere but in Panama, in Peru, Colombia and Brazil, before returning to the US in August 1944.¹⁷⁰
			This was the USAAC version of the G.21 Goose six-seat light amphibian, with 26 being acquired in 1938 for liaison and observation duties (a small number were

¹⁶⁹ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

¹⁷⁰ *Ibid.*

			also impressed from civilian owners in the US during the war, and a small number from the Navy, which designated the type the JRF). The first Grumman monoplane design, flying in 1937, it spawned a series of other amphibians. Oddly perhaps, its origins were from 1936, when a group of wealthy residents of Long Island approached Grumman and commissioned an aircraft that they could use to fly to New York City. Capable of carrying up to eight passengers, the USAAC also used it for air-sea rescue work (as it was in Panama).
OA-10	Consolidated Catalina	Twin-engine patrol flying-boat	See PBY
OA-11	Sikorsky Baby Clipper	Twin-engine amphibian transport	This large twin-engine amphibian 11-seat transport was a scaled-down version of the S.42 Clipper airliner built for Pan American Airways. The S.43 was originally ordered by Howard Hughes for a planned round-the-world flight. Impressed by the USAAC and assigned to the Corps of Engineers, sent to France Field in August 1941. However, it was soon transferred to Trinidad, where it would be wrecked. ¹⁷¹
OA-14	Grumman Widgeon	Twin-engine amphibian light transport	These were impressed G.44 amphibians, something of a “smaller brother” to the OA-9 Goose. Four were nominally assigned to Panama, but actually they mostly operated throughout the Caribbean region.

¹⁷¹ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

OS2N	Chance Vought Kingfisher	Single-engine scout/observation floatplane	Four of these observation scout types were lost by the US Navy in Panama during the war. They were the OS2N-1 model, a licence-built version produced by the Navy's own production facility, thus allowing Chance Vought to close its own production line of the equivalent OS2U-3, although using parts that were actually produced by Chance Vought. 300 OS2N were delivered to the Navy in 1942, having been ordered in 1941. In frontline Navy units, it began to be replaced by the Curtiss SC-1 Seahawk from 1944. There were OS2N-1 at Coco Solo, thought a good option for inshore patrols, with at least 16 used.¹⁷²
			A two-seater, it could use either a fixed tail undercarriage or operate as a seaplane on floats (a central main float and outriggers). The design had been originally ordered as the OS2U in 1937, for the Navy's VOS (heavier-than-air observation-scout) requirement. Operational in 1940, it was intended primarily for use as a scouting aircraft based on large warships, as a floatplane launched by catapult. Armed with a fixed

¹⁷² *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

			forward and a dorsal machine gun, it could also carry two small bombs. It was also used for air-sea rescue and in the anti-submarine patrol role.
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NOTE

Between the wars, the USAAC required its fighters to be point-defence interceptors, able to defend key population and industrial centres of the Continental US (or those near the seacoasts), and the overseas possessions in the Philippines, Hawaii and Panama. For this role, they needed excellent climb rates from take-off, a decent armament, a good low-to-medium altitude performance, and the range and endurance to carry out its role. After all, there was, until at least the late 1930s, little chance of large numbers of enemy strategic bombers reaching the targets protected, and the only fighters encountered might be those flown from aircraft carriers. Hence, despite what one might think of the capabilities of the fighters in use with the USAAC, those deployed in the 1930s and early World War 2 were the best that were available, given the official requirements.

P-12	Boeing	Single-seat biplane fighter	 As war approached, at the start of 1939, the 19th Wing in the Canal Zone still had on its strength a handful of obsolete P-12E and P-12F biplane fighters¹⁷³. However, by June 1939, the P-12 had been replaced in the main by the much better P-36A Hawk monoplane fighters – although some of the equally obsolete P-26A remained on the strength.
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¹⁷³ <https://www.afhra.af.mil/Portals/16/documents/Studies/1-50/AFD-090602-096.pdf>

			The first P-12 had arrived in the Canal Zone in 1930, with two squadrons retaining them until 1939. As with other aircraft types, the basic process was that older types and versions would be sent to overseas units, as newer types became available in the Continental US to what was known (from 1935) as GHQ Air Force. Hence, the P-12 received in the Canal Zone would have been formerly used by squadrons in the US. The 16th Pursuit Group (with 24th, 29th, 74th and 79th squadrons) used the P-12. The two models mentioned in use in the Canal Zone were the P-12E, which featured a semi-monocoque metal rear fuselage and later saw the tailskid being replaced by a wheel; and the P-12F, which had an uprated engine and a tail wheel as standard (or retrofitted), and some had a headrest incorporating a life raft. Both were armed with two 0.3-inch (7.62 mm) machine guns and were powered by a Pratt & Whitney R1340 Wasp radial engine. In 1939, the P-12E and P-12F took part in a final exercise, before being dismantled and shipped by freighter back to the US, destined for the most part for the Advanced Flying School at Kelly Field. The P-12 stationed in the Canal Zone were armed only with 0.30-inch machine guns, with the reason for not using the heavier 0.50-inch machine guns appears to be the widely held belief that any force attacking the Canal would be using lightly built, carrier-borne aircraft and that the weight saved by using the lighter machine gun would enable the elderly P-12 to have some chance of carrying out a successful interception. However, in the annual exercises, up against the new Martin B-10B monoplane bomber (see below), such interception was shown to be impossible except under the most unusual and carefully planned circumstances.
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			The type first flew in 1929, was perhaps the ultimate USAAC biplane fighter and was the equivalent to the US Navy's near identical F4B. A typical biplane fighter of between the wars, it had an open cockpit, fixed landing gear, a single-seat and an armament of two rifle-calibre machine guns. It was the last Boeing biplane and, with the contemporary P-6E, the last USAAC biplane fighter. It began as a private-venture and a virtual double of the F4B, which had impressed the USAAC, and was taken on by the USAAC without even a prototype. It was largely replaced by the P-26 in 1934-35, being relegated to the training role, and then to use for ground instruction etc from 1941. Production of all variants totalled 586.
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P-12E were originally built with flotation gear in the upper wing as on previous models, but this feature was deleted in service and replaced in most examples by a rubber life raft for the pilot stored in an enlarged "Panama" headrest, so named because it was originally developed for use in the Canal Zone area. This gave the P-12E a distinctive "hunchback" appearance. Many P-12F were also fitted in service with the "Panama" headrest.¹⁷⁴

¹⁷⁴ http://axis-and-allies-paintworks.com/e107_plugins/forum/forum_viewtopic.php?p=1&id=12967#post-12967



A model of P-12E of 16th Pursuit Group in Canal Zone in 1934



Painting of P-12E of 24th Pursuit Squadron in 1935



P-12E over Canal Zone in 1935

P-26	Boeing Peashooter	Single-engine fighter	 It was 1938 before the first of 26 P-26A arrived in the Canal Zone (in accordance with the USAAC policy of pushing older types out to overseas garrisons as newer type were delivered to GHQ Air Force in the Continental US) to relieve
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			the last of the 19th Wing's P-12 biplanes in late 1938.¹⁷⁵ However, by then the youngest of the P-26A supplied was already five years old and had seen good use in the Continental US. With the more modern P-36A arriving in the Canal Zone from August 1939, the P-26A was to be merely a transitional type. Most arrived wearing spectacular pre-war colour schemes, and were assigned in small packets to the various Pursuit Squadrons,¹⁷⁶ which were then working up, although initially they were concentrated at Albrook Field with its hard-surface runway. Despite its antiquated appearance to modern eyes, to many of the young pilots at the time, the P-26A was their first monoplane, and its relatively high landing speed, combined with the (to say the least) indifferent runway surfaces such as at France Field, led to many landing accidents – although the first two that were lost in 1939 were actually ditched in the sea.¹⁷⁷ By the time of the Pearl Harbor attack in December 1941, the P-26A had been supplanted in the defence of the Canal Zone by the P-36 and P-40. For example, the 30th Pursuit Squadron had been activated on 1 February 1940 at Albrook Field, as part of the build-up of the Canal Zone defences. It was initially equipped with the P-26A, with its mission being the air defence of the Canal, these being replaced by P-40 in November 1941.
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¹⁷⁵ The Philippine Department received the first, early in 1937, followed in turn by the Hawaiian and Panama Canal Departments:

<https://media.defense.gov/2016/Mar/17/2001481634/-1/-1/0/PAGES%20FROM%20AVIATION%20IN%20THE%20US%20ARMY%201919-1939.PDF>

¹⁷⁶ Until the USAAC became the USAAF in 1942, it persisted in calling fighters “pursuit” types, and even after then continued the “P” designation series, “F” (for fighter) designations only beginning when the new US Air Force was established in 1947.

¹⁷⁷ *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

			By the end of 1941, just 11 of the original 26 P-26A remained; nevertheless, they were tasked with providing (as part of the newly-formed Panama Interceptor Command) detachments at Guatemala City and San Jose Aerodrome in Guatemala – to guard the air supply route through Central America and the upper end of the Pacific patrol arc. As mentioned, the Sixth Air Force¹⁷⁸ in Panama was the last USAAF command to operate the P-26A in unit strength, long after units elsewhere had confined them to become operational trainers or instructional airframes.¹⁷⁹
			First flown in 1932, this small, open cockpit fighter, with its wire-braced wing and fixed tail undercarriage, looked outdated almost as soon as it entered service – this illustrating the rapidity of fighter development during the 1930s. It was the last US Army fighter with an open cockpit, the last with externally-braced wings, and the last with a fixed landing gear. It had been officially retired from frontline use by the time of the Pearl Harbor attack in December 1941, but a few remained in use in the Philippines, with the Philippine Army Air Corp¹⁸⁰ also having 12 of them, which saw some action during the Japanese invasion. By 1942, the only P-26A still in USAAF service in 1942 were nine that were based in Panama.¹⁸¹ Begun by Boeing as a private-venture, production deliveries began in 1934 and, at its peak it equipped five USAAC squadrons, with a total of 135 being delivered. The

¹⁷⁸ In 1942, with the creation of the USAAF, and under a further reorganisation, the Panama Canal Air Force (the former 19th Wing) was redesignated the Caribbean Air Force in August 1941, as part of the overall Caribbean Defense Command, and then became the Sixth Air Force in September 1942, retaining that title until 1946.

¹⁷⁹ *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

¹⁸⁰ Created in 1935.

¹⁸¹ For what subsequently happened to them, see <https://wordpress.com/post/raytodd.blog/40561>

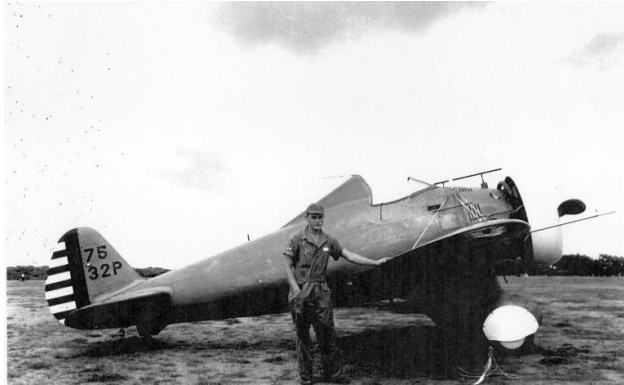
			"Peashooter" name, coined to its small size, was an unofficial nickname. Like the P-12 biplane, the P-26A used the Pratt & Whitney R130 Wasp radial engine, and was armed with just two rifle calibre (0.3-inch, 7.62 mm) machine guns. The only P-26A still flying today can be found at the Planes of Fame in the US, this being a former Canal Zone example, acquired from the Guatemalan Air Force¹⁸² in 1957 by the Museum's founder and returned to flight in 1962.¹⁸³
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In June 1940, a P-26A made a forced landing on a beach near Managua, Nicaragua. Crews from the TACA airline in the country retrieved the aircraft and moved it to Corinto on a barge, and then using a narrow-gauge railway, to Managua. A C-33 was sent from Albrook Field with mechanics and equipment and, with the help of men from the Nicaraguan *Guardia Nacional*, reassembled the P-26A, which was flown back to the Canal Zone, alongside the C-33, and via San Jose, Costa Rica.¹⁸⁴

¹⁸² In 1942, the USAAF had disposed of nine of its P-26A (as PT-26 *trainers*, as there was a US Congressional prohibition on transferring lethal armament to Latin American countries, except Brazil and Mexico), with one more supplied only as a source of spares, to Guatemala (the other example in Panama was written off). The Guatemalans rebuilt the "spares" example into an airworthy example. Though of virtually no use, some survived to take a limited part in a CIA-backed "war" in the 1950s, and by 1954 only two remained airworthy, but were only officially phased out in 1957: <https://www.laahs.com/guatemalan-peashooters/>

¹⁸³ <https://planesoffame.org/aircraft/plane-P-26A>

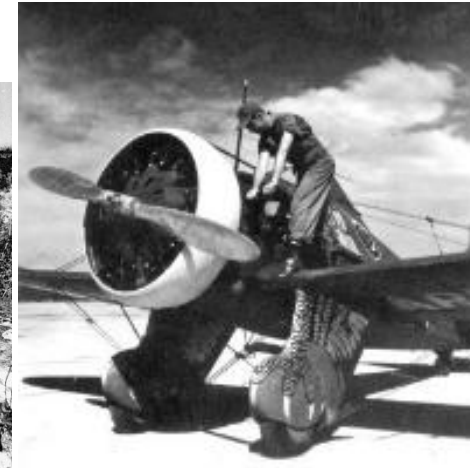
¹⁸⁴ Whilst in Managua, the C-33 gave President Somoza a flight over the city.



P-26A at Rio Hato Gunnery camp in 1941



P-26A that overshot runway at Rio Hato in 1941



P-26A in Panama

P-36	Curtiss Hawk	Single-engine fighter	 Deliveries to Panama usually involved flights of three P-36A at a time, this representing quite a test for any inexperienced pilots.	Plans to reinforce overseas garrisons following the outbreak of war in Europe in 1939 included sending 30 P-36A, mostly from Selfridge Field in Michigan, to Panama. They were to replace the obsolete P-26A monoplanes and, even more obsolete, P-12E and P-12F biplane fighters in June 1939.¹⁸⁵
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¹⁸⁵ *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

			For example, on 4 September 1939, three P-36A left Managua in Nicaragua for David in the Republic, the last stop before their planned arrival at Albrook Field. However, they encountered a massive tropical front and disappeared, triggering a search by a number of other aircraft – including other P-36A that had safely arrived.¹⁸⁶ Two were found on or near a beach, and the pilots rescued, but other was never found. During the rescue operation, a USAAC OA-9 Goose amphibian landed in the water near the wreckage of one of the downed P-36A, receiving damage and having to taxi ashore as a result.¹⁸⁷ Having been the standard USAAC fighter in 1939 (although by then considered obsolescent),¹⁸⁸ at the time of the Pearl Harbor attack there were no less than five squadrons of P-36A in Panama, three at Rio Hato in the Republic and two at Albrook Field. It was concern over what was seen as the inadequate air defences of the Canal Zone that had triggered the mass reinforcement effort, and the P-36A being sent from the US. Similar concerns would see them supplemented and replaced by some 80 P-40 in 1941. The P-36A units in Panama had to not only carry out patrols and air defence, but also had to prepare crews for transition to the promised P-39 and P-40 fighters. As with the P-26A, some pilots with units in Panama struggled to cope with what was the relatively high-performance P-36A and its retractable gear, this being quite a step up from the P-12 and even the P-26A.¹⁸⁹
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¹⁸⁶ The searchers comprised two B-18 bombers, two A-17 attack bombers, a Grumman OA-9 Goose amphibian, two Thomas-Morse O-19E observation biplanes and 17 other P-36A.

¹⁸⁷ *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

¹⁸⁸ Having a lower service ceiling, being slower and with a weaker armament than a Spitfire or Bf 109.

¹⁸⁹ *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

			In 1940-41, the P-36A was in the process of being replaced by the P-40, but in Panama, one Fighter Group (the 32nd) retained some P-36A into 1943, when the Group was itself disbanded. By February 1940, only the 24th Pursuit Squadron was fully-equipped with P-36A. By April 1941, only 21 of the original 27 P-36A received remained available, and just 17 by 11 June. Nevertheless, the Caribbean Air Command was told in 1941 to select its 10 “best” P-36A (together with two B-18 bombers) for overhaul and supply to Fortaleza in Brazil, to bolster defences there, and help keep Brazil out of the Axis camp. Hence, by 1942, just seven P-36A were left flying in Panama. These were sent, as the 16th Fighter Group Detachment, to Salinas in Ecuador to provide air defence there.¹⁹⁰ However, the Sixth Air Force¹⁹¹ did not condemn and scrap its last 2 RP-36A (as they were redesignated when classified as obsolete, or “restricted”) in June 1944, these then probably being the longest-serving USAAF P-36.¹⁹²
			The Model 75 single-seat monoplane fighter proved a great success for Curtiss in the 1930s, with orders in various versions (with both fixed or retractable undercarriage) from the USAAC and for export¹⁹³. The first modern monoplane fighter from the company, it had lost the original 1936 USAAC fighter competition to the Seversky P-35, but had still been ordered and went on to become the first monoplane fighter to be used in large numbers by the USAAC. An all-metal design, like previous Curtiss fighters it was named Hawk.

¹⁹⁰ Ibid. Salinas was one end of the long patrol arc over the Pacific approaches.

¹⁹¹ Caribbean Defense Command became the Sixth Air Force in September 1942, retaining that title until 1946.

¹⁹² Ibid.

¹⁹³ Including to the RAF as its Mohawk.

			The design was subsequently developed, with its radial engine replaced by an inline V12 in the even more successful P-40. Although a great improvement over the P-26A, the P-36A was nevertheless considered obsolescent by the time it saw combat, and was outclassed by other Allied and enemy fighters, despite having only being delivered from 1938 (versions with fixed landing gear for some export customers was even less competitive)¹⁹⁴. Its only combat use with the USAAC involved a handful which got airborne in Hawaii during the attack on Pearl Harbor. As with the preceding P-12 and P-26 fighters, the armament of the P-36A remained just two rifle calibre machine guns (although one was the heavier 0.5-inch, 12.7 mm calibre). It was powered by a Pratt & Whitney R1830 Twin Wasp with a single supercharger, so that high-altitude performance was lacking.
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Lieutenant George "Bo" Ranney was in one of those P-36 that crashed on the delivery flight in September 1939, having encountered fog, rain, low cloud and very limited visibility. Becoming lost, he had flown low over the sea but keeping visual contact with the shoreline. When he finally ran out of fuel, he landed in very shallow water close to shore. He salvaged what he could from the aircraft and began walking south. He swam rivers, fought insects, hunger, heat and the jungle until he was rescued.¹⁹⁵

¹⁹⁴ However, the Hawk 75 was arguably the most effective French fighter during the Battle of France in 1940 (though it fared badly when up against Allied fighters in Vichy North Africa in 1942 during Operation *Torch*), and the Finns made good use of it against the Soviet Union. The RAF sent those it inherited from a French order (called Mohawk) for use in India.

¹⁹⁵ Journal of American Aviation Historical Society, Winter 1988.



P-36 of 24th Pursuit Squadron at Rio Hato



P-36A at Langley Field, Virginia

P-38	Lockheed Lightning	Twin-engine fighter	 With many single-engine fighters being lost over the jungle and sea of the Panama region, the Sixth Air Force had pressed USAAF Headquarters for a twin-engine aircraft, with the only suitable type at the time being the P-38. However, these were in demand elsewhere, particularly in the Pacific theatre, where their twin-engine safety and longer range were as valuable as they would be in Panama. At least some of the P-38 that were sent to Panama were built under licence by Consolidated-Vultee in Nashville, which produced 113 before having the balance of its orders cancelled after VJ-Day. By the end of the war, all the fighter units of the
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			Sixth Air Force in Panama were equipped with the P-38L¹⁹⁶, and many were those built by Vultee.¹⁹⁷ In fact, when the 32nd Pursuit Group activated in Panama on 1 January 1941 it had been intended that it be equipped with P-38, and later that year it was anticipated that it would receive its complement of P-38 in the first half of 1942. However, it was equipped with a mix of P-40, then P-39, before finally receiving the P-38 at last in July 1945, four-and-a-half years late. The P-38 were eventually recommended for service in Panama in November 1943 after numerous incidents involving the P-39 and a USAAF board having decided that experience having shown that the P-39 was unsuitable for use in the Panama and Caribbean areas. It was initially planned to supply more P-40, but these were not available, and the P-38 was considered the optimal choice. The P-38 was seen as having several inherent advantages over the other option, the Republic P-47 Thunderbolt (see below), including – • its rate of climb; • the tricycle landing gear reducing accidents on landings and taxiing with the pilot having better vision; • maintenance personnel were already familiar with its Allison V1710 engines (which were used by the P-39 and P-40 fighters already used in Panama); and • having twin engines would present more favourable odds of survival over water and rough terrain¹⁹⁸.
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¹⁹⁶ Based on the previous P-38J model but with uprated engines, and with a total of 3,293 built, including 113 by Vultee. Survivors with the new USAF became F-38L in 1947.

¹⁹⁷ <https://jewlscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content>

¹⁹⁸ Ibid.

			However, in late 1943, P-38 were not available, as they were needed in the Pacific theatre, and a reluctant decision was made in 1944 to instead allocate the P-47 Thunderbolt. Then, in September 1944, the Sixth Air Force reported that it had only 161 aircraft and with an attrition rate of five aircraft a month, the command's availability for missions would be considerably short of its target of 189 aircraft. While it still preferred the P-38, if those were not available, P-47 should be sent earlier than planned. However, the USAAF responded that the P-47 were now required for use in Europe and so would not be available in October 1944, but that now P-38 production had increased and hence they would be available after all.¹⁹⁹ 200 The Sixth Air Force would receive 199 P-38 at the end of the war. These comprised 43 of the P-38J²⁰¹ and 149 P-38L²⁰². As mentioned, both variants used the same Allison V1710 liquid-cooled engines as on the P-39 and P-40. Some early deliveries were used, and worn, P-38J coming from the Seventh Air Force in Hawaii²⁰³. There would also two examples of a two-seat version for training purposes²⁰⁴, and these would arrive in December-1944.²⁰⁵ Initially, use of the P-38 was also hampered by a lack of spare parts, so that by the end of January 1945 only six of the 26 aircraft received, by sea, from Hawaii had been delivered to XXVI Fighter Command. At the
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¹⁹⁹ <https://jewlscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content>

²⁰⁰ Sixth Air Force responded that acceptance of P-38, meant that maintenance on twin engines would require an increase of 162 men.

²⁰¹ The P-38J was based on the P-38H, but with chin radiators on engine nacelles. It was a long-range version with an endurance of up to 12 hours, and had first flown in 1943, later receiving a flat, bullet-proof windscreen and boosted ailerons. Some 2,970 were built, some being completed as photo-reconnaissance versions and others with a glazed nose as a light bomber pathfinder. It became F-38J (or ZF-38J as obsolete) with the new USAF in 1947-48.

²⁰² The P-38L was similar to the P-38J, but with uprated engines. 3,293 were built, including 113 by Vultee. After VJ-Day 1,380 on order from Lockheed and 1,887 from Vultee were cancelled. Survivors were redesignated F-38L (or RF-38L) in 1947.

²⁰³ When the aircraft from Hawaii did arrive in November 1944 their condition is said to have come as a shock and disappointment – with the maintenance man-hours required per aircraft increased from the budgeted 300 to an actual 650.

²⁰⁴ Most likely TP-38J, an unofficial designation for two-seat modified P-38J. These were single-seaters modified with a second seat by the Customer Modification Center at Love Field, Dallas in Texas.

²⁰⁵ <https://jewlscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content>

			time there were just 36 P-38 in service, and no single squadron had its full complement of the type²⁰⁶. In January 1945, a dedicated P-38 Mobile Training Unit arrived to relieve the pressure on units which had been having to undertake conversion training and checking out pilots for the P-38. It was equipped with drawings and diagrams, aids, films and instructional devices. Providing pilot and maintenance training, the Unit remained in Panama for six months. A dedicated Instrument School was also established at Aguadulce Auxiliary Aerodrome for training P-38 aircrew.²⁰⁷ Having complained of a shortage of available aircraft, as deliveries of P-38 continued (none were delivered in February and March, but surged in April), by the end of April of 1945²⁰⁸, the Sixth Air Force fighter complement was 33 over the planned operational strength of 186 aircraft²⁰⁹, and in June it was 13 aircraft over strength.^{210 211} A spate of accidents in March 1945 resulted in all XXVI Fighter Command P-38 being grounded temporarily whilst an official investigation was held.²¹² In May 1945, the XXVI Fighter Command began mounting “Long-Range Fighter Navigation Flights”. This involved flying up to eight P-38 at a time to destinations
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²⁰⁶ *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

²⁰⁷ Ibid.

²⁰⁸ 71 arrived on a single day, on 11 April, being ferried by air from the US.

²⁰⁹ Just two P-38 that were ferried by air to Panama were lost.

²¹⁰ Ibid.

²¹¹ The Sixth Air Force was told that the surfeit of P-38 resulted from an acceleration of its orders, due to the cancellation of other orders for the European theatre freeing up supplies.

²¹² It was concluded that the primary causes were fuel lines breaking due to chafing or vibration, the failure of rubber hose connections, gaskets and hose connections on intake manifolds failing due to backfires or pre-ignition (which explained why some aircraft had simply burst into flames). Faulty spark plugs were also suspected. By coincidence, a new Technical Order was received requiring rubber hose connections on intake manifolds to be reinforced with metal bands, and for new gaskets to be fitted.

			around the region – to bases in Guatemala, Trinidad, Barranquilla in Colombia and to Curacao. Each flight was also accompanied by a UC-45F or UC-78 twin-engine light transport.²¹³ When the war ended, many P-38 were stored in hangars on air bases in Panama²¹⁴, the USAAF having announced that the type would be phased out of USAAF service by November 1945. Nevertheless, the P-38 remained on the strength of units in Panama into January 1946. During 1945, a few surplus P-38 were supplied to the Venezuelan and Nicaraguan governments, the Ciricana Aviation Company, and a few independent individuals. However, the majority of surplus aircraft were simply loaded on barges and dumped at sea.²¹⁵ As with all the fighter types assigned to Panama during the war, the P-38 saw no combat operations involving actual enemy aircraft or even, at least in the case of the P-38, any enemy or suspect vessels. Despite local commanders having lobbied for the P-38 since 1941, seeing a twin-engine fighter as better suited to the conditions and situation in Panama, it would be replaced by another single-engine type – the Republic P-47N Thunderbolt, with the first arriving in 1946.
			The P-38 was a single-seat, twin-engine fighter of twin-boom design, which was also used by the USAAF as a fighter-bomber, and as a two-seat trainer and night-

²¹³ *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

²¹⁴ With the arrival of P-38, even though the process was slow, the Sixth Air Force had had storage space and preventive maintenance problems.

²¹⁵ <https://jewischolar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content>

Many were loaded onto a barge and dumped in the Bay of Panama. Panama at the time lacked a suitable industry capable of smelting and recycling the metal of the aircraft: *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

			fighter, as well as for photo-reconnaissance. It was designed in response to a 1937 USAAC requirement as a high-altitude interceptor.²¹⁶ The fighter had its armament clustered in the nose, was the first US fighter to make extensive use of stainless steel and smooth, flush-riveted butt-jointed aluminium skin panels; and it was also the first military aircraft to fly faster than 400 mph (640 kmh) in level flight. The prototype flew in 1939 and the USAAC placed production orders later that year (even before the pre-production YP-38 prototype had flown), and the operational versions entered service in 1942. It was in production when the US entered the war and was still in production in 1945, but was disposed of very quickly once the war ended. The end of the war left the USAAF with thousands of P-38 rendered obsolete by the advent of jet fighters, and orders for 1,887 more were cancelled – with the very last P-38 in service with the US Air Force²¹⁷ retired in 1949.
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Several P-38 and F-5G (a dedicated photo-reconnaissance version) operated in Panama postwar, although none were actually owned by the Panamanian Government or ended up on its civil register. In 1953, two F-5G used by the Fairchild Camera & Instrument Corporation are believed to have been involved in work for the Interamerican Geodetic Survey (IAGS), and Panama was named as the destination to avoid suspicion that the export was connected to the widespread revolutionary activity then affecting Central America, but were based at El Coco Airfield, near San Jose in Costa Rica. IAGS was a US Army (later Department of Defense) organisation set up to assist Latin American countries in

²¹⁶ The specification used the word "interceptor" in order to bypass the inflexible USAAC requirement for "pursuit" (fighter) aircraft to carry no more than 500 lb (230 kg) of armament including ammunition, and to bypass the USAAC restriction of single-seat aircraft to one engine.

²¹⁷ By then redesignated F-38. The independent US Air Force had been created in 1947 in succession to the USAAF.

surveying and mapping, and was established in 1946 as part of the Army Map Service and had its headquarters at Fort Clayton in the Canal Zone (where there was also a survey, cartographic and map reproduction school).

A full breakdown of P-38 used in Panama, listed in USAAF serial number order is available in the book *P-38 in Latin America*.



USAAF P-38 Lightning at France Field



Officers of 24th Fighter Squadron at Old France Field, July 1945



P-38 with armament and parts removed at PAD for disposal



As the wartime P-38 was quickly disposed of at the end of the war, the replacement was to be the Republic P-47N Thunderbolt. Unlike the P-38, it was a single-engine fighter, but did boast a long-range capability. The first P-47N arrived in 1946, and this example is shown at Albrook Field. It was lost on 22 October 1946 at Pocrì Auxiliary Aerodrome.

P-39	Bell Airacobra	Single-engine fighter	As one of the standard USAAF fighter types, it was inevitable that it would see service in Panama, and it would prove to be numerically the most significant type in the wartime Sixth Air Force. Deliveries to the Caribbean theatre began from June 1941, and at least 447 of all four major variants²¹⁸ served with the Sixth Air Force and Antilles Air Command. As a result, from 7 December 1941 to August 1945, there was not a single day when the P-39 was not in front line service in the Caribbean.²¹⁹ The first version to arrive was the P-39D, virtually brand-new. From August 1942, the P-39K model began to arrive, singly or in small groups, from the San Antonio Air Depot in Texas²²⁰. A single P-39K remained on Sixth Air Force strength on 7 October 1944, although 49 had been returned to the Continental US by Ferry Command. The P-39N was the major production model, and was the fastest version (though with less range), and the first (from a batch originally earmarked for the RAF – which had planned to pass them on the USSR) arrived in March 1943. However, in Panama, attrition rates of the P-39N were high, with only 49 on strength in March 1944, 47 having been written off. In Panama, with its heat, rain and mud, and its unpaved auxiliary airfields, the tricycle gear P-39, with a somewhat fragile nose leg, suffered. At least 305
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²¹⁸ 116 P-39D, 69 P-39K, 96 P-39N and 155 P-39Q.

²¹⁹ *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²²⁰ Virtually identical to the P-39D, but with a more powerful engine and an new, Aeroproducts propeller.

			accidents involving P-39 were recorded²²¹, and the “taildragger” P-40 was considered more robust and suitable for use from low-quality airfields.²²² The loss by P-39N of their tail assemblies in Panama also caused USAAF specialists at Wright Field in the US to investigate if there was a structural problem with the type. They concluded the cause was severe winds found in altitude in the tropics, not an inherent defect in the design. However, at least five P-39 on patrol were lost without trace – usually when operating singly.²²³ Soon after the P-39N deliveries, the Sixth Air Force began to receive P-39Q, with the first in June 1943. In March 1944, the Sixth Air Force made plans to standardise on the P-39Q, scrapping most of earlier models that were not returned to the US. In 1944, the P-39 became the predominant fighter type in Panama. However, by June 1945, only two squadrons still had the P-39Q, as units had generally transferred to the P-38.²²⁴ For example, the 24th Fighter Squadron transitioned from its P-40C Warhawks to the P-39D model (the first fully operational version and first true production model) starting in 2 May 1942, though by September 1942, the P-39D had been exchanged for 14 P-39K.²²⁵ The unit flew its last P-39 missions in June 1943, these were then replaced by two refurbished P-40C and 2 new P-40N. From that point through until August, the Squadron transitioned into new P-40N. However, in
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²²¹ With some individual machines suffering at least 3 separate incidents during their service life.

²²² *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²²³ Ibid.

²²⁴ *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²²⁵ As the P-39D but with changes including an Aero products propeller; retaining the 37mm cannon in the propeller hub, but with 2 x 0.5-inch and 2 x 0.3-inch machine guns (whereas the P-39D had had 4 x 0.5-inch) and the same 227 kg (600 lb) bombload.

			March 1944 it again re-equipped, this time with Bell P-39Q (the major production model).²²⁶ On 15 October 1942, eight P-39K were dispatched on a mission near Rio Hato to graphically illustrate the effectiveness of the cannon-armed fighter as a ground-attack aircraft. They attacked a column of derelict trucks positioned there and, when the dust settled, all but five of the 115 vehicles had been completely destroyed. It was found the P-39, with its heavy nose armament (including the 37 mm cannon firing through the propeller hub), proved useful in both the anti-submarine and anti-bomber roles.²²⁷ In the former role it was used as a patrol type and as such usually carried either a 250 lb (114 kg) bomber or a 325 lb (148 kg) depth charge. They also usually operated with belly auxiliary fuel tanks for patrols over the ocean or jungle. The twin-engine P-38 Lightning would be chosen for service in Panama in 1944-45, following numerous incidents involving the P-39 and a board having decided that the P-39 was unsuitable for use in the Panama and Caribbean areas, despite its excellent low-level performance and heavy armament.²²⁸ In November 1943, an inquiry had recommended that all P-39 be replaced by the P-40.²²⁹ However, USAAF Headquarters had proposed the Republic P-47 Thunderbolt, as all production of P-40 were committed to other requirements. As mentioned above, the XXVI Fighter Command in Panama countered by highlighting advantages of the P-38 – pilots there already familiar with tricycle undercarriage,
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²²⁶ This had a 37mm cannon, with 6 machine guns and a 227 kg (600 lb) bombload; later batches had a 4-blade propeller.

²²⁷ Although in December 1941, of the 43 P-39D in the Caribbean, only 9 actually had the cannon fitted.

²²⁸ <https://jewlscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content>

²²⁹ *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

			use of the same Allison V1710 engines, and the inherent benefits in terms of safety in having a twin-engine type operating in the regions.²³⁰ In 1944, despite having deployed large numbers of P-39, the Sixth Air Force conceded that, despite its excellent low-level performance and heavy armament, it was unsuitable for operations in Panama and the Caribbean. As with the other fighter types based in Panama, the P-39 saw no combat action involving enemy aircraft. At least 447 of all four major variants²³¹ served with the Sixth Air Force and Antilles Air Command and, from 7 December 1941 to August 1945, there was not a single day when the P-39 was not in front line service in the Caribbean.²³² At the end of the war, when considering disposal of aircraft on hand, it is said that the head of the USAAF was “adamant” that no P-39 be returned to the US.²³³
			This single-seat fighter was unusual in having a tricycle undercarriage (the first USAAC fighter with one) and an engine mounted in the centre of the fuselage, driving the propeller via a long shaft. It also boasted a 37 mm cannon firing through the propeller hub. It first flew in 1938, ordered into production in 1939 and produced 1940-43. It is generally not regarded as a great success, being rejected by the RAF, but large numbers ended up being supplied to the USSR. Nevertheless, becoming operational in 1942, until 1944 it and the P-40 (also not the best fighter of the war

²³⁰ *P-38 in Latin America* by Dan Hagedorn (Aviation Art & History, 2022).

²³¹ 116 P-39D, 69 P-39K, 96 P-39N and 155 P-39Q.

²³² *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²³³ <https://jewlscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content>

			either) were the main USAAF fighter types. Like the P-40, because its engine lacked a supercharger, the P-39 was best at low altitudes below 17,000 feet (5,181 meters). Hence it was seen as being more effective when used for ground-attack. At the time of the Pearl Harbor attack in December 1941, the P-39 (along with the P-40 and a few P-38) was one of the few modern fighter types available to the USAAC, and those already in service were deployed at home bases, but were quickly moved forward to overseas bases in Australia, Alaska, Hawaii, Panama, and New Guinea.
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It is said that it was not originally planned to deploy the P-39 to Panama, despite it being later thought to be an ideal type for the region, given its heavy armament and low-altitude performance. However, some continued to serve there until 1944-45, although all 48 surviving P-39N were withdrawn in May 1944.²³⁴ It was found the P-39, with its heavy nose armament (including the 37 mm cannon firing through the propeller hub), proved useful for both anti-submarine and anti-bomber work²³⁵. It served in the former role as a patrol type and as such usually carried either a 250 lb (114 kg) bomber or a 325 lb (148 kg) depth charge. They also usually operated with belly auxiliary fuel tanks for patrols over ocean or jungle. However, in Panama, with its heat, rain and mud, and its unpaved auxiliary airfields, the tricycle gear P-39, with a somewhat fragile nose leg, suffered. An official report in November 1943 concluded that, to “high degree”, the P-39 was unsuitable for use in Panama and the Caribbean, recommending its replacement with variants of the P40.²³⁶

²³⁴ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

²³⁵ Although in December 1941, of the 43 P-39D in the Caribbean, only 9 actually had the cannon fitted.

²³⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).



P-39 in engineering hangar in Panama



P-39 of 31st Fighter Squadron in 1943



P-39K at Madden Field

P-40	Curtiss Warhawk	Single-engine fighter	 In 1941, less than a month after the USAAC commenced deliveries of the P-39D to the Canal Zone and Caribbean, it directed the P-40 be supplied to the region. The P-40 would be second only to the P-39 in use by the Sixth Air Force in terms of numbers used – with some 219 used by the Caribbean Air Force, Sixth Air Force and the Antilles Air Command. Like the more suitable (given its cannon armament) P-39, the P-40 was also used on anti-submarine patrols in Panama.²³⁷
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²³⁷ Ibid.

			Between 14 July and 1 August 1941, five used P-40B (including the last production example) were rushed to the Canal Zone²³⁸. Two of there were later modified locally at the Panama Air Depot to become P-40C, but the first new-built P-40C actually arrived at Albrook Field in June 1941, ahead of the first four of the P-40B. The last P-40C delivered by air through Central America arrived on 4 August 1941, and then the first P-40E on 2 October 1941. On 7 December 1941, there were four squadrons equipped with P-40 based in Panama, three at Albrook Field in the Canal Zone and one at Chorrera in Panama Oeste. Immediately after the Pearl Harbor attack in December 1941, realising that the threat from the Japanese seemed greater than that from U-boats or the Vichy French in Martinique, 17 P-40C and 18 P-40E of the 36th Pursuit Group were reassigned to Panama from Puerto Rico, together with nine B-17 Flying Fortress bombers. The transfer of the 35 P-40 from Puerto Rico was completed by 14 December (allowing the obsolete P-26A to be passed on to another unit) and, by the end of the year, 80 additional P-40 arrived from the US. One unit, the 30th Pursuit Squadron, having received new P-40E and achieved operational readiness by the end of Summer 1941, moved to Aquadulce Field in February 1943, being reclassified as an Operational Training Unit (OTU) with its mission to prepare new fighter pilots for duty in the tropical conditions of the Canal Zone. However, it had inherited 28 of its aircraft from the 53rd Fighter Squadron, these being mixed P-40 models, most of which had seen hard service in Puerto Rico and the Antilles Air Command²³⁹. Although it remained classified as an OTU, the
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²³⁸ Four survived to be returned to the US, after hard use, in 1944.

²³⁹ In a way that was common in Panama, the squadron also had small detachments at Albrook Field and Corozal in the Canal Zone and, by October, another detachment was also maintained at Howard Field.

			squadron did also mount some air defence patrols. In January 1945, the squadron surrendered its tired P-40 Warhawks to the Panama Air Depot and was reequipped with new P-39Q Airacobra. The late model P-40N began to arrive in Panama in June 1943.²⁴⁰ When the 24th Pursuit Squadron had its obsolete P-26A replaced by its first nine P-40C in June 1941, the squadron undertook a number of long-range navigational flights, one going so far as Trinidad. This unit transitioned from its P-40C to the P-39D from May 1942. The Squadron flew its last P-39D missions on 25 June 1943 and, ironically, these were then replaced on 27 June by two refurbished P-40C and on 29 June by two new P-40N. From then until August, it transitioned into new P-40N, having 22 on hand by the end of August. On 27 August 1943, flying their new P-40N, two Flights flew a mass cross-country to Costa Rica and, the next day, they flew down the Atlantic side of the Isthmus of Panama – completely undetected – and made a successful surprise mock "attack" on the Gatun Locks of the Panama Canal. "B" Flight made three dive-bombing attacks while "A" Flight made four strafing passes. Defending interceptors, finally alerted to the attack, did not appear until the it was completely over. In March 1944, it again re-equipped, this time back to the P-39, but the P-39Q model, as well as a single Curtiss RP-40C.²⁴¹ Like the other single-engine fighter types used in Panama, the P-40 was not immune to unexplained losses. On 7 April 1943, a formation of six P-40, in two groups of three, flew into cloud on a return leg of a long-range training flight, heading for their base at Aguadulce. Emerging from the cloud at 8,000 feet (2,440
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²⁴⁰ *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²⁴¹ The "R" prefix denoted it being "Restricted", or obsolete, and meant that the aircraft was probably a trainer or squadron hack

			metres), one of the first group of three was missing, together with all three of the second group. A large-scale search failed to find any trace of aircraft or pilots. With its tail undercarriage, as opposed to the tricycle gear of the P-36A (and its rather fragile nose leg), the P-40 was considered more suitable for conditions at some of Panama's unpaved and frequently muddy airfields.²⁴² Eventually, a total of 222 P-40 of various marks would be deployed to Panama and the Caribbean. At least 16 of the P-40E received in 1941 survived the war (to be scrapped or returned to the US), alongside 28 P-40N.²⁴³ During the war, PAD manufactured at least 150 dummy P-40 to be used as decoys.²⁴⁴ The Brazilian Expeditionary Force, which took part in the fighting in Italy, included a fighter group from the Brazilian Air Force²⁴⁵, formed in 1943 and which undertook its combat training under the jurisdiction of the Sixth Air Force at Aguadulce in Panama – its commander and 32 pilots using the P-40 (although it would re-equip with P-47 Thunderbolts in the US before being sent to Italy). On 13 July 1943, an engineering report stated that – <i>“Sixth Air Force, G-4 Engineering, is making some 150 dummy P-40 airplanes. These are for issue to the Panama Interceptor Command. We will deliver theses as soon as possible and get them out of our way”.</i>²⁴⁶
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²⁴² *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²⁴³ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

²⁴⁴ Ibid.

²⁴⁵ 1st Fighter Group (1^o Grupo de Aviação de Caça)

²⁴⁶ *Panama Canal Defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

			There were also two-seat TP-40 modifications in Panama, these being locally modified examples. Four of these were later converted by the Panama Air Depot at Albrook Field back to single-seaters in 1944. They are said to have been modified in March 1944, for delivery in April for use in the training programme for the Brazilian Air Force unit at Aguadulce.²⁴⁷
			Until the P-51 Mustang (and to a lesser degree, the P-47 Thunderbolt) came to represent USAAF fighters in World War 2, it was the P-40 that was <i>the</i> US fighter. At the time of the Pearl Harbor attack in December 1941, the P-40, together with the P-39 were the only modern fighters available in quantity to the USAAC. Over 13,000 of all marks was built, having first flown in 1938. The first order of 524 in 1939 was then the largest-ever fighter order placed by the USAAC. It was present at Pearl Harbor, and made a small contribution to the defence, though most were destroyed on the ground. Perhaps its most famous use was with the “Flying Tigers”, the American Volunteer Group (AVG) flying with the Nationalist Chinese forces against the Japanese. It has become synonymous with the shark’s teeth markings (as in photo above), but these originated on RAF 112 squadron P-40B Tomahawks in North Africa, later being adopted by the AVG in Burma.²⁴⁸ When given a name by the Americans, it was known as the Warhawk.²⁴⁹ The RAF and other allies received examples, but tended to use them for ground-attack

²⁴⁷ *Panama Canal defenders: Camouflage and Markings of US Sixth Air Force and Antilles Air Command 1941-1945 – Volume 1: Single-engined Fighters* by Dan Hagedorn (Model Centrum PROGRES, 2021).

²⁴⁸ <https://www.smithsonianmag.com/air-space-magazine/when-shark-bites-180974484/>

²⁴⁹ It was Hawk 81 to its maker, Curtiss (being a development of the Hawk 75, the P-36, essentially with a radial engine replaced by an inline one), or Hawk 87 from the P-40D models on.

			missions, as their Allison V1710 engines meant that they lacked the performance at altitude to match the best Axis fighters. The RAF used the name Tomahawk for early models, and Kittyhawk for later ones. After Japan's surrender, the USAAF decided that the P-40 would be withdrawn immediately - with the P-38 and P-47 no later than 1949, leaving only the P-51 Mustang as a long-term piston-engine fighter as jets entered into service. No operational examples of the P-40 would have been present in Panama by the end of the war. The first production model, the P-40B, had four machine-guns (two 0.5-inch and two 0.3-inch); the P-40C²⁵⁰ had optional fuel drop tanks; the P-40E²⁵¹ had six 0.5-inch wing guns and later underwing bomb-racks; the P-40N²⁵² was the major production version, lighter and with less fuel, an uprated engine and four 0.5-inch wing guns.
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In October 2007, the remains of a Sixth Air Force P-40C was found near a former fighter airstrip on North Seymour Island in the Galapagos.²⁵³

²⁵⁰ Both the P-40B and P-40C were called Tomahawk by the RAF.

²⁵¹ Known as Kittyhawk IA to the RAF.

²⁵² Kittyhawk IV for the RAF.

²⁵³ Ibid.



P-40N of 43rd Fighter Squadron after belly landing at Howard



On stand-by at Isla del Rey



P-40 of 31st Fighter Squadron at La Joya Field

P-70	Douglas Nighthawk	Twin-engine night fighter	 By September 1942, 59 P-70 were ready for combat, with about half going to training schools at Orlando, Florida, and the other half to operational units defending the Panama Canal (for use by the 24th Fighter Squadron – however, other sources say it had only a single example between November 1942 and 11 January 1943) and Hawaii.²⁵⁴
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²⁵⁴ Conquering the Night Army Air Forces Night Fighters at War by Stephen L McFarland (Air Force History and Museums Program), 1998: <https://media.defense.gov/2010/May/26/2001330259/-1/-1/0/AFD-100526-018.pdf>

			A Sixth Air Force memorandum dated 5 May 1942 had recommended twin-engine night fighters be acquired.²⁵⁵ The presence of P-70, was a seen as a modest Sixth Air Force response to a concern over the lack of night fighter defences for the Canal. During late 1942, three P-70 were also briefly assigned to the 53rd Fighter Squadron for the same reason²⁵⁶. At the time it was still considered a strong possibility that a night attack on the Panama Canal might be attempted. The P-70 of the 53rd Fighter Squadron departed in mid-January 1943.
			The A-20 Havoc²⁵⁷ was a high-performance twin-engine light bomber which first flew in 1939. It had been designed to meet a USAAC requirement for an attack bomber, but it was then ordered by France for its air force before the USAAC had decided it would also meet their requirements. It was 1942 before the USAAC A-20 saw action, in North Africa with the USAAF after Operation <i>Torch</i>. The P-70 variant resulted from a USAAC need for a long-range fighter, with 60 A-20 on the production line being completed as P-70 night fighters, and all being delivered by September 1942. These had radar, with the glazed nose often being painted black to prevent glare, and extra fuel. Variants followed included those with a US radar (in place of the original radar based on a British design), and various armaments – including a solid nose with six 0.5-inch (12.7 mm) machine guns. All P-70 had been retired from service by 1945. In Spring 1942, Signal Corps' copies of the British-designed AI Mk IV long-wave airborne interception radar had begun to come off the production line at Western

²⁵⁵ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995)

²⁵⁶ These would have used the British-designed SCR-540 airborne radar (a version of the AI Mk IV).

²⁵⁷ Known as the Boston to the RAF.

			Electric, designated SCR-540, with just 580 sets on order ²⁵⁸ . The first sets were sent to sources such as the Signal Corps School, Army Air Force Technical School No 2 and the Western Electric Technical School (though three sets were sent to the Hawaiian Department). After this initial delivery, 59 sets were supplied to the Douglas Aircraft Company, and some of these were installed in the night fighter version of the A-20 ²⁵⁹ . ²⁶⁰
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Douglas A-20A Havoc of the Sixth Air Force, 33rd Bombardment Squadron (Medium), 28th Composite Group, in flight over the Canal Zone from Albrook Field, c.1942. From their base at Albrook Field, these early-model A-20 Havocs conducted anti-submarine patrols, coastal reconnaissance, and readiness exercises.

Postwar, night fighters would be deployed to Panama once more, with the purpose-built Northrop P-61 Black Widow of the 319th Fighter Squadron formed at Rio Hato in March 1947 – having to relocate to France Field by the following January after the US was forced to abandon Rio Hato. In December 1948, the P-61 were replaced by F-82F Twin Mustangs.

²⁵⁸ The SCR-540 was soon replaced by the much larger, microwave AI radar, the SC-520. This meant that, by October 1943, the first US AI radar, SC-540, was already obsolescent: *The Signal Corps: The Test (December 1941 to July 1943)* By George Raynor Thompson, Dixie R Harris, Pauline M Oates & Dulany Terrett (Center of Military History, US Army, Washington DC), 2003.

²⁵⁹ Eventually 205 of various variants of P-70 would be produced for the USAAF.

²⁶⁰ *The Signal Corps: The Test (December 1941 to July 1943)* By George Raynor Thompson, Dixie R Harris, Pauline M Oates & Dulany Terrett (Center of Military History, US Army, Washington DC), 2003.

PBM	Martin Mariner	Twin-engine patrol flying-boat	 The type's first assignment was with the US Navy patrol squadron VP-32 stationed at the NAS Coco Solo in the Canal Zone. Then VP-206 transferred from the US to Coco Solo in April 1943. It sent detachments to other advance bases, but in February 1944 the whole squadron relocated to Corinto in Nicaragua, but left for Key West, Florida in April 1944. VP-207, with 12 PBM, relocated to Colón from Guantanamo Bay, Cuba in June 1943²⁶¹, and during 1943, it flew the long Pacific approaches patrols between Salinas in Ecuador and Nicaragua, via the Galapagos Islands²⁶². Postwar, the PBM saw continued use from Coco Solo into the 1950s, but was eventually replaced by the P5M Marlin development.
			This gull-wing, boat hull flying-boat was developed to a 1937 US Navy specification and first flew in 1939. The design had originally been developed as a private-venture by Martin, but then was ordered into production. Although overshadowed by the PBY (see below), the PBM remained an important type during the war, becoming operational in 1941, and seeing continued postwar use, with production

²⁶¹ <https://boeingtestpilot.com/chapter-2-vp-207/>

²⁶² They could be anchored overnight in the bay at Salinas, Ecuador and at night a duty crew was kept aboard in case of a storm. A PB2Y was lost in such a storm whilst moored in Puerto Castilla, Honduras in October 1943, and all but two of the crew were lost – the survivors drifted with the storm for four days, and nine days after the aircraft sank were washed ashore alive.

			only ending in 1949. Faster than a PBY (for which it was the intended successor), it could also carry a heavier warload further. After trials with the initial versions, in 1940, the US Navy ordered the type into production as the PBM-3, it being built in a variety of sub-series variants. The PBM-3 was the first major production version and featured new powered nose and dorsal turrets, both with a single 0.3-inch (12.7 mm) machine gun; a proper powered tail turret, with a single 0.5-inch (12.7 mm); and revised beam gun positions. However, it was subsequently concluded that most Mariners were not likely to encounter fighter opposition, so much of the defensive armament was deleted – once the guns, turrets and ammunition were removed, the weight saving resulted in a 25% increase in the range of the lighter PBM-3S anti-submarine version. However, the nose guns were retained.²⁶³
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²⁶³ <https://weaponsandwarfare.com/2019/01/16/martin-pbm-mariner/>



PBM-3S lying off a pier in San Blas²⁶⁴



PBM lying off the Galapagos Islands



Use continued postwar, this PBM-5 off Panama in 1954

PBY OA-10	Consolidated Catalina	Twin-engine patrol flying-boat		In Panama, the PBY was the flying-boat in use with the US Navy from the start of the war (being supplemented later by the PB2Y Coronado and PBM Mariner), mainly operating from Coco Solo. The Navy's primary use for the type was in the maritime patrol and anti-submarine roles.
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²⁶⁴ The PBM-3S was a specialised anti-submarine version of the PBM-3C, with extra fuel and two 325 lb (147 kg) depth charges, with 156 being built from 1944. The PBM-3S served exclusively or nearly so in the Atlantic, particularly in defence of the Panama Canal.

			Coco Solo had been an early base for the PBY, with the initial PBY-1 model used by squadron VP-3 in the mid- to late 1930s. Various models of PBY (PBY-3 and PBY-5)²⁶⁵ were used, also operating from bases to/from Guantanamo Bay and Puerto Rico. In 1941-42, it was reported that Coco Solo had up to 28 PBY present. It was one of a variety of types used by the 20th Transport Squadron, with two former US Navy PBY-5A amphibians (redesignated on paper as OA-10A), but this unit had disposed of it by 1943. Four more USAAF Catalinas arrived in October 1942, being assigned to air-sea rescue work throughout the CDC region, including on the Galapagos Islands. Requiring more, although the Navy also needed them, the USAAF in the CDC received as surplus PBY-4, two PBY-5, and four PBY-5A on what amounted to loan. In 1943-44, another three PBY-5 were loaned to the USAAF.²⁶⁶
			This was the classic wartime flying-boat/amphibian, which had first flown in 1935, and had been initially produced as a pure flying-boat for the US Navy. Eventually about half of all production would be amphibians.²⁶⁷ It had a very long range and saw extensive use in both the Atlantic and Pacific theatres. The US Navy designated it PBY (as well as PBN and PBV for licence-built versions),²⁶⁸ while the OA-10 was the USAAC/USAAF designation for the Catalina amphibian. It was chiefly used by the Army for the air-sea rescue role with Emergency Rescue Squadrons during the war and for several years afterwards.

²⁶⁵ The PBY-3 introduced uprated engines and extra fuel; and the PBY-5 was even more powerful and an option of more fuel and other improvements.

²⁶⁶ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

²⁶⁷ A flying-boat can only land on water (and needs a beaching gear trolley if it comes ashore), whereas an amphibian also has a wheeled undercarriage and can land and take-off from either land or water.

²⁶⁸ PBN were Naval Aircraft factory Nomads, and PBV were Canadian Vickers- and Boeing Canada-built Cansos.

			Initial deliveries to the USAAF were ex-US Navy PBY (but being of the amphibian versions), these later being joined by Canadian-built versions, ²⁶⁹ and others built by Consolidated. In Panama, it was one of a variety of types used by the 20 th Transport Squadron, but this unit had disposed of it by 1943.
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US Navy PBY at the Galapagos Islands



*PBY-1 Catalina (BuNo 0143) from Patrol Squadron 3 (VP-3) in flight.
VP-3 was stationed at NAS Coco Solo*

²⁶⁹ It was built under licence by Vickers and Boeing in Canada. It was also built by the US Navy's Naval Aircraft Factory, and in the USSR.

PB2Y	Consolidated Coronado	Four-engine patrol flying-boat	 In Panama, the type was used by US Navy patrol squadron VP-207 from Coco Solo, replacing its PBY on Pacific patrols. Another user was VP-1, which transferred to Coco Solo in October 1943 with its PB2Y-1²⁷⁰ – also undertaking many utility flights between Miami and Coco Solo, carrying up to 50 passengers each way. In 1944, redesignated as patrol bomber squadron VPB-1, the squadron moved to the Galapagos Islands, returning the next year to be relieved, replaced and returning to the US to be disestablished. In April 1944, VP-15 was transferred to Coco Solo, with one detachment deployed to Corinto in Nicaragua and another to the Galapagos Islands. It returned to the US in October 1944. In the patrol role, the PB2Y was equipped with radar, and local modifications to the aircraft while at Coco Solo included removal of all interior heating units, de-icing equipment, armour-plating and engine superchargers – all of which found to be unnecessary in its use from Panama.
			The Consolidated Model 29 was a shoulder-wing, four-engine, boat-hull flying-boat that was the result of a USN contest held three months after the XP3Y prototype (later the PBY Catalina – see above) had flown, and was ordered in 1936.

²⁷⁰ The electric propeller controls caused many problems during the early days of the deployment, resulting in the loss of one aircraft.

			It was much larger type than the PBY, powered by four Pratt & Whitney R1830 Twin Wasp radials. Due to large numbers of PBY that had been ordered, the first orders for the PB2Y were only placed in 1939, with deliveries from 1940 – with each PB2Y-1 costing as much as three PBY. However, its range of 1,070 miles (1,722 km) was less than that of the earlier PBY (at 2,520 miles or 4,055 km). Its electric propeller controls also caused many problems during the early days of the type's deployment in Panama, resulting in the loss of one aircraft. It was one of a series of four-engine flying-boats ordered by the Navy in the 1930s, with the three ordered 1937-42 (the PBS, PB2M, and PB2Y) being called "Flying Dreadnoughts", and all derived from the same 1935 requirement. The PB2Y was used relatively little in the patrol role, and all had been withdrawn from active service by 1945. In its later use, many would be modified for use as transports designated JRY-1, rather than as patrol bombers.
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PB2Y-3 of VPB-1 on the Galapagos c.1945

PQ-8	Culver Cadet/Redbird	Target drone	 At least 15 PQ-8/PQ-8A were supplied to the Sixth Air Force for use by the Tow Target Detachment of the 72nd Observation Group (later absorbed by the 23rd Tow Target Squadron). A further 10 PQ-8A (plus at least 1 PQ-8) were later received, and all 10 were said to be on hand to be declared surplus to the FEA.²⁷¹ In 1944, the type appeared on the list of “excess” aircraft for disposal by the Sixth Air Force.²⁷²
			The PQ-8 was a radio-controlled adaptation of the Culver Cadet two-seat, low-wing light cabin monoplane. It was used as a target by the USAAF. Another variant was the PQ-14 (see below). Designed by famous lightplane designer Al Mooney, the Cadet first flew in 1939, was all-metal and had a retractable tail undercarriage. In 1940, the USAAC had issued a requirement for a small radio-controlled aircraft for use as a target for anti-aircraft gunnery practice, and Culver submitted a drone variant of the Cadet, and it was selected as being suitable, being initially procured as the A-8²⁷³, before the designation changed to PQ-8.

²⁷¹ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

²⁷² <https://jewlscholar.mtsu.edu/server/api/core/bitstreams/25d785ba-305a-4781-8a47-015a9951b1f0/content> p.32

²⁷³ The “A” designation category for targets was dropped in 1941 to avoid confusion with “Attack” types.

			The target version had a fixed tricycle undercarriage and, after tests, an initial 200 were ordered, followed by 200 more as the PQ-8A with a more powerful engine. It was also used by the US Navy as the TDC. The PQ-8 could be flown by a pilot for ferry or check-out flights²⁷⁴ and, as an unmanned drone, painted bright red (hence the “Redbird” moniker in Panama) it was visually tracked, and remotely controlled by a relatively simple radio-command system.
PQ-14	Culver Cadet/Redbird	Target drone	Like the PQ-8, it was known locally as the “Redbird” and operated from New France Field, 10 having been assigned to the Sixth Air Force in December 1944. In Panama, it operated from France Field, but all of the remaining PQ-14 were grounded in 1948 for safety checks, but by 1 July 1948 there were 28 still on the strength (together with an unspecified number of PQ-8) of the Radio Control Tow Target Flight, with at least four CQ-3 drone-director aircraft.²⁷⁵

²⁷⁴ Using a rudimentary control panel installed for that purpose and using their parachutes as a seat.

²⁷⁵ American Aviation Historical Society Journal, Winter 2012.

The CQ-3 was redesignated DC-45F by the new USAF in 1948.

			 <i>PQ-14B (with a TB-26C behind)</i>
			Like the PQ-8 (see above), this was a target drone modification of the Culver Cadet lightplane. The prototype XPQ-14 flew in 1942 and was subsequently assigned to USAAF training units. Unmanned and radio-controlled (though it could be flown by a pilot for ferry flights²⁷⁶) and painted bright red, they were controlled by a mother-ship (such as a CQ-3, later DC-45F, version of the Beech 18). Over 2,000 were built and last survivors were retired by the USAF in 1950.

²⁷⁶ Using a rudimentary control panel installed for that purpose and using their parachutes as a seat.

PT-19	Fairchild Cornell	Primary trainer	 In 1945, it was said that the Sixth Air Force had more trainer and liaison types on its strength than it had had combat types at the start of the war. One of the several trainer types in use was the PT-19.
			This was a low-wing monoplane of mixed construction (metal and wood – the 1938 specification for which it had been designed had called for a minimal use of “strategic materials”) with tandem open cockpits and a fixed tail undercarriage. It had won a 1939 fly-off, in competition with 17 other designs – to a 1938 Air Corps Material Division requirement, to become the new standard USAAC primary trainer. It was ordered into production in 1939, and subsequently produced in several variants by various manufacturers, with nearly 5,000 being supplied to the USAAC/USAAF, or nearly 8,000 of all marks built. It was normally used as an <i>ab initio</i> primary trainer.
PV-1	Lockheed-Vega Ventura	Twin-engine patrol bomber	 Late in the war this twin-engine land-based patrol bomber was used from Coco Solo by the US Navy.

			Bomber squadron VB-141²⁷⁷ deployed six of its aircraft to Coco Solo from Puerto Rico in March 1944. However, in July, all the unit's aircraft redeployed once more, to NAS Beaufort in South Carolina.
			The Lockheed Model 37 was originally developed as a bomber type for the RAF from the Model 18 Lodestar airliner, with the first orders placed in 1940. Built by the Vega Division of Lockheed, it flew in 1941 and it was also used by the USAAF as the B-34 and later B-37 (both named Lexington), and the first US Navy PV-1 were ex-USAAF B-34 and included some examples originally ordered for the RAF under Lend-Lease but then requisitioned by the USAAF. The PV-1 entered service in 1942 and became operational in 1943, with 1,600 being delivered. Powered by two Pratt & Whitney R2800 Double Wasp radials, it carried a 3,000 lb (1,360 kg) bombload. It had a greater fuel load than the B-34, an ASD-1 search radar and reduced forward defensive armament. Postwar, the improved PV-2 Harpoon saw service with the US Navy Reserve, having been ordered in 1943 and delivered from 1944, seeing limited operational use during the war.

²⁷⁷ Later redesignated VPB-141 on 1 October 1944.

TBF	Grumman Avenger	Single-engine torpedo bomber	 There are photographs that show TBF-1 Avengers at an airfield in Panama. These are presumed to have been from a passing aircraft carrier, and may have been at New France Field, which was close to Coco Solo Navy base. Only three were shown in the photograph seen.  <i>Photo showing TBF in Panama</i>
			The TBF was a licence-built version of the Grumman TBM Avenger carrier-based torpedo-bomber, built by General Motors. 9,839 of this large three3-seater were built by Grumman and GM from 1941.

			It replaced the obsolete TBD Devastator in the US Navy, with the prototype ordered in 1940 “off the drawing board” (and defeating 12 rival designs), flying in 1941 and becoming operational in 1942. It was produced by Grumman to 1944, but with most actually licence-built by GM, also to 1944, it having received its first contracts in 1942. A mid-wing design with a weapons bay, powered dorsal turret and ventral gun position, and heavily used during the war, it continued in a variety of roles postwar, serving until 1954, including as the Navy’s first AEW type in 1946.
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SM.83	Savoia-Marchetti	Three-engine transport	 This USAF photograph shows an SM.83 airliner in USAAF service, albeit with civilian markings, and said to be at Howard Field circa 1942. This aircraft had been seized in Chile from the Italian Latin American Airline (LATI)²⁷⁸ and given to the 20th Transport Squadron in the Canal Zone because of the severe shortage of transport aircraft at the time. It is said that, although delivered to Howard Field, it was not used for any operational missions, and it never received a USAAF designation.²⁷⁹
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²⁷⁸ A transatlantic airline operating between Italy and South America 1939-41. It operated from Rome to Rio De Janeiro via Spain and Portugal (taking 23 hours), with the route extended to Buenos Aires in Summer 1941. The commercial flights were for postal services but a few passengers were allowed to use the transatlantic route. LATI had been able to pick up much of the mail traffic that Lufthansa had provided to South America prior to August 1939; and it was the main carrier of postal services between Axis-occupied Western Europe and South America until December 1941.

http://risorse.issp.po.it/dbcollezioni/993_beith.pdf

²⁷⁹ <https://www.defensemecanetwork.com/stories/the-real-soft-underbelly/>

			It was later flown to Love Field, Texas (being mistakenly recorded as an "SM.72") and recorded as being "excess to military requirements" by 20 March. ²⁸⁰
			The SM.83 was the civil airliner version of the SM.79 <i>Sparviero</i> bomber and first flew in 1937. It was a low-wing monoplane trimotor with a retractable undercarriage and was of mixed (steel, wood and fabric) construction. With four crew, it could only accommodate between four and 10 passengers. Only 23 were built, with LATI, Alia Littoria and SABENA (of Belgium) amongst the customers. During the war, the Italian examples were impressed as transports for the Italian air force, <i>Regia Aeronautica</i>.
V-1	Vultee	Single-engine monoplane transport	 One V-1A was at the PAD in February 1943, although its origin and intended use was unclear. What is known that it ended up on the postwar Panama civil register before eventually returning to the US.²⁸¹
			This was the prewar single-engine monoplane light transport that was developed into the V-11 attack combat aircraft.

²⁸⁰ *Alae Supra Canalem: Wings Over the Canal – The Sixth Air Force and the Antilles Air Command* by Dan Hagedorn (Turner Publishing, 1995).

²⁸¹ *Ibid.*

			An eight-passenger type had American Airlines as its launch customer, as then the fastest commercial airliner available, but in 1936 the Bureau of Commerce severely limited the use of single-engine airliners.
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