

# Vickers Wellington - Owners' Workshop Manual

by Iain R. Murray; Haynes, 2012

## Reference List and Notes

The Haynes manual format does not permit the inclusion of footnotes or references, but the following references pertain to the book as printed.

### Bibliography

- C.F. Andrews & E.B. Morgan, *Vickers Aircraft since 1908*, Putnam, 1989.  
Norman Barfield, *Broughton: From Wellington to Airbus*, Tempus, 2001.  
Martin Bowman, *Wellington: The Geodetic Giant*, Airlife, 1989.  
Chaz Bowyer, *The Wellington Bomber*, William Kimber, 1986.  
Chaz Bowyer & Armand van Ishoven, *Halifax and Wellington*, PRC Publishing, 1994.  
Andrew Hendrie, *The Cinderella Service: RAF Coastal Command 1939-1945*, Pen & Sword, 2010  
Robin Holmes, *One of Our Aircraft: The Story of "R for Robert", the Loch Ness Wellington*, Quiller Press, 1991  
Alec Lumsden, *Wellington Special*, Ian Allen, 1974.  
Alec Lumsden, *British Piston Aero Engines and Their Aircraft*, Airlife, 1994.  
Martin Middlebrook & Chris Everitt, *The Bomber Command War Diaries*, Midland Publishing, 1998.  
Michal Ovcacik & Karel Susa, *Vickers-Armstrongs Wellington*, Mark I Publications, 2003.

N.B. TNA = The National Archives (Kew)

### Introduction

- p.8 American use of "cloth bomber" - a Wellington pilot quoted in *The Aeroplane*, Sep 2001.  
Max Hastings quoted from *Wellington Bomber*, BBC, 2010.  
Discussion of the "prop effect" and other geodetic theory is given in *A Brief Note on Geodetic Construction*, Barnes Wallis, Vickers Aviation, 1935 (sourced from RAF Museum).  
"greater proportion of its theoretical strength", *The Aeroplane*, 1939.
- p.9 "3% saving in weight over other forms", TNA DSIR 23/13998.  
"33% larger than articulated structures", *Note on Geodetic Construction*, Barnes Wallis, Vickers Aviation, 1933 (sourced from TNA DSIR 36/3000).  
"a beautiful thing" - *Twenty-First Profile* #1, p.9.  
Resistance to forces, TNA DSIR 23/5182.  
Change of longeron position and spars to carry lift shear, TNA DSIR 23/5182  
"easier to manufacture", Norman Barfield and Norman Parker, private communication
- p.10 Photo, bottom right - these geodetics are modern examples.
- p.11 Comparison of G.4/11 and Vincent, TNA DSIR 23/5182
- p.13 Most of the details on the B.9/32 are from *Twenty-First Profile* #1.  
Tare weight limitation from Bowyer (1986).  
"Barnes Wallis said he was almost prouder of having created the Wellington than he was of creating the bouncing bomb" - Max Hastings quoted from *Wellington Bomber*, BBC, 2010.
- p.14 Comments on flaps and wheel brakes from A&AEE flight test report, Brooklands Museum Library.
- p.15 N2761 - flight test report, 17/8/1940, Brooklands Museum Library, confirms N2761 as the first Broughton-built aircraft, although Barfield (2001), states it was L7770 (this was the earliest serial to come from Broughton).  
X3160 - production date from Lumsden (1974).  
Rolling machines - Lumsden (1974), p.43, states that all the geodetics for Broughton were made by three Midlands firms.

### Chapter 1 - The Wellington Story

- p.16 Although this colour photo of a 4,000lb HC bomb is well known, there is no known archive photograph of the bomb loaded onto a Wellington, or of the bomb bay fitted out for this bomb - however, see p.156.
- p.18 All test flight details are from original flight test reports, Brooklands Museum Library.  
Mk I/IA - AP1578 *Pilot's Notes* for the Mk I (para 12) indicate that the Mk I did not have a ventral turret but the IA did; AP1578 *Pilot's Notes* for the Mk I (para 13) indicate that the Mk I did not have a flotation system but the IA did.
- p.19 Mk IC - Derek Alloway (9 Squadron) confirms that some early ICs retained the ventral turret.  
Mk IC first flight - Bowman, p.46
- p.20 "extending the backstays" - flight test report, 17/3/1939, Brooklands Museum Library.

- “eighteen months later” - flight test report of first production Mk II, 6/8/1940, Brooklands Museum Library.
- “autumn of 1940” - flight test report, 17/8/1940, Brooklands Museum Library.
- Mk V - R3298 (Type 421 then Type 436) and R3299 (Type 407) were built at Foxwarren, W5796 (Type 426) at VAX1.
- p.21 Mk VIII - T2919 was the ASV prototype.
- Mk IX - Lumsden (1974), p.78, and *The Aeroplane*, Sep 2001, state that only P2522 was converted to a Mk IX; Air Britain serial books do *not* confirm P2522 conversion to Mk IX and state that T2977 was converted to Mk IX; Andrews & Morgan states “the exact number so converted is not known”.
- “Fairings” - Norman Parker, private communication.
- Mk X production Type 440 - confirmed by Andrews & Morgan; however *The Aeroplane*, Sep 2001, p.71, and Ovcacik & Susa, p.2, both state that Type 440 was the prototype with Type 448 production.
- Differences between Mk XI/XII/XIII/XIV are from Bowyer (1986), p.196, and Andrews & Morgan p.358.
- p.22 Mk XV/Mk XVI - Norman Parker says that several were converted from Mk IIIs, private communication.
- Layout details and weights are from TNA AIR 10/2496.
- p.23 Mk XIX - contrary to some sources, T.10s were *never* converted to Mk XIXs nor vice versa; Stoke Heath information from Andrews & Morgan, p.360, other details of Mk XIX conversions from Norman Parker, private communication.
- T.10 - figure of 270 conversions is from the RAF Museum’s official history of MF628 and Ovcacik & Susa; conversion details from the RAF Museum’s official history of MF628 and Bowyer & van Ishoven, p.179.
- Main Particulars - data from Andrews & Morgan except prototype data from *Twenty-First Profile* #1 and weights from TNA AVIA 18/642.
- p.24 Spotter’s Guide - compiled by the author from numerous sources.
- p.27 Air-Sea Rescue - Mk IVs were tested with Lindholme gear in September 1942, Andrews & Morgan, p.337.
- p.28 Basic requirement - TNA AVIA 15/118.
- Herbert Jeffree - from Jeffree’s papers via Tony Hadland.
- Vickers selection - TNA AVIA 15/118.
- Mk V first flights with different engines - *Twenty-first Profile* #12, p.376.
- p.29 switch to Mk VIs - the airframes built as Mk Vs were designated Mk VIAs and new-build aircraft as Mk VIGs.
- Mk VI first flight - *Twenty-first Profile* #15, p.76.
- p.30 “partially-pressurised FN.20” and “sighting by periscope” - TNA AVIA 15/1091.
- “sighting via a mirror” - *Twenty-first Profile* #15, p.79.
- “DR480 and DR484” - *The Aeroplane*, Sep 2001, p.71.
- “At least eighteen Mk VIGs” - Lumsden (1974), p. 73, says thirty-two with Oboe including three trainers.
- “in favour of the Mosquito” - Bowyer (1986), p.32.
- “off charge by the end of 1943” - Bowyer (1986), p.35.
- p.31 Jet test beds - most information from *Air-Britain Aeromilitaria*, Vol.28 No.109, Spring 2002.
- “512 hours” - Andrews & Morgan, p.363.
- p.32 “later used to trial another” - Andrews & Morgan, pp.344-5.
- Rocket projectile test beds - TNA AVIA 18/1027 and AIR 65/112.
- Glider Tugs - TNA AVIA 21/249, AVIA 21/254, AVIA 21/271, AVIA 21/274, AVIA 15/1303 and AVIA 21/277.
- There is no known archive photograph of a glider under tow behind a Wellington in flight.
- p.33 “trials towing a Hurricane” - TNA AVIA 15/1232.
- Paratroop loads - Lumsden (1974), p.66, and Ovcacik & Susa, p.67.
- p.34 Details of previous record holder - <http://blogs.chesterchronicle.co.uk/cheshire-memories/2008/04/remembering-airmen-who-perishe.html>
- Details of narrator - [http://www.nationalarchives.gov.uk/theartofwar/films/workers\\_week.htm](http://www.nationalarchives.gov.uk/theartofwar/films/workers_week.htm)
- p.35 “attaching powerful bar magnets to fish” - this was a genuine proposal in TNA AVIA 13/395.
- p.36 P2518 - some sources give P2516 as the first DWI, but this aircraft was *never* converted to DWI.
- Coil attachment, flap modifications and generator installation - *Twenty-first Profile* #9, p. 261.
- First flight details - TNA AVIA 15/141.
- Engine and generator location - from diagram in *Twenty-first Profile* #3, p.78.
- p.37 “Four IAs were initially converted” - these were P2518, P2521, P2522 and P9223.
- p.38 “a further twelve Mk IIs were flown” - these were L4212, L4221, L4227, L4235, L4352, L4356, L4358, L4374, L4391, L7771, R2701 and HX682
- “width of the swept channel” - TNA AVIA 44/459.
- Formation of No.1 GRU - TNA AIR 29/136 (the Operational Record Books for all three GRUs); many other DWI details given are from the ORBs.
- Crash of L4391 - most sources (including the ORB) give the location of the crash as Bizerte (in northern Tunisia), but *Twenty-first Profile* #9, p.285, gives it as Bordeaux (in France), and states that the Germans may have recovered the wreckage and copied it.

- p.39 P2521 service with 161 Squadron - confirmed by *Flights of the Forgotten*, Kenneth Merrick, Weidenfeld Military, 1989; message relay use from Norman Parker, private communication.  
"75% of this total" - author's calculation from data given by Andrews & Morgan.

## Chapter 2 - The Wellington at War

- p.43 "100 Wellingtons" - TNA AIR 22/31-22/49 (War Room Summaries: Bomber Command) cited by Bowyer, p.93.  
First use of the 4,000lb HC "Cookie" - *Bombs Gone*, John MacBean & Arthur Hogben, Patrick Stephens, 1990 and *The Aeroplane*, Sep 2001, p.69, both say that the bomb was first used operationally against Emden by one aircraft each from 9 and 149 Squadrons on the night of 31 March 1941; Bowyer, p.103, says it was only 149 Squadron, 9 Squadron not using it until 3 May against Cologne; Roger Audis (9 Squadron historian) confirms that 9 dropped incendiaries on 31 March to illuminate for 149, R5445 dropping 9 Squadron's first Cookie on 3 May.  
"ten times as great" - Bowyer, p.108.  
Wellingtons on first 1,000 bomber raid - *The Aeroplane*, Sep 2001, p.65, says 599 of 1043 aircraft were Wellingtons; Bowyer, p.116, says 602 from 1047 aircraft were Wellingtons, of which 364 were from frontline squadrons and 238 from OTUs.  
Wellingtons on other 1,000 bomber raids - Bowyer, p.116, says 545 from 956 aircraft on the 2<sup>nd</sup> raid were Wellingtons and 472 from 1067 aircraft on the 3<sup>rd</sup> raid were Wellingtons.  
"began to be phased out" - *The Strategic Air Offensive Against Germany*, Noble Frankland & Charles Webster, HMSO, 1961, says 15 squadrons by Feb 1943; other sources suggest 17 squadrons at this time.  
Date of last Wellington raid - Middlebrook & Everitt and *The Aeroplane*, Sep 2001, p.65.
- p.45 Details of Ward's exploits come from his VC citation in <http://www.london-gazette.co.uk/issues/35238/pages/4515>  
RAF Feltwell naming - <http://www.lakenheath.af.mil/news/story.asp?id=123256371>  
"only person" - <http://www.raf.mod.uk/stclementdanes/history/victoriacross.cfm> has a list of RAF VC holders and even when augmented with FAA holders and cross-checked with other sources, Ward is the only one.  
"His medal is currently on display" - confirmed with the museum, private communication.
- p.46 Wellingtons arriving at 70 Squadron - *The Aeroplane*, Sep 2001, p.65.  
"Commander Watson" - later Vice Admiral Sir Robert Dymock Watson KCB CBE (1904–1988)
- p.47 Table 1 data is extracted directly from Middlebrook & Everitt, p. 707.  
Table 2 data was collated by the author from the day-by-day accounts given in Middlebrook & Everitt.
- p.48 "Morgan-Giles" - later Rear-Admiral Sir Morgan Charles Morgan-Giles; retiring from the Navy in 1964, he became MP for Winchester that year serving until 1979; he became the oldest surviving former MP in May 2012.  
"Initial trials in December" - Bowyer, p. 165, and Bowman, p.150 say the first drop was by Chaplin on 20 December.  
"lucky to escape" - Morgan-Giles in letter to Norman Parker.  
"to drop their torpedoes" - Bowyer, p. 168 and *The Malta Airmen*, J. A. Whelan, War History Branch, Dept. of Internal Affairs, New Zealand, 1951.  
"to Italy from North Africa" - 205 Group followed the ebb and flow of the desert war, moving to Tripoli in 1943 where they stayed until the end of the North Africa campaign; 330 Wing of the British North African Air Force operated from Tunisia in the summer of 1943, attacking railway bridges in Italy with 4,000lb bombs. At the end of 1943, the Desert Air Force moved to Foggia, Italy, from where they attacked German troops in Yugoslavia and mined the River Danube in 18 raids from 8 April 1944.  
"up to March 1945" - the last raid was on Treviso on 13 March 1945.
- p.49 "over Burma in August 1944" - Bowyer, p.234.  
Coastal Command's roles - William Sholto Douglas speaking in a public information film about Coastal Command.
- p.50 Turbinlite - patents GB574970, GB575093 and GB576214.  
Formation of 172 Squadron and crew stations - *Leigh Light Wellingtons of Coastal Command*, J.H. Greswell, *The RUSI Journal*, Vol.140 No.3, June 1995, pp. 55-58.  
Attack on Italian submarine - Hendrie, p.93.
- p.51 Leigh Light procedure - from Coastal Command training film
- p.52 Photo, top - this may be a Mk XII; late versions looked identical to the Mk XIV.  
Use of Mk III low-level bombsight - TNA AIR 65/68  
"locating enemy convoys with ASV" - Hendrie, p.93.  
"sank thirty-two U boats" - Greswell (op cit); however <http://uboot.net/allies/aircraft/wellington.htm> lists only twenty-eight U-boats sunk by Wellingtons as follows: 1942 - U-502, U-372, U-165, U-412, 1943 - U-268, U-562, U-126, U-435, U-459, U-614, U-403, U-134, U-760, U-431, U-566, U-340, U-966, U-211, U-542, 1944 - U-231, U-545, U-283, U-575, U-852, U-846, U-616, U-960, 1945 - U-321.
- p.53 Wellington nicknames - Bowyer, p.198, and other sources; confirmation of meaning of nicknames from Norman Parker, private communication.  
"up to the end of 1942" - author's calculation based on data in David Smith, *Vickers Wellington Crash Log Vol.1 1937-42*.  
"around 54 aircraft" - RAF Air Historical Branch, private communication.

- Free French Air Force use of Wellingtons - [http://www.ffaa.net/squadrons/2f/2f\\_fr.htm](http://www.ffaa.net/squadrons/2f/2f_fr.htm), <http://www.ffaa.net/flights/10s/10s.htm> and <http://www.ffaa.net/flights/51s/51s.htm>; Alan Hall, *Warpaint Series: Vickers Wellington*, Hall Park Books, 1985, confirms that *Esquadrielle 55S* operated the Wellington; other sources suggest that *Esquadrielle 52S* also operated the Wellington.
- p.55 17 Squadron South African Air Force use of Wellingtons - [http://www.historyofwar.org/air/units/SAAF/17\\_wwll.html](http://www.historyofwar.org/air/units/SAAF/17_wwll.html), <http://www.saairforce.co.za/the-airforce/squadrons/4/17-squadron> and [http://www.historyofwar.org/air/units/SAAF/17\\_wwll.html](http://www.historyofwar.org/air/units/SAAF/17_wwll.html)
- 26 Squadron South African Air Force use of Wellingtons - [http://www.historyofwar.org/air/units/SAAF/26\\_wwll.html](http://www.historyofwar.org/air/units/SAAF/26_wwll.html) and <http://mysite.mweb.co.za/residents/bd000006/History.html>
- 28 Squadron South African Air Force use of Wellingtons - [http://www.historyofwar.org/air/units/SAAF/28\\_wwll.html](http://www.historyofwar.org/air/units/SAAF/28_wwll.html) although some details conflict with <http://www.saairforce.co.za/the-airforce/squadrons/8/28-squadron>
- Hellenic Air Force use of Wellingtons - [koti.welho.com/msolanak/13helengl.html#Wellingtons](http://koti.welho.com/msolanak/13helengl.html#Wellingtons) and [http://www.haf.gr/en/mission/weapons/historic/1941\\_1950/Vickers\\_Wellington.asp](http://www.haf.gr/en/mission/weapons/historic/1941_1950/Vickers_Wellington.asp)
- L7788 - Lumsden (1974), p.59.
- T2501 - <http://home.comcast.net/~TACRTC/Vickers%20Wellington%20T2501.htm>
- L7842 - <http://aviation-safety.net/wikibase/wiki.php?id=21586>
- "39,836 sorties" - Middlebrook & Everitt, pp.782-4; Lumsden (1974), p.31, states 47,409 sorties with Bomber Command (including 6022 by OTUs) dropping 42,000 tons of bombs with 1332 lost on ops and 337 in accidents.
- Hours flown - Lumsden (1974), p.31.

### Chapter 3 - Anatomy of the Wellington

- p.59 "aerofoil section" - Ovcacik & Susa, p.3.
- p.61 "high-tensile duralumin" - TNA AIR 10/2456.
- p.66 "instead of bolts" - TNA AIR 10/2456.
- p.67 Photos, top right - these covering samples are modern examples.  
"standard coating" - Sheet 28500 "Camouflage Doping Scheme", Sheet 42000 and Sheet 43300, Brooklands Museum Archive.
- p.69 bomb bay door coverings - Norman Parker, private communication.
- p.70 "electro-magnetic release" - TNA AVIA 18/642.
- p.73 rudder control on Mk VIII - TNA AIR 10/4342.  
Changes in trim and cutting out - Ken Wallis, private communication.
- p.78 Many sources suggest that the Mk I carried a ventral turret, but this appears to have been fitted only to L4212 - see notes for p.18.  
"just two men" - Norman Parker was one of them.  
Vickers turrets description and particulars - TNA AIR 10/2223.  
"unpopular in service" - TNA AVIA 18/642.
- p.80 Weight and drag of ventral turret - commentary from *Vickers Wellington: The War File DVD*
- p.81 "traverse can be increased" and "abandoned in favour" - Ovcacik & Susa, p.67.
- p.83 FN.121 turrets description and particulars - TNA AIR 10/3475 and AIR 10/2223; the FN.121 was a modified version of the FN.120 which was fitted on some Wellingtons and was an improved version of the FN.20.
- p.85 "adjacent to the main tank cock handles" - AP1578 *Pilot's Notes* (para 4).
- p.86 Weight of self-sealing tanks - Norman Parker, private communication.
- p.87 Pneumatic compressor details - Ovcacik & Susa, p.4.
- p.88 Landing light details - AP2068 in TNA AIR 10/2951.
- p.89 Fire extinguisher details - AP3042.  
TR9 transceiver - flight test reports in Brooklands Museum Library confirms that this was fitted to Mk IA aircraft, and was still being fitted to Mk V aircraft; frequency ranges from AP1938.
- p.90 R1155/T1154 details - <http://www.ab4oj.com/1st/main.html> and <http://www.duxfordradiosociety.org/equiphist/r1155/t1154-r1155-v1mod3.pdf>
- p.91 Range details - Walter Rogerson, private communication.
- p.95 Flare launching procedure - TNA AIR 10/4342.
- p.96 Photo-flash information - Ken Wallis, private communication.  
Steering arm information - TNA AIR 10/4342.  
Leigh Light details - Greswell (op. cit.)  
Leigh Light manufacturers - TNA AVIA 15/774.
- p.97 Accumulator details - TNA AVIA 15/774.  
"original six depth charges" - Bowyer, p.195.
- p.98 "up to 80° each side" - TNA AVIA 7/664.  
ASV Mk III unit size - *Twenty-first Profile* #3, p.77.

- p.99 Bomb attachments - author observation from R for Robert; diagrams are often ambiguous.  
 Rodded bombs - Ken Wallis dropped some of these and was almost blown up by one which hung up.  
 SBC contents - Bowyer & van Ishoven, p.177.  
 SBCs in outer cells only - TNA AVIA 18/642.
- p.101 "fined ten shillings" - Walter Rogerson, private communication.

#### Chapter 4 - Engines

- p.104 Inline engines more prone to flak damage - Ken Wallis, private communication.  
 "built in shadow factories" - Patrick Hassell, private communication.  
 "Around 20,500" - Lumsden (1994), p.23.  
 Epicyclic gearing - TNA AIR 10/2007.
- p.107 "domed perforated plate" - this was often removed from aircraft on Middle East service.
- p.108 Supercharging history - Bill Sweetman, *High Speed Flight*, Jane's, 1983, p.16 and p.24.  
 "lower gear should remain selected" - AP1728 in TNA AIR 10/2675.
- p.109 Auxiliary drive details - AP3042.  
 Pegasus particulars - TNA AIR 10/2007.
- p.110 "snowdrop grease" - Bowyer & van Ishoven, p.175.  
 Details of different propeller types - AP3042.  
 Hercules propeller details and propeller weights - Patrick Hassell, private communication.
- p.111 "development nightmare" - Patrick Hassell, private communication.  
 "around 65,000" - Lumsden (1994), p.23.
- p.112 "increased power at low-level" - Patrick Hassell, private communication.
- p.113 Hercules particulars - AP1728 in TNA AIR 10/2675.
- p.115 Merlin particulars - mostly from AP3042, some from AP1590.
- p.117 Origin of Mk IV - Andrews & Morgan, p. 336.  
 "destined for French aircraft" - Norman Parker, private communication.  
 Twin Wasp particulars - AP1847 in TNA AIR 10/2723 and AP3042.

#### Chapter 5 - The Loch Ness Wellington

- p.120 First detection by radar - researched by Robin Holmes; 18 December 1939 was the first time that Freya radar was mentioned in historical documents that he has researched, but he thinks that it was in operation earlier and detected the 3 and 14 December raids also.  
 Marwood-Elton's duties - TNA AIR 14/3523 describes Marwood-Elton in May 1942 (cited by [ir.canterbury.ac.nz/bitstream/100092/915/2/thesis\\_fulltext.pdf.txt](http://ir.canterbury.ac.nz/bitstream/100092/915/2/thesis_fulltext.pdf.txt)) as a "staff member in Bomber Command HQ" who was investigating bombing results; Science Museum document Arch BNW D3/1 shows that he was present at a meeting discussing Highball/Upkeep on 29 April 1943.  
 History - most of this section is derived from Holmes.
- p.121 Location - most of this section is derived from Holmes; *After the Battle* #53 features the wreck recovery, but the map given shows an incorrect location halfway down the loch.
- p.122 Recovery - most of this section is derived from Holmes.
- p.127 Restoration - much of the chronological detail between 1985 and 1994 is derived from documentation prepared by William Risbridger in 2009 (from meeting minutes and reports) and held by Brooklands Museum.
- p.128 Drawings and microfilms - *FlyPast*, Feb 1997, and Risbridger (Nov 1987).  
 "complete by mid-1989" - Risbridger (Jul 1987).
- p.129 "Monarch Aircraft Engineering" - *FlyPast*, Feb 1997.  
 "injected with lanolin" - John Lattimore, private communication.  
 "ex-Vickers engineer" - Norman Parker, private communication.
- p.130 "students at nearby Brooklands College" - *FlyPast*, Feb 1997.  
 Engine refitting dates - Risbridger, though John Lattimore questions their accuracy.
- p.132 Perspex and undercarriage - *FlyPast*, Feb 1997.  
 12½ frame - Risbridger (Jul 1989).  
 Pilot's seat and controls - Risbridger (Mar 1988).  
 Turret underpans - John Lattimore, private communication.  
 Viking wheels - Risbridger (Aug 1993).  
 "done very gently" - John Lattimore, private communication.  
 Instrument panel and seat cushion - *FlyPast*, Feb 1997.

- p.133 Portsmouth Museum - Risbridger (Sep 1986).  
 Cockpit canopies - Risbridger (Sep 1986 and Jan 1990) and John Lattimore, private communication.  
 Bent propellers - John Lattimore, private communication.  
 Propeller refurbishment - Risbridger (Jul 1989).  
 "back to working order" - John Lattimore, private communication.  
 "250 people" - *FlyPast*, Feb 1997.  
 "100,000 man hours" - John Lattimore, private communication.

## Chapter 6 - The Crews' Views

- p.136 "Mutt" Summers quote - George Edwards speaking in *Wellington at War* DVD.  
 "change in the elevator" - Andrews & Morgan, p.320.  
 Test pilots - flight test reports in Brooklands Museum Library.  
 "throughout the production life" - these continued at least until late 1944, when rudder trials were still being conducted.  
 Eric Brown - he has flown more different aircraft types than anyone else in history, partly due to flight testing all the captured German designs at the end of the war; despite many of them attempting to kill him, he is still alive.  
 "easy to fly" - Rupert "Tiny" Cooling said "It was a lovely aeroplane to fly" in *Wellington Bomber*, BBC, 2010.
- p.137 "spinning was unadvisable" - Bowyer & van Ishoven, p.147.  
 "always unsatisfactory" - flight test reports in Brooklands Museum Library.  
 "lumps of ice" - Ken Wallis, private communication.  
 "hot metal parts" - Bowyer & van Ishoven, p.213.
- p.138 "similar in every respect" - flight test report dated 19 May 1939 (first flight) in Brooklands Museum Library.  
 Cockpit Drill - from RAF training film.
- p.139 Take-off Checks/Landing Checks - from RAF training film.
- p.140 After Landing/ Gun Turret Drill - from RAF training film.
- p.142 Emergency Drill - AP1578 *Pilot's Notes* for Mk III.
- p.143 Ditching Drill - from Lumsden (1974) and AP1578 *Pilot's Notes*.

## Chapter 7 - The Engineers' Views

- p.146 "act as a tent" - Bowyer & van Ishoven  
 "whatever the weather" and electrical inspection - Bowyer, p.267.
- p.147 "fatigue cracks" - Bowman, pp.3-5.
- p.148 Servicing times - A&AE flight test report dated 14 Jan 1940 in Brooklands Museum Library.  
 "manually winched up" - Bowyer, p.261.
- p.149 "heavy bogies" - these could be wheeled or tracked.
- p.150 "intelligent bodes" - Ken Wallis, private communication.  
 Damage repair - AP1578 B & C Volume II in TNA AIR 10/2346.
- p.151 "alongside the railway", "six weeks" and "metal reclaimed" - Norman Parker, private communication.

## Appendices

- p.153-4 All numbers in these tables were compiled by the author from his own master list of individual aircraft, and cross-checked among several sources, including Andrews & Morgan, Robertson's *British Military Aircraft Serials 1912-1966* and the Air-Britain RAF Serials series. The total number of Wellingtons built is usually quoted as 11,460 or 11,461 but the actual total appears to be 11,462, even from Andrews & Morgan's own data (they quote 11,461).
- p.154 "an additional 1,000" - Barfield, p.98.
- p.155 "the notch" - likely reasons for the notch were discussed with the RAF Air Historical Branch, private communication.  
 The top graph shows the number of squadrons and OTUs operating *one or more Wellingtons* each month; due to differences between individual units, actual aircraft numbers cannot be implied from the graph.
- p.156 Photo - Norman Parker's model was built to show how the 4,000lb HC bomb was carried on a Wellington, as there is no known photograph of an actual bomb on the aircraft.

## Errata

- p.24 "ASV Mk II radome under-nose turret" should be "ASV Mk III radome under nose turret"
- p.28 Delete "pressure-cabin" from the first paragraph
- p.58 "see page 25" should be "see page 26"
- p.61 Caption "the main spar root, attaching the outer wing" should be "the main spar root; attaching the outer wing"