# DE HAVILLAND MOSQUITO

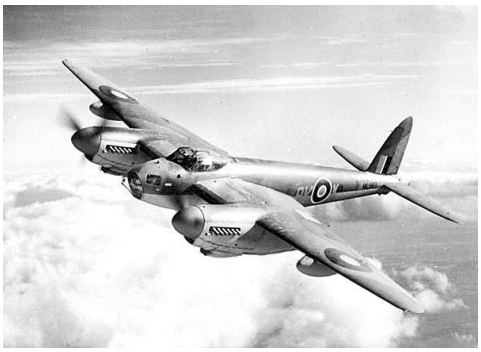


*Researched and Written by: Capt (N) (Ret'd) M. Braham*
*Edited By: Hugh Spence*

**Introduction:** The de Havilland DH.98 Mosquito was one of the most versatile British combat aircraft of the Second World War. It was known affectionately as the "Mossie" to its crews and was also nicknamed "The Wooden Wonder" or "The Timber Terror" as the bulk of the aircraft was made of laminated plywood. It saw service with the Royal Air Force (RAF) and many other air forces in the European, Pacific, and the Mediterranean theatres of operations, as well as for some years following the war.

Originally conceived as an unarmed (no defensive weapons) fast bomber, the Mosquito was adapted to many other roles during the air war, including: low to medium altitude daytime tactical bomber, high altitude night bomber, pathfinder, day or night fighter, fighter-bomber, intruder, maritime strike, and fast photo reconnaissance aircraft carrying out aerial reconnaissance. It was even used by the British Overseas Airways Corporation (BOAC) as a transport. It was also the basis for a single-seat heavy fighter, the de Havilland Hornet.

When it first entered into production in 1941, it was the fastest operational aircraft in the world.



**Mosquito B. Mk. XVI**

**Basic Design:** The Mosquito was a mid-wing (or shoulder-wing) aircraft powered by two Merlin engines. In the most numerous variant, the FB 6 (Fighter-bomber Mark 6), two Merlin Mk 23 or Mk 25 engines driving three-bladed propellers powered the aircraft.

The airframe was built mostly from wood. The fuselage was a frameless monocoque shell made of sheets of Ecuadorean balsawood sandwiched between sheets of Canadian birch, but in areas needing extra strength, such as along cut-outs, stronger woods replaced the balsa filler. A covering of doped Madapolam, a fine, plain woven cotton fabric completed the unit. The fuselage could be made in a week by six technicians. A coat of silver dope was applied before exterior camouflage was applied.

The all-wood wing was installed into the roots by means of four large attachment points. The wing was built as a one-piece structure and was not divided into separate construction sections. It was made up of two main spars, spruce and plywood compression ribs, stringers, and a plywood covering. The outer plywood skin was covered and doped like the fuselage. The wing contained metal framed and skinned ailerons, but the flaps were made of wood and were hydraulically controlled.

The nacelles were mostly wood, but the engine mounts were all metal as were the undercarriage parts. Engine mounts of welded steel tube were added, along with simple landing gear oleos filled with rubber blocks.

The control surfaces, the rudder and elevator were aluminum framed and fabric

covered. Apart from the engines, the total weight of metal castings and forgings used in the aircraft was only 280 lb (130 kg).

**Variants:** Three prototypes were built, each with a different configuration. The first to fly was the bomber prototype *W4050* on Nov. 25, 1940, followed by the night fighter model on May 15, 1941 and the photo-reconnaissance model on June 10.

Based on these three prototypes, a long list of variants for a wide variety of tasks and with a range of performance criteria was produced. They are summarized in Appendix 1.

**Canadian Built Mosquitoes:** A total of 1,133 Mosquitoes were built by De Havilland Canada in Ontario at Downsview Airfield.

**Mosquito Operations:** The de Havilland Mosquito operated in many roles during the Second World War. Mosquito-equipped squadrons performed medium bomber, reconnaissance, tactical strike, intruder, anti-submarine warfare and shipping attack and night fighter duties, both defensive and offensive, until the end of the war.

Mosquitoes were widely used by the RAF Pathfinder Force, which marked targets for night-time strategic bombing. Despite an initially high loss rate, the Mosquito ended the war with the lowest losses of any aircraft in RAF Bomber Command service.

The Mosquito famously annoyed the Commander in Chief of the Luftwaffe, Reichsmarschall Hermann Göring, when, on Jan. 20, 1943, the 10th anniversary of the Nazis' seizure of power, a Mosquito attack knocked out the main Berlin broadcasting station, putting his speech off the air.

Typical of the special operations carried out by Mosquitoes was the low-level bombing raid on Gestapo Headquarters in Copenhagen on Mar. 21, 1945 carried out by 140 Squadron RAF.

Before the attack could be carried out, several weeks of careful planning had been necessary. Two large scale models, one representing the city, and the other the Gestapo building, were used to brief the pilots in every detail. Even trees, lakes and houses were pointed out on these models which took 340 man hours to construct.

The target was a large building, U-shaped, and six storeys in height. From information received it was known that the entire Gestapo staff for the whole of Denmark, as well as a large number of police personnel were housed in this headquarters.

The Mosquitoes took off in three waves of six, together with two Mosquitoes of the RAF Film Unit at exactly nine o'clock in the morning, the time that the Gestapo workers would be arriving at the Headquarters. After flying across the North Sea for over two hours, they made landfall exactly as planned on the coast of

Jutland and soon the city of Copenhagen came into view.

A reconnaissance aircraft took off the following day and photographed the area. Interpretation reports of these photographs showed that the target had received severe damage. The top storey and roof of the south front were destroyed and the remainder was partially gutted and destroyed. The west wing was demolished nearly to ground level and the east wing top storey and roof were destroyed and the floor below damaged. Rescue work was in progress when the photographs were taken. A photograph received later from Danish Underground sources shows the building ablaze from end to end, solid evidence the targeting and bomb-aiming had been superb. Furthermore, 151 Gestapo men were killed and 30 Danish patriots imprisoned in the building managed to escape, making the mission a complete success.

The Mosquito flew its last official European war mission on May 21, 1945, when 143 Squadron and 248 Squadron RAF were ordered to continue to hunt German submarines that might be tempted to continue the fight.

Some of the most successful RAF pilots flew the Mosquito. Night fighter pilot Wing Commander Branse Burbridge claimed 21 kills; Bob Braham claimed 10 of his 29 kills flying intruder missions in a Mosquito; and John Cunningham claimed 19 of his 20 victories at night in his Mosquito.

**CANADIAN MOSQUITO OPERATIONS**

In addition to the many Canadians who flew Mosquitoes with distinction in RAF squadrons, there were six RCAF squadrons ultimately equipped with Mosquitoes.

**400 (City of Toronto Squadron):** The 110 City of Toronto Squadron, originally No. 10 Army Cooperation Squadron, was formed in October 1932, and was the RCAF's first auxiliary squadron. The Squadron arrived in Britain in February 1940. It was renumbered as 400 Squadron at Odiham Hants, on March 1, 1941, operating Curtiss Tomahawks and later North American Mustang Mk I aircraft. During the Mustang period some engagements with Luftwaffe aircraft took place when tactical reconnaissance sorties were being flown over Western Europe during late 1942 and 1943 and nine victories were claimed by December 1943. The squadron was re-equipped with the unarmed photo reconnaissance Spitfire Mk XI and Mosquito Mk XVI. The squadron was disbanded on Aug. 7, 1945 at a captured airfield in Germany, and later re-formed in 1946.


**404 (Buffalo) Squadron:** The squadron was formed at Thorney Island in Sussex, England on April 15, 1941, under Royal Air Force operational control. Tasked with coastal patrol and attack, the squadron initially flew the Bristol Blenheim Mk.IV and later the Beaufighter and Mosquito. From May 1944 to September 1944 No. 404 was based at RAF Davidstow Moor in Cornwall. The squadron disbanded on May 25, 1945.


**406 (City of Saskatoon) Squadron:** It was first formed at Acklington in May 1941, as part of No. 13 Group of Fighter Command. The unit was equipped with Blenheim IF heavy fighters, re-equipping with the improved Beaufighter IIF the next month. They operated out of several bases in the United Kingdom, changing to


the Beaufighter VIF in mid-1942, and receiving the Mosquito XII night-fighter in April 1944. They upgraded to the Mosquito XXX in July, and operated this aircraft for the remainder of the war.

In June 1945, the Squadron transferred to RAF Predannack in Cornwall, where it disbanded in August.

**409 (Nighthawk) Squadron:** No. 409 Nighthawk Squadron was formed at RAF Digby in June 1941 for night operations with Boulton-Paul Defiants, moving in July to RAF Coleby Grange, where, in August, Beaufighter IIF's arrived. In February 1943 the Squadron moved to Acklington, returning later in the year to Coleby Grange. In March 1944, No. 409 Squadron moved to Hunsdon, converting to the Mosquito Mk XII and joined No. 85 Group of the 2nd TAF (Tactical Air Force). Intruder and offensive patrols commenced and much action was seen over the Normandy beachhead in June: 11 victories were claimed during that month. After some action against V-1 Flying Bombs, operations over Europe re-commenced, and late in August the unit moved to Carpiquet in France, the first night fighters to be based on the mainland. By mid-October the Squadron had settled in the Lille area, where it was to remain until April 1945. On April 19 a move was made to the Rhine in Germany, and from there the unit was able to claim six victories in a single night. Shortly after this the war ended with the squadron's total victories at 61½ claimed.

**410 (Cougar) Squadron:** The RCAF's third night-fighter, No. 410, equipped with Defiants, formed at Ayr at the end of June 1941, moving to Drem in August with detachments located at several other airfields. Beaufighter II's replaced the Defiants in April and in June the Squadron returned to Ayr, before moving to Scorton in September and to Acklington in October where it converted to de Havilland Mosquito Mk II's, with which the Squadron's first victory was claimed. In February 1943 the unit moved to Coleby Grange to undertake some 'Ranger' sorties. Mosquito Mk VI's supplemented the Mk II's from July, while in November the unit moved to Hunsdon where in December Mosquito Mk XII's replaced the earlier types. In June 1944 a move was made to Zeals where the Squadron became part of the 2nd TAF (Tactical Air Force), moving to Colerne in July. In August No. 410 commenced conversion to the Mosquito Mk XXX. A return to Hunsdon preceded a move to France in September. The Squadron had the distinction of being the top-scoring night-fighter unit in 2nd TAF in the period between D-Day and VE-Day. A total of 75 3/4 victories had been claimed by the end of the war.


**418 (City of Edmonton) Squadron:** This was the RCAF's only Intruder Squadron. Initially flying Douglas Bostons, the squadron's aircraft ventured alone into the night's sky to patrol the perimeters of the enemy's airfields and attack aircraft as they took off on their night raids. No. 418's fame began to mount in

1943 when they converted to the de Havilland Mosquito. It was the only Canadian unit given free rein to "intrude" into enemy territory from the fjords of Norway to the Mediterranean and even to the steppes of Eastern Europe.

Adopted by the City of Edmonton, the squadron performed a multitude of roles unparalleled in the history of aerial warfare. These ranged from dropping money and supplies for clandestine operations, to lightning quick strikes at tree-top height against railway yards and airfields. Squadron aircraft were also in the fore in the defence against the German's new V1 and V2 weapons. At war's end, 418 was the top fighter squadron in the RCAF and its units score was one of the highest in all the Allied Air Forces.

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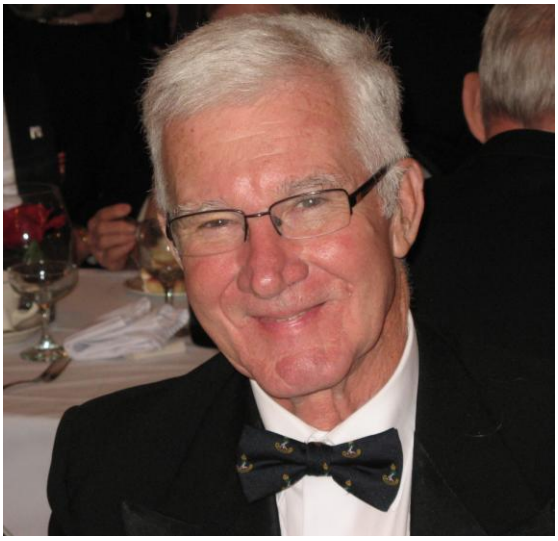
**Captain (N) (Ret'd) M. Braham, CD**



Mike Braham is a graduate of the Royal Military College (1965) and a former naval officer and senior official with DND. He has an abiding interest in military history.

**Appendix 1**

**MOSQUITO VARIANTS**

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| **Prototype/PR.1** | Prototype and first few photo-reconnaissance aircraft. Easily distinguishable by short engine nacelles. Two Rolls-Royce Merlin 21 engines with two speed, single stage superchargers and De Havilland hydromatic propellers. |
| **F.II Fighter** | Developed from prototype W4052. Four 20mm cannon and four.303in Browning machine guns. Rolls-Royce Merlin 21 and 23 engines. Two were built experimentally with a rotating dorsal turret equipped with four .303in machine guns. Some examples converted to PR.II |
| **T.III Trainer** | As Mark II but with dual control and without armament. Rolls-Royce Merlin 21 and 23 engines. |
| **B.IV** | Unarmed bomber. Like the PR.1 but with longer engine nacelles. Rolls-Royce Merlin 21 and 23 engines. Capacity for four 500lb bombs (with shortened fins) in the fuselage in place of the four 250lb bombs in the original design. Later modified to carry a 4000lb bomb (blockbuster or "cookie") with a bulged bomb-bay. The first operational sorties were made in daylight to Cologne. The first bombing of Berlin by daylight was made by B.IV's on 30th January 1943. |
| **PR.IV** | Unarmed photo-reconnaissance aircraft. Like the B.IV, but with provision for cameras instead of bombs. A variant of the PR.IV was supplied to BOAC as the prototype Mosquito courier-transport. 'Accommodation' for the two passengers was on their backs in the felt-padded bomb bay |
| **B.V** | Prototype developed from the B.IV with new 'standard wing' to take either two 50 gallon jettisonable wing tanks or two 500lb bombs. Rolls-Royce Merlin 23 engines. This aircraft was the basis of the Canadian B.VII. |
| **FB.VI** | Fighter bomber. Developed from the NF.II with Rolls- Royce Merlin 22, 23 and 25 engines. Same armament as the NF.II plus two 50 gallon jettisonable wing tanks or two 500lb bombs (or extra tankage in the |

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| | fuselage behind the cannon). Provision was made in 1944 to carry four 60lb rockets under each wing in place of the wing tanks or bombs for attacks on shipping. Two Mk.6 Mosquitoes were modified for deck landing and converted to Sea Mosquitoes by adding an arrestor hook, strengthening the rear fuselage and fitting four bladed propellers, becoming the basis for the Mk.33. |
| **B.VII** | Bomber. First 25 Canadian built Mosquitoes based on the B.V, but with Packard Merlin 31 engines driving Hamilton standard propellers. |
| **PR. VIII** | Photo-reconnaissance aircraft. The first high altitude Mosquitos. The PR.VIII was converted from B.IV by fitting special Merlin 61 intercooled engines with two speed, two stage superchargers and adding provision for two 50 gallon jettisonable wing tanks. Only five were built. |
| **B.IX** | Bomber. First high altitude unarmed bomber. Merlin 72 intercooled engines with two speed, two stage superchargers. Capacity for four 500lb bombs in the fuselage and two 500lb bombs on the wings or extra fuselage fuel tanks and 50 gallon jettisonable wing tanks. A few were converted to take one 4000lb bomb in the fuselage with two 50 gallon jettisonable wing tanks which were later in 1944 replaced by 100 gallon jettisonable wing tanks subject to a weight limitation of 25,200lb. A Pathfinder version was developed by the RAF |
| **PR. IX** | Photo-reconnaissance aircraft. Photo-reconnaissance version of the B.IX, used by the RAF and US 8th Air Force for meteorological reconnaissance over Europe before all major day and night bombing raids. |
| **NF. XII** | Night Fighter. Four cannon fighter developed from the NF.II, but with the four machine guns and the A.I. Mk. 5 radar being replaced by centimetric A.I. Mk 8 radar in nose radome. Merlin 21 and 23 engines. The 'standard wing' was not fitted. |
| **NF. XIII** | Night Fighter.Four cannon fighter developed from the FB.VI. The four |

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| | machine guns in the nose replaced by A.I Mk 8 radar in 'bull' nose. Merlin 21 and 23 engines. |
| **NF. XV** | Fighter. Special high altitude fighter developed in only seven days from pressure cabin prototype PR.VIII with extended wing tips, reduced fuel tankage and four .303in machine guns in a blister under the fuselage. Only five built. |
| **B.XVI** | Bomber. Pressure cabin development of the B.IX with Merlin 72, 73, 76 and 77 engines able to carry 3000lb bombs. All were converted in 1944 to take 4000lb bomb in the fuselage and two 50 gallon wing drop tanks or 100 gallon drop tanks with four 500lb bombs. |
| **PR. XVI** | Photo-reconnaissance aircraft. Photo-reconnaissance version of the B.XVI. Three extra fuel tanks fitted in the bomb bay. In addition to the cameras carried in the fuselage, one F.52 camera could be carried in each drop tank. |
| **NF. XVII** | Night Fighter developed from and similar to the NF.XII with American A.I. Mk 10 radar. |
| **FB. XVIII** | Fighter bomber. The 'Tsetse'. Developed from the FB.VI with the nose modified to take a six-pounder (57mm) anti-tank gun instead of the four 20mm cannon. The six-pounder could fire 25 shells in 20 seconds. Merlin 25 engines. Used mainly by Coastal Command against submarines and shipping. |
| **NF. XIX** | Night Fighter. Developed from and similar to the NF.XIII, but with Merlin 25 engines and able to take either British or American radar sets. In 1948-49, 45 were overhauled and fitted with four blade airscrews and supplied to the Royal Swedish Air Force who designated the aircraft the J.30. |
| **B.XX** | Bomber. Second batch of Canadian production. Similar to the B.VII but with Canadian-American equipment and Packard Merlin 31 or 33 engines. Forty fitted with cameras were supplied to the USAAF (who designated them the F.8) and were used for meteorological and operational reconnaissance. |
| **FB. 21** | Fighter bomber. Canadian built fighter |

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| | bomber corresponding to the FB.VI otherwise as the B.XX. Only three were built, one with Packard Merlin 33 engines, the other two with Packard Merlin 31 engines. Replaced by the FB.26. |
| **T.22** | Trainer. Canadian built unarmed dual control trainer based on the FB.21 with Packard Merlin 33 engines. Only six were built. Similar to the T.III. |
| **B.25** | Bomber. Canadian built bomber identical to the B.XX but with Packard Merlin 225 engines. |
| **FB. 26** | Fighter bomber. Canadian built fighter bomber developed from the FB.VI but with Packard Merlin 225 engines and Canadian-American equipment. |
| **T. 27** | Trainer. Canadian built trainer developed from the T.22 with Packard Merlin 225 engines. |
| **NF. 30** | Night Fighter. Developed from the NF.XIX with high altitude Merlin 72, 76 and 113 engines. |
| **PR.32** | Photo-reconnaissance aircraft. Specially lightened version of the PR.XVI with Merlin 113 and 114 (two stage, supercharged) engines and extended wing tips for high altitude operation. |
| **TF/TR.33** | Fleet Air Arm version developed from the FB.VI for multi role operation. Merlin 25 engines, manually operated folding wings and pneumatic landing gear with smaller wheels. |
| **PR. 34** | Photo-reconnaissance aircraft. Very long range development of the PR.XVI with Merlin 113 and 114 engines. This was the fastest version of the Mosquito managing 422mph in level flight. |
| **B.35** | Bomber. Similar to the B.XVI except for Merlin 114 engines in early versions, Merlin 114A engines in later versions. 274 built, including 65 by Airspeed Ltd. |
| **PR.35** | Photo-reconnaissance aircraft. Ten converted from B.35's. |
| **TT.35** | Target tower. Modified from B.35 |
| **NF. 36** | Night Fighter. High powered development of the NF.30 with Merlin 113 engines and American A.I. MK 10 radar. Armament consisted of four 20mm cannon. |
| **TR/TF.37** | Torpedo |

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| | fighter/bomber. Similar to the T.33 with British ASV Mk. 13B radar fitted in a 'bull' nose. |
| **NF.38** | Night Fighter. Similar to the NF.36, fitted with British A.I. Mk 9 radar. Merlin 113, 114, 113A or 114A engines. |
| **TT.39** | Target tower. Target tower converted from B.XVI. |
| **FB.40** | Fighter Bomber. First Australian built Mosquitos, based on the FB.VI with Hamilton Standard or Australian built De Havilland hydromatic propellers. The first 100 aircraft were built with Packard Merlin 31 engines, thereafter, Packard Merlin 33 engines. |
| **PR.40** | Photo-reconnaissance aircraft. Australian built conversion of the FB.40. Packard Merlin 31 engines. |
| **PR.41** | Photo-reconnaissance aircraft. Australian built, similar to the PR.40 but with extra radio gear and Packard Merlin 69 (two stage, supercharged) engines. |
| **T.43** | Trainer. Australian built conversion of the FB.40 and almost identical except for the addition of dual controls and dual elevator trim tabs. |

**Appendix 2**

**SPECIFICATIONS: DH. 98 MOSQUITO B. MK.XVI**

**General characteristics:**

- **Crew:** 2: pilot, bombardier/navigator
- **Length:** 44 ft 6 in (13.57 m)
- **Wingspan:** 54 ft 2 in (16.52 m)
- **Height:** 17 ft 5 in (5.3 m)
- **Wing area:** 454 ft² (42.18 m²)
- **Empty weight:** 14,300 lb (6,490 kg)
- **Loaded weight:** 18,100 lb (8,210 kg)
- **Max takeoff weight:** 25,000 lb (11,000 kg)
- **Powerplant:** 2× Rolls-Royce Merlin 76/77 (left/right) liquid-cooled V12 engine, 1,710 hp (1,280 kW) each

**Performance**

- **Maximum speed:** 361 kn (415 mph, 668 km/h) at 28,000 ft (8,500 m)
- **Range:** 1,300 nmi (1,500 mi, 2,400 km) with full weapons load
- **Service ceiling:** 37,000 ft (11,000 m)
- **Rate of climb:** 2,850 ft/min (14.5 m/s)
- **Wing loading:** 39.9 lb/ft² (195 kg/m²)
- **Power/mass:** 0.189 hp/lb (311 W/kg)

**Armament**

- **Bombs:** 4,000 lb (1 800 kg)

**Avionics**

- GEE radio-navigation