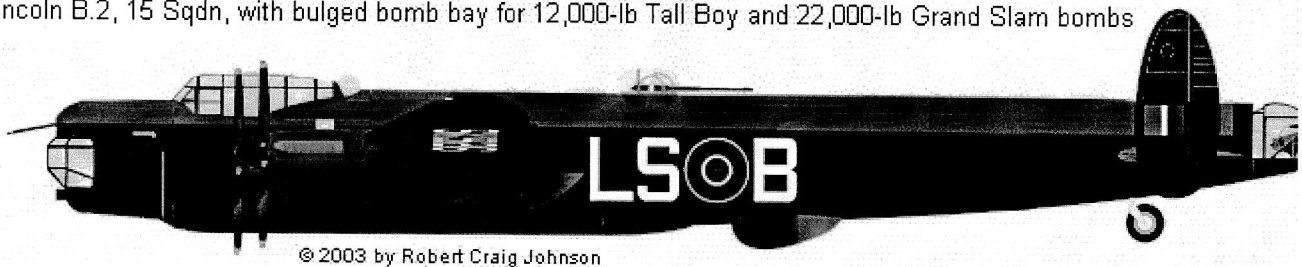


## The price of perfection: Avro's Lincoln

From the point of view of a 1950s RAF officer, Great Britain had the great misfortune of stumbling over the perfect heavy night bomber early in the Second World War: the Avro Lancaster. This aircraft brought a line of development that stretched back to the middle '30s to its zenith. It combined the successful formula exemplified by heavy bombers from the Heyford through the Hampden, Whitley, and Wellington with the power, range, and load-carrying capacity provided by four of the most powerful engines available: Rolls Royce Merlins or Bristol Hercules. It was a quintessentially simple, easily supported aircraft optimized for the area-bombing missions that were the mainstay of Bomber Command operations during the war years. It had few complex systems, an unpressurized fuselage, engines optimized for low- to medium-altitude operations, and an enormous, unobstructed bomb bay capable of handling heavy loads of out-sized bombs, including the 22,000-lb (10,000-kg) Grand Slam earth penetrator and Barnes-Wallis Dam-Buster mines. Unfortunately, perfection tends to inhibit further advances, particularly in war time, when the exigencies of production and supply are apt to discourage change, however beneficial. Air staffs are apt to want more of the same, rather than something really new. As a result, when it came time for the RAF to develop its next-generation heavy bomber, it selected a version of the tried and the true, with more power, heavier defensive armament, and longer range: the Lincoln. Unfortunately, by the time it began to leave the production lines, the Lincoln was, in terms of both technology and flight performance, already a generation behind significantly older American counterparts like the Boeing B-29. By 1945, when it was ready to enter service, the strategic role was already the province of manned and unmanned jets and ballistic missiles optimized for carrying nuclear weapons at the highest possible speeds and altitudes. So, while the Lincoln was a fine aircraft that would serve for many years, it would do so in a tactical role and not as the sort of war-winning weapon that Bomber Command had envisioned.

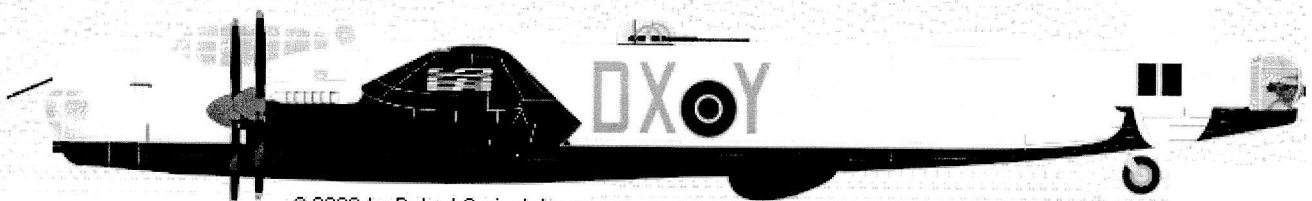
Lincoln B.2, 15 Sqdn, with bulged bomb bay for 12,000-lb Tall Boy and 22,000-lb Grand Slam bombs



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Lincolns were originally meant to spearhead *Tiger Force*, the British component of the Allied air campaign against Japan. To suit it for Pacific operations, the aircraft was given a considerably longer range than the Lancaster's. The Lancaster's armament had proved to be a bit light by late-war standards, so .50-cal (12.7-mm) machine guns and 20-mm cannon replaced the .303-cal (7.7-mm) guns of the older aircraft. As a concession to modernity, the nose guns were placed in a remotely operated turret above the large, glazed bomb-aimer's position. The Lancaster had also proved a bit cramped for some of the new electronic equipment, so the Lincoln provided more space for operators and bulky components like the larger scanners of the latest H2S ground-mapping radars. To cater for the higher weights that resulted, higher-powered Rolls-Royce Griffon engines replaced the Lancaster's smaller Merlins.

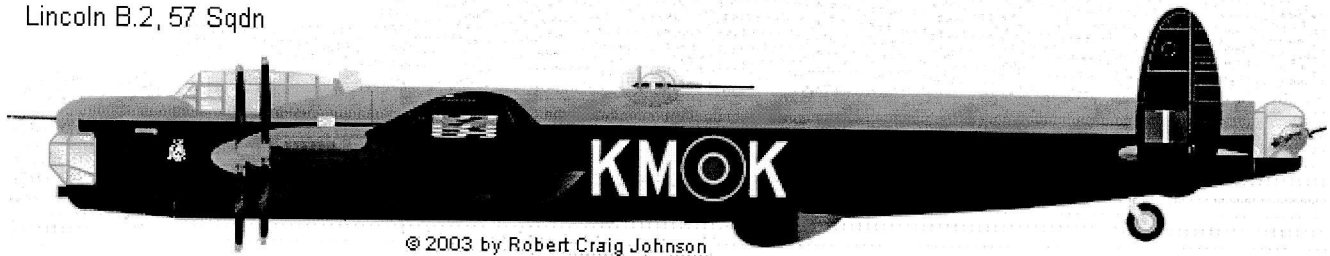
Lincoln B.2, 57 Sqdn, in the tropical finish associated with Tiger Force



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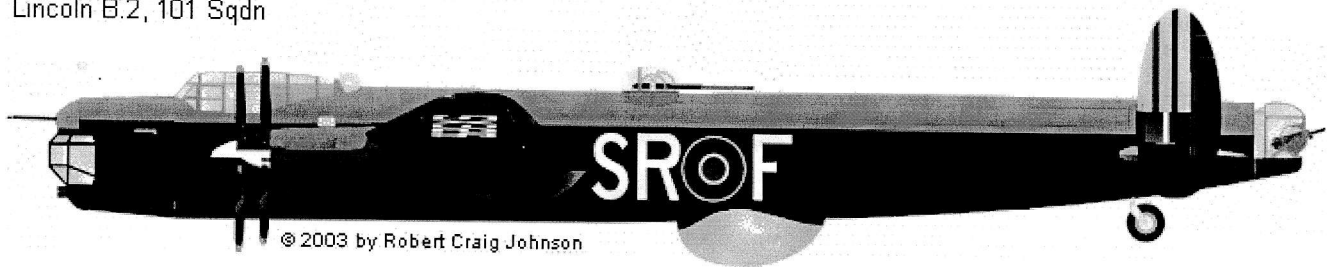
When the war abruptly ended with the nuclear attacks on Hiroshima and Nagasaki, the Lincoln was effectively obsolete, just as it was entering production. It was neither fast enough nor high-flying enough to safely deliver a nuclear weapon and had little hope of evading the coming generation of interceptors. The aircraft's one great virtue, bomb load, now seemed irrelevant, given the destructive power of a single nuclear device. Accordingly, orders were sharply cut back in 1945. Incomplete aircraft were simply cancelled, while completed airframes were delivered to a small number of Bomber Command squadrons or, in many cases, sent directly from the production line to storage. For the strategic, nuclear mission, the RAF leased aging, trouble-prone B-29s—Boeing *Washingtons*—as interim equipment until the advent of the jet-engined V-bombers. Lincolns continued to perform vital if secondary missions, such as electronic countermeasures and signals intelligence, where long range at lower altitudes was a plus and relatively low performance was acceptable.

Lincoln B.2, 57 Sqn



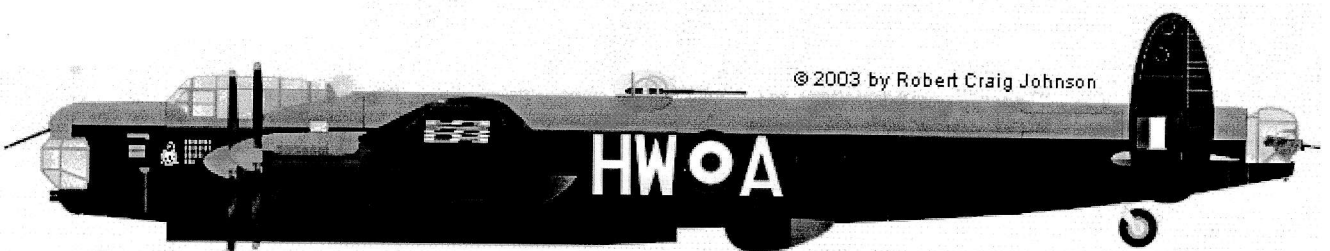
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Lincoln B.2, 101 Sqn



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Ironically, the Lincoln is thus best known for its contributions as a tactical, counterinsurgency bomber in Malaya and Kenya. During *Operation Firedog*, as the air component of the Commonwealth response to the Malayan Emergency was known, conventional tactical air support was found to be of little value. Fast piston-engined light-bombers and jet fighter-bombers could not readily locate small guerrilla bands under the thick, multistory tropical jungle of the Malayan peninsula. As a result, the small load of rockets and 500- or 1000-lb bombs these aircraft carried could not be dropped with enough precision to guarantee a lethal effect at the target. It was therefore decided that saturating an area of jungle with larger numbers of heavier bombs would provide better results against small, dispersed groups. Whether this was true is debatable, given the small size of the targets, the large areas covered, and the load limitations of the Lincoln. But the old bomber's alleged successes became one of the generally accepted lessons of the war. RAF Lincolns operated against the Malayan rebels alongside Australian aircraft (see below) and against Mau-Mau insurgents in Kenya. The claimed success of these efforts was such that they encouraged the USAF to embark on an enormously costly series of *Arc Light* missions over Vietnam, in which three to nine eight-engined B-52 bombers dropped up to 72,000 lbs of bombs each on ill-defined, unseen Viet Cong concentrations.

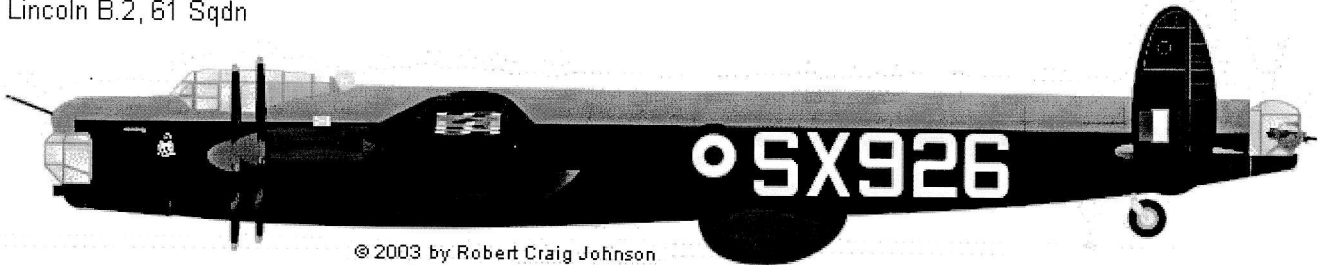


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Lincoln B.2, 100 Sqn

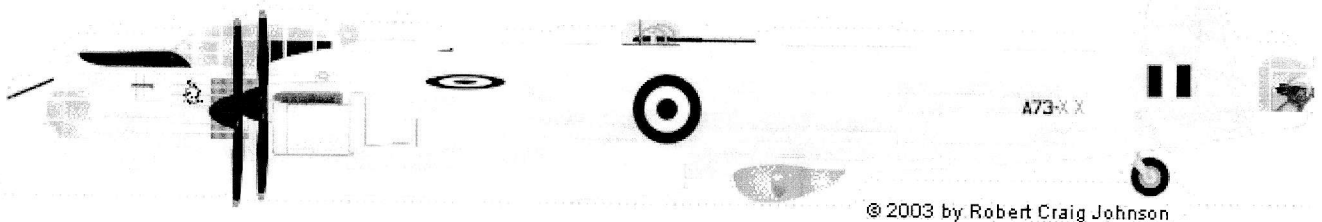


Lincoln B.2, 61 Sqn



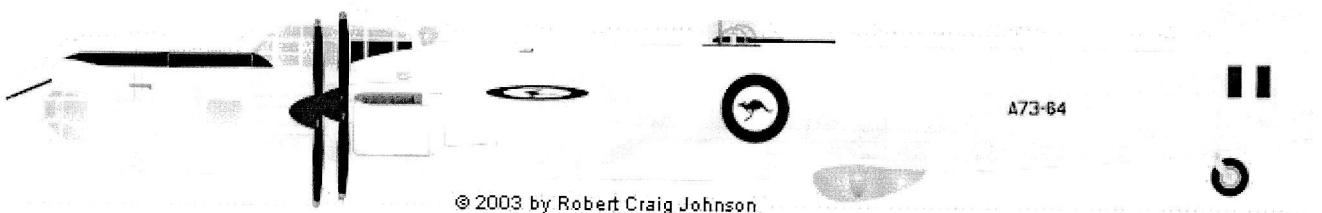
Australia negotiated a production license for the Lincoln late in WW2. The war ended before work could really commence. But unlike its British counterpart, the Australian government did not cancel its order. The money had largely been spent setting up the production line, the RAAF had relatively little modern equipment other than that provided under Lend-Lease, and, for economic reasons, the government wanted to keep the workers in the government-owned aircraft factories working. So, when the Malayan Emergency was declared, Australia had the largest nearby force of heavy bombers available to the Commonwealth. Australian Mk.30s thus had the most extensive combat career of any of the Lincolns. They served throughout the emergency, even after their RAF counterparts had departed or reequipped.

Lincoln B.30, 1 Sqn, RAAF, Operation Firedog, Malayan Emergency, ca. 1951-53



Once the Lincoln's returned to Australia, they were converted for use as maritime-reconnaissance aircraft, as Lincoln MR.30s. In this role, they soldiered on for some years.

Lincoln MR.30, 10 Sqn, RAAF, ca. 1961-62



Argentina was the only other nation to operate the Lincoln. In the late 1940s, the United States refused to supply Argentina with military equipment. The Peron dictatorship had openly supported the Fascists and Nazis during the war and had sheltered war criminals thereafter. It had or was thought to have designs on friendly, Allied nations such as Chile. Economically depressed post-war Britain was less fastidious, however. Avro was allowed to repurchase and refurbish 30 stored Lincoln B.Mk.2s and B.Mk.2As for resale to Argentina, along with a number of Lancasters and Lancastrian transports. The

four-engined heavy bombers replaced decrepit Martin 139 bombers and, on paper, gave Argentina the most potent strategic air arm in South America. But their impact was less than Peron might have hoped. The aircraft entered service slowly, the first being accepted in October 1947 and the last between March and July 1949. Avro found that the process of refurbishing the stored airframes was more involved and more expensive than it had anticipated. The aircraft had deteriorated more than had been expected. Armament and equipment was often missing and frequently out of production. Related problems dogged the deployment of the aircraft. Damage during shipment and initial operations could not be immediately repaired, due to chronic shortages of spare parts. Qualified mechanics and aircrew were in short supply. As a result, many Argentine Lincolns went straight into storage, while others were cannibalized for parts.

Lincoln B.2, Regimiento 1 de Bombardeo, Fuerza Aérea Argentina, ca 1949



Lincoln B.2A, Regimiento 1 de Bombardeo, Fuerza Aérea Argentina, ca 1965

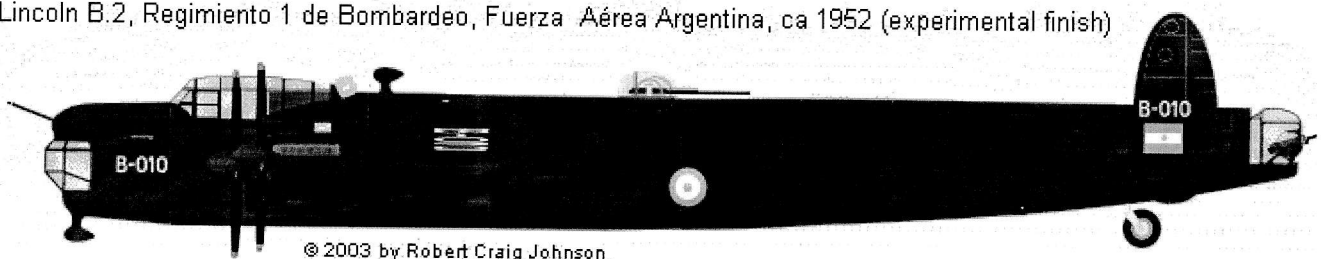


Nonetheless, the Lincolns saw limited combat in the revolutions of 1951, 1955, and 1963. In 1955, they fought on both the revolutionary and government sides. The aging heavy bombers dropped a few bombs but do not seem to have made any decisive contribution. Argentina had jet fighters during this period—Gloster Meteors and Grumman F9F Panthers—so large, piston-engined bombers were, in most cases, too vulnerable to fly by day. Yet they could not fly effectively by night or in bad weather. Navigation was poor and H2S radar does not seem to have been carried. Perhaps it proved unreliable in Argentine service. No bombs other than 110-lb (50-kg) and 440-lb (200-kg) seem to have been available, and even these seem to have been in short supply.

Lincoln B.2A, Regimiento 1 de Bombardeo, Fuerza Aérea Argentina

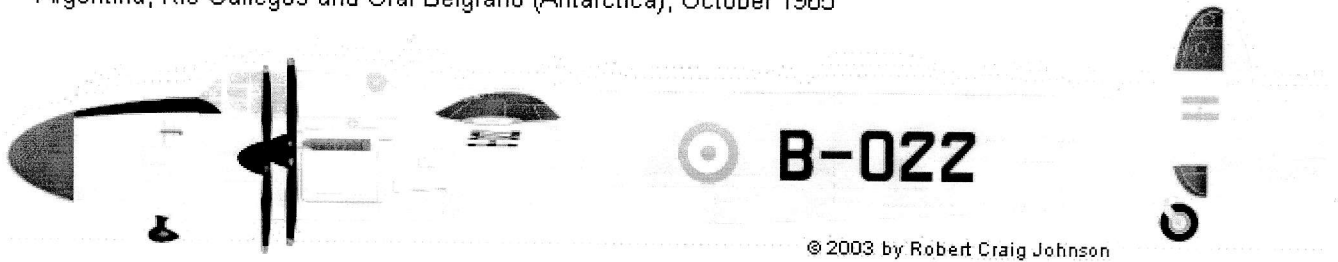


Lincoln B.2, Regimiento 1 de Bombardeo, Fuerza Aérea Argentina, ca 1952 (experimental finish)



The last operational Argentine Lincoln (and the last Lincoln in service anywhere) had a rather more significant if less bellicose life. Originally a B.2A, it was extensively modified and used as a long-range transport in the Antarctic. It supported Argentina's extensive Antarctic research program until well into the 1960s.

Lincoln B.2A, Fuerza Aérea de Tareas Antárticas, Fuerza Aérea  
Argentina, Río Gallegos and Gral Belgrano (Antarctica), October 1965



Avro's Lincoln thus illustrates the price of perfection in a changing world. The most successful aircraft of the Second World War—the C-47 Dakota, the P-51 Mustang, the B-24 Liberator, the Mosquito, and the Beaufighter—attained greatness in many if not most cases in roles they were not designed for. They were adaptations of designs specialized for something else, good enough to meet the immediate need but far from the ideal as it was then understood. The Lincoln's parent, the Lancaster, was itself a four-engined adaptation of the Manchester, a failed twin-engined aircraft intended for day or night bombing. By the time Avro's underlying conception had at last been perfectly adapted for the nocturnal area-bombing campaigns of WW2, those campaigns were over. Military technology had moved on, and the conditions that drove the development of the Lincoln had vanished. The prematurely aged bombers lived out their days doing odd jobs in odd parts of the world.

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