

# AIRCRAFT PROFILE

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## Avro Lancaster Mk. II

by Bruce Robertson





*Lancaster II (DS652) of No. 115 Squadron, R.A.F., which was fated to crash near Udem, the night of June 12-13, 1943 while attacking Bochum. Two of the eight cable cutters fitted to each wing can be clearly seen in this photograph protruding from their inset containers. (Photo: Imperial War Museum ref. CH19792)*

# Avro Lancaster II

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OF THE 7,377 Avro Lancasters built all had Rolls-Royce Merlin in-line liquid-cooled engines except for a mere 301 which had Bristol Hercules radial air-cooled engines. These exceptions were the Lancaster Mark IIs, a variant conceived and effected as a kind of insurance policy so that if, perchance, the supply of Merlin engines were to be inadequate—through the disruption of production by enemy action or diversion of use to other urgently needed aircraft types—then an alternative source of supply for power units would be available.

## ORIGIN

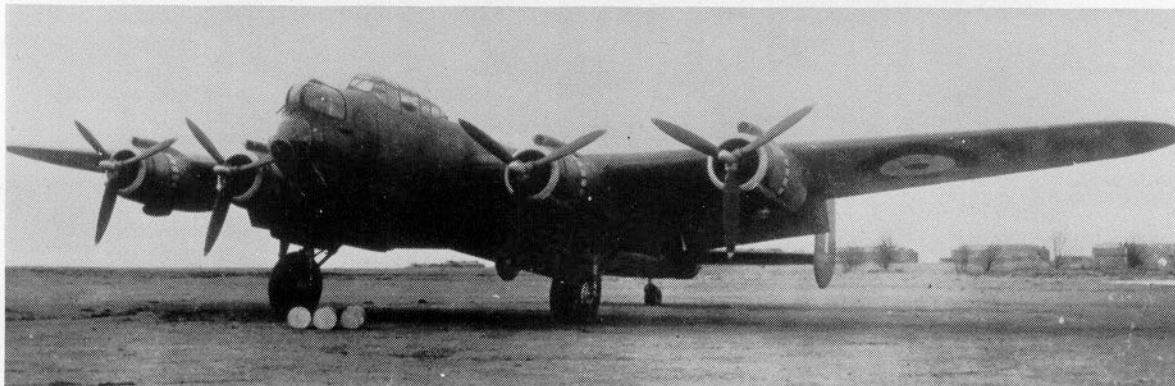
The feasibility of the Lancaster—as a Manchester with four Merlin engines—had only just been proven when the idea of a Hercules version was officially accepted. Without reservation in fact, for both prototype and production aircraft were ordered simultaneously. In these circumstances, it may be asked why a prototype was necessary at all? In the event, the reasons were logical. To avoid the disruption of existing Lancaster production on the one hand, the new production contract could not be placed with A. V. Roe or Metropolitan-Vickers already actively engaged on Lancaster Mk. I production. On the other hand, A. V. Roe's experimental department, with the Mk. I Lancaster off their hands, could fairly quickly hand-make a Mk. II up from airframe parts in the Chadderton (Manchester) factory. Further, Avro could have this prototype

assembled for test and development flying in time to iron out snags before production—with all that this entailed in jig and tool making—could get under way.

The prototype, serial DT810, first flew on November 26, 1941. In February the following year, DT810 was flown to the Aeroplane & Armament Experimental Establishment (A. & A.E.E.), Boscombe Down (Wiltshire), for its official type tests. These tests were so promising that the possibility of increasing the bomb load was mooted and the Hercules-powered prototype was returned to Avro's for further development work. Meanwhile, Coventry-based Armstrong Whitworth was attempting to tool-up for Lancaster Mk. II production.

## PRODUCTION SETBACKS

Sir W. G. Armstrong Whitworth Aircraft Limited had been trying to put an Avro bomber in production at their Baginton (south of Coventry) works since 1939, when the company had been awarded contracts for Avro Manchesters which were subsequently cancelled. During the crisis year of 1940, Armstrong Whitworth was directed to continue with Whitley production and not until May 1941 was the order for Lancaster IIs placed. Then the rôle of the Whitley in the Battle of the Atlantic prolonged its life in production, with consequent setbacks to getting the Lancaster programme moving. Consequently, it was not until March



*Two views of the prototype Lancaster II (R.A.F. serial: DT810) which first flew on November 26, 1941. After type trials at R.A.E. Farnborough, it was used for fuel system tests with high-pressure vapour fuel and, subsequently, exhaust stack flame-damping tests. It was finally struck-off-charge in 1944.*  
(Photos: I.W.M. refs. MH4510 and MH5664)

1942 that the Ministry of Aircraft Production finally gave sanction for Whitley production to cease and Lancaster II production to start in its place.

A further setback to production came in the following June. In the early hours of June 25, a German bomber dropped high explosive and incendiary bombs on the Oram Works of Armstrong Whitworth in Newton Road, Nuneaton (north of Coventry), where components were made up into sub-assemblies and spar machining work was done for the main Baginton factory. An intensive fire was started and production did not get back to normal until the following September.

#### **POWER UNIT—THE MK. II's PRIME FACTOR**

The engines were a particularly vital factor and the vulnerability of their production plants was, as related, a prime factor in the very existence of a radial-powered Lancaster. The feared attacks on the Rolls-Royce production plant complex did not materialize. Fortunately during 1942 there was only one limited, but determined, attack. Under cover of heavy cloud, and three minutes after the day workers had arrived, a single German bomber came low over the Derby area and dropped four high-explosive bombs on the central store. Some 5000 square feet of roofing was destroyed, causing alternative stores sites to be found, and

machine shops were damaged by cannon-fire. However, the total effect of an estimated five per cent reduction in production for about three weeks in no way affected the issue—but it did show the dangers.

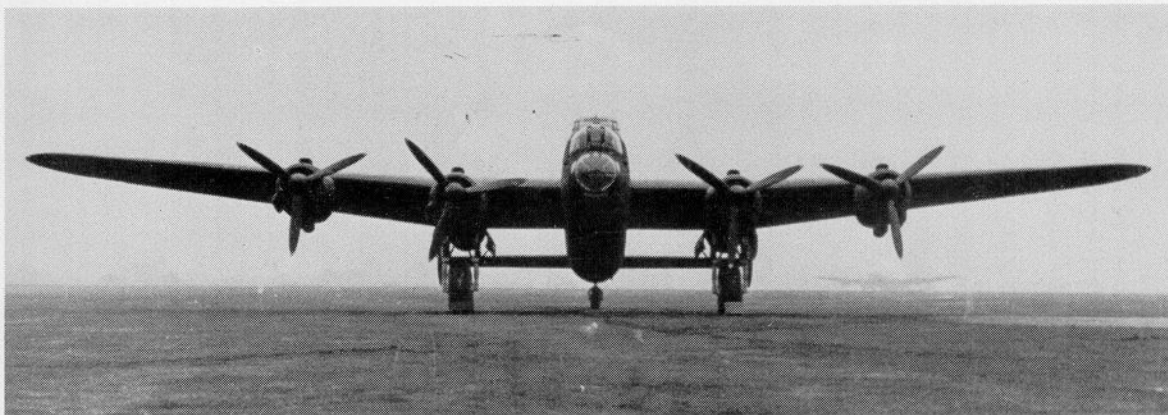
The logical further insurance against Merlin engine supply failure—namely the production of the engine by Packard in the U.S.A.—was at this time not so certain for although production was getting under way to meet the Lancaster Mk. III programme, there were fears that America's entry into the war might mean a demand for the engines to meet their own production needs. The Merlin was even mooted for the Boeing B-17 Flying Fortress.

There was, of course, the vulnerability of Bristol's own engine production complex, spread around a dozen plants in the Bristol area. Fortunately at this time, 1942, there was only a single incident. On the night of May 25, a bomb fell in C Block of Fry's Cocoa factory at Somerdale near Keynsham, Bristol, where engine units were being assembled. Fortunately the bomb failed to explode and production was only held up for a day while it was being rendered harmless.

#### **PLANS AND TRIALS**

By May 1942, a special rôle was being forecast for the Lancaster II. Air Chief Marshal Sir Wilfred Freeman (Vice-Chief of the Air Staff), referring to the raid of the previous month in which Lancaster Is had pene-





*In place of the familiar Rolls-Royce Merlins, the radial Bristol Hercules "look" for the Mark II Lancaster.*

(Photo: Flight International ref. W152/6)

trated to southern Germany and bombed Augsburg in daylight, proposed a squadron of 12 specially-armoured Lancaster IIs for day penetration raids. The choice of the Mk. II for this task rested primarily with their absence of vulnerable engine cooling liquid (glycol). It was planned to install 1,710 pounds of protective armour for crew, fuel tanks and air coolers and carry several thousand extra rounds of 0.303-inch ammunition.

Air Chief Marshal Sir Arthur Harris (commanding Bomber Command) was, however, violently opposed to the scheme. The increased weight, he pointed out, would reduce the Mk. II's bomb-load to 2,000 lb. and restrict these Lancasters to second- or third-rate targets as well as retarding production even further. Currently there were still only four Lancaster I squadrons fully operational and the build-up of fully effective squadrons for the night bomber offensive was Harris's main concern—he was never really happy with the latter idea of the special squadron of Mk. Is for dam-busting. Harris had his way, and approved an alternative suggestion of using the Lancaster II for increased bomb load depending on the outcome of trials on production models.

Armstrong Whitworth completed its first two Lancasters (DS601 & DS602) in September 1942. Both, together with DS606 available a couple of months later, were allotted to the A. & A.E.E. at Boscombe Down for trials. All other early production aircraft up to and including DS613—except for DS611 allocated for ballistic trials—were flown to Syerston (north-east of Nottingham) where No. 61 Squadron, Royal Air Force, acted as a service trials unit for the Mk. II Lancaster.

### TRIAL SERVICE

No. 61 Squadron, R.A.F., had been operating Lancaster Is since April 1942, being the fourth squadron to operate this famous bomber. At that time bomber squadrons were normally established on a two-flight basis with 'A' and 'B' Flights. It was not unusual for a 'C' flight to be added temporarily to be built up by the squadron before being detached to form the nucleus of a new squadron. In this case the additional flight was to act both to introduce the Mk. II and to assess its capabilities in relation to the Mk. I. Their

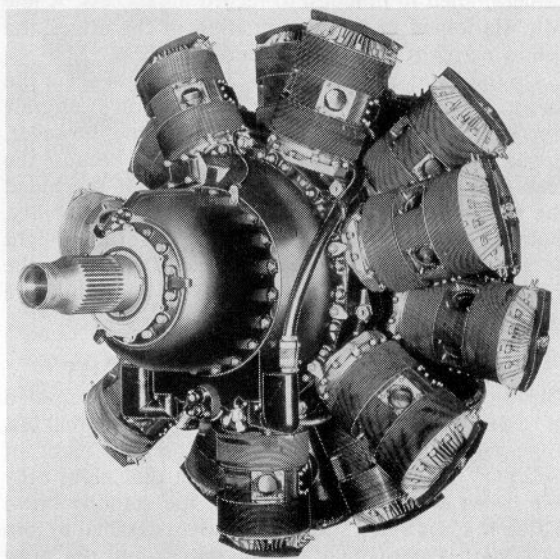
first Lancaster Mk. II (DS605), arrived mid-October 1942 with eight others following at intervals up to late January 1943.

After a series of cross-country flights while crews accustomed themselves to the new version, the Mk. II was tentatively introduced to operations. Two were detailed to join in with the squadron's standard Lancasters bombing the Krupp's Works at Essen on the night of January 11-12. Their participation was a dismal failure. For that raid, 22,000 feet was the recommended height to approach the target, equally to make use of cloud cover and to out-range the lighter anti-aircraft guns. Neither of the two Lancasters could make this height. Flight Lieutenant G. W. Gilpin (in DS810) was unable to rise above 14,000 feet and Sergeant A. Meagher's maximum (in DS607) was 18,400 ft. In the circumstances they returned early, jettisoning their bombs in the North Sea.

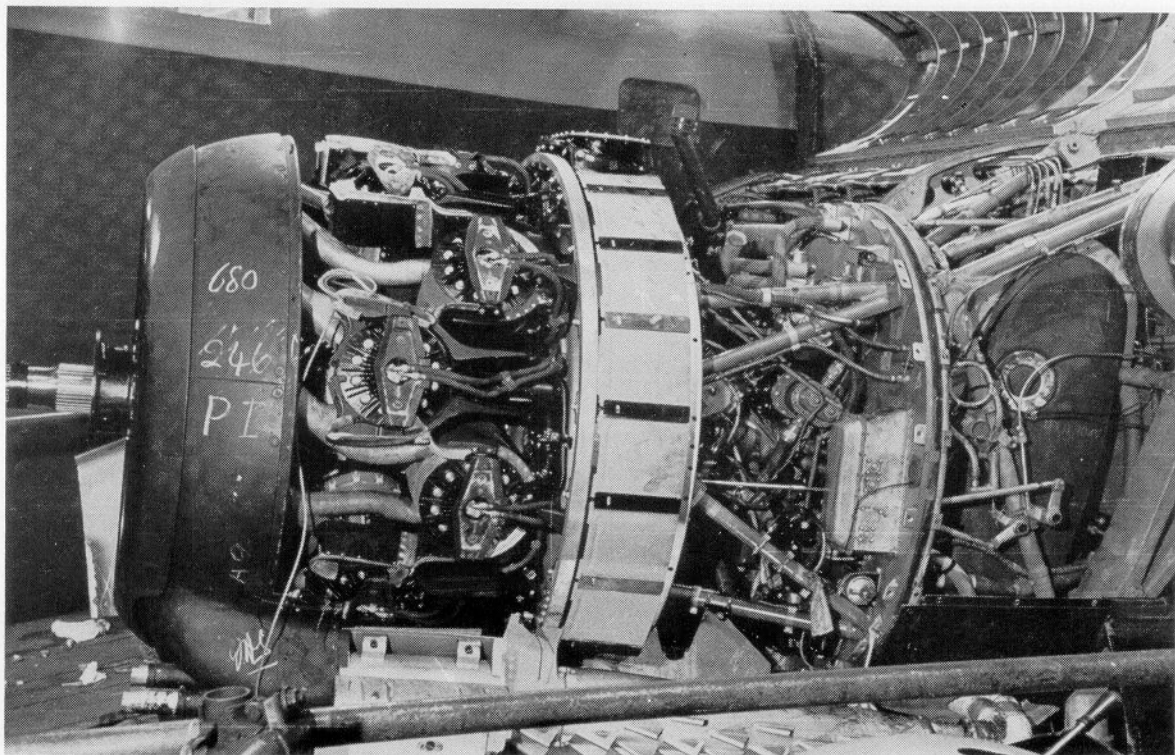
The Squadron Commander, Wing Commander R. M. Coad, decided to try the new version for him-

*The basic Bristol Hercules VI sleeve-valve radial aero-engine. The Hercules of 1936 followed the Perseus of 1932 which is credited with being the world's first successful sleeve-valve aero-engine.*

(Photo: Bristol ref. 10242)







*Close-up of the Bristol Hercules installation in the Lancaster II.*

(Photo: *Flight* ref. W152/21)

self and took Meagher's Lancaster on the night of January 16-17, when Berlin was attacked for the first time since 1941. Trouble developed with the engines and the best he could do was bomb Greifswald (now in East Germany) which had been scheduled as a 'last resort target'. Other pilots flying the new Mark II also had their trials and tribulations. Sergeant H. Champion (DS610), bombing from 15,000 ft. while the Mk. Is from the station were making between 18,000 and 19,000 ft., had a crate of incendiary bombs hang up. Similarly, Flight Sergeant J. V. Cockshott, who made a good run in to the target, found that his camera failed to function to record his success. A few Mk. IIs joined in the continuation of the attack the following night with only moderate success.

On the night of January 21-22, Essen was again the target. Only five of No. 61 Squadron's aircraft operated; including two Mk. IIs. This time, however, it was the Mk. Is that returned early—one because the rear gunner had been frostbitten—which precluded the possibility of comparisons in mechanical ability. But the irony of this operation was that Flight Sergeant C. L. Elliott (who had coaxed DS608 over the target), had his strike evidence lacking as again there was a camera failure.

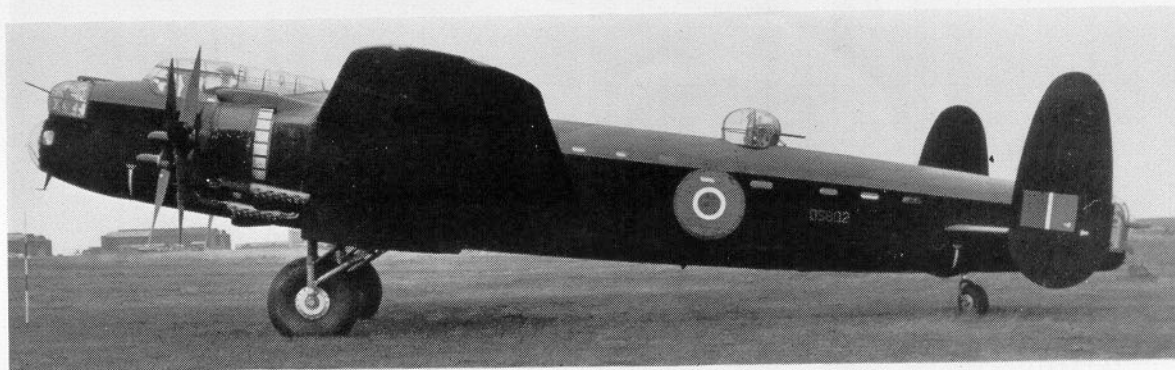
### **OPERATIONAL TESTING FLIGHT**

During the rest of January, the odd Mk. II participated in raids on Düsseldorf and Hamburg, but the real test appeared to have been arranged for the night of February 3-4, 1943. For the briefing that night only five crews were called, including the standby crew. Three Mk. IIs and a single Mk. I were detailed to join in a Main Force attack on Hamburg—and the story

soon spread around that the Mk. I was acting as "pacer". The outcome was awaited with interest and some results came in sooner than expected—two of the Mk. IIs returned early having jettisoned their bombs; DS607 with oxygen failure and DS609 with engine trouble. This left the Mk. I and a Mk. II in the running. While the Mk. I had made a routine target run-in bombing from 22,000 ft., Flight Lieutenant Gilpin (in DS612) was lining-up with the target 5,000 ft. below. This time it was even more frustrating than camera failure, for the bomb release mechanism failed. After "jinking" (violent manoeuvres) the aircraft unsuccessfully, Gilpin headed for home still with his bombs. On route, the air bomber rechecked the release circuits and the crew tried again over Lüneburg (south-east of Hamburg), where the bomb load was finally deposited.

When next night a single Lancaster II from the squadron was detailed to bomb Turin, the news was received with some astonishment. Apparently Headquarters No. 5 Group, Royal Air Force, had approved this venture with the observation that if the Short Stirlings of No. 3 Group could do it on four Hercules apiece—so should a Lancaster similarly powered. The personnel of No. 61 Squadron were not as impressed and there were some grim jests of the Lancaster II's ceiling being below Alpine peaks. But the Lancaster went, bombed on the Pathfinder Force flares, and returned safely after an uneventful trip.

Lancaster IIs then participated in a series of attacks on Lorient, a short distance but to a heavily defended target, until the night of February 14-15, when a Lancaster II set-piece was planned with no less than seven detailed for Italy again; this time Milan. Apart



Two views of the second production Lancaster II (DS602) on type trials at Boscombe Down in the autumn of 1943. It remained on tests until February 1944 when it was placed in store until scrapped in 1946. (Photos: I.W.M. refs. MH4511 and MH5632)

from Squadron Leader Ward Hunt's DS612 returning early with a sticking elevator control and fuel-flow problems, all went well.

Two nights later the Mk. IIs made their last attack with No. 61 Squadron, another Lorient raid. It was time to sum up, report on the initiation and hand the aircraft over to the new users. One pleasing factor was that in spite of fairly intensive use on operations, not one of the nine Lancasters used by the squadron had been lost; all were passed over to the new users.

### FIRST LANCASTER II SQUADRON

To No. 115 Squadron, R.A.F., at East Wretham in Norfolk, the ex-No. 61 Squadron Lancaster IIs were most welcome, for they were still operating Vickers-Armstrong Wellingtons. The bigger, new bomber came to them with all the prestige of the name Lancaster and with a familiar engine. This was the pattern behind the planning by R.A.F. Bomber Command. It was logical that a No. 5 Group squadron should have run the comparative tests for they were the Lancaster specialists with squadrons equipped solely with the Merlin-engined Lancasters. By the same token, it was logical that for full squadron operations the Lancaster II was better placed operationally and administratively with a squadron in No. 3 Group which operated mainly the Hercules-powered Stirlings, and particularly to a squadron still operating Wellingtons.

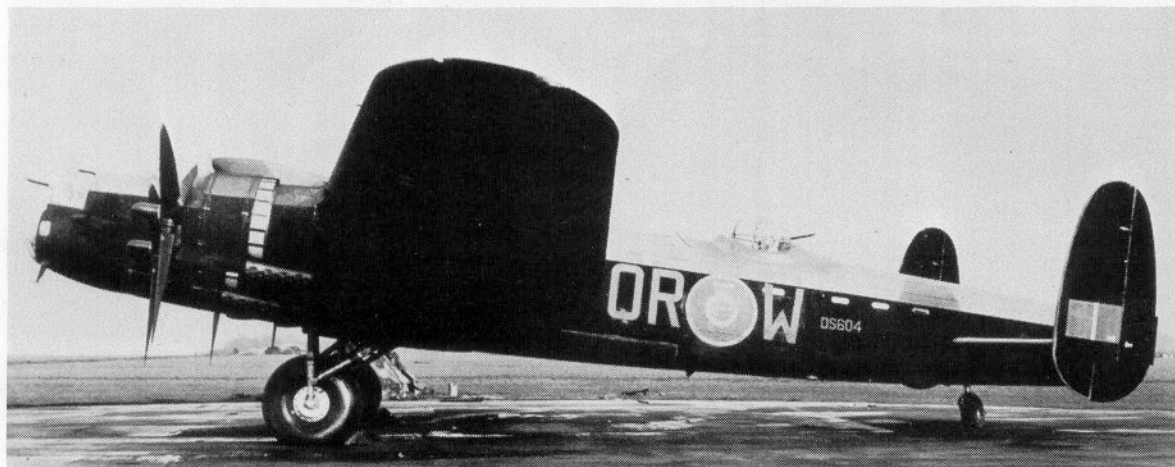
Conversion training started on March 1, 1943 and at the end of a fortnight the first squadron to be completely equipped with Lancaster IIs was declared operational. Following this, the first operation was detailed for the night of March 20—mining in the Isle-de-Ré area (off La Rochelle) by four aircraft each carrying six 1500 lb. mines. The squadron commander, Wing Commander A. F. M. Sisley, put himself down to fly in DS623.

From then onwards the squadron was frequently operating. Among the crew captains serving with the squadron at that time was Flight Lieutenant W. L. Farquharson (now a Group Captain, and still serving in the R.A.F.) and Flight Lieutenant I. W. Bazalgette—who received the Victoria Cross posthumously for his gallant action some eighteen months later.

### CONVERSION TRAINERS

The first Mk. II Lancaster to be lost was DS625 on the night of March 30 in the course of a limited attack on the German capital. No. 3 Group had already taken steps to ensure a backing of trained personnel on this version of the Lancaster to meet operation losses and expiration of crew tours. A Lancaster Flight of four Mk. IIs was established at No. 1657 Heavy Conversion Unit (H.C.U.) which operated some thirty Stirlings at Stradishall. However, since the Command was authorised to raise another Lancaster II squadron within the Group as soon as production permitted, it





Two views of the fourth production Lancaster II (DS604) serving in 'C' Flight, No. 61 Squadron, R.A.F., early in 1943. After moving to No. 115 Squadron, R.A.F., it was lost attacking Frankfurt, April 11, 1943. (Photos: I.W.M. refs. MH5955 and AM12118D)

was decided to double the numbers of crews converting to this particular aircraft. As a result, the Lancaster Flight of No. 1657 H.C.U. was withdrawn to form the nucleus of No. 1678 Heavy Bomber Conversion Flight on May 18 and to share East Wretham with No. 115 Squadron. At this time No. 115 Squadron had an establishment of 16 Lancaster IIs with a permitted reserve of four while the conversion flight had eight Lancasters.

Dual control was introduced to Lancasters IIs used for conversion training in March 1943. At first this was a special local modification, but a few months later a Manchester dual control conversion kit was available for all marks of Lancaster.

### MODIFICATIONS

With the replacement aircraft came a variation in engine mark. The first 26 Lancaster IIs up to and including DS626 had Hercules VI engines, but all subsequent were initially fitted with the Hercules XVI engine. This new mark, introduced in April 1943, featured an A.I.T. 132ME carburettor which unlike earlier marks, had an entirely automatic regulation of mixture strength. This also meant that Lancasters so fitted differed by the absence of mixture selection controls in the cockpit. In service, after repair and overhaul, it is certain that some of the first 26 Lancaster IIs had Hercules XVIs fitted and possible that a few

later aircraft had Hercules VI, but the ruling was that all four in the one aircraft, except in an emergency, should be of the one mark.

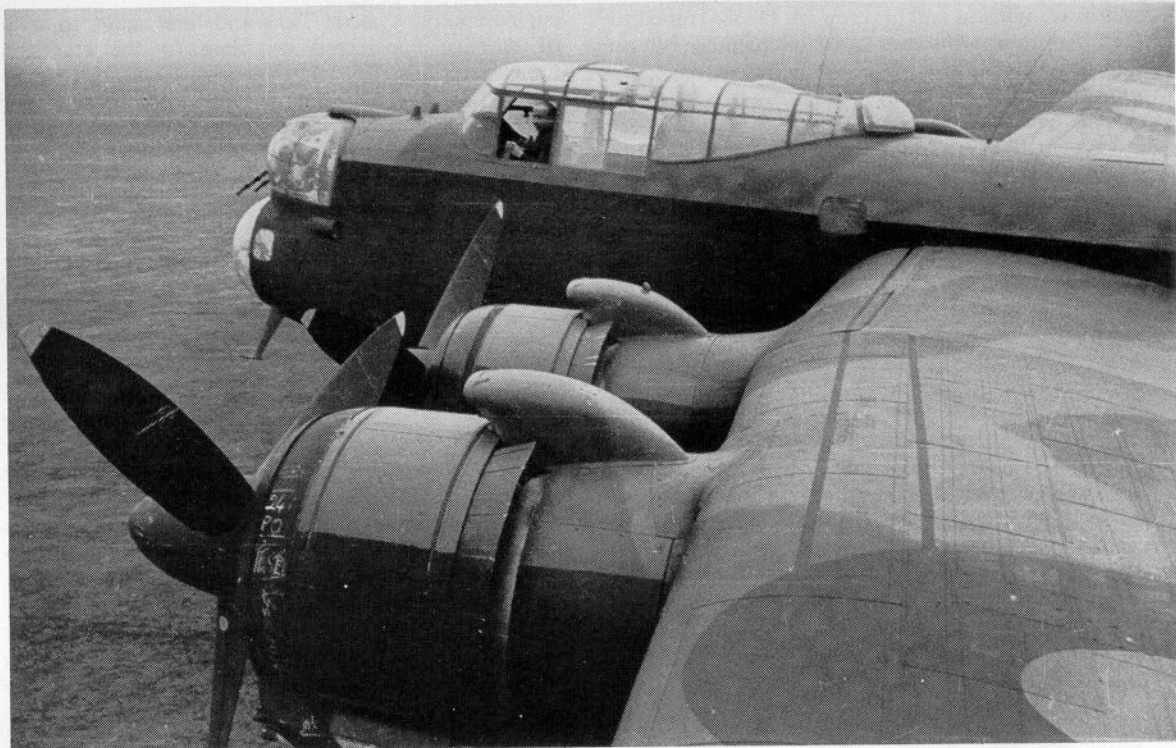
Further engine modification resulted from experience with Hercules engines used on Bristol Beaufighters—at both ends it could be said. The Beaufighter-type intake was adopted which, being smaller as well as more efficient, achieved a saving of 134 lb. in weight; and the flame-damping exhaust as used on Beaufighters, and extended to Handley Page Halifaxes, was adopted generally during 1943 for Lancaster IIs.

Next came a change in the power-operated rear turrets. A total of 30 Nash & Thompson FN120 rear turrets had been delivered to No. 115 Squadron in March. These had improved heating and ammunition feed as well as being 40 lb. lighter. They gradually replaced the existing FN20s which were used for aircraft at Operational Training Units. Yet another change, at the same time to Lancaster IIs, was a replacement of Gee Mk. I medium range radar navigational aids by the improved Mk. II model.

### OPERATIONAL HAZARDS

On the night of August 16 no fewer than 14 of the squadron's Lancasters, each carrying a 4,000-lb. high-explosive (HE) bomb plus incendiaries, set out to bomb Turin on the last occasion that R.A.F. Bomber Command attacked Italy. From this attack Squadron





*Bristol Beaufighter-type air intakes were introduced on the Hercules engines of Lancaster IIs during 1943 as shown; compare with intakes in the photograph of DS652 (on page 1) which had the original production type.*  
 (Photo: Flight ref. W152/16)

*The Mark II prototype (DT810) after modification with bulged bomb doors. Most of its flying life took place at A. & A.E.E., Boscombe Down; being employed on performance trials, flame damping and fuel system trials, before being scrapped in April 1944.*  
 (Photo: A. & A.E.E., Crown copyright)



Leader J. R. Watson and his crew (in DS684) failed to return. Another Lancaster was intercepted by an Italian fighter over the target area, but managed to evade protracted attacks by violent evasive manoeuvres. This Lancaster returned safely, but with the starboard fin, an aileron and parts of the fuselage shot up. The very next night, after returning from that trip over the Alps, some of the same crews and aircraft were among the 12 aircraft from the squadron detailed to attack the German rocket weapons experimental base on the island of Peenemünde, off the Baltic coast (now E. Germany). Again the squadron lost an aircraft, this time DS630.

It was not only operations that took their toll. When Flight Sergeant E. Bradford took DS780 up on September 14, 1943, it had only flown three hours on acceptance test before delivery to No. 115 Squadron. His intention was to try out DS780 with his crew and to level the bombsight preparatory to the Lancaster being declared ready for operations. All went well until the zeroing of the bombsight started. The air bomber, finding the Lancaster diving gently, called over the intercom for the pilot to hold DS780 steady or otherwise his sight would jam. The pilot replied that for some inexplicable reason he just could not maintain height and ordered the crew to crash stations. It was then too late for baling-out, the Lancaster hit a railway embankment at Magdalan, some four miles north-east of R.A.F. Downham Market. Only the air bomber and the wireless operator survived.

Although inferior in performance, some crews in No. 115 Squadron swore by their aircraft and considered, not without some reason, that they were safer than the Merlin-powered versions with their vulnerable

engine cooling system. Time and time again, in spite of damage considered crippling to the standard Lancasters, Mk. IIs struggled back. The crews themselves, however, were just as vulnerable in whatever Lancaster they flew. On the night of October 18, 1943, Warrant Officer E. Boutilier (piloting DS683) was on his target run-in when an enemy fighter attacked from astern. The rear gunner, Sergeant S. Allen, was killed and both flight engineer and wireless operator were brought back in the shot-up fuselage to a crash-landing at Little Snoring. There were no further injuries sustained, but the Lancaster never flew again.

### OFFENSIVE MODIFICATIONS

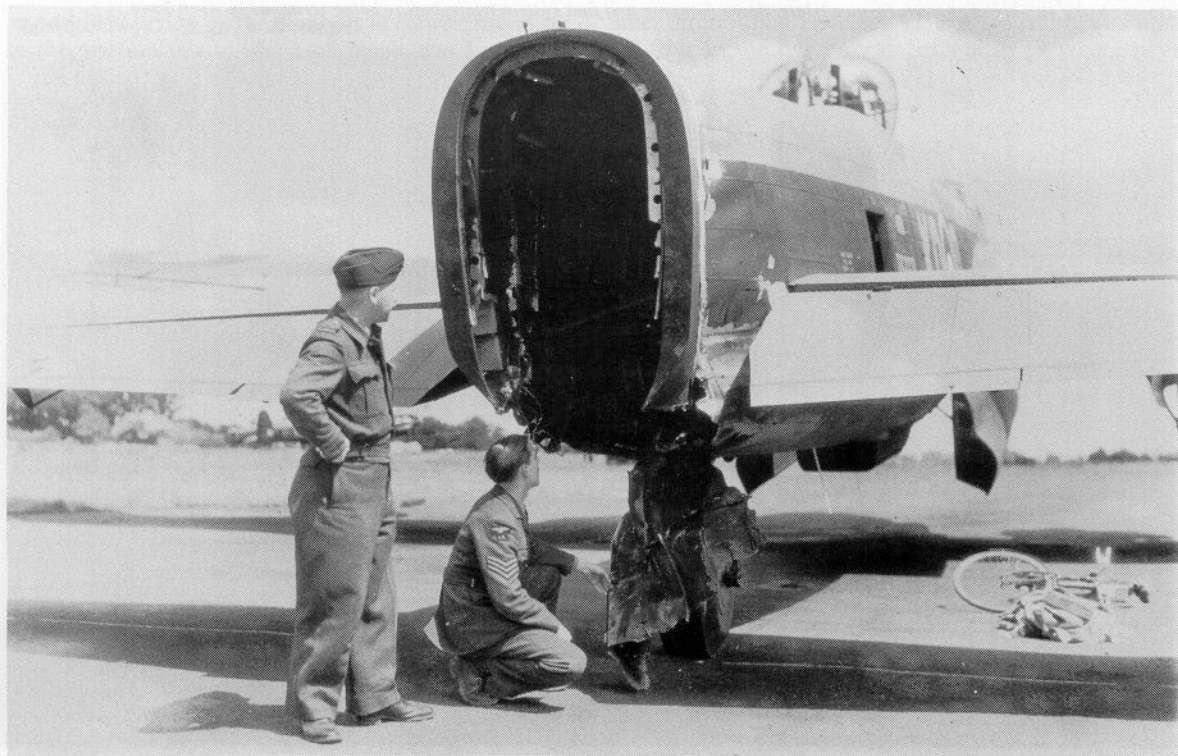
To co-ordinate and direct gunners in a determined attack, the astrodome at the rear of the cabin cover was raised to effect a "fighting station" in October 1943. This applied to all Lancasters, but other modifications affected only the Mk. IIs.

Following the earlier suggestion that Lancaster IIs should be used for day attacks, provision has been made for the FN64 ventral turret with two 0.303-in. Browning machine-guns to be a standard fitting, but in squadron use their manning by an eighth crew member was optional. This depended largely on the squadron commander who was influenced by the nature of the target to be attacked. On some units the turrets were removed altogether—a saving of 122 lb.

The maximum bomb-load of a standard Lancaster was 18,000 lb., but the Lancaster II, after a few months of service, was considered capable of only a 14,000 lb. bomb-load, but including the carriage of a 8,000-lb. bomb which necessitated fitting bulged bomb-bay doors. These were of two types, a service modification

*A Lancaster II of No. 115 Squadron, R.A.F., which returned from an operation with the rear turret shot completely away.*

(Photo: I.W.M. ref. CE79)



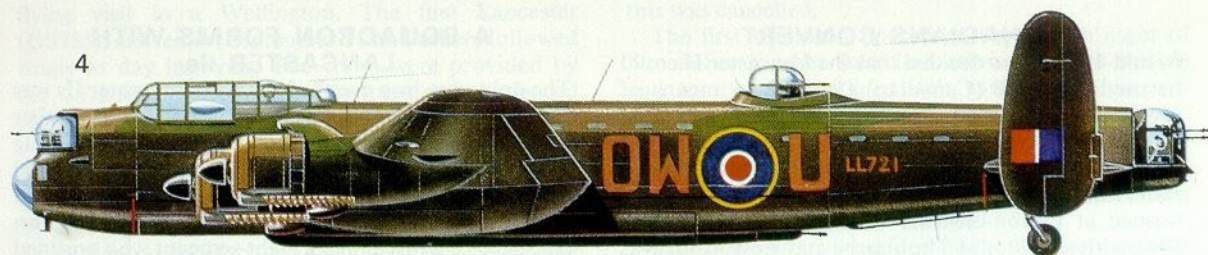
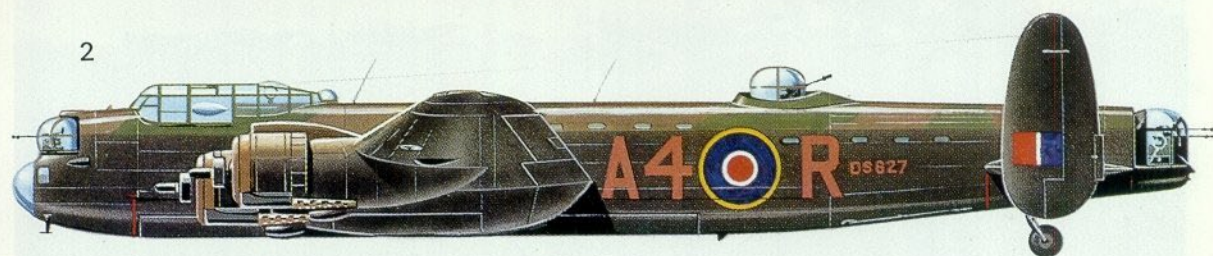
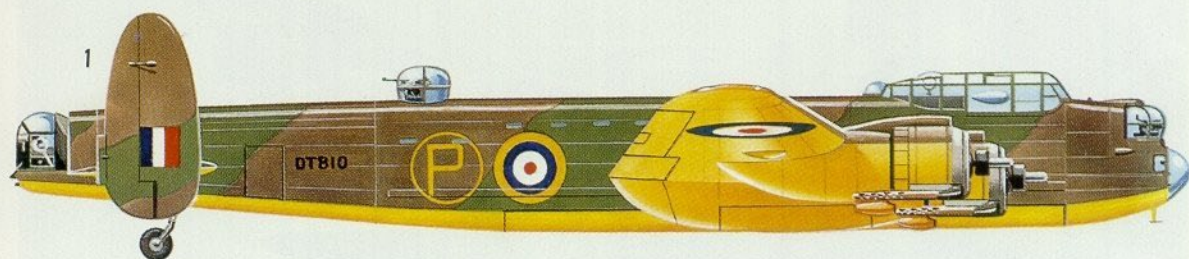


*Top* Lancaster II prototype DT810 in 1942.

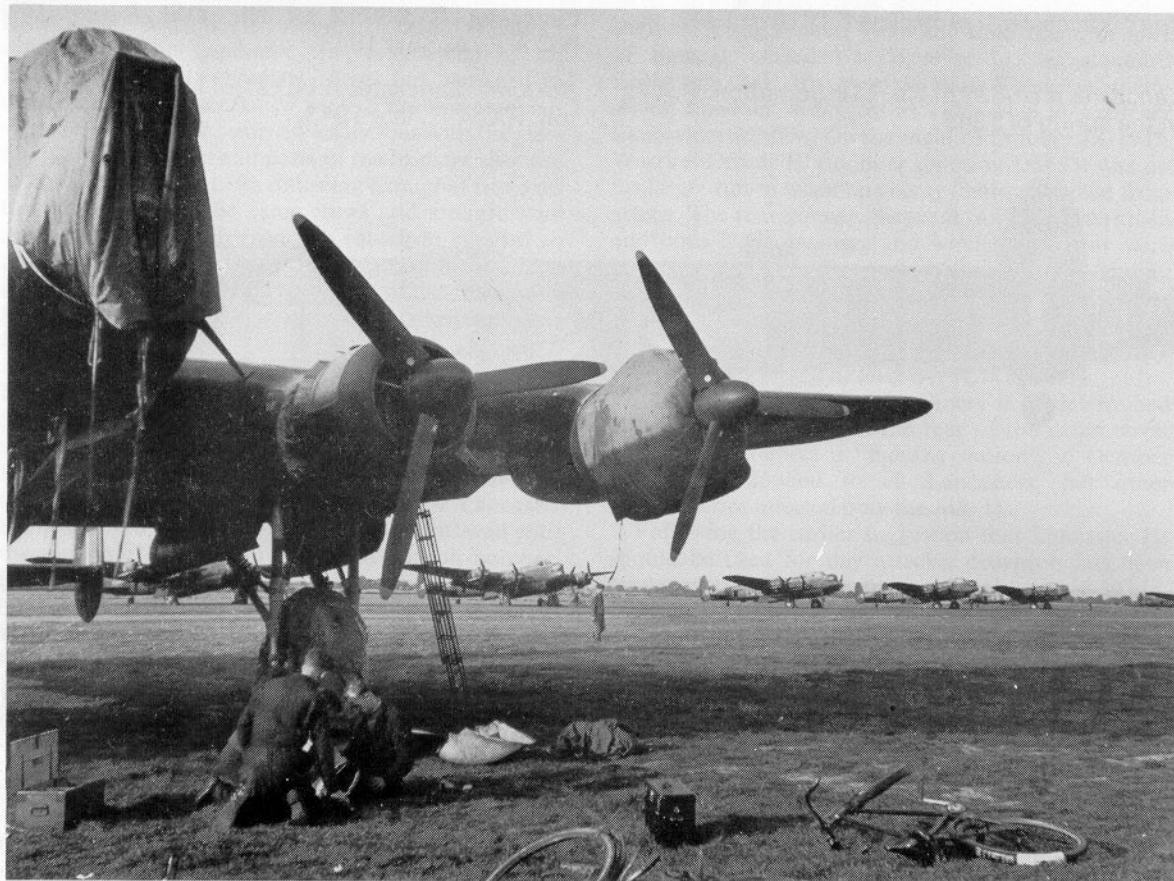
Lancaster II DS713 of No. 408 Squadron, R.C.A.F., August 1943.

Lancaster II DS627 of No. 115 Squadron, R.A.F., in the spring of 1943.

*Bottom* Lancaster II LL721 of No. 426 Squadron, R.C.A.F., late 1943.







*Lancaster IIs of No. 408 (Goose) Squadron, R.C.A.F., at Linton-on-Ouse, Yorkshire, October 21, 1943.*

(Photo: Public Archives of Canada ref. PL-22046)

with distinctive “kinking” and a production type introduced shortly afterwards for Mk. IIs in general and certain Mk. I and III Lancasters in particular. These doors were introduced as available on repair and servicing.

Introduction of the bulged doors left a gap between their aft end and the FN64 turret which also protruded below the fuselage by the same amount, so a fairing was produced to fit between and preserve the streamlining of the fuselage’s ventral surface. Because of both the bulged doors, fairing and under-turret, H2S with its large under fuselage radome was not fitted to Mk. IIs.

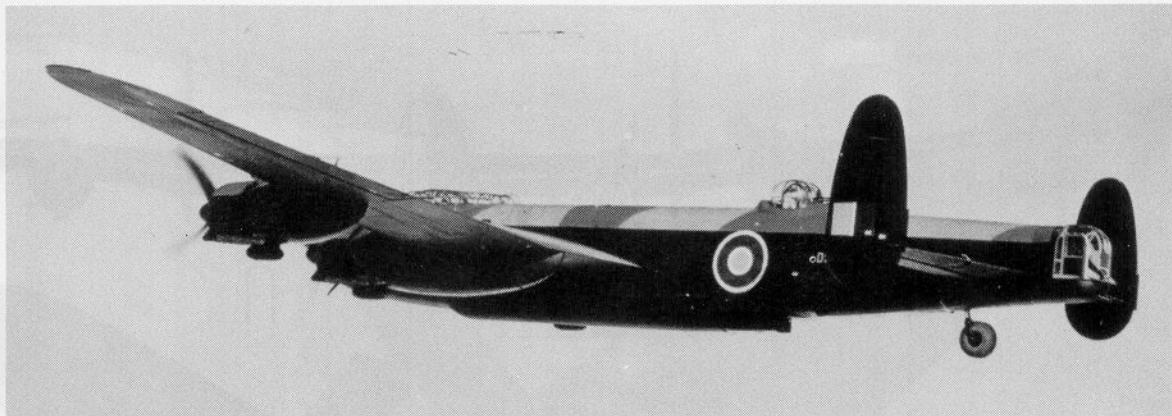
### CANADIANS CONVERT

In mid-1943 it was decided that the Lancaster II could be used in No. 6 (Canadian) Group as a means of providing Canadian squadrons still operating Wellingtons with a four-engined bomber, or as a replacement for the unpopular Halifax Mk. II. No. 62 Base, known as the Canadian Beaver Base, which had formed at Linton-on-Ouse (Yorkshire); on June 18, 1943 with satellites at Tholthorpe and East Moor was decreed the centre for the introduction of the Lancaster II into the Group. First to convert was No. 426 *Thunderbird* Squadron which moved into Linton that June, followed by No. 408 *Goose* Squadron in August, and finally No. 432 *Leaside* moved to East Moor to convert from Wellingtons in September.

An initial setback followed an incident with DS679 in the hands of Second Lieutenant S. Gaunt, who had been seconded from the United States Army Air Forces. Finding his port outer engine on fire, he immediately cut the fuel feed and brought the Gravinier extinguishing system into play, and circled round to bring the aircraft back to a three-engine landing. On investigation it was found that the fire was caused by a short-circuiting in the fuel pressure warning system, and an examination of other squadron aircraft revealed a similar danger. On reporting this to the Air Ministry, a temporary grounding of all Lancaster IIs was ordered until a re-wiring had been effected.

### A SQUADRON FORMS WITH LANCASTER IIs

The only squadron ever to form with Lancaster IIs was No. 514. Officially this squadron formed on September 1, 1943 at Foulsham, under the command of Wing Commander A. J. Samson, D.F.C., with an authorized establishment of 16 Lancaster IIs plus four reserve aircraft. But in fact on that date the entire squadron consisted of a disciplinary flight sergeant who presided over a handful of airmen engaged on clearing out offices and two domestic sites recently vacated by Nos. 98 and 180 Squadrons equipped with North American Mitchells. It was a week before the first officer arrived, the adjutant Flight Lieutenant M. Stevens, and he had to visit nearby Swanton Morley



*Shown to advantage in this view is a Lancaster II modified with the bulged bomb-bay doors.*

(Photo: Royal Aircraft Establishment, Crown copyright)



*The Queen of Spades, Lancaster II (DS708) OW-Q of No. 426 (Thunderbird) Squadron, R.C.A.F., at Linton-on-Ouse, November 8, 1943 being serviced by Leading Aircraftsmen A. H. Erickson (on ladder) and D. G. Lait (on engine nacelle). This aircraft survived the war and ended its days dumped on Foulness Island, Essex.*

(Photo: Public Archives of Canada ref. PL-22236)

to scrounge forms from No. 226 Squadron before he could indent for equipment.

It was a fortnight before the Commanding Officer could be released from his staff appointment at No. 3 Group Headquarters, but he had previously paid a flying visit in a Wellington. The first Lancaster (DS735), arrived on September 11 and others followed singly at day intervals. The crews were provided by No. 1678 Heavy Conversion Flight and an experienced crew was posted in from No. 115 Squadron.

Ground crews were arranged by Central Postings and it soon became evident that the nature of the Mk. II Lancaster had not been appreciated, for the majority of the engine fitters were Merlin-trained who had never worked on Hercules engines. It was September 21 before the first squadron aircraft flew, on air test. By that time some 14 aircraft had arrived and a dozen crews were waiting to carry out familiarisation training.

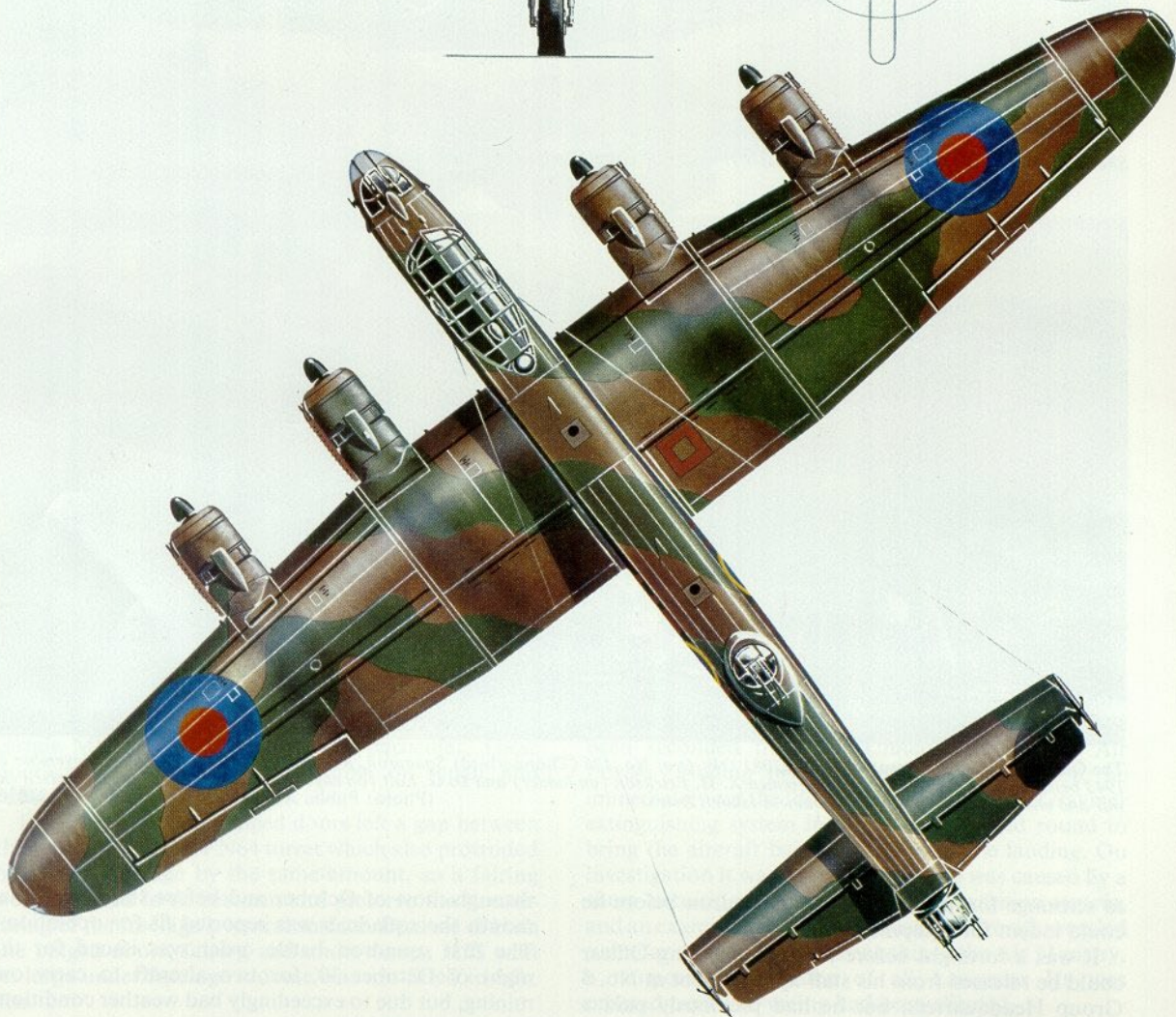
After a series of exchange postings of groundcrews, serviceability improved and training was carried out

through most of October and before the end of that month the squadron was reported fit for operations. The first squadron battle order was issued for the night of October 30, for two aircraft to carry out mining, but due to exceedingly bad weather conditions this was cancelled.

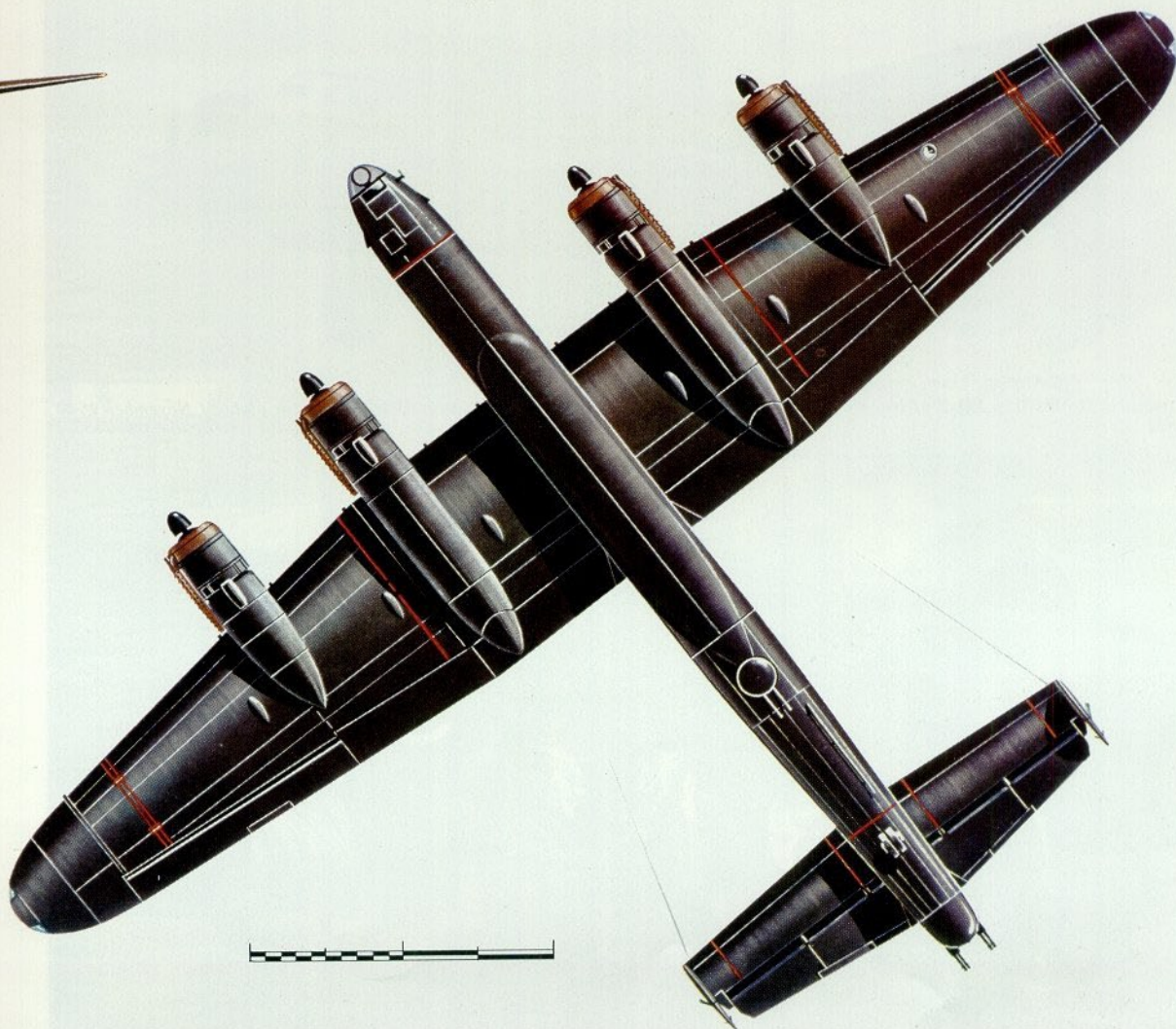
The first squadron operation was on the night of November 3, when four Lancasters went out mining and another two joined 449 Main Force aircraft attacking Düsseldorf. Thereafter the squadron operated regularly. Inevitably there came the first squadron loss—DS784 with Pilot Officer S. P. I. Thomas and crew who took off from Foulsham at 17:25 on November 18, and did not return.

Without being pulled out of the line of available Bomber Command Squadrons, the squadron moved to Waterbeach (near Cambridge) on November 23. By that time the squadron was fully into the swing of operations and playing its part in the Battle of Berlin. Their loss rate was not high, but the serviceability rate was poor and the difficulty in maintaining the height









Typical of the configuration of Lancaster IIs, DS620 had bulged bomb doors and an FN64 under-turret. Serving first in No. 115 Squadron where it was coded KO-V at one time and then as KO-W as shown, it participated in over 50 operations. After No. 115 Squadron discarded Lancaster IIs, DS620 went on to serve at No. 1668 Heavy Conversion Unit where it was wrecked on November 14, 1944 after 554 hours of wartime flying.

*P. Endsleigh Castle, ARAeS © Profile Publications Ltd*







*Lancaster II (DS723) EQ-B of No. 408 (Goose) Squadron, R.C.A.F., which was lost attacking Berlin the night of November 26-27, 1943.*  
(Photo: Aeroplane ref. 283593)



*Air and ground crew members with Lancaster II (DS830) of No. 426 (Thunderbird) Squadron, R.C.A.F., at Linton-on-Ouse, March 22, 1944 after a raid on Frankfurt in which DS741 (OW-T) and LL647 (OW-R) were lost. Left to right are: Leading Aircraftsman Don Hewitt, Flight Lieutenant F. R. Shedd, Sergeants T. F. Jones and W. W. Korchensky, and Leading Aircraftsman C. F. Drake.*  
(Photo: Public Archives of Canada ref. PL-28585)

of the other Lancasters put it in a class with the Halifax for operational planning.

The night of December 2 can be taken as typical. The squadron was detailed to join the Main Force attacking the German capital and from which DS738 of the squadron was one of the 40 aircraft lost that night. On this Berlin raid, the crew of DS815 appreciated the disadvantages of Lancaster II's low ceiling when a 4-lb. incendiary bomb from a bomber above fell through the Perspex behind the navigator's table,

fortunately without igniting. While the navigator was throwing it out to continue its interrupted fall, his log was sucked out of the hole it had made. Another hole pierced through the port aileron, discovered on return, suggested that it was not the only incendiary bomb to have made its mark.

Other hazards faced the crew of DS736; first *flak* punched holes through the wing and then the pilot had to take violent evasive action to avoid colliding with another Lancaster which came within 30 yards.



Victory Loan posters and slogans on an 8,000-lb. bomb (composed of two 4,000-lb. sections and tail unit) in front of a Lancaster II of No. 426 (Thunderbird) Squadron, R.C.A.F., at Linton-on-Ouse, February 21, 1944. Sitting on the bomb is Flight Sergeant E. J. Wilkie (left) and Pilot Officer J. M. Hollingsworth (right). Clearly visible are the four cable cutters on starboard wing inboard section. (Photo: Public Archives of Canada ref. PL-29625)

Yet an even deadlier hazard threatened the crew of DS783; an enemy fighter, risking its own side's anti-aircraft fire, attacked it in the target area. The rear gunner was killed and both his turret and the mid-upper turret was damaged. The hydraulic system was out of action and the port inner engine ceased to function. Pilot Officer G. S. Hughes who brought this crippled Lancaster back to land at Waterbeach on three engines, received the first of 84 Distinguished Flying Crosses to be awarded the squadron personnel.

In contrast the crew of DS822 reported no trouble from *flak* and no enemy fighters seen either to, from or over the target. Two others that night failed to reach the target. The starboard inner engine of DS821 stopped and oil temperature rose alarmingly, so the captain decided to jettison his 4,000-lb. high-capacity HE bomb and the 630 small incendiary bombs in the North Sea. Similarly, the crew of DS787 experienced some trouble with one of their engines and when severe icing added to their trouble it was decided to return early. Operations continued much in the same vein.

### DITCHING THE LANCASTER II

There had been some controversy over the ditching qualities of the Mk. II Lancaster. The popular conception was that the large frontal area of the radial engines would not permit so smooth an entry to the water as the streamlined form of the cowed Merlins;

but statistics showed that the Hercules-powered Halifaxes had a better record for safe ditchings than Merlin-engined Lancasters. The result of an incident on the night of December 31 proved the point to the squadron personnel's satisfaction. DS821 had been attacked by a fighter over Berlin and evidently a tank had been punctured for fuel gave out when some fifty miles from the British coast; the pilot ordered ditching stations after instructing the wireless operator to signal base to that effect and give his position.

Air-sea rescue services were alerted, but Wing Commander Samson did not leave it at that. Before dawn he called round for a scratch crew and set out in a Lancaster on a planned search pattern. On the first leg a Very light was spotted and on heading in its direction a dinghy was seen containing several men. For three hours the squadron commander circled over the dinghy calling up rescue craft and eventually other aircraft arrived and a rescue launch was directed to the scene and all seven crew members were safely transferred. Meanwhile the Lancaster, twelve hours after the ditching, was still floating.

### PIONEERING G-H

It was the Lancaster II that pioneered the G-H bombing aid. This apparatus was introduced to ensure the accurate bombing of small targets for which H2S was unsuitable. In principle it depended on an initial transmission from the aircraft being relayed by two

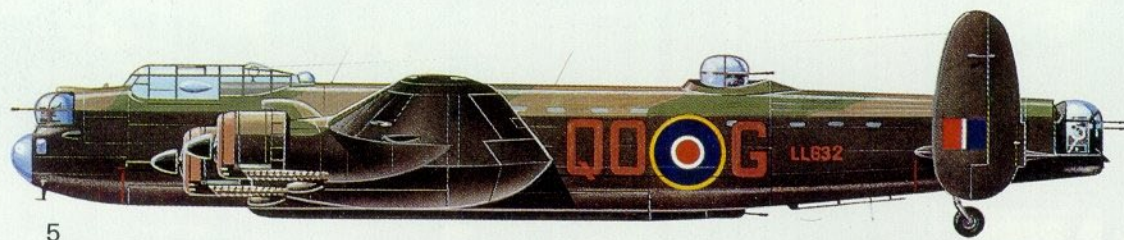


Top Lancaster II LL632 of No. 432 Squadron, R.C.A.F., late 1943.

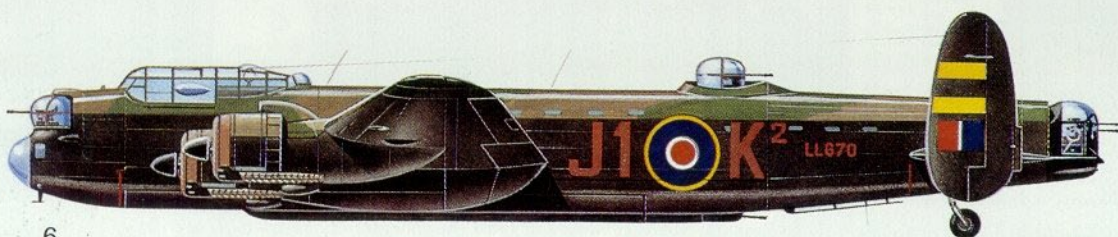
Lancaster II flying test bed LL735 at the Royal Aircraft Establishment, Farnborough, Hampshire, in 1944.

Lancaster II LL670 of No. 514 Squadron, R.A.F., mid-1944.

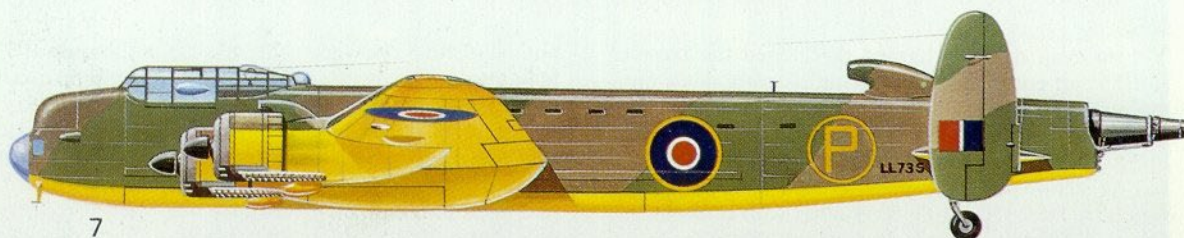
Bottom Lancaster II flying test bed LL735 at R.A.E., Cranfield, Bedfordshire, late 1947.



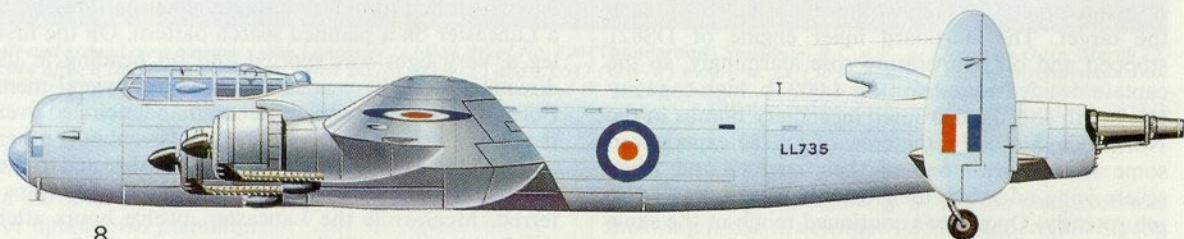
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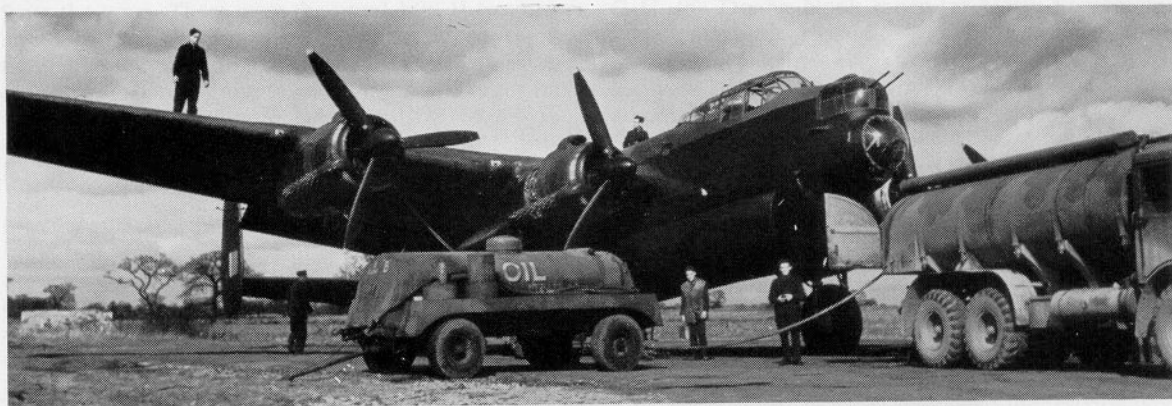
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8



Refuelling a Lancaster II of No. 426 (Thunderbird) Squadron, R.C.A.F., at Linton-on-Ouse, March 22, 1944.

(Photo: Public Archives of Canada ref. PL-28591)



Zombie (LL725) seen here at Linton-on-Ouse on April 24, 1944 was coded EQ-Z of No. 408 (Goose) Squadron, R.C.A.F., normally flown at this time by a crew captained by Flying Officer E. M. C. Franklin. The mission markings show two swastikas for enemy aircraft claimed shot down, and bomb silhouettes and maple leaves for attacks on Germany and installations in occupied territory respectively.

(Photo: Public Archives of Canada ref. 29074)

ground stations to give a position plot; as well as target plotting it could be used for continuous navigation.

The two Lancasters allotted for the G-H trials were DS671 and DS672 at the Bomber Development Unit situated at Feltwell when trials started in June 1943. This was "bomber country" and not ideally suited for set-track flying, so that the two Lancasters moved to Fairwood Common (near Swansea) in South Wales, using R.A.F. Station Llandow as a theoretical aiming point. With mobile ground stations in various locations, 58 photo checks were made on the Llandow aiming point to prove the system.

Following a satisfactory analysis of results by Bomber Command's scientific staff, trials were

temporarily suspended in August while selected service signallers were trained to operate the new sets. Using these signallers in the same two Lancaster IIs, live bombing trials were conducted on ranges and in all 150 bombs were dropped in this final phase of G-H trials.

G-H was adopted for service with priority of issue to Lancaster squadrons having aircraft fitted with 8,000-lb. bomb bomb-bay doors which meant the Mk. II Lancaster units. Initial installation was completed by late October 1943 and the first operational use of G-H was on the night of November 3-4 when 38 Lancaster IIs, using the equipment, joined a Main Force attack on Düsseldorf. The G-H force were briefed to attack the Mannesmann steel works a mile or so





Another view of Zombie showing the bomb aimer's position and window with its circular glycol spray rig for de-icing, and further under, just in front of the bomb bay, the F-24 camera aperture can be seen. The louvre in front of the Zombie painting is the cabin heating outlet. In this case, the front guns have protective sleeves over the barrels. (Photo: Public Archives of Canada ref. PL-29072)

from the town. There were the usual Mk. II troubles and five of the 38 returned early with various systems failures and another 16 found their new sets unserviceable and so bombed the town on the markers set for the Main Force. Two more, DS713 and DS774 of Nos. 426 and 408 (Canadian) Squadrons, failed to return, leaving only 15 that bombed as planned by G-H.

Subsequent photo reconnaissance of the steel works revealed that of the bombs that had been dropped blind by G-H half had fallen within half-a-mile of the aiming point, a degree of accuracy that passed expectations. However, to the squadron personnel it appeared that the new equipment had proved to be a dismal failure, for it was immediately withdrawn and aircraft that had been fitted up with it in October, were stripped of it in November.

The reasons, clear to Command, could not be conveyed to unit personnel on the grounds of security. Winter was approaching with Berlin scheduled as the main target in a period that was to become known as the Battle of Berlin. The German capital was too distant a target for G-H to be used effectively and in the winter battle against German towns, the existing H2S was reasonably effective. The G-H sets were withdrawn for limited use in pin-point mining operations and large-scale use in the spring and summer when the land battle would be carried to the continent and specific targets such as marshalling yards would appear on the target lists.

While G-H was held in abeyance pending suitable targets, a chain of stations was being deployed across the country and in January 1944, DS672—still with the Bomber Development Unit (B.D.U.), now based at Newmarket—made a series of flights to check the accuracy of the Southern G-H chain. For bombing by

G-H, the Donna Nook range (at North Somercotes in Lincolnshire) was used. The Lancaster this time dropped incendiaries since a test was also required on the yaw of 4-lb. incendiaries to assess bomb-sight adjustments for incendiary loads.

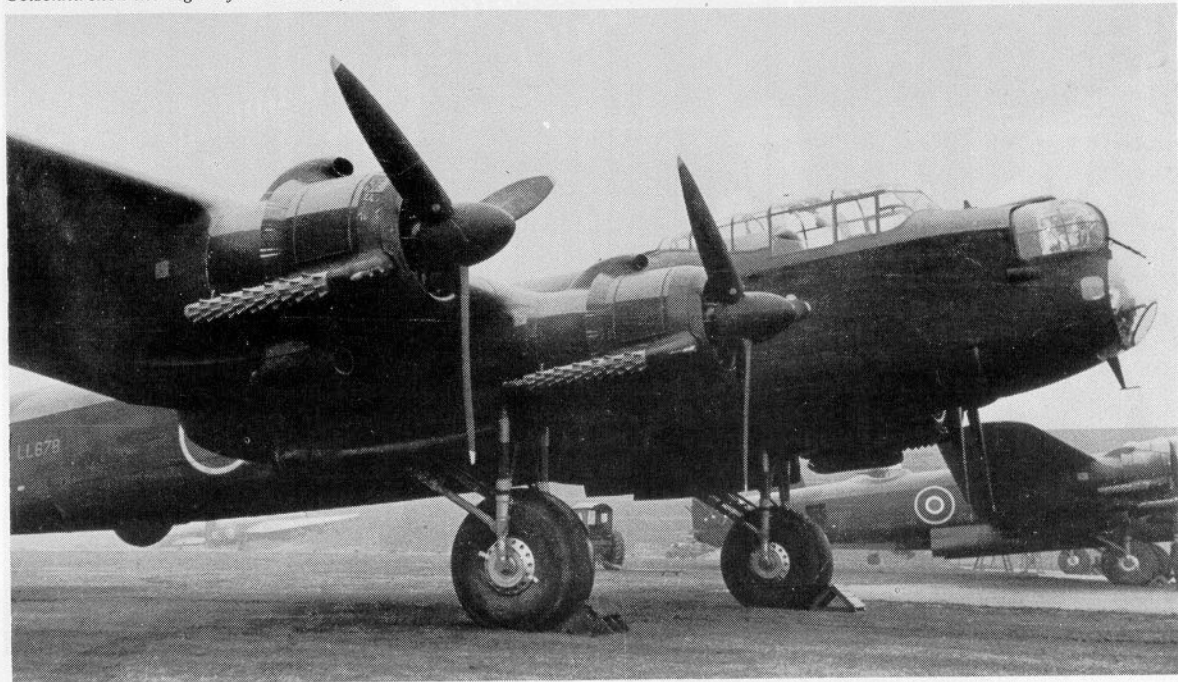
### PHASING-OUT

Armstrong Whitworth had been making a phased change-over to the production of Lancaster Is from November 1943 onwards. Early in 1944 there was insufficient backing to maintain five squadrons with all it involved in replacements for losses and repairs, aircraft on 200-hour overhaul, and others at Conversion Units. The official view was that the Halifax Mk. III—with the same power units—promised all that the Lancaster II could offer and, in the interests of type standardization, the Lancaster II would be phased-out.

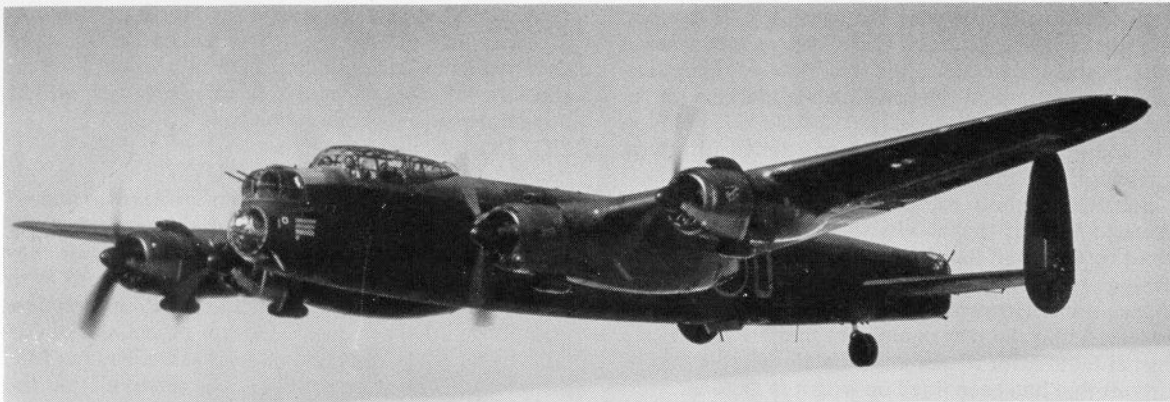
Last squadron to receive Lancaster IIs, No.432, was the first to give them up. They had started operations with their Lancasters on the night of November 18, 1943 when four aircraft had been detailed for a night sea search—and of these two returned early with technical faults. It was not an auspicious start, and as if to give confidence the squadron commander, Wing Commander W. A. McKay, obtained permission to fly on the squadron's first bombing raid which was to Berlin on the night of November 26. All crews reported successful attacks and all returned unscathed—confidence was restored and maintained until early 1944. On February 3, authority was given to convert to Halifax Mk. IIIs and, such was the tempo of wartime, six days later the bulk of the Lancasters had been flown out, and replacement Halifax IIIs were in station.

The first complete Lancaster II squadron, No.115,

*A characteristic of production Mk. II Lancasters was their large "barbed" exhausts designed to damp the flame that might reveal their presence in the night sky to an enemy fighter. This Mark II (LL678) coded JI-L2, served in No. 514 Squadron and was lost attacking Gelsenkirchen the night of June 12-13, 1944. (Photo: Flight ref. W152/10)*





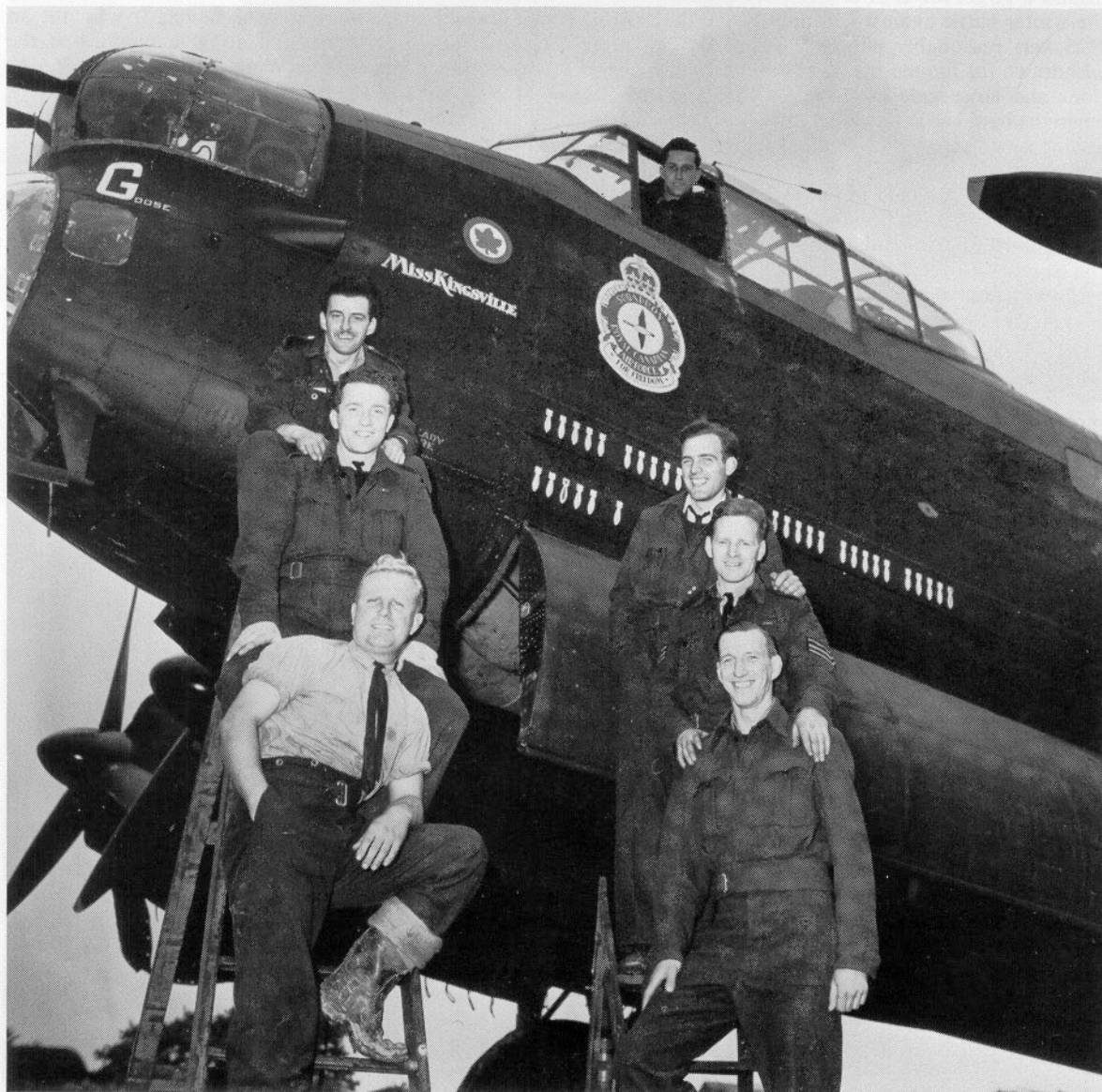


*A veteran Lancaster Mk. II of No. 514 Squadron, R.A.F., (LL734) seen after completing 32 sorties in mid-1944. This aircraft has standard bomb-bay doors and a single 0.5-in. Browning machine-gun mounted in the FN64 ventral turret position.*

(Photo: I.W.M. ref. CL561)

*Groundcrew of Lancaster II (LL636) EQ-G of No. 408 (Goose) Squadron, R.C.A.F., in June 1944. They are, top to bottom left, Leading Aircraftsmen Harry Truax and Harvey Arnold and Sergeant Jeff Godfrey; top to bottom right, Leading Aircraftsmen Bob Ferry and Keith Cinnamon, Sergeant Sam McCracken and Leading Aircraftsman Gordon Palin.*

(Photo: Public Archives of Canada ref. PL-30770)



started to phase-out their Mk. IIs in March, a bad month for the squadron. The last of the attacks in the Battle of Berlin on March 24 took a toll of four of their Mk. IIs and another made an emergency landing at Manston with two engines out of action. A loss of a No. 514 Squadron's Mk. II attacking the same target, made this the blackest night's operation for Lancaster IIs—and from that time finding replacements was to become increasingly difficult, as in March 1944 the very last Mk. II Lancaster was delivered.

During April, No. 115 Squadron changed almost completely over to Merlin-powered Mk. I and III without being taken off operations. In fact, for April, the records show 50 sorties by Mk. Is, 58 by Mk. IIs and 59 by Mk. IIIs. On the night of April 18-19, German intruder aircraft shot down two of their Lancasters (LL667, a Mk. II; and LL867, a Mk. I) that were circling over Witchford prior to landing after returning from a raid on the Sotteville marshalling yards near Rouen. Four sorties with remaining Lancaster IIs in early May, finally ended the squadron's association with the type.

The pattern of withdrawal of the type was now set. No. 426 were next to lose their Lancasters for Halifax IIIs in May. The unit diarist reported that the Lancaster IIs were withdrawn with "many a groan and a heartache" and that many crews wished to finish their tours on the type. And well might they have expressed this wish, for April, their last month of full operations on Lancasters, was a model month. There had been 58 sorties of which only two were unsuccessful and there had been no loss at all.

## D-DAY PARTICIPATION

By the time of D-Day on June 6, 1944, only two Lancaster II squadrons were in the line, namely No. 514 and the Canadian No. 408. On D-Day the Lancasters of No. 408 Squadron left Linton-on-Ouse from 02:12 onwards to attack the coastal battery at Longues. Subsequently, all four casements were damaged. It was not until some hours after the aircraft returned—including LL636 with a 1000-lb M65 general-purpose bomb aboard that had failed to release—that the squadron personnel realized that this raid was a prelude to the actual landings. Rumours had been rife the previous night when all personnel at the base were confined to camp until further notice. A broadcast by the Station Commander over the Tannoy announced the landings at 09:30 and there was a spontaneous move by all ground crews, including those on rest, to give their Lancasters an extra grooming for the days to come.

R.A.F. Bomber Command had been assigned the destruction of 37 railway centres in north-west Europe stretching from Nantes in the south to Aachen in the north, prior to the invasion and in the weeks immediately following. From these relatively short-haul targets that did not entail running the gauntlet of the Ruhr defences, the overall loss rate went down and the operational life of the Lancaster II was extended in the two squadrons still using the type. One Mk. II written-off in this period was DS729. It had been attacked by a Messerschmitt Me 410 over the Paris area while bombing the Acheres marshalling yards. With flaps shot up



*Maintenance on a Lancaster II of No. 408 Squadron, R.C.A.F., in May 1944. Left to right is Squadron Leader Russell, Leading Aircraftsmen J. Murray and G. Delday, and Corporal 'Pop' Percival. (Photo: Public Archives of Canada ref. PL-29330)*

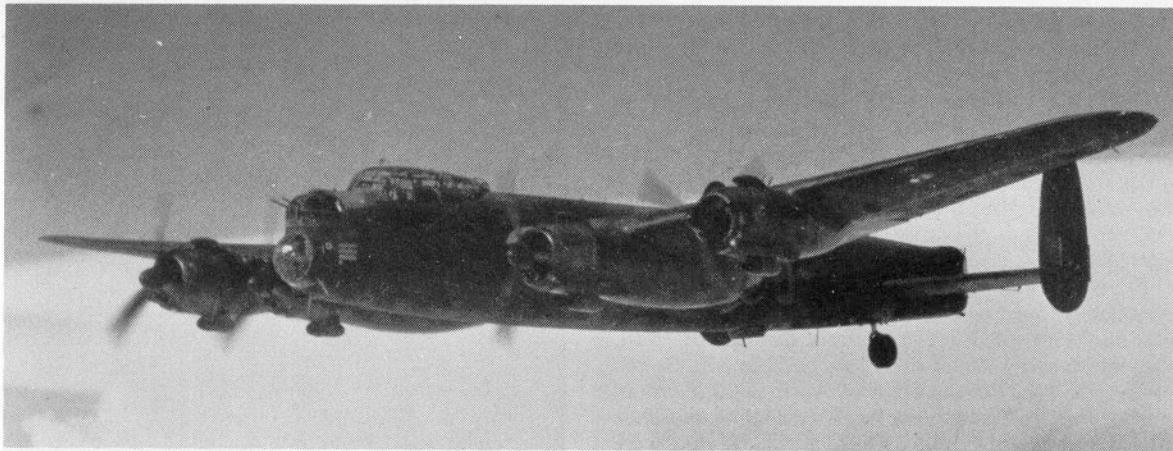
and not functioning, DS729 ground-looped when landing back at Linton-upon-Ouse in the early hours of June 8.

With the invasion, and the possibility of operating G-H stations on the continent where their proximity to targets would ensure even greater accuracy, G-H once again became a priority device and plans were made to equip all Lancasters in No. 3 Group. This brought DS671 again into the G-H test rôle, but it had difficulty in reaching the 25,000 ft. specified in the test schedules and by July, on a warm day, it could not rise above 21,500 ft. The B.D.U. asked for replacement by a Mk. I or III, but before it was pensioned off it did a final G-H bombing check dropping 104 bombs of which 50 per cent were within 310 yards of the range target, so finally proving the system.

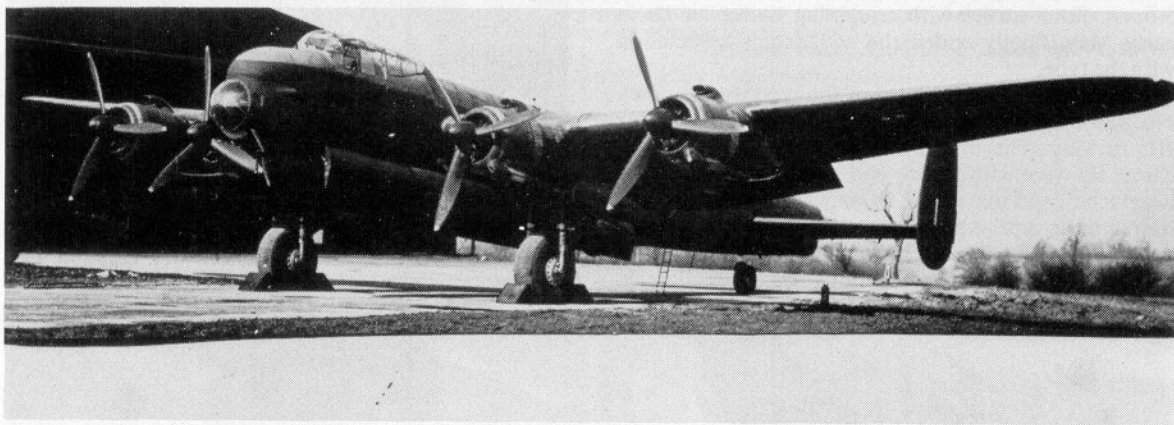
## WITHDRAWAL FROM SERVICE

In July No. 408 (Canadian) Squadron started reverting to Halifaxes and by August re-equipment was complete. As early as June some Lancaster I and IIIs had reached No. 514 Squadron and by the end of September they completely replaced the Mk. IIs; the last Lancaster II operation was on the night of September 23 when DS842 and LL666 bombed Neuss (opposite Düsseldorf). In the final withdrawal, Lancaster IIs were passed on to Heavy Conversion Units (H.C.U.). By the time of the German collapse in May 1945, only





Two Mark IIs of No. 514 Squadron—including LL734 in foreground—operating in the summer of 1944. (Photo: I.W.M. ref. CL562)



Lancaster II (LL735) seen on March 27, 1945, when an experimental Metropolitan-Vickers F2/4 jet engine was installed in the rear fuselage. A fairing has been placed over the nose in place of the front turret. (Photo: Power Jets)

sixteen Lancaster IIs remained of which less than ten were serviceable.

The average utilization of this mark of Lancaster had been over 150 flying hours per aircraft and those operational averaged about twenty sorties. At the two extremes are DS668 lost mining off the French coast on its first operation June 19, 1943, while DS620 and DS622 which served in No.115 Squadron and later for five months at No.1668 H.C.U. reached 554 and 598 flying hours respectively. Both were wrecked during November 1944.

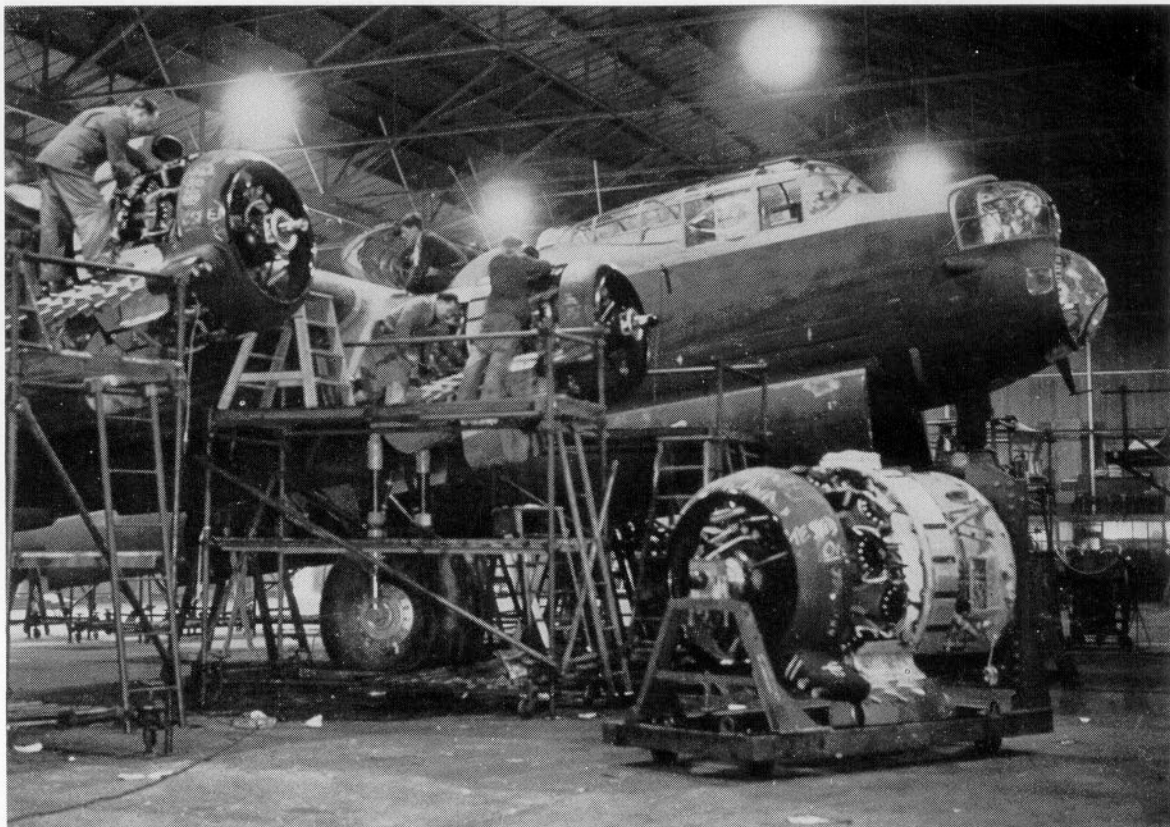
### REPRIEVE FOR THE MK. II SPECIALS

In May 1945, the Lancaster II airframe was declared obsolete for all service purposes and disposal instructions were given to return the aircraft to maintenance units. However, some at experimental establishments were given a reprieve. DS819 continued freight-carrying duties for the Airborne Forces Experimental Establishment, but not for long as it crashed on the continent July 29, 1945.

LL736 had gone to the Telecommunications Flying Unit (T.F.U.) at Defford in December 1944 for the

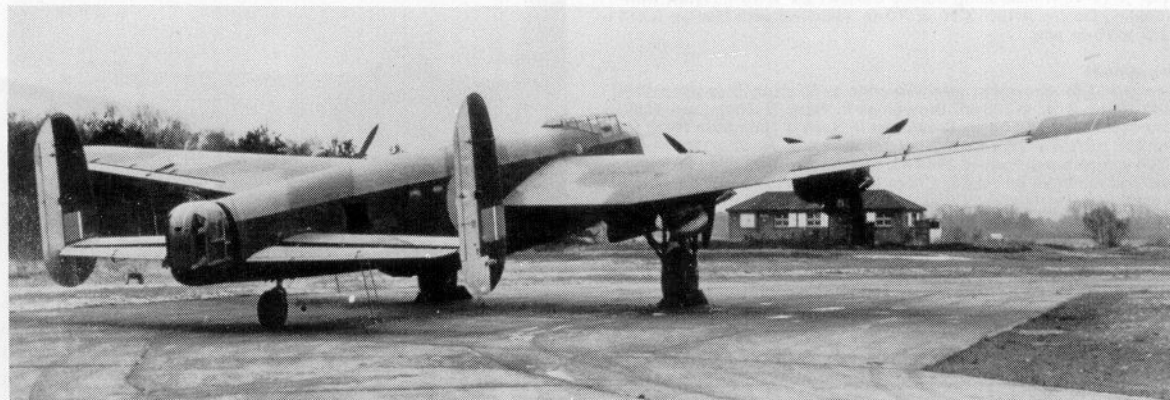
fitting and trials of a new type of experimental radar gunlaying equipment for turrets, AGLT Mk.III. It remained at the unit after trials had been completed and was unserviceable for a considerable period. In May 1948 it was again brought into use, this time for radar bombing equipment in connection with trials to meet Air Ministry Specification B.3/45 for a jet bomber. This project evolved as the English Electric Canberra which, as originally envisaged, was to be a two-seat blind bombing aircraft. By the time the sophisticated equipment had been fitted into LL736, the Canberra was being remodelled to meet Specification B.5/47 and the radar-bombing Canberra B.1 was never built. The T.F.U. then had no further use for LL736 and it was sent to a maintenance unit in the autumn of 1948 and scrapped.

Outliving all other Lancaster IIs was LL735, the universal engine test-bed. It was allotted to Farnborough in 1943 in connection with a joint Royal Aircraft Establishment and Metropolitan-Vickers Electrical Co. Ltd. venture to perfect an axial-flow jet engine, for which developments had reached the flying test stage with an engine model known as the F2/1. With this experimental power unit at the rear of the fuselage, the aircraft came into the special guard



*Where it all began. Bristol Hercules radial engine "power eggs" being installed. Chalked on the collector ring is the approval go-ahead of "Tested".*

(Photo: Barratts Photo Press ref. 295610 via Air-Britain archives)



*One Lancaster II (DS708) spent three post-war years at the Royal Aircraft Establishment, Farnborough, on servo spring tab controls. After testing at R.A.E. in normal condition in October 1946, it was fitted with a series of modified elevators and rudders—one example of which is shown.*

(Photo: R.A.E. ref. 80746, Crown copyright)

category and the serial number accordingly became LL735/G.

Taken over by Power Jets Ltd., later Power Jets (Research & Development) Ltd.—the 1944 State-operated successor to the pioneer Power Jets Ltd. enterprise—LL735/G had a further development of the engine, the F2/4, fitted in the rear fuselage. Subsequently, a similar engine was fitted while the aircraft went successively on charge to the National Gas Turbine Establishment, Metropolitan-Vickers and

Armstrong Whitworth Aircraft at Bitteswell, on proving tests and trials with different types of fuel. The aircraft was finally withdrawn in 1950 and the last surviving Lancaster II went to the scrap heap.

**Series Editor: CHARLES W. CAIN**



## SPECIFICATION

### Crew Duties (7 members)

Pilot (Crew captain), Navigator, Air Bomber (manned front turret as gunner if required), Wireless Operator (from late 1943 designated Signaller), Air Gunner (mid-upper turret), Air Gunner (rear turret), Flight Engineer (from mid-1944 trained in piloting sufficient to bring aircraft back over the U.K. for crew bale-out in an emergency). Additional Air Gunner carried on certain raids, particularly low-level or day raids to man FN64 ventral turret.

### Main Dimensions

Wing Span, 102 ft. 0 in.; area (including ailerons) 1,297 sq. ft.; wing section, NACA 23018 at root; chord, 16 ft. 0 in. at root; dihedral, 7 degrees 0 minutes; incidence 4 deg. 0 min.

Overall length, 69 ft. 6 in. tail up; 68 ft. 10 in. tail down.

Overall height, 20 ft. 6 in. to fin tip with tail up.

Main undercarriage track, 23 ft. 9 in.

Ground clearance, 3 ft. 10 in.

Tailplane span, 33 ft. 0 in.; mean chord (including elevators) 7 ft. 0 in.; dihedral, nil; incidence, 2 deg. 30 min.

Distances between engine centres, 23 ft. 9 in. inboard, 50 ft. 3 in. outboard.

### Engines

Four 1735 h.p. Bristol Hercules VI or Hercules XVI 14-cylinder air cooled sleeve-valve radial engines, each weighing 1,890 lb.

### Propellers

Four Rotol RE6 electric fully-feathering units with left-hand rotation as apart from right-hand rotation on all other Lancaster variants. Pitch settings were 17 degrees 45 minutes fine, 52 deg. 45 min. coarse and 82 deg. feathered.

### Tankage

Total fuel capacity 2,154 Imperial gallons for 100 octane fuel, made up of 2 x 580, 2 x 383 and 2 x 114 Imp. gal. tanks situated in the wings. Additionally, provision was made from March 1943 for one or two 400 Imp. gal. self-sealing auxiliary fuel tanks to be carried in the bomb-bay as required.

Oil capacity 150 Imperial gallons in four 37½ Imp. gal. tanks, one to each engine.

### Construction

Mainplane of two-spar type with centre-section of parallel chord and thickness, built integral with fuselage. Tapering outer sections built in two port and two starboard sections. Ribs of aluminium alloy pressings, flanged and swaged, and covering of aluminium sheet.

Fuselage of Duralumin built in five sections each with transverse formers and longitudinal stringers.

Main undercarriage of two retractable single-wheel units with twin Dowty oleo-pneumatic shock absorber struts with Dunlop AH2238 17.5 x 19-in. wheels using Dunlop SKA641 24 x 19-in. tyres. Non-retracting Dunlop AH8013 10 x 10-in. tailwheel with Dunlop NX11 12.5 x 10-in. tyre.

### Armament

Two 0.303-in. Browning machine-guns in Nash & Thompson FN5 nose turret, 2 x 0.303-in. Brownings in Nash & Thompson FN50 dorsal turret, 4 x 0.303-in. Brownings in Nash & Thompson FN20 (or FN120) tail turret, 2 x 0.303-in. Brownings in Nash & Thompson FN64 ventral turret. Early in 1944 a single 0.50-in. Browning machine-gun was mounted on fuselage floor in lieu of FN64 turret on certain aircraft. Bomb load up to 14,000 lb. made up into various combinations of high-explosive and incendiary, or mines. Provision in certain aircraft with bulged and extended bomb doors to take 8,000 lb. bomb.

### Main Equipment

Automatic bomb sight Mk.II or Mk.IV. F.24 camera. TR9F and T1154/R1155 transmitter/receiver. D.R. Mk. 1 compass. Type J Mk.III emergency dinghy stowed in inboard trailing edge section of starboard main plane. "Gee" Mk.I or III according to period. "G-H" periods as advised in text. Auto-controls.

### Weights

All-up weight with 2,154 Imp. gal. of fuel and 11 x 500 lb. bombs: 62,700 lb. Tare 36,450 lb. Maximum all-up weight 63,000 lb. Maximum fuel 15,510 lb. Oil 1,350 lb. Maximum bomb load 14,000 lb. Military load other than bombs including crew 3,875 lb.

### Performance

Maximum speed 265 m.p.h. at 14,000 ft. with full bomb load. Cruising speed 167 m.p.h. at 15,000 ft. Rate of climb 255 ft./min. Maximum permissible diving speed 360 m.p.h. Service ceiling 18,500 ft. Range up to 2,550 miles according to load. Take-off run with full load 1,350 yds. Maximum permissible landing weight 56,000 lb.

### Control Surfaces

Aileron spanning 17 ft. 3½ in. of 2 ft. 6 in. mean chord, with an area, including tabs, of 85½ sq. ft. and a movement of 16 deg. up and down. Aileron trimming tab movement 19 deg. up and down. Split trailing-edge flaps between aileron and fuselage with down movement of 56 deg. 30 min. Elevator area of 82 sq. ft., with movement of 28 deg. up and 14½ deg. down. Elevator trimming tab movement of 6 deg. up and down. Rudder movement (both) 22 deg. port and starboard.

## LANCASTER Mk.II PRODUCTION, DISPOSAL & SERVICE

### Production

Prototype DT810 built by A. V. Roe & Co. Ltd. at Chadderton in the northern suburbs of Manchester (Lancashire), and first flown November 26, 1941. Total of 300 built by Sir W. G. Armstrong Whitworth Aircraft Ltd. at Baginton, south of Coventry (Warwickshire), delivered from September 1942 to March 1944. R.A.F. serials: DS601-635; DS647-692; DS704-741; DS757-797; DS813-852; LL617-653; LL666-704; & LL716-739.

### Initial Allocation

To Service squadrons, R.A.F. & R.C.A.F.	282
To experimental establishments	15
To training units	4
<b>Total:</b>	<b>301</b>

### Disposal

Lost on operational missions	179
Crashed in or around the United Kingdom	71
Used as instructional airframes	10
Scrapped as obsolete or through deterioration	41
<b>Total:</b>	<b>301</b>

### Squadron\*

Squadron*	Code	Base	Date
No. 61 Squadron ("C" Flt. only) R.A.F.	QR	Syerston (Nottinghamshire)	Oct. 42-Feb. 43
No. 115 Squadron R.A.F.	KO & A4	East Wretham (Norfolk)	Mar. 43-Aug. 43
		Little Snoring (Norfolk)	Aug. 43-Nov. 43
		Witchford (Cambridgeshire)	Nov. 43-May 44
No. 408 Squadron, R.C.A.F.	EQ	Linton-on-Ouse (Yorkshire)	Aug. 43-Aug. 44
No. 426 Squadron, R.C.A.F.	OW	Linton-on-Ouse (Yorkshire)	Jun. 43-May 44
No. 432 Squadron, R.C.A.F.	QO	East Moor (Yorkshire)	Sept. 43-Feb. 44
No. 514 Squadron, R.A.F.	JI/A2	Foulsham (Norfolk)	Sept. 43-Nov. 43
		Waterbeach (Cambridgeshire)	Nov. 43-Sept. 44

\*Also, unit service in limited numbers in Nos. 1657, 1660, 1666, 1668, 1678, 1679 Heavy Conversion Units, Royal Air Force.



On the night of November 26-27, 1943, No. 432 (Leaside) Squadron, R.C.A.F. made their first raid on the German capital. The aircraft shown was flown on this raid by the squadron commander, Wing Commander W. A. McKay, and five members of his crew are seen in this photograph taken two days later at East Moor, Yorkshire.

(Photo: Public Archives of Canada ref. PL-22393)

The last Lancaster to survive (LL735) in late 1947—was used on extended trials with the experimental Metrovick F2/4 jet engine in rear.

(Photo: Flight ref. 19236)

