

DATABASE

DOUGLAS DB-7/A-20

WORDS: JAMES KIGHTLY

A staged photo of an A-20C-BO Havoc — probably 41-19635, built as an RAF Boston but diverted to the USAAF — at Langley Field, Virginia in July 1942.

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● All of this versatile attack bomber's variants described

● Service stories from the Battle of France to the Pacific war

● Flying "one of the nicest medium twins of the war"



Douglas DB-7 B-3 serial 89
Armée de l'Air
CHRIS SANDHAM-BAILEY

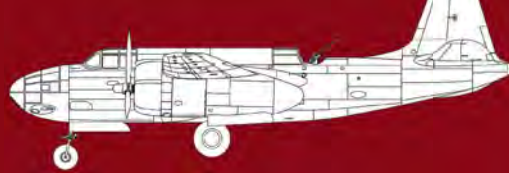


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DEVELOPMENT | DOUGLAS DB-7/A-20



A success from uncertain beginnings

The Douglas DB-7/A-20 family is usually underrated, despite its successful use by most of the major Allied combatants — although it was not their first choice. It was in front-line combat service from 1939, with the French Armée de l'Air, to 1945 and beyond, and it was popular with air and groundcrews. The type was able to accept increases in armament, armour and equipment and remain a useful and effective medium bomber. Yet its early days required much luck, and support from customers who were desperate for any aircraft at all.

The concept of a fast, twin-engine, multi-crew bomber grew in viability during the 1930s. In March 1936, a private venture was proposed by the Northrop Corporation led by Donald Douglas, with Jack Northrop defining the concept and the detailed design coming from Ed Heinemann. Called the Model 7A, this observation and attack aircraft was to be powered by two 425hp Pratt & Whitney R-985 engines, carry a crew of three with a maximum

weight of 9,500lb and a bomb load of 1,000lb, and be defended by six .30-calibre guns. It was regarded as a multi-role type, having an option for an interchangeable observation compartment that could be fitted in the bomb bay. Top speed was expected to be 250mph.

Lacking interest from the US military, and with recognition that it was essentially underpowered, the idea was shelved until 1937. It was revived in response to a US Army Air Corps (AAC) specification for an aircraft with a range of 1,200 miles, a

top speed of 200mph, and which carried a 1,200lb bomb load. The Northrop company, meanwhile, had become a wholly owned subsidiary of Douglas Aircraft, and Ed Heinemann took over design work. Other entries into the competition were the North American NA-40, the Stearman X-100, the Martin Model 167F, and the Bell Model 9. All but the Bell design were built by the manufacturers at their own cost, with the NA-40 and Martin 167F later being developed into successful types in their own right.

ABOVE: Although a US Army Air Corps requirement entered the equation early in the type's gestation, it took some time for the US forces to adopt what became the A-20. This is an early A-20A model. USAF

The revised Model 7B flew for the first time on 26 October 1938. It was powered by a pair of 1,100hp Pratt & Whitney R-1830 Twin Wasp engines to a speed of more than 300mph, remarkable for a bomber. It was not just fast, but well-armed, too. The 'solid'-nose version carried a (for the time remarkable) battery of six .30in and two .50in machine guns, while the glazed bombardier nose could still be fitted with fixed forward-firing guns in cheek blisters. If the bombardier or observer positions weren't fitted, the aircraft was to be operated by just two crew, a pilot and a rear gunner. The latter was provided with a manually operated dorsal turret that could be retracted to an almost flush position, and another flexibly mounted ventral gun. It was unusual in having a dihedral tailplane and tricycle undercarriage.



ABOVE: The ill-fated — and somewhat ungainly — Douglas Model 7B, which attracted the attention of the French.

The new machine was demonstrated to AAC officials but rapidly gained the attention of a French purchasing commission that was then looking at armaments in America. Initial interest solidified into serious intent, and the French were, with cautious American government approval, able to become involved in the tests. This had an unforeseen consequence. When the sole Model 7B crashed after an engine failure while demonstrating its engine-out capability on 23 January 1939, costing the life of pilot John Cable, the press discovered that the badly injured crewman aboard was Capt Maurice Chemidlin of the Armée de l'Air. Congress having voted in June 1939 to maintain an arms embargo upon all European powers, isolationists pressurised the US government about the potential sale. AAC chief Gen Henry H. 'Hap' Arnold and even President Roosevelt were expected to apologise. Nevertheless, what could have been the end of the Douglas project was saved by the French going ahead and ordering 100 Model 7Bs on 15 February 1939.

FAMILY NAMES

The models, designations and names for the A-20 family are complicated. Broadly, the type was known throughout the British Commonwealth as the Boston, with common mark numbers appended. The exceptions here were the night fighter and interdiction types, which were named Havoc after an abortive suggestion of Ranger. In US service, they were mostly the A-20 for the attack bomber version, or P-70 for the night fighter; the name Havoc was officially adopted by the US for all versions, though it was less used in practice. The French called it the DB-7 B-3 or 'the Douglas'.

VARIANT BY VARIANT



ABOVE: Boston I BD111 was among the aircraft diverted to the RAF from French orders. It was later converted into a Havoc I. *AEROPLANE*

Model 7A: Concept, not built.

Model 7B: Single prototype with two 1,100hp Pratt & Whitney R-1830-S3C3-G Twin Wasp engines.

DB-7: First production type (for France); 270 built, using the Model 7B's wing, a new, deeper fuselage and 1,100hp Pratt & Whitney R-1830-S3C4-G engines. Sub-variants were 20 **Boston Is** diverted from French orders to Britain, with R-1830-S3C3-G engines, and the **Boston II** with -S3C4-Gs. Early Bostons were converted to what were later known as Havoc night fighters, initially as the Havoc IV, then the **Havoc I (Intruder)**, the **Havoc I (Night Fighter)**, **Havoc I (Pandora)** — itself previously the **Havoc III** — and the **Havoc I (Turbinlite)**.

DB-7A: Improved type for France with larger vertical tail, incorporated for greater directional control with the more powerful 1,600hp Wright R-2600-A5B engines. It also had a stronger airframe and undercarriage. All 100 of these were delivered to the UK after the fall of France, and entered service as **Havoc II** night fighters, fitted with airborne intercept radar and a solid gun nose, and with two crew, a pilot and an AI radar operator in the upper gunner's position, with the defensive guns removed. Of

these, 39 were converted to **Havoc II (Turbinlite)** standard. Martin-Baker was responsible for the design of a nose configuration with 12 .303 guns that was fitted to many Havoc night fighters. Heston Aircraft produced about 100 noses, for which design work was completed in just two-and-a-half months.

Boston III: With manufacturer's designation **DB-7B**, this version was purchased by the Air Ministry rather than taken over from French orders, fitted with a glazed nose and British instrumentation and armament. A total of 300 were supplied. The **DB-73** was the French-ordered (to the tune of 481 examples) version of the DB-7B, identical structurally to the British order, except for French instruments and armament — it too was named as the **Boston III** when entering British service. Some MkIIIs were modified as the **Boston III (Intruder)** with a four-20mm belly gun pack, while there were at least three **Boston III (Turbinlite)** conversions.

DB-7C: 48 ordered by the Dutch government in exile for the Netherlands East Indies, equipped with 1,600hp Wright R-2600-A5B engines and an interchangeable nose, either with a bomb aimer's position or four 20mm

cannon, and with torpedo equipment. Several ended up in Australia as the **Boston III** type (discussed in the 'In Service' section), and 14 were converted with glazed noses as the **RA-20A** for use Stateside as trainers, not being suitable for combat.

A-20 (no suffix): The first 63 examples purchased directly by the US Army Air Corps, essentially of DB-73 standard, but intended for high-altitude bombing and fitted with turbo-superchargers for the Wright R-2600-7 engines on the outside of the nacelles. Only one was built in this form, as the engine proved troublesome and the AAC dropped the role. The rest were completed as A-20As. These were quickly followed by 143 examples of the **A-20A** proper, with 1,600hp R-2600-11 engines.

A-20B: Development of A-20A with horizontal rather than vertical bomb stowage in the rear bay, and revised nose glazing — 999 were built, eight being diverted to the US Navy as **BD-2** high-speed target tugs, albeit retaining the Navy's 'BD' bomber designation. They remained in service until 1946. A single **XA-20B** was a multi-turret experimental version not proceeded with, and in 1942 the remaining aircraft were re-designated **RA-20A** as restricted from combat use. ➤

DEVELOPMENT DOUGLAS DB-7/A-20

VARIANT BY VARIANT



ABOVE: A rare colour shot from 1941 of a US Army Air Corps A-20A operated by the 3rd Bombardment Group. NASM

A-20C: An attempt early in 1941 — before the US entry into the war — to standardise a common British and American version. Finally, the vital self-sealing fuel tanks and further armour were added. An additional pair of fixed forward-firing guns were fitted in cheek blisters, and it was powered by Wright R-2600-23 engines instead of the earlier -3 or -11 versions. The extra weight resulted in a drop in top speed from 350mph on the A-20A to 342mph on the A-20C. The British Commonwealth version was the **Boston IIIa**, which had .303-calibre machine guns instead of the US .30 guns, and usually an extended carburettor air intake above the cowl to include tropical filters. US Army Air Force (AAF) A-20Cs had individual exhaust stacks instead of an exhaust collector ring on the 1,600hp R-2600-23 engines, which resulted in a theoretical increase in top speed of 15mph.

A-20D: A paper-concept lightweight version with R-2600-7 engines.

A-20E: Modified A-20s with A-20B engines and other changes.

XA-20F: Single A-20A with experimental dorsal and ventral low-profile power-operated turrets as later used in production on the Douglas A-26 Invader, and trialled with a 37mm cannon in the nose.

A-20G: Main model in production terms with R-2600-23 engines, and six nose-mounted .50in Browning guns (or four 20mm cannon). Some 2,850 were built. The main visible revision during production was the replacement of the by then very obsolete open dorsal position with a Martin turret carrying two .50in guns in a widened rear fuselage and the ventral .30in gun replaced by



ABOVE: A-20C 42-33253 *Dina Mite* (formerly RAF Boston III AL331) shows off the port outer cheek-mounted gun. USAF

a .50in example. Two wing hardpoints allowed the carriage of two more 500lb bombs. The **CA-20G** was an Air Transport Command freighter version.

A-20H: G model with 1,700hp R-2600-29 engines, as the -23 was being discontinued. 412 were built, and the **TA-20H** was a trainer conversion.

A-20J: A-20G with the improved Plexiglas frameless glazed nose. Intended as a lead ship for A-20G formations, unfortunately it proved slower than the G model, with a maximum speed of 317mph at 12,700ft. It was supplied to the UK as the **Boston IV**, while the **A-20K** was simply an H with a J-type nose. Of the 413 built, 90 went to the RAF as the **Boston V**. The **TA-20K** was another trainer version.

P-70: The night fighter version. When the AAF found

itself without any real night fighter capability, it followed the RAF's lead with the original night fighter Havoc concept by creating the prototype **XP-70** from the 15th A-20, powered by R-2600-7s. It was modified with four ventral 20mm cannon and British AI MkIV radar in a solid nose. This was followed by 59 **P-70** night fighters adapted from A-20 bombers. The next model was the **P-70A-1**, 39 former A-20Cs with R-2600-23 engines and six or eight .50in guns in a ventral tray. The **P-70A-2** was an A-20G with the defensive armament removed and the nose guns retained; 65 were converted. Further trials resulted in the **P-70B-1**, a single A-20G with a SCR-720 centimetric radar and six forward-firing .50in guns. This led to the **P-70B-2**, 105 examples of A-20G and J standard fitted with the SCR-720 or -729 radar and six or eight .50in guns in a ventral tray.



The A-20H that tested the tracked undercarriage. USAF

TRACKED GEAR

The British company Dowty developed a multi-wheel tracked undercarriage system. After trials on lighter and slower types, it was used on an A-20C and later an A-20H, as they had the advantage of a nosewheel configuration and higher weights and speeds. Trials demonstrated that objects up to 9in in size could be traversed by the tracked main gear, while on soft ground, such as mud and sand, the tracks continued to function on the surface while the nosewheel became completely buried. One Boston was modified with twin tails, but there was no advantage found.



ABOVE: A bomb-toting Boston IV on a test flight over the UK. This variant was equivalent to the AAF's A-20J, itself an A-20G with a Plexiglas nose. KEY COLLECTION

F-3: The photo-reconnaissance derivative. The prototype **XF-3** was powered by turbo-supercharged R-2600-7 engines and fitted with T-3A

cameras, retaining the defensive armament of the A-20. The powerplants proved troublesome, so it was later given R-2600-3s and

transferred to the US Navy for evaluation for use by the US Marine Corps in 1940 as the sole **BD-1**. Two more A-20s were completed as **YF-3s**,

fitted with the same engines as the XF-3, but also having a (unique to the type) manned twin .30-calibre gun position in the tail. The production reconnaissance version was intended for night use, and designated **F-3A**. The 46 built were transparent-nosed A-20J and A-20K models with the nose guns removed to enable the incorporation of cameras in the nose. Additional K-198, K-17 or K-22 cameras were installed in the bomb bay, and photoflash bombs could be carried in the forward section of the bomb bay.

O-53: Intended as an observation aircraft, harking back to the original type concept. Although 1,489 were ordered, they were cancelled in June 1942 before any were built. ▶



ABOVE: Turbinlite Havoc II AH570 of No 1459 (Fighter) Flight at Hunsdon, Hertfordshire, during 1941. AEROPLANE

TURBINLITE AND 'PANDORA'

During late 1940, the limitations of RAF night fighter capability became evident, and a number of experimental trials were conducted. One idea was to mount a very powerful searchlight in a Havoc equipped with an AI radar operator and pilot, guided initially by ground control radar to find and illuminate bombers, which would then be attacked by accompanying single-seat fighters. The need for a heavier aircraft was because it had to carry the operator, radar, and the batteries and light itself.

The system settled on was a Helmore Turbinlite 2,700 million-candela searchlight. It was mounted in the nose of a Havoc behind flat glazing, with the arrowhead aerials of the radar and wing-mounted dipole aerials alongside. Fighter support was provided by Hawker Hurricanes. The searchlight was

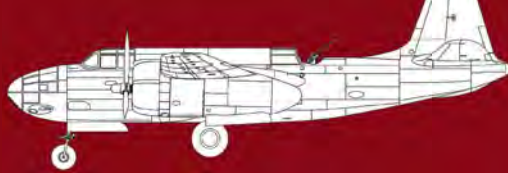
developed by RAF officer William Helmore and produced by GEC. While the technical elements were reliable, the logistics of operating a close formation of aircraft at night and then reacting accurately to the sudden use of a powerful searchlight proved cumbersome. The system was out-

evolved by radar developments, notably the centimetric type, and the Turbinlite Havocs were withdrawn in early 1943.

Some of the Havocs had previously been used in an even more bizarre experiment, involving a weapon known as the Long Aerial Mine (LAM) and codenamed 'Pandora'. Initially tried with obsolete Handley Page Harrows, it was an explosive on a 2,000ft-long cable attached to a parachute. This was dropped over the sea in front of approaching German bombers, hoping that the bombers would snag the cable and drag the explosive onto themselves. Twenty converted Havocs, first with the designation Havoc III, then later Havoc I (Pandora), equipped No 420 Flight — subsequently redesignated as No 93 Squadron — but with only one confirmed victory the unit was disbanded and the Havocs re-allocated.



This Long Aerial Mine-equipped Havoc I, BT465 Frances from Middle Wallop-based No 93 Squadron, was credited with one He 111 destroyed and another probable. AEROPLANE



TECHNICAL DETAILS | DOUGLAS DB-7/A-20

A tough attack bomber



A completed A-20 being pulled from the assembly line at the Long Beach, California, factory. LIBRARY OF CONGRESS

The A-20 was a conventional stressed-skin aluminium alloy semi-monocoque aircraft, with single-spar wings, and a two-spar horizontal fin and tailplane. Rudder, elevators and ailerons were fabric-covered, the tailplane

having a marked dihedral to clear the airflow from the nacelles. The early triangular tail was supplanted by a larger unit, though handling was good with either. Split flaps were fitted inboard and outboard of the engine nacelles. The original design

was very clean, the engine nacelles being completely without excrescence.

The tricycle retractable undercarriage had single oleo legs. The aircraft used hydraulic systems for the undercarriage, bomb doors and flaps. Early examples had no back-up system, but from the Boston III onwards the type featured a compressed air cylinder to blow down the wheels.

The propellers were constant-speed, fully featherable hydromatic units. Oil coolers on the inboard side of the nacelles had thermostat-controlled cooling flaps. The lights, oil dilution system, engine fire extinguisher system, forward-firing guns, camera drive and timing and heating for the pitot head were all electrically powered.

One innovation was that the design was structured to make it easy to break down into sub-assemblies, both for transport and repair. Each wing

could be separated into two sections. The tail surfaces were separate units, as was the nose, which detached along a vertical bulkhead in front of the cockpit. The fuselage could also be bisected.

In March 1940, Douglas stated that orders in hand for France, Great Britain and the US Army Air Corps totalled US\$75,000,000. In response to this demand, Douglas was running the Santa Monica plant 24 hours a day before the US entry into the war, augmented by the new factory at Long Beach, both taking advantage of the Californian weather. An innovative 'flow line' assembly factory was used for A-20 production in Santa Monica, wrapping a 6,100ft assembly run into a 700ft-long building. The only A-20s not built by Douglas were 380 made by Boeing at its Seattle facility. They were comparable with Douglas-built examples thanks to master tooling being supplied.

SPECIFICATIONS: DB-7B/BOSTON III

POWERPLANTS: Two Wright Cyclone GR-2600-A5Bs, 1,600hp each

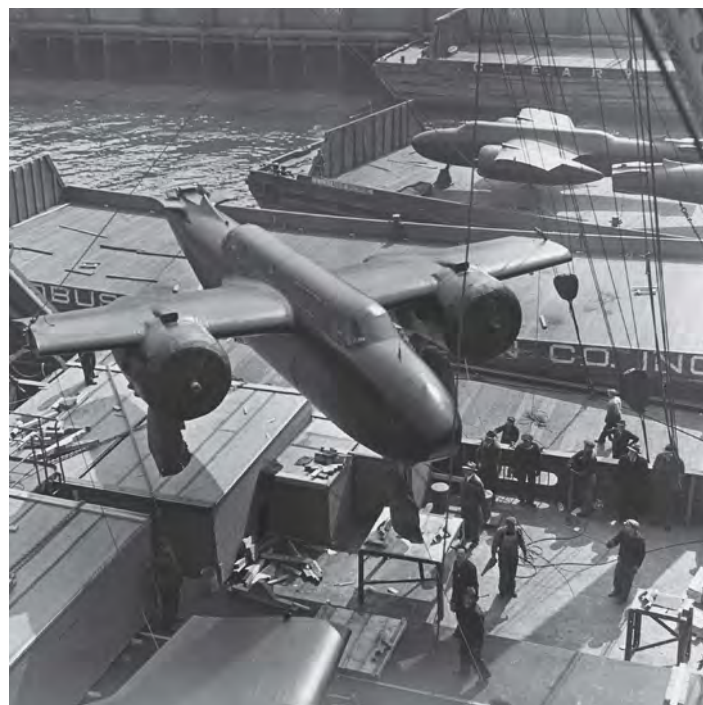
DIMENSIONS: Length: 47ft 3in (14.40m)
Height: 18ft 1in (5.51m)
Wingspan: 61ft 4in (18.69m)

WEIGHTS: Empty: 15,051lb (6,827kg)
Maximum: 21,580lb (9,790kg)

ARMAMENT: Maximum bomb load: 2,000lb (907kg)
Defensive: Four fixed .303in Browning machine guns in nose, twin flexibly mounted Browning .303in guns in dorsal position, one flexibly mounted .303 VGO in ventral position

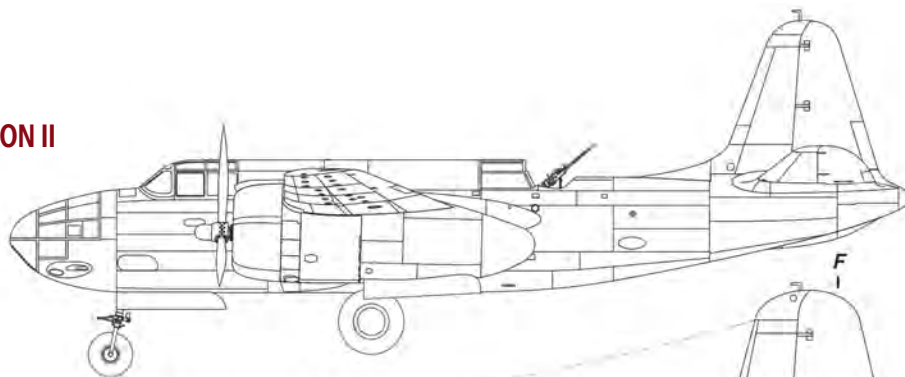
PERFORMANCE: Maximum speed (sea level): 311mph (500km/h)
Cruise speed: 273mph (439 km/h)
Normal range: 535 miles (845km)
Service ceiling: 25,170ft (7,672m)

CREW: Two to four (pilot, gunner, bomb aimer and ventral gunner)

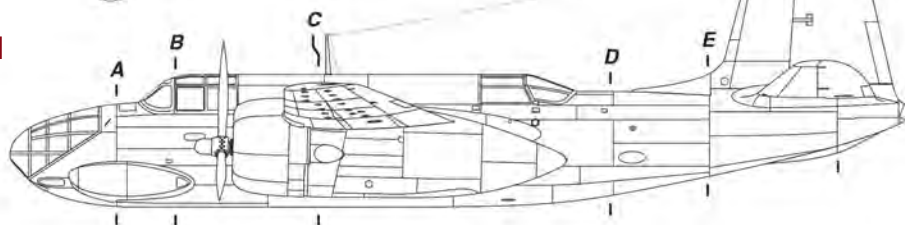


A-20Cs being loaded onto a cargo vessel for transport to the USSR, fully protected for their sea voyage. FRANKLIN D. ROOSEVELT PRESIDENTIAL LIBRARY

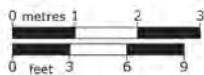
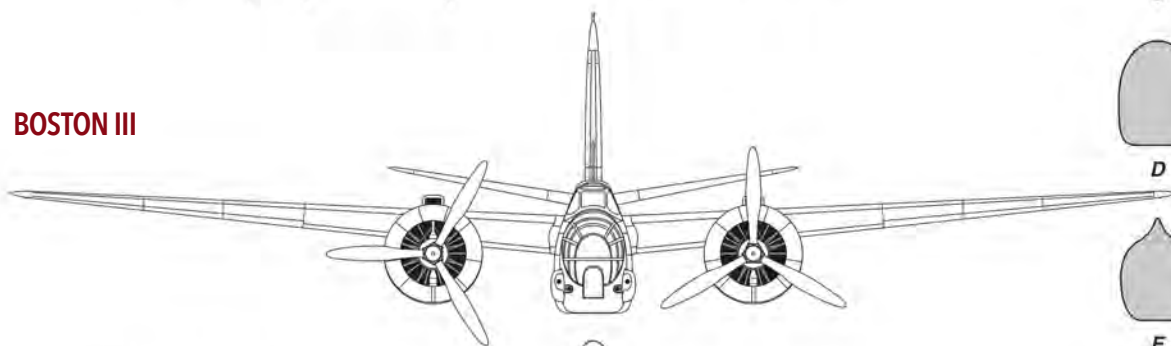
DB-7/BOSTON II



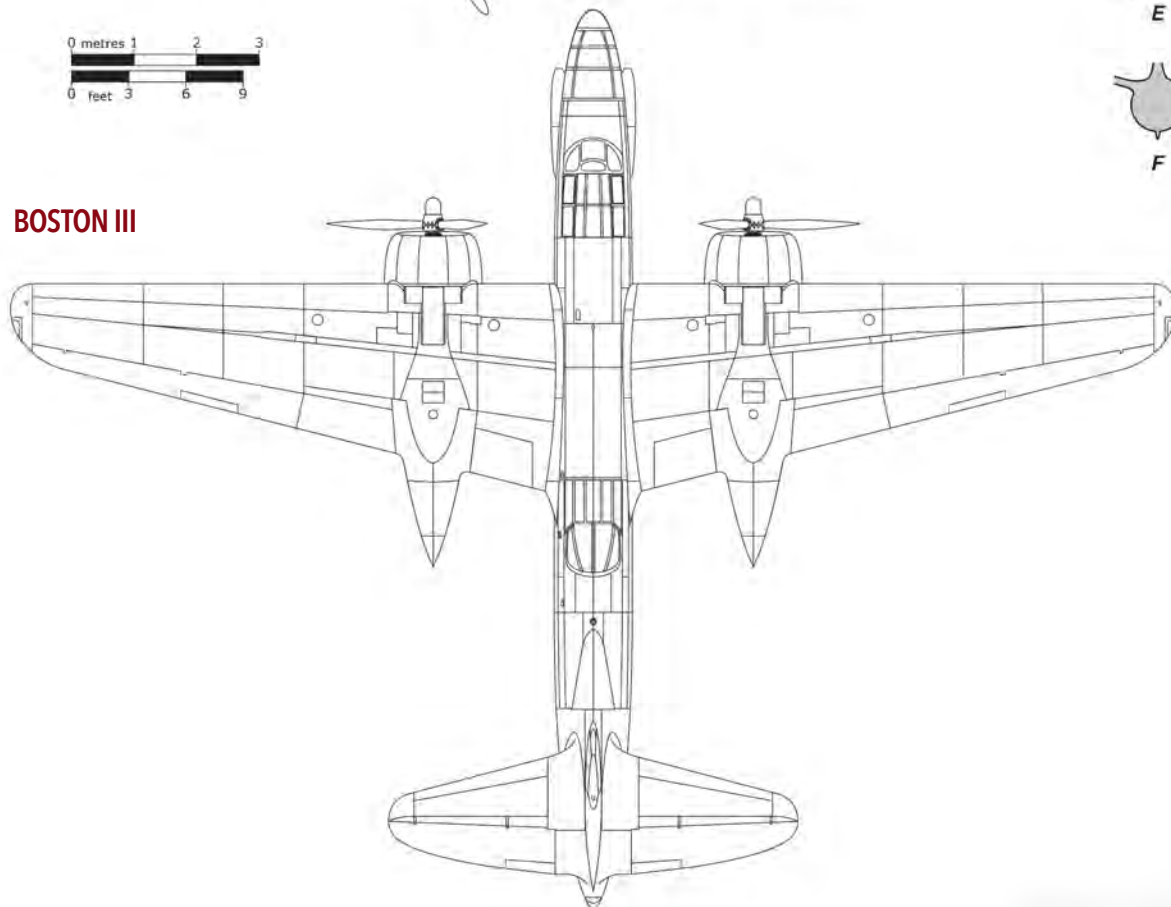
BOSTON III

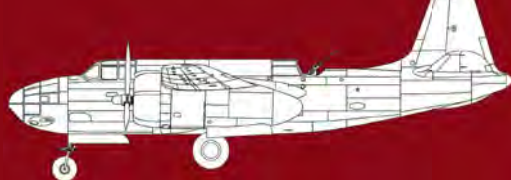


BOSTON III



BOSTON III





IN SERVICE | DOUGLAS DB-7/A-20

Not a first choice, but a first-class performer



ABOVE: A DB-7 B-3 operated by the Armée de l'Air, photographed in North Africa. VIA GILLES COLLAVERI

ABOVE RIGHT: One of the last DB-7s in Armée de l'Air service, used to attack the so-called 'Atlantic pockets' in September 1944. VIA GILLES COLLAVERI

FRANCE

The French order secured the future of the type, but actual French use was subject to the vagaries of war. The first machines for France were designated as the DB-7 B-3 (DB for Douglas Bomber, as against the familiar DC for Douglas Commercial, and B-3 for 'three-seat bomber') and had two 1,000hp Pratt & Whitney R-1830-SC3-G engines, French gun mounts and guns, and metric instruments. The second batch employed more powerful R-1830-S3C4-Gs of 1,100hp each.

Even with the fatal crash of the Model 7B, the French purchasing commission placed contract 649/9 on 4 February 1939 for 100 aircraft to be equipped with 1,000hp R-1830-SC3-G turbocharged engines. Deliveries were to be completed by 31 January 1940. Eight months later, following the outbreak of war and in the light of disarray in the French aviation industry, another order was placed on 14 October 1939 for an additional 170 DB-7s. On 20 October 1939 there followed a deal for a third batch of 200 machines, but fitted with Wright R-2600-A5B Twin Cyclones of 1,600hp. Douglas

designated these as the DB-7A.

Although initial deliveries to the Armée de l'Air were expected in June 1939, the first DB-7s did not arrive until November. Originally intended for delivery to mainland France, they were diverted to Morocco, assembly being undertaken by Atelier Industriel de l'Air (AIA) of Casablanca. The initial DB-7 was ready in January 1940. By June, 116 had been delivered to Casablanca. The planned re-equipment of five complete bomb groups was disrupted by supply problems for

22 May 1940 when aircraft from GB II/19 attacked advancing German columns between Bohain-en-Vermandois and Cambrai. One Douglas was shot down by ground fire and another damaged. Two days later, another six DB-7s from the same unit flew from Amiens and Arras but were intercepted by Messerschmitt Bf 109s, with one DB-7 being downed and two more sustaining damage. In return, one Bf 109 was claimed destroyed and one damaged. On 29 May, 12 DB-7s of I/19 and II/19 bombed Wehrmacht forces

Hs 123 shot down while they were returning from a bombing mission, while I/19 delayed the German advance by destroying the bridge at Missy-sur-Aisne, but losses continued. The last missions during the Battle of France took place on 14 June, six DB-7s of I/19 and II/19 hitting targets at Château-Thierry and Romilly-sur-Seine. Upon the Italian entry into the war, on 24 June aircraft from GB I/61 bombed Cagliari.

The surviving DB-7s were evacuated to North Africa on 15 June. By then, GB I/19 had only four aircraft and II/19 five, though I/61 was still at full strength. The Armée de l'Air's DB-7s had flown more than five missions a day in the course of the Battle of France, totalling 134 sorties. Fifteen aircraft were lost in combat, with one more falling victim to an accident — a remarkable testament to the type's reliability and the crews' efforts with a new and essentially unproven type.

With the fall of France and the establishment of the Vichy regime, French Douglasses ended up fighting both with and against the Allies. In service with the Vichy French air arm, the Armée de l'Air d'Armistice, DB-7s from the original French order saw little

“The first combat for the DB-7 family took place on 22 May 1940 when aircraft from GB II/19 attacked advancing German columns”

equipment, two groups having to wait until 16 May.

At the start of the Blitzkrieg invasion of the Low Countries and France, Groupes de Bombardement (GB) I/19, II/19 and I/61 were assigned to Groupe 2. On 17 May 1940, after completing their training, the II/19 crews were transferred to Cazaux and then the next day to Saint-Martin-la-Campagne.

The first combat for any of the DB-7 family took place on

north of Abbeville; while returning, DB-7 serial 43 shot down a Henschel Hs 126 taking off from Drucat.

A dozen DB-7s attempted a major operation on 31 May, bombing German columns between Ham and Saint-Quentin. They were attacked by Bf 109s and Bf 110s, two Douglasses being shot down and another damaged, while a fourth exploded during a forced landing. On 6 June, DB-7s of II/19 claimed an



ABOVE: No 88 Squadron Boston IIIs AL693/RH-U and AL721/RH-T flying from their Attlebridge base near Norwich. The unit, which had previously operated Bristol Blenheims, moved to Attlebridge from Swanton Morley in August 1941. VIA JAMES KIGHTLY

action until the Royal Navy attacked the French fleet on 3 July 1940 to prevent it from falling into German hands. DB-7s from GB I/32 carried out a retaliatory strike against Gibraltar, but neither did any damage nor sustained losses.

The finale of the Vichy French air force's activities was precipitated by the invasion of North Africa by a combined British and American force in Operation 'Torch'. Grumman F4F Wildcats from the USS *Ranger* strafed and destroyed three DB-7s of GB I/32 while they were being refuelled and rearmed at Casablanca, but missed three others. The next morning, GB I/32 bombed the US landings on the beaches at Safi; one DB-7 exploded while attempting a forced landing.

With the Allies, a Free French unit, Groupe de Bombardement 1/20 'Lorraine', was formed at RAF West Raynham, Norfolk on 7 April 1943. It operated as No 342 Squadron alongside the RAF's No 88 Squadron, both equipped with the Boston IIIa, on bombing missions over northern France as part of No 2 Group, RAF. Later still, from October 1944 to the war's end a few DB-7s operated by GB I/34 'Béarn' and I/31 'Aunis' attacked German strongholds

on the Atlantic coast of France; thus, French DB-7s flew from the beginning to the end of France's war.

UNITED KINGDOM

The British essentially acquired the aircraft by accident. Initial examples for the RAF were all ex-French stock, augmented

by the whole of a small order of 16 placed by Belgium's Aviation Militaire. The first Bostons were superior to the Bristol Blenheim in many ways, but were inadequately protected and, having been built for French tactical operations, had insufficient range to attack continental European targets. The metric

instrumentation was also problematic, but the most critical change required was the switch to a 'push for power' throttle set-up rather than the then-standard French pull arrangement. The new ventral gun was a pan-fed VGO (Vickers Gas Operated, otherwise known as Vickers K) machine gun, while the



ABOVE: Boston III Z2303 heads this six-strong formation of No 88 Squadron aircraft. AEROPLANE

IN SERVICE DOUGLAS DB-7/A-20



ABOVE: In the hands of a Polish crew, No 23 Squadron Havoc I BD112 shot down one Ju 88 and damaged another on the night of 6 December 1941. KEY COLLECTION



ABOVE: No 107 Squadron crews and their Boston IIIs were put on parade for the press at Great Massingham, Norfolk, on 8 April 1942. AEROPLANE

single dorsal gun position, initially equipped with another VGO, quickly received twin belt-fed Brownings instead.

These early Havocs were able to support some of the developing night fighter trials. They entered service with No

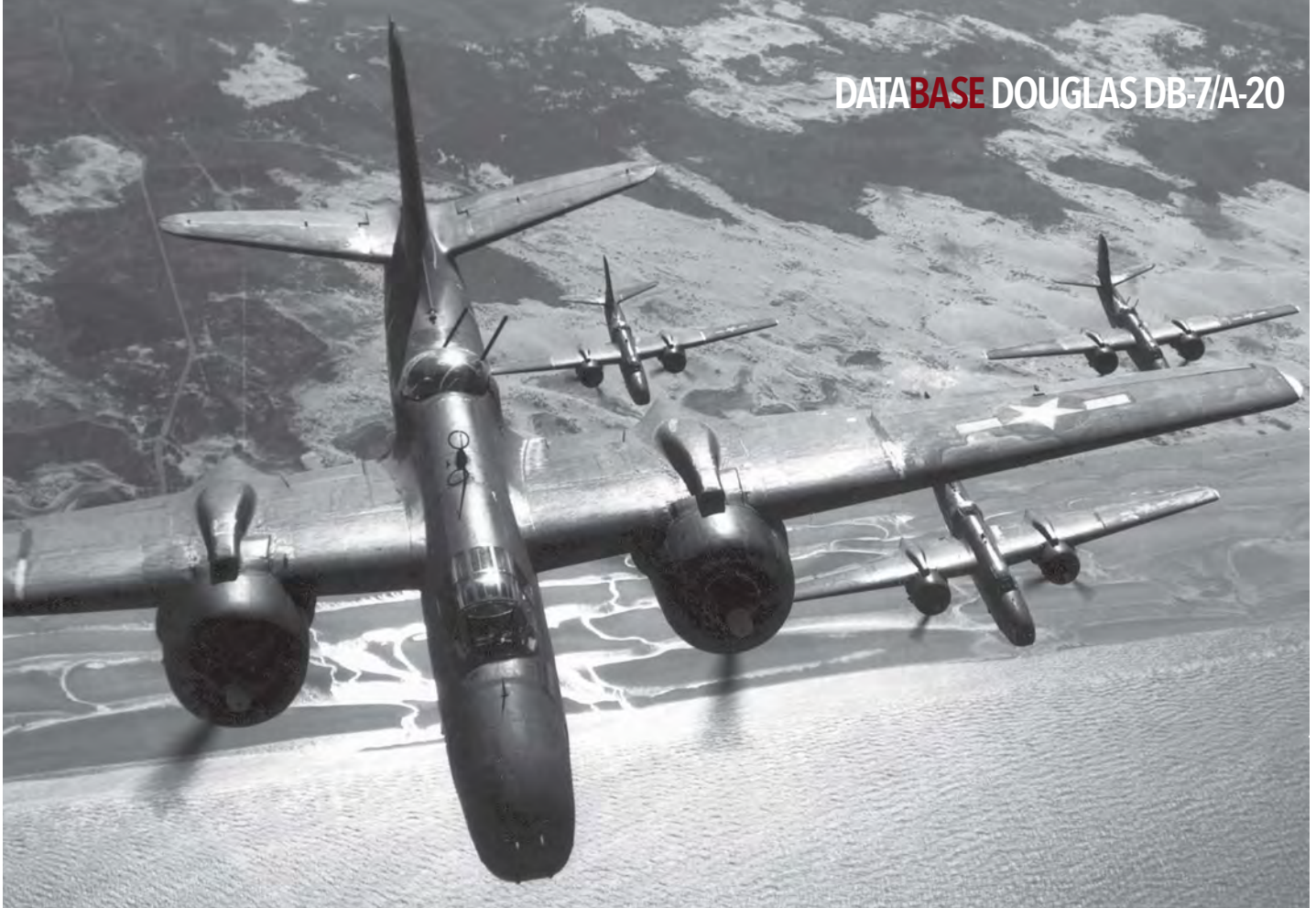
85 Squadron in December 1940, becoming operational in April 1941, and were soon joined by Nos 23 and 93 Squadrons. The aircraft proved ideal, and pioneered the role until being replaced by the still better Bristol Beaufighter and

de Havilland Mosquito night fighters. Meanwhile, the Havoc I (Intruders) of No 23 Squadron started to harass the enemy over its own airfields during the winter of 1940-41 with a mix of gun attacks and bombing.

In 1940, the British Purchasing Commission was able to specify to Douglas its preferences for a version of the type. A name — Boston — was allocated in the Air Ministry system of place names for bombers, but these new machines were dubbed Boston IIIs as the name had been retrospectively allocated to the ex-French aircraft, which were now the Boston I and II. The developed bomber version, the Boston IIIa, had “twice the power, carried twice the bomb load, but only half the duration of the Blenheim”, as wireless operator/air gunner Mike Henry DFC recalled after his transition to the type. “What a magnificent aeroplane it was. It was immediately apparent how much more powerful and manoeuvrable it was when compared to the Blenheim.”

Twenty-four RAF squadrons operated the Boston. It entered service in 1941, equipping No 88 Squadron and then No 107 Squadron. The type played a key role in the ‘lean into France’ from 1942, when few other blows could be landed against the enemy. The campaign of taking the war to Europe with daylight raids used the Boston IIIs of Nos 226 and 342 Squadrons as well, bombing German bases in France and the Low Countries from February 1942. They did so partly as bait to tempt Luftwaffe fighters into the air, doing so at a cost.

In North Africa, Nos 13, 14, 18 and 114 Squadrons operated the Boston as part of the Desert Air Force. The South African Air Force’s No 12 Squadron flew the type from 1942, ending up in the Italian theatre, while No 24 Squadron, SAAF replaced its Martin Marylands with Bostons during mid-1941, and in turn supplanted them with Marauders in December 1943. Within the Desert Air Force, No 55 Squadron, RAF was part of the SAAF’s No 3 Wing, re-equipping with Bostons from Martin Baltimores in October 1944 and moving to Greece in September 1945.



ABOVE: 410th Bombardment Group A-20Gs over the French coast. This unit was part of the 9th Air Force. USAF

UNITED STATES

The very first American users of the A-20A in service were the 3rd Bombardment Group (Light) based at Savannah, Georgia, and the 27th Bombardment Group (Light). Initially operating as high-altitude bombers, there were teething problems with the engine cooling, ultimately solved by manufacturer-made oval holes in the engine cowlings aft of the cylinders. But during war games held at Shreveport, Louisiana during September 1941, crews found they had a 'hot ship' — as fast as many pursuit types then in service.

A-20s were present in the very first hours of America's involvement in World War Two. The 58th Bombardment Squadron's A-20As were at Hickam Field, Hawaii on 7 December 1941, two being destroyed in the Japanese attack. Plans to establish the 27th Bombardment Group in the Philippines as an A-20A unit were aborted. The first American unit to see combat with A-20s was the 89th Bombardment Squadron of the 3rd Bombardment Group,

commencing operations from Port Moresby in New Guinea on 31 August 1942. It was not until early 1944 that more A-20s joined them in that theatre, thanks to the 312th and 417th Bombardment Groups. They were equipped with the superior A-20G, the 89th BS converting to the variant at the same time. By September 1944, there were 370 A-20s in the Fifth Air Force.

Low-level attacks were preferred in the Pacific, the pilot using the fixed forward-firing armament to overwhelm base, harbour or ship defences, aiming the aircraft at the target to drop bombs by the naked eye, or sometimes skip-bombing them into the sides of ships. These tactics resulted in enhancements to the forward-firing armament and the abandonment of the bombardier's role, initially on an extemporary basis but later embodied in developed

“Low-level attacks were preferred in the Pacific, the pilot using the forward-firing armament to overwhelm base, harbour or ship defences”

versions of the type, notably the A-20G. The 4.5in M8 spin-stabilised rockets in T30 three-tube launchers proved more trouble than they were worth and were rarely employed.

As the New Guinea campaign was wound up, the AAF A-20s were re-tasked to aid with the recapture of the Philippines. By April 1944, three full four-squadron A-20 groups of the Fifth Air Force were island-hopping through the region, taking part in the invasion of Luzon in January 1945, and then hitting Japanese targets on Formosa.

The categorical rejection by Gen George Kenney — commander of the Allied air forces in the south-west Pacific — of the replacement Douglas A-26 Invader resulted in the 312th Bombardment Group starting to convert to the four-engined Consolidated B-32 Dominator. At the war's end, the 387th and 389th

Bombardment Squadrons were still flying A-20s, while the 417th BG was transitioning to the A-26. Having been in at the start of the Pacific war, the 3rd BG retained its A-20s until the very end. It proved to be the last operational AAF A-20 unit, preparing to move to Okinawa for the invasion of Japan.

After flying the Atlantic using ferry tanks, the 47th Bombardment Group (Light) of the 12th Air Force arrived in the Mediterranean theatre in December 1942, and was to remain A-20-equipped. Its first combat mission was from Youks-les-Bains, Algeria on 13 December 1942. The 47th BG primarily used its Havocs for tactical work, doing so notably successfully during the Kasserine Pass battle that helped lead to the final German defeat in Tunisia. Afterwards it carried on the same task, trekking up through Malta, Sicily, Italy, Corsica, France and finally back to Italy where, from February 1945, it started re-equipping with the A-26 Invader.

In northern Europe, a couple of propaganda-driven operations were flown by



ABOVE: Boston III AL672 was among the RAF aircraft that took part in the 4 July 1942 mission to the Netherlands in the hands of a US crew from the 15th Bombardment Squadron. It survived and went into AAF service, retaining its RAF serial; this shot shows it in use with 9th Air Force Headquarters, taking off from Chalgrove, Oxfordshire. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

US crews in RAF Bostons due to pressure over a perceived lack of US combat action during mid-1942. A single AAF crew from the 15th Bombardment Squadron flew a Boston III from No 226 Squadron, RAF on a sortie to attack the Hazebrouck marshalling yards in Belgium on 29 June, while on 4 July six crews from the same unit again borrowed aircraft from 226 to join other RAF Bostons in striking airfields in the Netherlands. Three aircraft were lost and three damaged in one of the first blows landed by the US against Nazi Germany — and on America's special day to boot.

The A-20G-equipped 409th, 410th and 416th Bombardment Groups (Light) joined the 97th Combat Bombardment Wing (Light) of the 9th Air Force between March and May 1944. They were another facet of the build-up of tactical air forces for the recapturing of continental Europe. The Pacific

“Three aircraft were lost and three damaged in one of the first blows landed by the US against Nazi Germany — and on Independence Day”

tactics of low-level attacks caused heavy losses to anti-aircraft fire in the European environment, necessitating a switch to medium-level formation bombing led by glazed-nosed bombardier-equipped

formation lead ships. A-20Gs with Boston III noses were used for this until A-20Ks became available. Flying from bases in liberated Europe, these units started re-equipping with A-26 Invaders at the turn of 1944-45. By the



ABOVE: An in-flight view of the first P-70, serial 39-736. USAF

European war's end all A-20s in the theatre had officially been replaced, the 410th BG being re-rolled as a night bomber outfit.

An often forgotten unit, the main user of the F-3A reconnaissance model, was the 9th Air Force's 155th Photographic Squadron (Night). It was issued with F-3As in May 1944 for night photographic operations in the European theatre.

The AAF had no night fighter units when the US entered the war, but used the Douglas twin to catch up. In 1942 a night fighter training organisation was established at Orlando, Florida with the gun and radar-equipped P-70. It developed tactics and procedures for radar-controlled night interceptions, and ultimately to train crews for 19 AAF night fighter squadrons. The first P-70 was delivered as early as April 1942. The type was allocated the name Nighthawk, which never stuck.



ABOVE: A low-level attack by an 89th Bombardment Squadron, 3rd Bombardment Group A-20 on the Japanese-held airfield at Lae, New Guinea — a Mitsubishi G4M 'Betty' is the unfortunate machine parked in the open. USAF

In contrast to Soviet and British views on the night fighter derivatives of the A-20, the AAF's experience in the Pacific was an unhappy one. The first P-70 units there were Detachments 'A' and 'B' of the 6th Night Fighter Squadron. 'B' served with the Fifth Air Force in New Guinea for eight months, but was recalled to Hawaii in the late autumn of 1943, while 'A' went to Guadalcanal with the 13th Air Force. The first P-70 mission on Guadalcanal was flown on 1 April 1943. Detachment 'B' departed Hawaii on 18 February 1943 with six P-70As, one of which was lost en route. Based at Port Moresby's Three-Mile Drome (Kila), they operated under 5th Fighter Command.

Having been transferred from Curtiss P-40s, the pilots were not keen on night fighting with the big twin. They quickly discovered that their P-70As had trouble gaining sufficient altitude to intercept enemy bombers, mostly Mitsubishi G4M1 'Bettys' launched from Rabaul.

The P-70's poor climb performance was the major reason why it failed to establish a reputation as a night fighter, in the view of pilot 1st Lt John Florence: "Operationally, with only five P-70s, our mission was to intercept bombers sent over our area at night. Since we could not get up to where they were, regular patrols were out of the question. When our ground radar

picked up an inbound enemy flight over the Owen Stanley Mountains, we would scramble only one aircraft, and on most occasions it was futile."

The first P-70 success in the Pacific occurred over Guadalcanal in the early hours of 19 April 1943. Pilot Capt Earl Bennett and TSgt Raymond Mooney intercepted a 'Betty' coned in searchlights at 22,000ft, after a 45-minute climb. However, later interceptions were frustrated when the G4Ms simply dived away, and the radar equipment coped poorly with the heat and humidity. In New Guinea, the type scored its first kill on 15 May 1943, credited to 2nd Lt Burrell Adams. The victim was one of six G4M1s that overflew Moresby at the cost of one aircraft shot down at 12,000ft.

SOVIET UNION

The largest user of the A-20 family was the Soviet Union. It received about half of the total production run, thanks to Lend-Lease. More than 3,000 examples were actually delivered, making it the most numerous foreign type in Soviet service. Two out of three of all A-20Bs manufactured were sent to Russia, plus A-20Gs and A-20Hs. The majority were delivered via the Alaska-Siberia ferry route, while some others were shipped to Cape Town, South Africa, on to Iran and thence Russia.

The Soviet forces considered the Boston a very good medium bomber. It had an excellent reputation with its pilots, thanks to its good handling and high ceiling, and was seen as being equal to German technology. Given that pilot training was often rushed and poor, favourable handling was even more crucial. On rough fields, with the tricycle undercarriage, take-offs and landings were regarded as much easier than in the Petlyakov Pe-2. Furthermore, although the Boston was heavier than the Pe-2, it was noted as being faster, initially by 10-15km/h (6-10mph). With development post-1943 the Pe-2 retained the same bomb load but had improved speed and a higher ceiling, while the entire increase in engine power on later A-20s was consumed by a bigger bomb load and more equipment, leaving performance slightly degraded.

Navigator and Hero of the Soviet Union Rostislav Sergeevich Demidov recalled another contrasting type: "The [Ilyushin] Il-4 was a very heavy aircraft, and it was much less manoeuvrable than the Boston. When we returned from a successful mission, we would fly a low-altitude barrel roll with a Boston."

Soviet A-20s were known as the 'A-20V' in Cyrillic, the 'B-3', or by the British name Boston, while the later A-20G was dubbed the 'A-20Z'. ➤

BELOW: A-20G-35-DO 43-9943 and A-20J-10-DO 43-9910, together with a B-25 Mitchell, on delivery to the Soviet Union. USAF





ABOVE: An 'A-20V' of the Soviet Air Force's 8th Guards Bomber Aviation Regiment with its crew at Zadonsk airfield, Lipetsk Oblast. VIA JAMES KIGHTLY

They served with the Soviet Air Forces (VVS) and Soviet Naval Aviation (AVMF), and were used in multiple roles including, uniquely for the A-20, as torpedo bombers. The 5th Maritime Torpedo Aviation Division by 1945 comprised the 9th Guards Maritime Torpedo Aviation Regiment, equipped with Il-4s and A-20s, while the 36th Maritime Torpedo Aviation Regiment had A-20s and a P-39 Airacobra-equipped fighter regiment, all based at Severomorsk-1, Murmansk Oblast. With the end of the European war, they were transferred to the Soviet Pacific Fleet. The 8th Bomber Aviation Brigade of the Baltic Fleet was redesignated in July 1943 as the 8th Maritime Torpedo Aviation Division, and in the 1945 order of battle consisted of the 1st Guards Maritime Torpedo Aviation Regiment with A-20s and the Il-4 and the 51st Maritime Torpedo Aviation Regiment flying A-20s alone. The 2nd Maritime Torpedo Aviation Division had the A-20G-equipped 49th Maritime

“The A-20's heated crew positions and armour plating seemed an unthinkable luxury in contrast to Soviet-built machines”

Torpedo Aviation Regiment at Novonezhino, Primorskiy Kray.

New knowledge of Soviet naval operations has allowed for much greater Western understanding of the type's capabilities as brought to bear by the AVMF. During early use in the summer of 1942, when Soviet naval Bostons flew low-level raids at 10m (33ft) against German convoys that were heavily protected by flak and fighters, they suffered heavy losses. The inadequate armament was quickly

upgraded, initially at the front line. The four Browning machine guns were replaced with faster-firing UB 12.7mm or ShKAS 7.62mm guns, and some Bostons gained an MV-3 turret with an ShKAS, or a UTK-1 turret with a UBT machine gun. The official rearmament, “by decree of the State Defence Committee of the proposed scheme of the Design Bureau of Plant No 43”, comprised two fixed UB guns on the sides of the nose, a UTK-1 turret with a UBT gun,

BRAZIL

In 1944-45, the Força Aérea Brasileira received 30 ex-AAF A-20K Havocs, and, for ground instruction, a sole Boston III. These aircraft remained in service well into the 1950s. Today, one example is on display at the Museu Aeroespacial in Rio de Janeiro. Brazil was the only Western nation to use the Havoc post-war; otherwise, they were quickly disposed of.

and another UB in the ventral position. Nevertheless, numerous Soviet Bostons kept either the open dorsal position or the Martin turret.

The type's offensive armament was modified to take in Soviet bombs, including cluster bombs and incendiary and smoke types. The final result was that the offensive load was increased to 2,000kg (4,400lb) provided that the take-off was from a concrete runway. Crews of the 449th Regiment usually attacked from an altitude of 1,000-2,000ft, diving at 20-25°, with a hedge-hopping escape after the bombs were dropped.

The heated crew positions and armour plating seemed an unthinkable luxury in comparison with Soviet-built machines. Various early-model Bostons with solid gun noses used by Soviet Naval Aviation had temporary navigator's stations until a more permanent position could be developed. Yuri Abramov of the 51st Maritime Torpedo Aviation Regiment used an extemporary navigator's cockpit in the gunner's compartment of an A-20G, and said he wasn't able to see anything except straight down or up, while Demidov recalled, “I flew in a shallow compartment behind the pilot, head-to-head with him. You couldn't see anything from the rear compartment, while I could see everything from here. The Americans sent all the Bostons to us as gunships, and we were unable to 'repair' them. The front compartment was added in Leningrad a bit later, but we had to fly missions somehow before those modifications were made. I helped my pilot, turned my head side to side, increasing his situational awareness. The pilot only flew the aeroplane; I did all the rest. I advised when he should release torpedo or bombs, when to open fire with machine guns. There was also a map in front of me, if it was needed to plot a course.”

The Soviets developed some Bostons into night fighters, with an indigenous

Gneiss-2 airborne radar and ground control system. Between February and June 1943, it was tested in an A-20, the type being found a better option for the role than the Pe-2. That July the Douglas machine equipped the newly formed 56th Aviation Division of Long-Range Fighters at Migalovo, Kalinin Oblast, which included the 45th Aviation Regiment of Long-

Range Fighters flying the A-20. Another user at the same base was the 173rd Aviation Regiment of Long-Range Fighters, and the 244th Bomber Aviation Regiment was stationed there by 1945. Each unit had a RUS-2 ground-based radar company to provide initial ground control for the airborne interception. Separately, using a developed Gneiss-2A radar

with sea search capability, A-20s were used by Soviet Naval Aviation to locate surface vessels.

As of May Day 1945, the Soviet Air Force had 935 Bostons in its inventory. More than two-thirds of them were A-20Gs, with 65 A-20J and K models — at the time they were redeploying to attack Japanese forces. Soviet A-20s continued in use beyond

1945, eventually being replaced in some units by the jet-powered Ilyushin Il-28 'Beagle'. As late as 4 September 1950, during the Korean War, a Vought F4U Corsair night fighter from the USS *Valley Forge* encountered two aircraft that its pilot identified as Soviet naval A-20s over the Yellow Sea, and he reported shooting one of them down.

AUSTRALIA

Australia acquired a squadron's worth of Bostons essentially by accident, but they were popular with their crews. In October 1941, after the German occupation of the Netherlands, the Dutch government in exile began modernising the equipment of Koninklijke Marine Luchtvaartdienst (Royal Netherlands Navy) units operating in the Netherlands East Indies. It ordered 80 DB-7 bombers; 32 were DB-7Bs diverted from a British order, while 48 were DB-7Cs built to a Dutch specification with interchangeable noses containing either four 20mm cannon or a bomb aimer position. Other equipment included automatically deploying life rafts and the capability to drop torpedoes.

The DB-7Cs never made it to their customer, as they were not completed before the fall of the Netherlands East Indies. Instead, they were converted to DB-7B specification at the factory and added to the significant supply of Bostons to the USSR.

Six DB-7Bs were delivered to Java before the Japanese invasion, but only one was flown by the Dutch. Later, at least two were operated by the Imperial Japanese Navy and Army, one being found at the Atsugi naval air base in Japan post-war. Of the remaining 26, four were still on freighters in the Pacific when the invasion took place — they returned to the US, being used for

training by the AAF. The ships carrying the other 22 DB-7s were diverted to Australia, arriving in March 1942. Quickly erected and named as Boston IIIs by the Royal Australian Air Force, which was in desperate need of modern combat aircraft, they were issued to No 22 Squadron in April 1942.

“The Boston was more complex than anything crews had encountered”

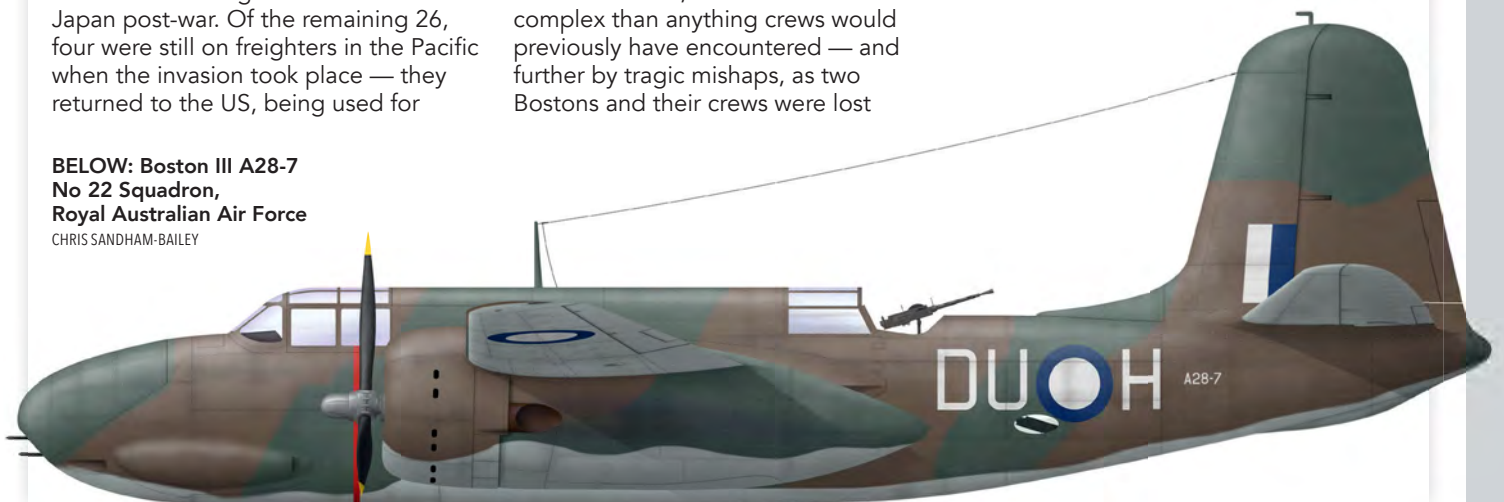
With apparent threats from Japanese forces everywhere, No 22 Squadron carried out anti-submarine patrols along the New South Wales coast, including two actual attacks, while preparing for deployment. Its Boston IIIs were converted with an all-gun nose featuring either a trio or a quartet of .50in Brownings, adding to the existing four .303s in the cheek positions. Some were given a fixed 'scare' gun in the tail. The aircraft usually flew with two crew members, the ventral position often not being needed at very low level. Initial combat was marred firstly by conversion accidents — the Boston being notably more advanced, faster and more complex than anything crews would previously have encountered — and further by tragic mishaps, as two Bostons and their crews were lost

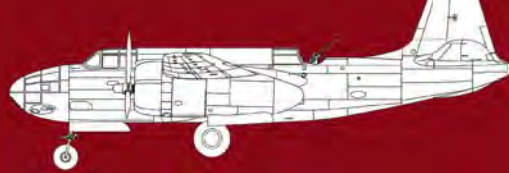
dropping 20lb anti-personnel bombs that exploded under the aircraft.

Deployed to Port Moresby, New Guinea in October 1942, the Bostons flew in support of the Australian Army fighting the Japanese around Buna and Gona. They were paired with No 30 Squadron, RAAF, flying Beaufighters on low-level attack missions, and notched up numerous successful operations including participation in the Battle of the Bismarck Sea and multiple raids on Lae and Salamaua. The RAAF's only Victoria Cross recipient from the Pacific campaign was Flt Lt W. E. 'Bill' Newton, who was gazetted, posthumously, for two destructive raids on Salamaua on 16 and 18 March 1943. He was shot down and captured on the latter mission and subsequently executed by the Japanese.

By October 1943 the unit was down to six operational Bostons. A transfer of A-20As from the AAF's 89th BS and used A-20Cs from the continental US was arranged, and the unit was able to continue with these until November 1944, when a single Japanese raid destroyed so many of the remaining aircraft that it was rendered non-operational. Ultimately, the RAAF flew a mere 69 Bostons and A-20s.

**BELOW: Boston III A28-7
No 22 Squadron,
Royal Australian Air Force**
CHRIS SANDHAM-BAILEY





INSIGHTS | DOUGLAS DB-7/A-20

“One of the nicest medium twins of the war”



ABOVE: No 88 Squadron Boston IIIs, with Z2236 breaking away from AL775. Pilots praised the type's handling qualities. *AEROPLANE*

Flight's anonymous correspondent 'Indicator' said: "I often wonder whether the Boston-Havoc combine ever received the praise due to it as an outstanding flying machine. Since a military aircraft must do rather more than fly fast and handle well, it is rather doubtful. The Boston was not a very practical bomber and the Havoc never got into its stride as a night fighter. But

nobody will deny that the type was one of the nicest medium twins of the war."

Capt Eric 'Winkle' Brown recorded his thoughts on the Boston IV, describing it as "being amongst the most enjoyable I have flown". He went on: "The Boston took off like a scalded cat, accelerating rapidly so that the nosewheel could be lifted off early and unstuck made at 100-110mph with a steady pull on the control column". Gunner Mike Henry DFC

recalled, "A strange innovation was the duplicated flying controls in the gunner's cockpit, a stick and rudder bar, and no instruments, nor could the gunner see where he was steering if he had to take control."

In July 1941, the Air Fighting Development Unit, then at RAF Duxford, produced a report on a Boston II. After detailed assessment of the guns and rearming, the flying characteristics were summarised by saying, "Its all-round performance is much better than that of a Blenheim". It added: "Comparative speed trials were undertaken with the Boston and a Blenheim MkIV. Both aircraft carried a crew of three and full service equipment but no bomb load. The Boston was found to be approximately 14mph and 5mph faster at 5,000ft and 13,000ft respectively. The Boston was fitted with flame dampers on the exhaust, which it is understood detracts about 20mph from the possible top speed."

Later, the AFDU report said: "The aeroplane has a good take-off, high rate of climb, and can land in a comparatively short space if full use is made of the brakes... The controls do not stiffen appreciably at high speeds and the aeroplane has a high degree of manoeuvrability. Instrument flying is simple due to the good stability of the aircraft". Furthermore, "At speeds above 140mph IAS, the low flying qualities of this aircraft are excellent, and very suitable for a low, high-speed approach to, and getaway from, a target. At speeds below 140mph IAS, control is not so good, but can be improved by the use of a small amount of flap."

When it came to establishing bombing technique, a May 1942 AFDU report on the Boston said: "Bombing is normally carried out by individual aircraft from a height of between 8,000-14,000ft, but if any observer is not satisfied with his own run-up, he bombs on a signal from the leader. It has been found that the opening of the bomb doors slows the aircraft by about 15mph, and gives it a tail-down attitude which must be compensated on the sight immediately prior to bombing. When this is done, very accurate results can be obtained."

SURVIVORS

Despite an attractive purchase price of US\$3,000 — with fuel — very few A-20s saw civil employment post-war, partly because of a limited type certificate, while the design's limited internal space mitigated against many civil uses. Today, fewer than 10 are on public display — the only one in the UK being the wreck of ex-Soviet A-20G 43-21664 with the Wings Museum at

Balcombe, Sussex — and just one is airworthy. This is A-20G 43-21709/ N747HS, part of the Lewis Air Legends collection in San Antonio, Texas. The ex-AAF aircraft was operated by numerous civilian owners, beginning with legendary film pilot Paul Mantz. It returned to the air on 15 July 2015 following restoration by Aero Trader at Chino, California.