



# ADF-Serials Telegraph



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Articles for those interested in Australian Military Aircraft History and Serials

***Our Editorial and contributing Members in this issue are:***

*John Bennett, Gordon Birkett, Garry Shepherdson (Acting Editor) and Mark Harbour.*

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## RAAF WWII IN COLOUR



**A series of RAAF aircraft in WWII – in Australia, New Guinea and the islands. Later, Europe and the Middle East will be included.**

### **No.11 – RAAF Demons**

**by John Bennett 2021**

The 'war weary' *Imperial Gift* aircraft had served the RAAF during the 1920s, and being built during the First War there had been no intent of these machines being operated for so long.<sup>1</sup> As 1930 approached, the last "Gift" aircraft in service were D.H.9As, which the RAAF Air Board, somewhat rudely and ungraciously, had submitted: "The Board consequently recommends that D.H.9As and Liberty engines be no longer used. The above recommendation, if approved, *will rid the RAAF of the last of the Gift aircraft equipment.*"<sup>2</sup> RAAF re-equipment was belatedly underway:

- the trainer supplied as part of the Gift was the WWI instructional stalwart, the Avro 504K, which the RAAF had already replaced, evaluating the **D.H.60 Cirrus Moth** in 1926 and then buying its first batch of twenty in 1928;
- for the operational fleet, the RAAF received the **Westland Wapiti** army-cooperation bomber from 1929, which was a natural progression for army-cooperation tasks and survey roles as it used many D.H.9A components;
- as a fighter to replace the S.E.5a, the **Bristol Bulldog** commenced the RAF interwar 'silver wing' era fighters, and the RAAF's token order of only eight as fighter trainers in JUN 1929 – for delivery in MAR 1930<sup>3</sup> – was purely to keep fighting skills alive, within 'Fighter Squadron' in 1 Flying Training School (1FTS).

For a longer-term and more dedicated dual fighter and army-cooperation machine, one of the Hawker lineage of two-seat RAF general purpose aircraft was identified, with the Hawker Demon being selected by Australia at the end of 1933. The Demon was developed from the RAF's Hawker Hart light bomber as a "fast fighter" – as the 1930s then became a decade of great aeronautic technological advance.



[RAAF PR image]

**The beautifully restored RAAF Museum Demon A1-8 at Point Cook**

RAAF Demons differed from those of the RAF by having a more powerful engine, different exhaust manifolds and a tailwheel.<sup>4</sup> They were known as the **Australian Demon I**, similar to the RAF version but fitted with a 600hp (447kW) Rolls-Royce Kestrel V(DR), and 18 built and delivered in 1935 (**A1-1 to A1-18**). A larger order for 36 (**A1-19 to A1-54**) was delivered in 1936. A further ten were ordered later that year (**A1-55 to A1-64**), designated the **Australian Demon II**, were delivered over 1937-1938.<sup>5</sup> Although obsolete for frontline service by this stage, the Demon enabled the formation of new squadrons for wartime expansion, and nearly a half were converted into dual-control trainers for valuable advanced flying SFTS instruction. The Demon also provided weapons training and target-towing at the Armament Training Station (1ATS) and with a Bombing and Gunnery School (3BAGS). All Demons had been withdrawn from Service flying by late 1943,<sup>6</sup> and provided ground training as Instructional Airframes until the end of the War.

Order No. <sup>7</sup>	Date of Order <sup>8</sup>	Variant	Delivery <sup>9</sup>	RAAF Details
<b>I.O.402</b> Spec 1/34	NOV 1933 Order for 18	Mk.I	<b>APR 1935 - MAY 1935</b> Delivered to Melbourne aboard SS <i>Balranald</i> , RMS <i>Mogolia</i> , and SS <i>Largs Bay</i> .	<b>A1-1 to A1-18</b> 1AD Laverton 1SQN/then 21SQN; some to Richmond 3SQN/then 22SQN. 9 converted to dual control; 3 to TT.
<b>I.O.452</b> <b>O.I.452A</b> Spec 1/34	JAN 1935 Order for 24, increased to 36	Mk.I	<b>OCT 1936 – DEC 1936</b> Delivered to Melbourne aboard SS <i>Coptic</i> , RMS <i>Maloja</i> . To Sydney MV <i>Waiwera</i> . Melbourne/Sydney SS <i>Jervis Bay</i> To Melbourne SS <i>Esperance Bay</i>	<b>A1-19 to A1-54</b> A1-19 to A1-25 1AD 1SQN/then 21SQN  A1-26 to A1-31 2AD 3SQN A1-32 to A1-51 1AD and 2AD A1-52 to A1-54 1AD. 15 converted to dual control.
<b>I.O.524</b> Spec 46/36	AUG 1936 Order for 10	Mk.II	<b>OCT 1937 – MAY 1938</b> Melbourne SS <i>Moreton Bay</i> . To Melbourne SS <i>Port Fairey</i> . To Sydney MV <i>Waiwera</i> . To Sydney SS <i>Largs Bay</i> .	<b>A1-55 to A1-64</b> A1-55 to A1-57 1AD A1-58 to A1-60 1AD A1-61 to A1-63 2AD A1-64 2AD delayed until MAY 1938.
<ol style="list-style-type: none"> <li>The delivery of 18 aircraft was divided between the Laverton and Richmond bases.<sup>10</sup></li> <li>Following the 1933 order for 18 aircraft, the 1935 order had been intended for 24 Demons, but was increased through a contract change in OCT 1935 as I.O.452A by a further 12<sup>11</sup> – purely for economy to tack onto a larger RAF production run.</li> <li>The final order for Demon IIs is often quoted as all being delivered with dual-control and fitted for target towing – this was not the case as the earlier Demon Is were upgraded by the RAAF with these capabilities, mainly by 1AD at Laverton.<sup>12</sup></li> </ol>				



[Image ctie.monash.edu.au]

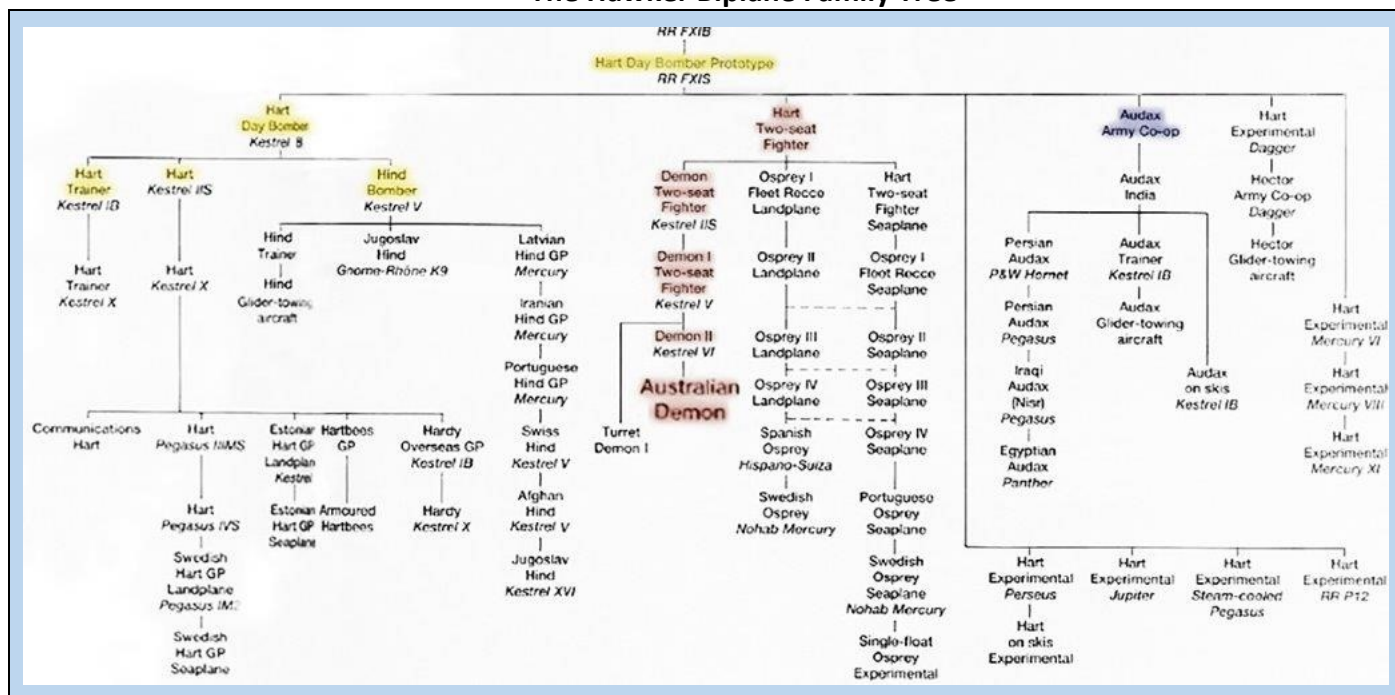
**RAF Hawker Hart two-seat fighter variant G-ABMR painted as the first Hart 'J9933' in 1961**

The Hawker Hart design spawned several bomber, army-cooperation and fighter variants, the primary fighter version becoming the Demon. Hart J9933 – the first Hart – served as the prototype Demon fighter.<sup>13</sup> Hart **G-ABMR** was painted as 'J9933' in 1959, presented to the RAF Museum at Hendon in 1972 by Hawker Siddeley, and now preserved with the RAFM marked as Hart 'J9941'.

At the commencement of the War in 1939, the Demon was still the RAAF front-line fighter with 3SQN at Richmond, and soon donned camouflage warpaint and the toned-down 'M1' (type-B) *red-blue* roundels. 3SQN was despatched to the Middle East in JUL 1940 to be re-equipped there from purchased RAF stocks of Lysanders, Gladiators and Gauntlets, and it was not until FEB 1941 that the first Hurricanes were received. The RAAF warhorses of the 1930s – the Demon and Wapiti – were not required from 1940 in the developing Empire Air Training Scheme (EATS) elementary pilot training in EFTS units, but were both long-term 'intermediate' and 'advanced' trainers at 1SFTS at Point Cook. Moreover, both types would be used in towing roles, the Demon for gunnery training and target-towing at armament schools until 1943, and the Wapiti for trials towing until 1944.

The Demon had descended from the family of the interwar Hawker biplanes that grew from the original **Hart two-seat day bomber**, which then produced the **Hind**, **Hartbees** and **Hardy**. Next were the Hart **two-seat fighters** which developed into the **Demon** and naval **Osprey** fighters. *Army cooperation versions* were the **Audax** and **Hector**. The contemporary **Fury** had used construction which led the way to the monoplane Hurricane. Although still a biplane, Sydney Camm had developed the Fury to a different concept – that of the fast-climbing interceptor. When the Hart two-seat bomber entered RAF service in 1930, it outclassed in performance every existing RAF fighter, except its stablemate the Fury. The Hart proved in air defence exercises that, because its top speed was superior to RAF fighters, it was virtually immune from interception.<sup>14</sup>

### The Hawker Biplane Family Tree



[adapted from AeroGuide 05 – Hawker Hart Family, pp.4-5]

### Hawker biplane lineage – the Demon flowed from the Hart two-seat fighter

The Hart’s potential as a high-speed two-seat fighter was obvious, so a small batch of Hart fighters were produced and entered service for trials. This led to the production fighter variant, the Demon.<sup>15</sup> This Hawker lineage of multi-seat variants, sired by the Hart – the largest peacetime family ever built in Britain – led to the ultimate descendant of this family of graceful biplane designs, the first RAF *monoplane* fighter. This was of course the Hurricane, which Hawker had been considering since 1933, and on which Camm would reflect: **“The extent to which we were able to depart from the standards of the biplane was rather a gamble”**.<sup>16</sup>



[modified from Alan Brown image, Airlines.Net]

RAF Demon K8203 during restoration at Cranfield 1999

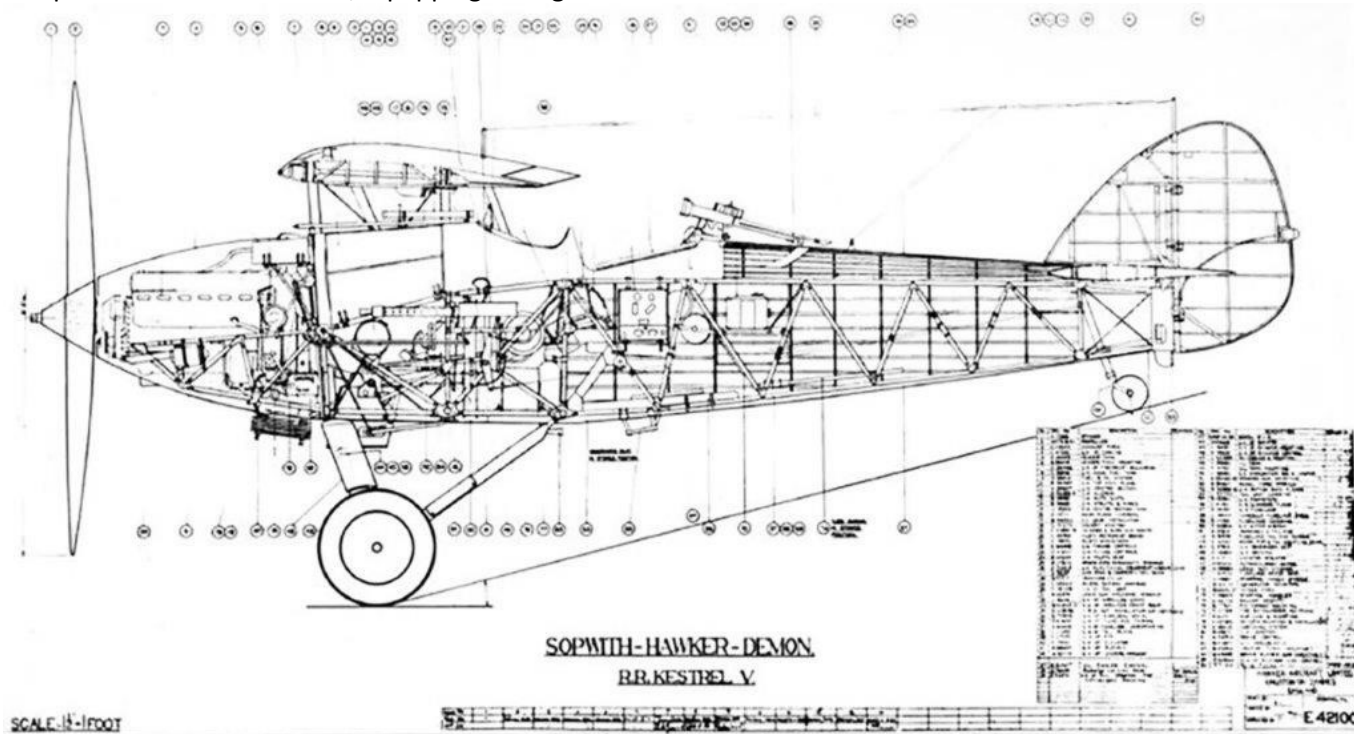
RAF evaluation of the Hart in its primary function as a light bomber had shown viceless handling characteristics, ease of maintenance, and superior performance over a wide speed range. It was soon accepted that the aircraft offered a potential range of military capabilities – day bombing, day fighting, army cooperation, fleet reconnaissance, and eventually advanced training.<sup>17</sup> The first Hart Fighter (to become the Demon) was designed against Specification 15/30 around the existing Hart design, by modifying the first production Hart J9933 as the prototype.<sup>18</sup> The first entered service for evaluation in 1931 with 23SQN RAF to replace the Bristol Bulldog, to which it proved to be greatly superior, and then as the Demon entered service in 1933. By mid-1933, the Hart and its derivatives equipped 28 RAF squadrons.<sup>19</sup> Total Hart-family production was 3,075 aircraft – the main variants being over 1000 Harts, 719 Audaxes, 582 Hinds and 306 Demons.<sup>20</sup>

Hawker used a new approach for construction of the airframe by using a steel tube primary fuselage structure. Also the wings, having spars made with rolled steel tubes top and bottom, linked with a light gauge metal web. The upper wing had a mild sweep back. The aircraft was built to take either a cross axle undercarriage or twin floats.<sup>21</sup>

In NOV 1933 the Australian Government ordered 18 of these adaptable general purpose/fighter Demons for the RAAF, its multi-role capabilities appealing to the cash-strapped Service – the initial squadrons equipped in Australia were 1 (Bomber) SQN at Laverton, and 3 (AC) SQN at Richmond.

### RAAF in the 1930s

One aircraft to be replaced by the Demon was the Bristol Bulldog Mk.II. Eight Bulldogs for the RAAF had arrived in Melbourne in FEB 1930, and allocated to the unnumbered Fighter Squadron, as part of 1FTS at Point Cook. The brand new Bulldogs represented the peak of fighter development at that time. The RAAF's most experienced Bulldog pilot was Paddy Heffernan, who would later record: "Apart from training in single-seat fighter tactics, a lot of time was spent in demonstrations at pageants around Australia, and in cooperation with the Army during their annual exercises. Another activity was introduced when the Meteorological Department asked for daily flights to 16,000 feet to record wet and dry temperatures every two thousand feet, cloud formations, etc." <sup>22</sup> By 1935, the remaining six Bulldogs were part of 1SQN at Laverton, equipping the fighter-bomber unit.<sup>23</sup>



[Hawker Drawing No. E42100]

### Hawker Demon fuselage cutaway

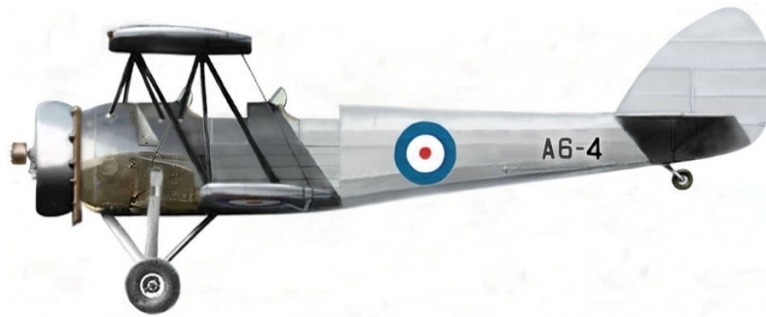
Joining 1SQN with the Bulldogs from APR 1935 were the RAAF's new Hawker Demons. On 15 NOV 1933 the replacement of a general purpose aircraft for the RAAF had been approved – 18 Hawker Demons (**A1-1 to A1-18**) with engines and spares were ordered at a total cost of £106,000.<sup>24</sup> As these aircraft were powered by the higher rated 600hp Rolls-Royce Kestrel V engine and fitted with a tailwheel, they were known as 'Australian Demons'. The RAAF Kestrel V was a 12-cylinder, V-type water cooled engine (instead of the RAF's 584hp Kestrel VDR) and was the forerunner of the Merlin, becoming the first supercharged engine to enter RAAF service.<sup>25</sup>

## RAAF RE-EQUIPMENT IN 1935

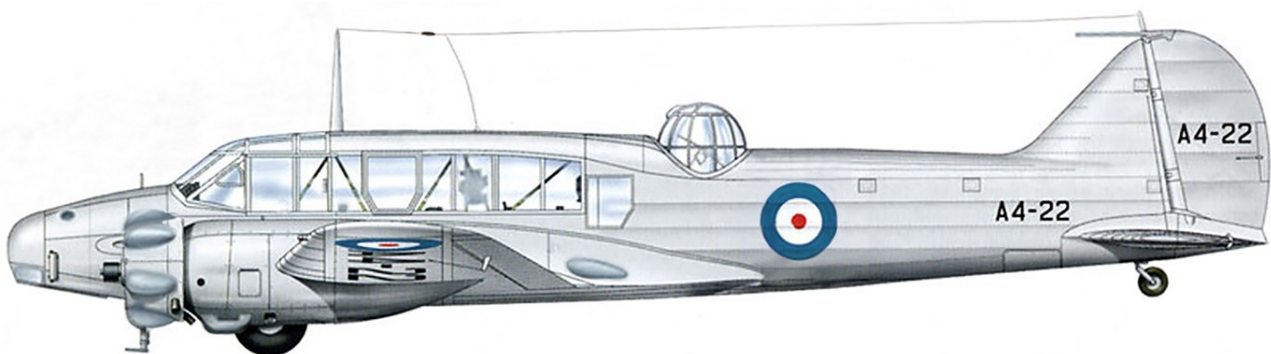
From 1929, in the face of the global Depression, there was slow modernisation of the RAAF, from its First War origins and equipment, to a contemporary force that could keep skills alive in modern warfare. Australia's dependence on Britain as the supplier of aviation equipment was maintained through the 1930s, with some acquisitions representing "cutting edge" technology – that was very quickly superseded as aerospace experienced never-before seen advances in aero engines and aircraft design. Significantly, wood and fabric structures were replaced by stressed skin and strengthened monocoque designs, with powerful engines that virtually doubled aircraft speed.



**1935** Ordered by the RAAF in 1933, delivered from 1935, the Hawker Demon represented the interwar state-of-the-art British warplane – still fabric biplanes in colourful RAF squadron markings, performing aerobatics at the Aerial Pageants up to 1937.



**1935** The Avro 643 Mk.II Cadet, ordered and delivered in 1935, had offered the increased performance that was required as an intermediate step in consolidating flying training. The Cadet had a good performance with the air-cooled radial engine, a structurally strong fuselage making it fully aerobatic, a raised rear seat, improved parachute egress, and the new feature of tailwheel steering.<sup>26</sup>



**1936** The Avro Anson – ordered in 1935 and delivered from 1936 – was a truly revolutionary design, a monoplane with an enclosed cabin, the new feature of retractable undercarriage, an internal bomb bay and enclosed gun turret.<sup>27</sup> But by JUN 1938, the visiting British *Marshal of the RAF Sir Edward Ellington* already **considered the Anson and Demon as obsolete and not "classed as modern aircraft"**.<sup>28</sup>

As the embryonic Australian aviation industry, led by Lawrence Wackett, struggled to develop resources over 1937/38, a North American design was selected as the basis for the Wirraway. A hinderance in JUL 1938 had been UK refusal to allow Australian aircraft manufacture because of local commitment to building American aircraft, so Wackett was perceived as anti-British due to their antipathy to our domestic production.<sup>29</sup> But significantly, Wackett was critical of British production methods – he had seen the potential of American mass production.

Such dated designs, although exhibiting some novel features, were all surpassed in the few years over 1936 to 1938 by the advances leading to war, and in UK the development of the Hurricane and Spitfire were the leading examples.



## British Aeronautical Development

Few industries have ever experienced such a sudden boom as that which began for the aircraft manufacturers of Great Britain in the summer of 1935.<sup>30</sup> The Government had suddenly called for new equipment in quantities which staggered the imagination of even the most fervent advocates of military preparedness. To some extent the delay in re-arming was fortunate, for **1935 was a critical year technically as well as politically**; it marked the emergence of a new race of aeroplanes – clean, efficient monoplanes, with cantilever wings and heavy armament, retractable undercarriages and metal monocoque bodies, powered by supercharged engines driving variable pitch airscrews and giving enormously increased power by virtue of high-octane fuel (available in quantity for the first time). The expansion of the RAF in 1935 led to the establishment of new government aircraft factories, and had rearmament begun two years earlier, the RAF might well have been equipped with large numbers of biplanes and braced monoplanes, which indeed proved a handicap to the French and Italian air forces when war eventually broke out.

In 1934, Air Ministry specification F.5/34 had called for a design built around the Rolls-Royce PV.12 twelve-cylinder engine (to become the Merlin), with eight wing-mounted machine-guns. At Hawker, Sydney Camm's F.36/34 Specification 'High Speed Monoplane' made its maiden flight in NOV 1935 – by which stage the biplane fighter had reached the peak of its development and the end of the 'biplane Scout' era was in sight. This new generation high speed monoplane became the **Hurricane** – the fast-climbing interceptor (following on from the Fury) with a heavy armament load, and entered RAF service with 111SQN in DEC 1937.

At Supermarine, Reginald Mitchell set out to design the smallest cleanest aircraft that could be built – this around the PV.12, the pilot, and the eight machine-guns. The fuselage drew upon the unmistakable lines of the Schneider racers, but having a wing with a new thin aerofoil and elliptical planform.<sup>31</sup> This, of course, was the **Spitfire** which first flew in MAR 1936, and entered service with 19SQN RAF in AUG 1938. These advanced fighters – in addition to radar and an effective air defence command and communications network – had been championed by the RAF Air Member for Research & Development, Air Marshall Sir Hugh Dowding.



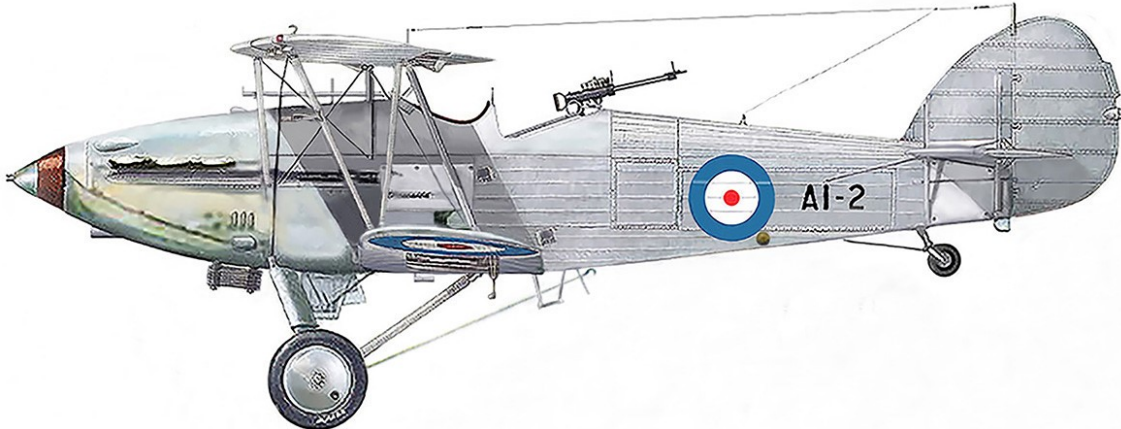
[Shuttleworth Collection]

**Superbly restored to airworthiness, Demon K8203 in colourful 64SQN RAF markings with the Shuttleworth Trust in 2009**

In their British "gay, heraldic paint schemes"<sup>32</sup> – the romantic concepts of RAF "silver wings" with colourful squadron markings of the interwar years displaying at aerial pageants – had led to lulling into a false sense of security. With the darkening security environment in Europe, it was only the insight of RAF leaders like Dowding, and aircraft designers like Mitchell and Camm, that broke this comfort bubble with visionary and strategic views to prepare for modern warfare. And just in time.

## A1-2 – A DUAL DEMON TRAINER 1939

**A1-2 – when originally delivered to Melbourne –** aboard SS *Balranald* with A1-1 in APR 1935, assembled by 1AD at Laverton and beginning the re-equipment program for 1SQN in MAY 1935. Like many of the Demons, A1-2 was passed onto the forming 'cadre' squadrons in 1936, in this case to 21SQN at Laverton.



With Australia's entry into the War in SEP 1939, many of the Demons were converted to dual-control trainers for pilot instruction, and A1-2 appears to have been converted by 1AD over NOV-DEC 1939, and then transferred with many duals into Intermediate Training Squadron (ITS) in 1SFTS Point Cook in MAY 1940.

### A1-2 after dual control conversion by 1AD late 1939



*[Colourised from adf-serials]*

Conversion for fitting of dual controls as pilot trainers also involved removal of the gun mount from the rear cockpit, raising the rear seat, fitting side panels and windshield. Not all Demon E/E.88s indicate which aircraft were, or when, fitted with dual control, as often the cards show "Dual" without recording dates. The above image shows removal of the rams-horn exhaust manifold, perhaps temporarily for a trial, and the ventral message collection hook which pivoted on the undercarriage spreader bar. **A1-2** was transferred back to 21SQN from 1AD in DEC 1939, then to 1SFTS.



*[Colourised from adf-serials]*

**A1-2 'dual'** in service with 1SFTS c1940 with darker roundel, and the front pilot under the *blind-flying hood*

## The Demon in the RAAF

On 14 JAN 1935, a further 24 aircraft were ordered primarily for army-cooperation, and this was increased by a further twelve on 30 OCT 1935 (**A1-19 to A1-54**), making a total of 54 RAAF orders for the type. Some sources state that these were modified for army-cooperation with a prone bomb aimer's position for the gunner in the lower fuselage and the fitment of bomb carriers – but from the beginning, the Australian Demon Mk.I had this capability, which can be witnessed on early RAAF aircraft with the visible bombaimer's illumination window in the fuselage sides, and fitted occasionally with racks for bombs. Similarly, all aircraft could be fitted with a message collection hook. All 36 Demons were delivered to Australia in 1936. On 18 AUG 1936, purchase of a further ten was approved (**A1-55 to A1-64**), these being designated the *Australian Demon Mk.II*. In JUL 1937, the cost quoted for the Demon was £4850.<sup>33</sup> This last RAAF order of Demon IIs is often referred to as being modified with dual-controls and for target towing. But that again appears not to be the case.

**Target Towers.** Similarly, only four Demons were apparently modified as target towers, all Mk.Is. **A1-1, A1-15 and A1-17** were marked as "T.T." on their Aircraft Status Cards (Form E/E.88s), all serving with 1 Armament Training Station at Cressy VIC. A fourth Demon, **A1-26**, while its E/E.88 is not annotated "T.T.", does record: "21/12/1941 Engine failure, *pilot jettisoned drogue*, made forced landing".

**Dual Controls.** The RAAF Demon E/E.88s are similarly not explicit in whether any Demons were delivered from UK with dual-controls, although it is possible some may have been. However, the final ten Australian Demon IIs were built to Specification 46/36,<sup>34</sup> and this must refer to some difference from the earlier Demon Is, more than just their derated Kestrel V engines. Most conversion to dual-control trainers was undertaken by 1AD at Laverton as Australia entered the War, from SEP 1939. On the eve of World War II, 54 Demons were still in operational service; the total RAAF strength was 164 "operational" aircraft – but *operational* was somewhat a misnomer as the types were Demons, Ansons, Seagulls and Wirraways.<sup>35</sup> The Demon ceased RAAF flying in 1943.



[Colourised from RAAF image]

**Demons in store at 1AD Laverton, probably 1935-37, awaiting erection**

**Powerplant.** All Australian Demons had the RR Kestrel V supercharged engine, and all Kestrel V-powered Hinds and Demons had the "ram's-horn" exhaust manifolds, fitted above the Vickers forward-firing gun trough (see below). The 600hp Kestrel engine was more powerful than their RAF counterparts, and E/E.88s for many Demons are marked as "derated". The *Australian Demon* could be distinguished by the ram's horn exhaust manifold (which appears not always to have been retained in service on all aircraft) and the tailwheel.



[adf-serials images]

Different views of the “ram’s-horn” exhaust manifolds, with the 3SQN metal badge on the cowling

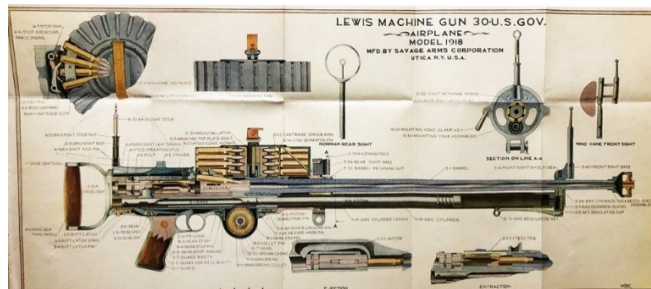
**Armament.** Demon armament comprised two forward-firing Vickers machine guns aligned with troughs either side of the fuselage, and underwing racks could be fitted for the carriage of light bombs. Compared to the Hart, the Demon had a cut-away rear cockpit like the Hind, with a **canted gun ring to improve the field of fire**. All these types of gun ring tended to be called the WWI “Scarff” mount, which grew from the 1916 No.2 Scarff ring. But developed between the wars, Hawker and Fairey produced their own ‘high-speed’ Universal gun mounts – this Universal gun ring was fitted to most of the Hart family for the Lewis,<sup>36</sup> with the mount inclined on the Demon and Hind.



[BAE image, from Rimell p.27]



[turbosquid 3D]



[AHSa website]

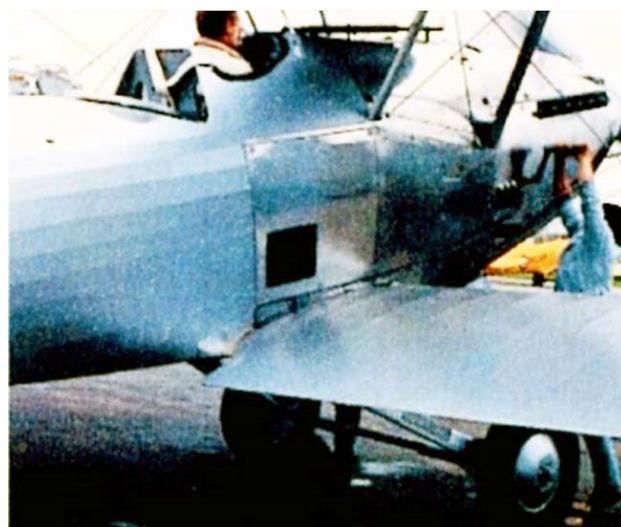
Hawker Universal (Scarff ring) gun mount    Graphic of a Lewis mount    Lewis Machine Gun (this illustrating the US 0.30”)

**Bombaimer’s Windows.** Known as the bombaimer’s “illuminating panel”, these side windows provided additional light into the lower fuselage for the gunner to become a bombaimer. All RAAF Demons appear to have these windows below the front cockpit on both sides of the fuselage (also carried by the RAF Hind, but not fitted to the RAF Demon). Being a true ‘general purpose’ fighter, the RAAF Demon had bombing and army-cooperation capabilities, with the rear crewmember able to lay prone beneath the pilot to visually sight vertically (through a sliding panel in the floor) and conduct level bombing or supply dropping. The side windows allowed increased illumination to enable operation of the release equipment, and the window itself appears to be about 12” x 10” (30.5cm x 25.4cm). Another indicator of the general purpose nature for army-cooperation was the ventral message collection hook pivoting on the undercarriage spreader bar below the fuselage, but this was often removed.



[Rimell p.24]

Vertical window, beside the turn and slip venturi

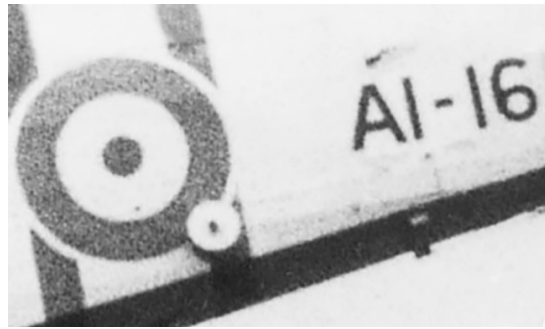


[CASM]

Bombaimer’s illuminating panel of the Hind and Demon



[RAAF Memories site]



[RAAF]

**A1-4 Demon Centre of Gravity (CG) shaft (left), and A1-16 with weights (right)**

With no occupant or armament in the rear cockpit of the Demon, the CG was corrected by ballast weights seen on the rear fuselage sides near the roundel. Weights totalling up to 100LB (45kg) could be carried on the fuselage sides to maintain the desired CG.<sup>37</sup>

**The Prewar Demon Accidents (1936-1938)**

The official RAAF history records: “Even the Hawker Demons which entered service with the RAAF from 1935 were discovered to be not as robust as their ‘modern’ status led some to expect. On 14 May 1937, Pilot Officer Donald Ashton-Shorter of 3SQN was demonstrating the aerobatic capability of Demon **A1-40** to members of a militia unit at Townsville. Taking his machine to 3000 feet, Ashton-Shorter commenced a near-vertical dive towards the Ross Plains aerodrome. Once below 500 feet he began to pull the aircraft out of its dive, but the port upper mainplane broke away and folded back, followed by the lower mainplanes. The machine continued on into the ground, killing him instantly. Fortunately he had not been carrying an Observer on this flight.”<sup>38</sup> A list of the Demon accidents over this period, resulting in loss of aircraft, is summarised below chronologically, with details from the *adf-serials* website.

Date	Aircraft	Unit	Details
24 SEP 1936	<b>A1-5</b>	22SQN	Stalled in turn onto finals, crash landed causing extensive damage, 2AD to components.
3 FEB 1937	<b>A1-3</b>	3SQN	Left Lav for Tasmania, into foul weather crash landed nr Wynyard, crew uninjured, CTC.
3 FEB 1937	<b>A1-8</b>	3SQN	In Tas into foul weather crashed in mountains nr Wynyard, crew uninjured. Found 1977.
14 MAY 1937	<b>A1-40</b>	3SQN	Demo flight Townsville, structural failure wings detached, P/O Ashton-Shorter fatal.
31 AUG 1937	<b>A1-32</b>	1SQN	Attempted tight turn at Hamilton Vic, dived into ground, crew could not be saved 2 fatal.
5 DEC 1937	<b>A1-33</b>	1SQN	Engine failed after take-off Frampton NSW, forced landed burnt, P/O Fallon fatal.
6 DEC 1937	<b>A1-36</b>	1SQN	Crashed soon after take-off from Cootamundra, crew injured and aircraft W/O.
7 DEC 1937	<b>A1-10</b>	22SQN	Engine fail on met flight, forced land Avoca Beach nr Gosford, NSW, extensive dam, I/A.1.
14 JUN 1938	<b>A1-51</b>	3SQN	Crashed at Llandillo near Richmond, burst into flames. 2 fatal, aircraft W/O.
20 JUL 1938	<b>A1-29</b>	3SQN	Engine failure, forced land at Douglas Park NSW, struck cable. Crew uninjured, CTC.
16 SEP 1938	<b>A1-45</b>	23SQN	At Pearce WA stalled immediately after take-off, crash landed, CTC.
25 OCT 1938	<b>A1-28</b>	3SQN	After a series of engine failures and forced landings in 1938, stored, converted to A/I.6



[Colourised from RAAF image]

**A1-10 of 22SQN, stored at 2AD, which crashed on 7 DEC 1937 on a met observation flight from Richmond**

Visible below the gunner’s cockpit is the Hawker c/n, which appears to be 41H-59730. A1-10 was not repaired, becoming I/A.1.

This series of Demon accidents would result in the first major flying safety inquiry in the RAAF when **A1-33** crashed (killing PLTOFF Fallon) at Frampton NSW on 5 DEC 1937. "The crash of A1-33 produced far-reaching upheaval in the administration of the RAAF. As there had been seven Demon mishaps in that one week period, the press maintained that there were problems with either airworthiness or standards of pilot training in the RAAF, notwithstanding evidence that A1-33 had been lost through a simple oversight by the pilot. An insistent, militant campaign mounted by Fallon's AWU union official father added to the clamour for a public inquiry."<sup>39</sup>

In DEC 1937 the Minister for Defence called for a Defence report, but rejected an open inquiry, stating nothing would be gained as the Government considered the Demons airworthy.<sup>40</sup> In JAN 1938, Fallon senior achieved a unanimous passage of a motion at his union's annual meeting that expressed alarm at the "hopeless inefficiency and inadequacy" of the RAAF.<sup>41</sup> In addition to these Demon losses, there had been a series of engine failures resulting in forced landings over late 1937. The report by the Air Accidents Investigation Committee to the Minister of Defence in JAN 1938 showed no definite cause – but highlighted potential problems with water-cooled engines, and special instruction to be given to newly trained pilots in the care and handling of Kestrel cooling systems.<sup>42</sup>

The result of the Demon accidents ultimately led to Marshal of the RAF Sir **Edward Ellington** conducting a visit of inspection in 1938, his Report being released on 31 AUG 1938. Ellington compared accidents over the past three years and said the rate before 1935 was considerably better than the present – of 12 accidents, three appeared to be due to disobedience of orders or bad discipline, with possibly a fourth, and this was a high proportion and pointed to the need for a strict enforcement of regulations.<sup>43</sup> Other extracts of his Report were that the rate of flying accidents was worse than in UK, there was room for improvement in training of squadrons, and that the training of instructors was not satisfactory.<sup>44</sup> A recommendation was that a new central training establishment should be expedited, this obviously referring to the forming of a CFS.<sup>45</sup> Further, Ellington reported: "I can find no evidence that these accidents were due either to faulty maintenance or to defects inherent in the design of the Demon."<sup>46</sup>

The RAAF Air Board contested the Ellington Report findings, and the Government then criticised many points of detail in the Air Board's comments – the result of which led to the removal of the RAAF's CAS AVM Williams. He was sent on exchange to the RAF for two years, which caused him to feel he was being "made a scapegoat for events which were never in his power to remedy".<sup>47</sup> The Minister for Defence told Williams: "It is politically expedient for the Government to send you to England at the present time."<sup>48</sup>

### **RAAF Wartime Expansion (from 1937)**

The deteriorating international strategic situation saw the RAAF belatedly beginning an expansion program from 1937, with new squadrons being formed.

**2 Squadron.** Two Demons (**A1-19 and A1-38**) provided the initial equipment for 2SQN on its formation at Laverton in MAY 1937. These two were joined by other Demons (**A1-57, A1-58 and A1-59**) to equip 'B' FLT until FEB 1939, by which time 2SQN was being fully equipped with Ansons.<sup>49</sup>

**4 Squadron.** **A1-49** and **A1-50** joined 4SQN on their delivery from UK and assembly by 2AD in MAY 1937. 4SQN was then renumbered 6SQN on 1 JAN 1939, with these Demons joining 6SQN. Shortly afterwards, with War a new 4SQN was formed at Richmond in JUN 1940, and several Demons were issued from 3SQN (as that unit proceeded to the Middle East): **A1-43, A1-44, A1-61, A1-63**. These were soon transferred south to 1SFTS in JUL 1940.




**7 Squadron.** 7SQN was formed at Laverton on 27 JUN 1940, originally intended to equip with Hudsons, but this was delayed for 18 months, and the unit had no aircraft, with its personnel attached to 2SQN to gain experience.<sup>50</sup> Over APR to SEP 1942, a few Demons (**A1-1, A1-15, A1-17**) were on strength before the re-equipping with Hudsons.

**12 Squadron.** 12SQN was formed at Laverton on 6 FEB 1939, and to conduct its general purpose role was equipped with four Ansons and four Hawker Demons (**A1-19, A1-38, A1-58 and A1-59**). An intensive flying training program was commenced in MAY 1939 to qualify in night flying and live bombing, and the advance party arrived in Darwin during JUL 1939 for the deployment of Ansons.<sup>51</sup> These Demons passed to ATS at Cressy in OCT 1939.

In addition over 1939-1940, **21 SQN** mobilised from its 'cadre' status to provide intermediate training of EFTS graduates, as the RAAF had no full EATS SFTS structure yet in place (1FTS at Point Cook would become 1SFTS on 1 MAY 1940). This *intermediate training* was conducted on Demons, after 8 weeks of elementary Moth training at the civil schools, trainees went on the Intermediate phase of training at 21SQN Laverton. 21SQN had restructured in DEC 1939, with 'C' and 'D' FLTs with Demons to undertake the intermediate training of cadets.<sup>52</sup> The first through this abbreviated system (No.26 Course) graduated at Laverton in MAR 1940, and 21SQN provided intermediate training until JUN 1940 (No.29 Course). Over this time, 21SQN Demons **A1-20, A1-21, A1-22, A1-23 and A1-25** had training accidents.<sup>53</sup>

## EVOLUTION OF RAAF DEMON MARKINGS

In past articles in this series, individual aircraft camouflage and marking details for the RAAF from cradle to grave have been covered. This is from entry into service (markings often resulting from the origin of the aircraft), through RAAF operations, to final changes at the end of the war. Below is a chronology of RAAF policy generically – and for the Demon specifically – from prewar all-over *Aluminium* Demons, in a logical timeline up to the Demon's withdrawal from service over 1943-1944.

Year	Change	Policy and References
<b>1937</b>	Squadron markings for the two RAAF "cadre" CAF squadrons – 21SQN and 22SQN. 1FTS Point Cook used large two-digit 'Training Numbers'.	<b>AFO 10/A/2 MAR 1937.</b> <sup>54</sup>
<div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;"><b>21SQN, A1-21 1939</b> [Colourised from AWM 000752]      <b>22SQN, A1-7 dual 1939</b> [Colourised from RAAF image]</p> <p style="text-align: center;"><b>CAF SQN markings 1937-1939</b></p>		
<b>1938</b>	RAF National Markings changed over 1936-37, from <i>gloss, bright, French Blue</i> to a <i>dull and darker shade of Blue</i> . While the RAAF maintained <i>gloss</i> roundels, with war the roundel colours were <i>dulled</i> – the blue becoming K3/197 <i>Dull Blue</i> .  RAF commences system of A.D. camouflage patterns.	No RAAF policy cited directing <i>bright</i> to <i>dull</i> colours, but aircraft produced in UK from 1937 should have had the dull and darker colours, and these colours, although not specified, would have been the intent of the first RAAF camouflage AGI C.11, 22 SEP 1939.
<b>1939</b>	RAAF AGI C.11 introduces the <i>Red/Blue</i> roundel to aircraft fuselages/upper surfaces – named the <b>M.1</b> roundel in 1940.  RAAF aircraft standard finishes, identification markings, and squadron code letters – Demon camouflage <b>A-1732</b> and Seagull A-1813, training aircraft <i>Aluminium</i> .    This SEP 1939 AGI C.11 also listed Squadron <b>Code Letters</b> for the second line units – <b>W</b> for Comm & Survey FLT, <b>X</b> for Armament Training Station (ATS), <b>Y</b> for 1FTS, and <b>Z</b> for CTE. (In OCT 1940, <i>Issue 3</i> of this AGI amended <b>Y</b> to Comm FLT, and <b>Z</b> to Survey FLT.)	<b>RAAFHQ DTS 9/1/442 of 12 SEP 1939.</b>  <b>RAAFHQ Aircraft General Instruction No. C.11, of 22 SEP 1939, 9/1/396(13A).</b>  The RAAF AGI is drawn largely from <b>AMO A.154/39 of 27 APR 1939.</b> <sup>55</sup>  The Australian designated A-1732 and A-1813 patterns are still unknown, but believed to be <b>adaptations of the RAF A.D.1162</b> and A.D.1174 respectively. <sup>56</sup>
<b>1940</b>	RAAF camouflage colours were <i>Camouflage Green</i> and <i>Camouflage Brown</i> , from the RAF <i>Dark Green/Dark Earth</i> . <b>JAN 1940.</b> Introduction of <i>Yellow</i> for <b>Elementary Trainers</b> . <b>MAY 1940.</b> Cancellation of camouflage for the Demon. <b>JUL 1940.</b> Within 1SFTS, Demons of ITS and ATS adopt <i>Red</i> and <i>Yellow</i> coloured training numbers. <b>OCT 1940.</b> Policy AGI C.11 <i>Issue 3</i> detailed trainer schemes <b>E.1 (overall Yellow)</b> and <b>E.2 (36" Yellow bands)</b> ; overall <i>Yellow</i> not on Demons until 1941. National Markings were: <ul style="list-style-type: none"> <li>○ <i>Marking M.1</i> – <i>Blue</i> ring surrounding <i>Red</i> centre, fuselage and upper wings (i.e. type-B roundel).</li> </ul>	<b>AGI No. C.11 A/L.5 of 26 JAN 1940, 150/4/658.</b> <b>RAAFHQ Message T.95 of 1 MAY 1940; DTS letter SAS.345 S.C. 1/501/329 (39A) of 9 MAY 1940.</b> <b>HQ S Area letter 240/9/S (9A) of 27 JUL 40.</b>  <b>RAAFHQ Aircraft General Instruction No. C.11, Issue 3, of 3 OCT 1940, para2(i)</b> stipulated <i>grey</i> serial number and codes on camouflaged aircraft.

- *Marking M.2* – a *Blue* ring surrounding *White* ring and *Red* circle, 1:3:5 (type-A roundel).
- *Marking M.3* – three colour M.2 *r/w/b* circle surrounded by a *Yellow* ring, i.e. 1:3:5:7 proportions (type-A1 roundel), introduced by RAF in MAY 1940.
- *Marking M.4* – *Red/White/Blue* stripes on the fin, stripes same widths as the rings of the roundel, *Blue* nearest rudder (applied to Seagull only).

**NOV 1940.** The RAF's Aircraft Design Memorandum (ADM) No.332 specified Air Diagrams for camouflage schemes for different types of service aircraft. The RAF *Temperate Land Scheme (TLS)*, had been mandated by RAF AMO A.926 in DEC 1940 – upper surfaces in Ministry of Aircraft Production (MAP) *Dark Green* and *Dark Earth*, and undersides MAP *Sky* (lower colour not adopted by the RAAF).

RAF ADM 332 (*Issue 3*) of 15 NOV 1940, *External Colour Schemes of Aircraft*, RAAFHQ file "150/4/852 AGI C.11, *Standard Finishes and Markings*".

AMO A.926/40 of 12 DEC 1940 replaced A.154/39.<sup>57</sup>

### Trainer Bands AGI C.11 Issue 3, OCT 1940



A1-16 dual of 1SFTS ATS 1941 [Colourised from RAAF]



A1-22 dual of 1SFTS ATS 1941 [Colourised from RAAF]

1941

**JAN 1941.** The RAF cancelled "mirror" camouflage schemes in JAN 1941 and manufacturers then selected only one pattern as standard. Most adopted the 'A' scheme – the scheme adopted in each case appears to have been '*sloping forward on the port fuselage, sloping aft on the starboard*'.

**JUL 1941.** To replace the multitude of RAF individual camouflage patterns, only five were introduced.

**DEC 1941.** The RAAF adopted 1941 policy of the RAF Directorate of Technical Services in **DTS 368/41**, which also for the first time laid out the RAAF's standard overland camouflage scheme; specifying *Foliage Green* (K3/177, to replace RAF *Dark Green*), *Earth Brown* (K3/178 to replace RAF *Dark Earth*), and *Sky Blue* (K3/195 instead of RAF *Sky*).

Merging of the 'A' and 'B' schemes occurred from 15 JAN 1941.<sup>58</sup>

RAAFHQ DTS directive 368/41, file 150/4/852(53A) of 23 DEC 1941, letter S.A.S.9984, paras.2 and 4.


RAF ADM 332 (*Issue 3*) of 15 NOV 1940, *External Colour Schemes of Aircraft*.



A1-35 dual Demon 1SFTS 1941 [Colourised from adf-serials]

**Allover trainer Yellow** – from the OCT 1940 AGI, not widespread until 1941



<p><b>1942</b></p>	<p><b>JUN 1942. Deletion of Yellow from RAAF roundels.</b> The RAF had introduced this <i>Yellow</i> outer ring in MAY 1940, the RAAF in OCT 1940.</p> <p><b>JUL 1942.</b> The <i>RAAF Technical Order, Aircraft General Instruction (AGI) No.C.11</i> was changed by <i>Issue 4</i> of 31 JUL 1942, for operational aircraft to retain <i>Red/White/Blue</i> National Markings, and drop the <i>Yellow</i> outer ring – but there were unintended consequences.</p> <ul style="list-style-type: none"> <li>○ Upper surfaces – <i>Red</i> deleted, so the roundel was specified as <i>Matt White</i> and <i>Dull Blue</i>, with the <i>White</i> diameter to be 2/5 of <i>Blue</i> – the first directive for what we call the ‘Pacific’ Roundel. <i>Red</i> deleted because of the 26 JUN 1942 USN fighter attack on a RAAF Catalina, understandably confused by the <i>M.1</i> type-B faded <i>Blue/Red</i> roundel.</li> <li>○ Fuselage sides – <i>Dull Red</i>, <i>White</i>, and <i>Dull Blue</i> roundels in the 1:3:5 proportions.</li> <li>○ Undersurfaces – the same <i>Dull Red</i>, <i>White</i>, and <i>Dull Blue</i> roundels but only for day fighters and trainers, but not for bombers or seaplanes.</li> <li>○ Fin markings – all aircraft marked with <i>Dull Red</i>, <i>White</i> and <i>Dull Blue</i> stripes of the same width, with <i>red</i> leading. Note <i>Red</i> would soon be deleted.</li> </ul> <p>Appendix I, belatedly, specified A.D.1162 as the camouflage pattern for the Demon – Demons had clearly been camouflaged from early 1942, and perhaps from 1941. <i>Issue 4</i> of this AGI reiterated 36” <i>Yellow</i> trainer band requirements, and also directed that “Training and Communication Aircraft” were to have <i>Yellow</i> undersurfaces, which did not apply to some aircraft due to Reserve squadron commitments.</p> <p><b>SEP 1942. Deletion of Red from RAAF roundels.</b></p> <p>On 19 SEP 1942 <i>Red</i> was dropped completely from National Markings – the RAAF ‘Pacific’ <i>Blue</i> and <i>White</i> roundel with the <i>White</i> diameter 3/5 (3:5) of the <i>Blue</i>. Roundels in six positions, with <i>Blue/White</i> fin stripes – specified colours <i>Matt White</i> K3/170 and <i>Matt Dull Blue</i> K3/197. <i>Yellow</i> surround of the ‘type-A1’ fuselage roundel had been overpainted in AUG 1942 with camouflage paint.</p>	<p><b>RAAFHQ DTS 280/42 of 18 JUN 1942</b>, filed on 1/501/329(63A); 1TG signal T.670 19 JUN 1942; Signal School Point Cook A.50, 29 JUN 1942.</p> <p><b>RAAFHQ Technical Order AGI No.C.11 (Issue 4) of 31 JUL 1942.</b> RAF ADM.332 (Issue 3) became the Appendix I to this new AGI, listing the different camouflage schemes.</p> <p>Colours were specified as <i>Matt Dull Red</i> K3/214 or K3/199, <i>Matt Dull Blue</i> K3/196 or K3/197.</p> <p>This is separate from the ‘one-off’ 3SQN camouflaging over SEP 1939-MAY 1940, which had used the emergency ‘A-1732’ camouflage pattern, but which was most probably derived from A.D.1162.</p> <p><b>RAAFHQ message T520, file 0947/19 (30A), of 19 SEP 1942.</b></p>
<p><b>1943</b></p>	<p><b>JUL 1943.</b> Already some roundels were 1:2 ratio, from converting type-C1 roundels. RAAFHQ AMEM specified that the roundel <i>White</i> circle was to be smaller, 2/5 the size of the <i>Blue</i>, the 2:5 roundel. For the Demon, typically the roundel had been converted from the ‘type-A’ resulting in the <b>3:5 ‘Pacific’ roundel.</b></p> <div style="text-align: center;">  </div> <p style="text-align: center;"><b>Ratio of the <i>White</i> to the <i>Blue</i> – 3:5 and 2:5</b></p>	<p><b>RAAFHQ AMEM DTS 1/501/329 SAS 13552, 8 JUL 1943</b>, adapted from RAF AMO A.664/42, of 2 JUL 1942. Further, in NOV 1943 SEAC specified the size of its new roundel (<b>based on that of the RAAF</b>) for ‘medium’ aircraft as approx. 2:5 32” (and fin flash 24” high x 22” wide) – Air Force Order (India) No.357. RAAF DTS specified 32” <i>Blue</i> roundel, 12” <i>White</i>, i.e. 3:8 (approx 2:5) and fin flash 24”x16”.<sup>59</sup></p>
<p><b>1944</b></p>	<p><b>MAY 1944.</b> Revision of AGI “Camouflage Schemes and Identification Markings”: Appendix E <i>Yellow</i> for trainers. Training numbers were to be in <i>Black</i> forward of roundel; camouflaged aircraft code letters changed from <i>Sky Blue</i> to <i>Medium Sea Grey</i>. However, by this stage, all Demons had been withdrawn from service.</p>	<p><b>RAAFHQ T.O. AGI Pt 3(c), Instruction 1, file 150/4/5056 (1A), of 26 MAY 1944.</b></p> <p><b>Also issued as DTS Special Instr Gen/34 1 MAY 1944.</b></p>

## RAAF 1930s ROUNDEL *BRIGHT BLUE*

The roundel colours of the RAAF into the 1930s had followed on from the Imperial Gift aircraft, themselves relics of the Great War. Roundels were carried in the standard six positions of the RAF, as was rudder striping. From the end of 1916, the roundel *Red* was V.R.2, a vermillion colour that was found to be more durable than the original V.R.1. The early *Blue* V.B.1 faded quickly, and after a new range of ultramarine pigments were formulated, the darker *Blue* V.B.2 became standard. The white dope, which had been changed to a zinc oxide base, became *White* V.W.3. The final change to these colours came in MAR 1918, when a more durable red pigment was formulated. In 1922, the RAAF was using bright *Red* V.R.3, *White* V.W.3, and the outer ring *Blue* V.B.2.<sup>60</sup> These bright colours were the standard RAF and RAAF national markings until the mid-1930s. In 1936, the RAF changed roundel colours from bright *Red* and bright *Blue* to 'dull night flying shades'.<sup>61</sup>

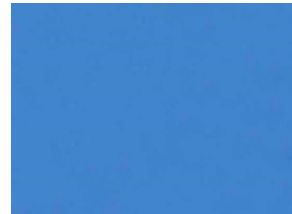
Ian Baker's early works provide colour chips of this lighter shade *Blue*.<sup>62</sup> These colours had carried over from the RAAF Equipment Standing Orders Part 3, dated circa 1922, which listed the following colours that would carry through into the 1930s: *Aluminium* (V.84), *Red* (V.R.3), *White* (V.W.3), *Blue* (V.B.2), and *Black* (V.Bl.4). As British colours were used, V.B.2 probably would have been **close to today's British standard of BS381C-166 French Blue**,<sup>63</sup> and probably not the lighter BS381C-175 *Light French Blue* I had suggested previously. In the RAF with the introduction of camouflage in 1936 as war approached, the '*bright*' roundel colours were replaced over 1936-37 by '*dull*' shades.<sup>64</sup> **Standard Demon roundel sizes were 25" diameter fuselage, 35" upper wing, 55" underwing.**<sup>65</sup>



Ian Baker's chip of RAAF inter-war roundel *Blue*



British Standard BS381C-166 *French Blue*



British Standard BS381C-175 *Light French Blue*



[Colour image from *adf-serials*]

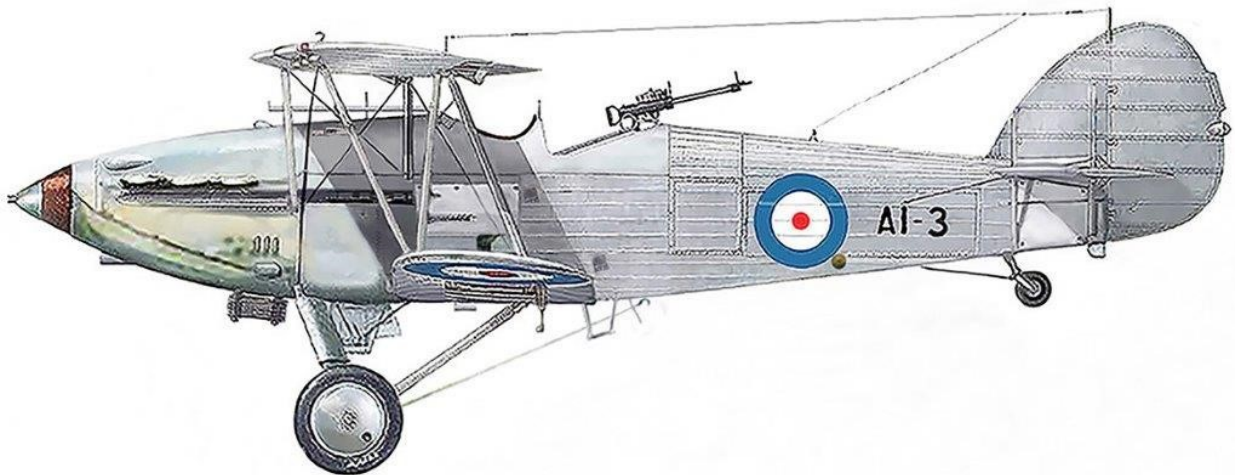
### RAAF Demon A1-17 22SQN Richmond 1937-1938 configured as a target-tower

These roundels, with the matching colour 22SQN unit fuselage bands, appear to have a slight *Greenish* hue to the *Blue*. Any number of variables could account for this – the early type of colour film used, discolourisation to the print over the years, or variation in our PC monitors. But these unit bands were the same colour as the roundel *Blue*. In RAF fashion, the spinner and the wheel hubs are painted to indicate a Flight colour – Demons forming the Demon Flight, in the 22SQN *Blue* stripes colour. The triple 'ramshorn' exhaust maifolds evident on the second aircraft in line.

## BRIGHT BLUE ROUNDELS – A1-3 1935-1939

While the RAF “*dull night flying shades*” should have been implemented by British aircraft manufacturers over 1936-37, as late as SEP 1940 there is evidence some companies were still using up their stocks of *bright* colours – Gloster was one, but it is not known who the other guilty parties were! <sup>66</sup> These transgressions made it necessary for the Ministry of Aircraft Production to send in SEP 1940 to companies a reference to DTD Technical Circular No.84 ‘*Identification Colours on Aircraft*’.

The AHCB works on the Demon and Wapiti refer to the lighter shade of a bright *Blue*. As noted, these colours had carried over from the RAAF Equipment Standing Orders Part 3, dated circa 1922, which listed the following colours that would carry through into the 1930s: *Aluminium* (V.84), *Red* (V.R.3), *White* (V.W.3), *Blue* (V.B.2), and *Black* (V.Bl.4). V.B.2 probably would have been **close to today’s British standard of BS381C-166 French Blue**.



**A1-3 was the first Demon to fly in Australia, on 4 MAY 1935**

**A1-3** arrived in crates at Port Melbourne aboard the 11,000-ton P&O Line *RMS Mongolia* on 25 APR 1935, and two days later was received by No 1 Aircraft Depot (1AD) at RAAF Laverton for assembly and testing. On 4 MAY 1935, A1-3 became the first Demon assembled and flown in Australia by SQNLDR Arthur Murphy, joining 1SQN at Laverton on 10 MAY 1935. This image below was taken on 25 MAY 1935, just after delivery to 1SQN. Visible are the CG weights, below the fuselage roundel, carried on both sides when there was no armament or occupant in the rear cockpit, and the message collection hook pivoting on the undercarriage spreader bar below the fuselage.



[Colourised from *adf-serials*]

As **A1-3** was delivered in 1935 – before the introduction of camouflage in the RAF in 1936 and before the ‘*bright*’ roundel colours were replaced over 1936-37 by ‘*dull*’ shades – and therefore photographed with the lighter ‘*bright*’ roundels. Darker roundels would not have been applied for another two or three years.

## RAAF DARKER ROUNDEL *BLUE*

The RAAF had always adopted RAF colours and markings. With the introduction in UK from 1936 of camouflage, changes were over 1936-1937 made to RAF National Markings with “dull” shades of *Blue* and *Red* toning down the roundels so as to not compromise the camouflage finish.<sup>67</sup> At the time of the ‘Munich Crisis’ in SEP 1938, the toned down *Red/Blue* type-B roundel was introduced onto wings for the same reason, while paradoxically the *Yellow* outer ring was added to the fuselage for improved visibility, the type-A1 roundel. However, all RAF operational aircraft were directed to be hurriedly camouflaged with type-B roundels on upper wings *and* fuselage<sup>68</sup> – formalised in APR 1939 by RAF Policy AMO A.154/39.<sup>69</sup>

These dull ‘night’ roundel shades became the colours used for all **RAF** roundels, but the **RAAF** continued with ‘bright’ (glossy) roundel colours.<sup>70</sup> Ian Baker’s colours research found that the RAAF’s later *Dull Blue* was apparently not quite as dark as similar British and US dark insignia blues, and then steadily faded back to something much lighter.<sup>71</sup>



RAF (Ministry of Aircraft Production) *Matt Blue* from MAP colour chart



RAF gloss *Bright Blue* later designated *Roundel Blue* BS381C-110<sup>72</sup>



Spartan Paints (Australia) colour chart for RAAF K3/197 *Dull Blue*



[Colour image, RAAF PR]

### RAAF Demon A1-8 restored by RAAF Museum at Point Cook

A1-8 shows this darker gloss *Blue* roundels, also marked on the Museum’s restored Cadet A6-34. With the RAF roundel colours changed over 1936-1937, it is probable RAAF roundels were also changed to the darker colour by 1938, and at the latest by 1939. They still remained gloss, and became matt in the early war years as *Dull Blue* K3/197.

Regarding rudder striping and fin flashes, these were not marked on the Demon. While the Imperial Gift aircraft had all carried tri-coloured rudder stripes (with *Blue* leading against the rudder post in WWI style), in AUG 1930 the RAF changed the order of the colour with *Red* leading to avoid confusion with the identity of the French Air Force.<sup>73</sup> In OCT 1930, the RAAF followed suit, with the instruction that all aircraft were to have markings changed by 1 JAN 1931.<sup>74</sup> This would soon become unnecessary as technology was evolving – rudder striping was then abandoned by the RAF in AUG 1934, as improved aircraft performance demanded smoother control surfaces free of paint.<sup>75</sup> This followed in the RAAF, although not immediately with the existing fleet, but from 1935 with new deliveries from UK – Demons (APR 1935), Cadets (DEC 1935) and Ansons (NOV 1936).

As British National Markings colours changed over 1936-1937, this was followed in the RAAF as new deliveries arrived from factories in the UK, and also as the RAAF changed to the “dull” colours of the RAF, by about 1938, but definitely by 1939. RAF interwar fuselage Demon roundels were 25” in diameter,<sup>76</sup> which the RAAF maintained. Not visible in most images, upper roundels were smaller than underwing roundels, to avoid control surfaces.<sup>77</sup>

## DARKER BLUE ROUNDELS – A1-49 1937-1938

The roundel colours of the RAAF into the 1930s had followed on from the Imperial Gift aircraft, themselves relics of the Great War. Roundels were carried in the standard six positions of the RAF, as was rudder striping. From the end of 1916, the roundel *Red* was V.R.2, a vermilion colour that was found to be more durable than the original V.R.1. The early *Blue* V.B.1 faded quickly, and after a new range of ultramarine pigments were formulated, a the darker *Blue* V.B.2 became standard.

In 1936, the **RAF** changed roundel colours from bright Red and bright Blue to “dull night flying shades”.<sup>78</sup> Sizes remained the same – standard roundel sizes on the Demon were 25” diameter fuselage, 35” upper wing, 55” underwing. Deliveries from late 1936 UK production should have been marked with the *dull* shade roundels. In the **RAAF**, the darker blue was adopted as deliveries were received probably from 1937-38, but *gloss* was generally retained until the War, when markings were toned down to *dull* colours, the roundel blue being K3/197 *Dull Blue*.



[Colourised from RAAF image 000-160-443]

### **A1-49 flying with 3SQN from Richmond over the Hawkesbury c1937 – still in freshly-applied original markings**

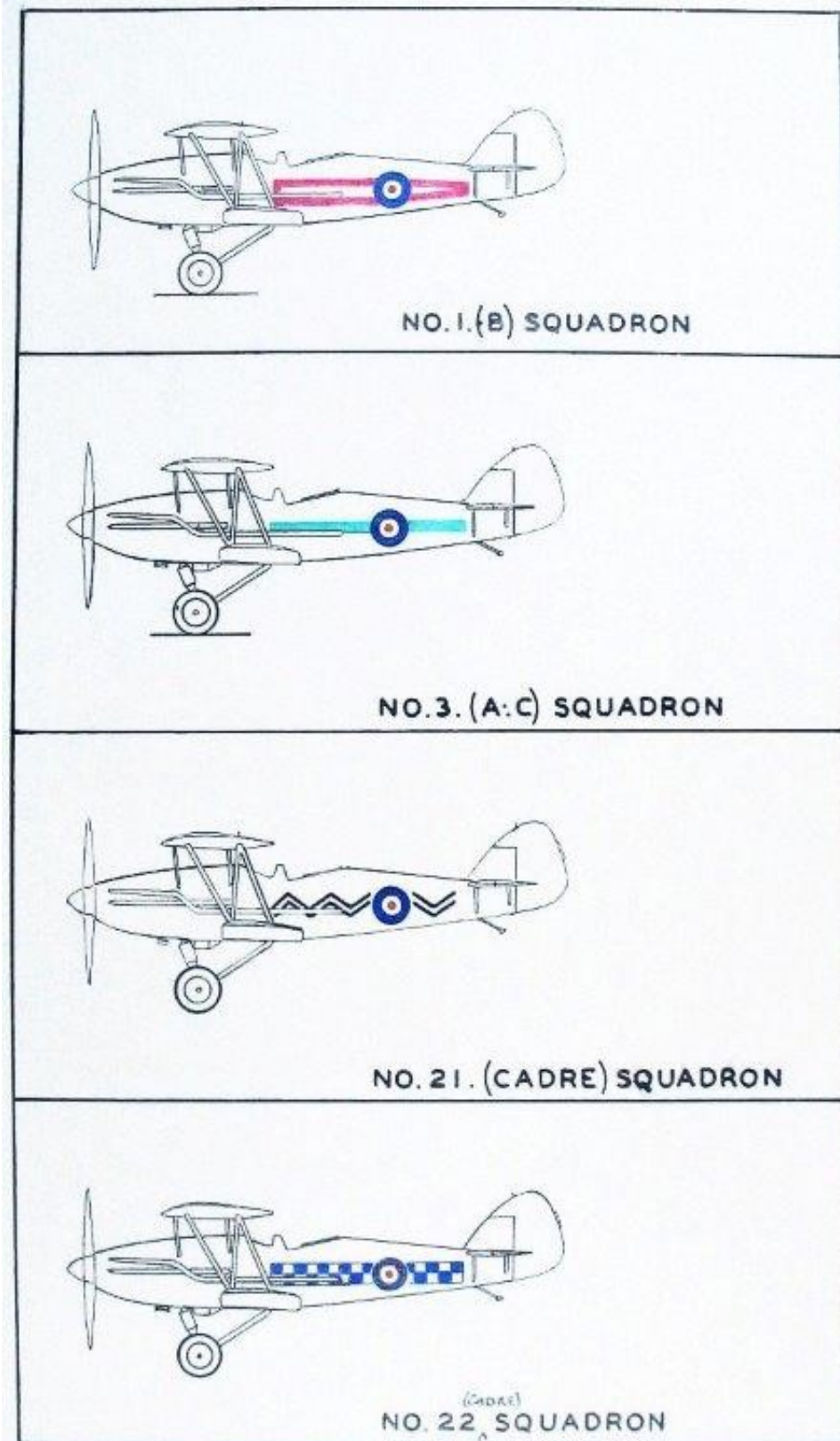
On 16 NOV 1936, **A1-49** arrived in crates at Pitman Wharf Sydney, aboard *SS Jervis Bay*. A fortnight later it was with 2AD Richmond for assembly. Originally in MAY 1937 it was allocated to 4(GR)SQN at Richmond, but immediately this was cancelled in favour of 3(AC)SQN. The RAAF image of A1-49 clearly shows the darker shade *Blue* roundels, and the factory markings on the fin, which were removed during service. 3SQN Demons were operated until unit deployment to the Middle East in 1940.



Postwar, the *bright* roundel colours would return. The dull *Red* was re-adopted by the RAF in 1947, initially as *Red*, then as BS381C-538 *Post Office Red*, and then as *Cherry* (but the colour remained unaltered). *Bright Blue* returned too in 1947, the name was changed in 1964 to BS381C-110 *Roundel Blue*.<sup>79</sup> The RAAF followed similarly in JAN 1948, but for roundels adopted the darker BS381C-105 *Oxford Blue*.<sup>80</sup>

## PREWAR SQUADRON MARKINGS – 1936

Squadron markings for Demon units was first proposed by RAAF Richmond in AUG 1936, to differentiate similar aeroplanes from different units operating from the same base: "The RAF experience this same difficulty of distinguishing between aircraft of different squadrons equipped with the same type when located together. They overcome this by a system of distinguishing markings in the colours on the fuselage of the aircraft."<sup>81</sup> In the RAF, these heraldic markings were displayed on fuselage sides and on upper mainplanes; the below were proposed for the RAAF.



[NAA A705 62/1/234]

Four proposed squadron markings in AUG 1936 for 1SQN, 3SQN, 21SQN and 22 SQN

## PREWAR SQUADRON MARKINGS – 1936-1939

**1936.** This was the proposed squadron marking in AUG 1936 for 22SQN at Richmond – which was very similar to that of 19SQN RAF (and coincidentally to 1SQN Wapitis in 1929) – but these bright RAF style heraldic markings were rejected by RAAF Headquarters.



**1937.** The RAF style markings were rejected by the RAAF, and instead in OCT 1936 RAAFHQ devised simpler 5"-wide *Blue* bands painted around the fuselage at the roundel. In 1937, both the CAF 'cadre' squadrons – 21SQN at Laverton and 22SQN at Richmond – adopted on its Demons and Ansons these *light roundel blue* fuselage bands, as described below. These were removed in 1939.



[from RAAFHQ file 121/24/118, of 30 OCT 1936]

**Air Force Order 10/A/2** issued in APR 1937 detailed that to distinguish similar aircraft of different squadrons at the same base, aircraft would be marked with coloured fuselage bands: **21SQN one** *blue* band 5" wide above and below the National Markings on each side; **22SQN two** 5" *blue* bands 10" apart, above and below the National Markings.<sup>82</sup> These dimensions were chosen as the fuselage roundel was 25" in diameter, and the 5" single *Blue* band for 21SQN aligned neatly through the 5" *Red* centre of the roundel – but RAAFHQ appears to have erred stipulating 10" between the 22SQN bands, as with each 5" *Blue* bands aligned with the outer rings of the roundel, the bands need to be 15" apart, and this is confirmed by contemporary imagery. The colour was the same *bright blue* as the roundels – *French Blue*, which later became the British standard as BS381C-166.

**1939.** In MAY 1939, 25 (City of Perth) SQN applied to RAAFHQ for distinguishing squadron markings, as both the units at Pearce (14SQN and 25SQN) were operating the Anson. 25SQN noted the unit bands used by 21SQN and 22SQN and noted: "It is thought that with 25SQN to have five bands round (sic) the fuselage would be too much, and it is suggested, therefore, that either one or two zigzag bands be placed in a similar position to the straight bands of the other cadre units."<sup>83</sup> In the event, the dire international situation of 1939 soon overtook any suggestion of bright squadron markings.

## PREWAR 21 SQUADRON – 1937-1939

21SQN formed at Laverton on 20 APR 1936 equipped with four Demons, two Wapitis and three D.H.60 Moths. On 1 JUL 1936 the title was changed from 21(Cadre)SQN to 21 (City of Melbourne) SQN, and its Honorary Air Commodore, His Excellency the Governor of Victoria, Lord Huntingfield submitted his family crest (a hunting horn) suspended from wings as the unit's badge with the motto *Coronat Victoria Fortes* ('Victory Crowns the Brave'). He also arranged affiliation with 600 (City of London) SQN RAF. On 16 DEC 1936, 21SQN received its first Anson and soon the Squadron's roles were changing to take on a more warlike aspect with joint service operations. Searches for suitable emergency landing fields in central Gippsland led eventually to the establishment of the RAAF airfields at Bairnsdale, East Sale and West Sale, which would prove necessary for the establishment of EATS training.

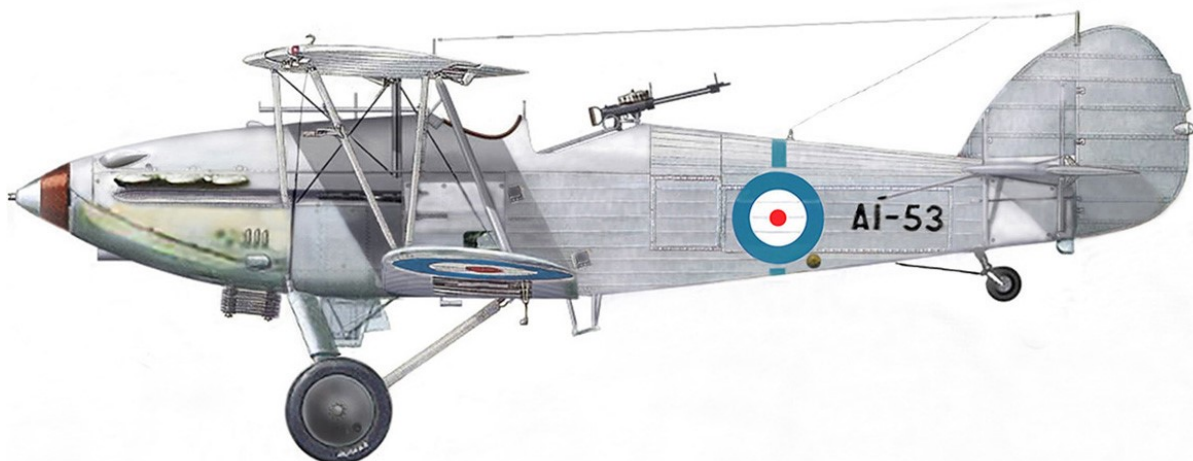
At the outbreak of war on 3 SEP 1939, 21SQN was equipped with nine Demons, Avro Cadets and four Ansons, and undertook air cadet intermediate flying training for EATS graduates. These aircraft remained until MAY 1940 – by this stage 21SQN had been allocated the squadron code letter "R" carried by the first Wirraway 'fighters', but not by Demons. 21SQN was ordered to deploy its Wirraways to Singapore on 1 JUL 1940, on 13 AUG 1940 embarking on RMS *Strathhallan*. Disembarking at Singapore on 26 AUG, 21SQN proceeded to RAF Seletar to train as a fighter unit, to be equipped during 1941 with the Brewster Buffalo.<sup>84</sup>



[Colourised AWM image 000716]

### AI-53 21SQN at Laverton c SEP 1939

The *Blue* CAF bands for 21 and 22 SQNs lasted from 1937 to 1939, until unit code letters were introduced for RAAF squadrons in SEP 1939. A single code letter was carried ahead of the fuselage roundel on each side – 21SQN was marked 'R', but not noted on Demons. Although the AWM caption for this image dates it as cFEB 1940, **AI-53** (having served with 1SQN from DEC 1936) flew with 21SQN from AUG 1939 until APR 1940, passing to 1FTS Intermediate Training Squadron (ITS) at Point Cook. The 21SQN band would have been applied on receipt by the unit in AUG 1939 – it should have been removed in SEP 1939. The different Flights of 21SQN Laverton appeared to have different wheel hub colours, *Black* was one Flight, *Red* was another.





## PREWAR 22 SQUADRON – 1936-1939

22(Cadre)SQN formed at Richmond on 20 APR 1936, with two Hawker Demons and three Gipsy Moths, and on 1 JUL the unit's title was changed to No 22 (City of Sydney) SQN. In MAR 1937, Ansons were received to enable naval cooperation exercises, and in FEB 1939, the unit became affiliated with 602 (City of Glasgow) SQN RAF. At the outbreak of war, 22SQN had four Ansons and eight Demons (**A1-7, A1-11, A1-14, A1-16, A1-17, A1-34, A1-35, A1-37**), and immediately three Ansons detached to RAAF Base Canberra, to conduct coastal searches. 'C' Flight of the Squadron was re-armed with Wirraways in OCT 1939, and two months later an 'O' Flight was formed to carry out the intermediate training of air cadets.

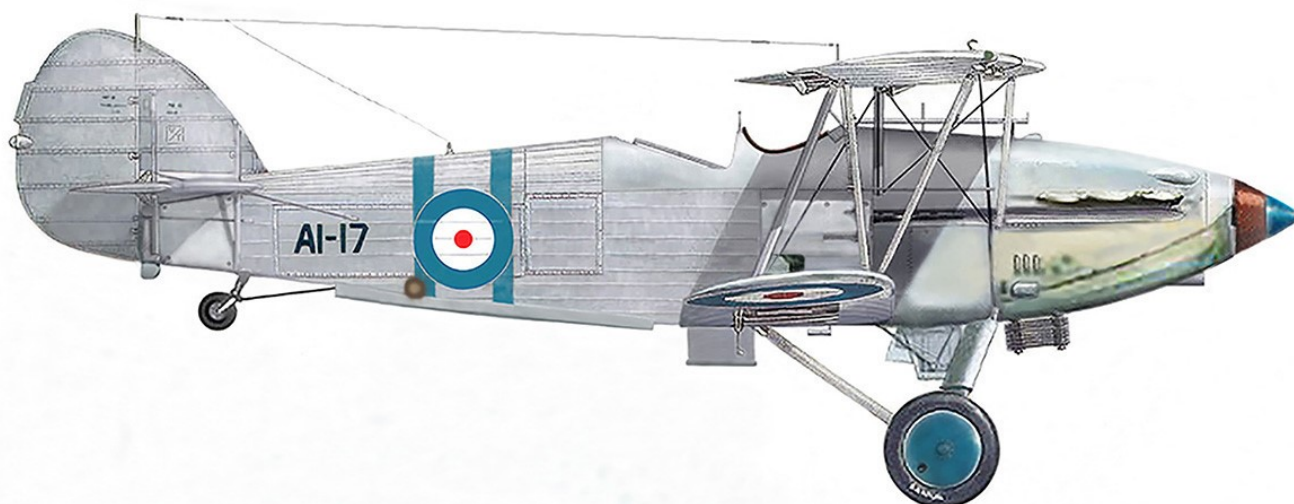
On 3 OCT 1940, 22SQN detached to Cressy VIC to No.1 Armament Training Station for weapons training. Returning to Richmond in NOV, 22SQN co-operated in air raid precaution exercises, and carried out protective coastal patrols during DEC 1940, when the *Queen Mary* was in Australian waters on AIF trooping duties. Throughout the early months of 1941, 22SQN continued training in Army co-operation, dive-bombing, parachute dropping and photography. With Japan entering the War in DEC 1941, 22SQN remained at Richmond in the defence of Sydney against possible enemy attack, and in APR 1942, began re-equipping with the DB-7 Boston.<sup>85</sup>



[Colour image adf-serials]

### **A1-17 22SQN, the only target-tower in this line-up, c 1937 at Richmond**

The colourful 21SQN and 22SQN CAF bands over 1937 to 1939, were replaced by unit code letters from SEP 1939. However, the single code letter ahead of the fuselage roundel on each side (22SQN allocated "S") were not carried by Demons. **A1-17** here is rigged as a target-tower with the banner panner underneath the rear fuselage for the flag targets, and the winch box below the centre section – it served on 22SQN from JUN 1936 until AUG 1939, passing to No.1ATS at RAAF Cressy, VIC.



## PREWAR 23/25 SQUADRON – 1937-1939

23(GP)SQN formed at Laverton on 3 MAY 1937 with Hawker Demons, when it received its first six Demons (A1-45, -46, -47, -48, -52 and -54). Moving to Pearce in MAR 1938, on 1 JAN 1939 23SQN at Pearce was curiously retitled 25(GP)SQN. (This was at the same stage that 4SQN Richmond was retitled 6SQN.) Over 1937-38, **23SQN** had operated **Demons A1-45, A1-46, A1-47, A1-48, A1-52, A1-54, and A1-60**. With the change of unit identity, on 1 JAN 1939, all these aircraft (except A1-45 which had been damaged in 1938) were transferred to **25SQN**. By JAN 1940, the Demons had been transferred to 1SFTS Point Cook. (Meanwhile a 'new' 23SQN had subsequently formed at Richmond in 6 FEB 1939, but with Ansons, and moved to Archerfield at the end of AUG 1939.)<sup>86</sup>



[Colourised from RAAF image]

### **25SQN Demon formation A1-52, A1-46, A1-60 in early 1939**

By this stage, it appears all aircraft have the darker *dull Blue* roundels. All aircraft were with 1SFTS Point Cook by early 1940.

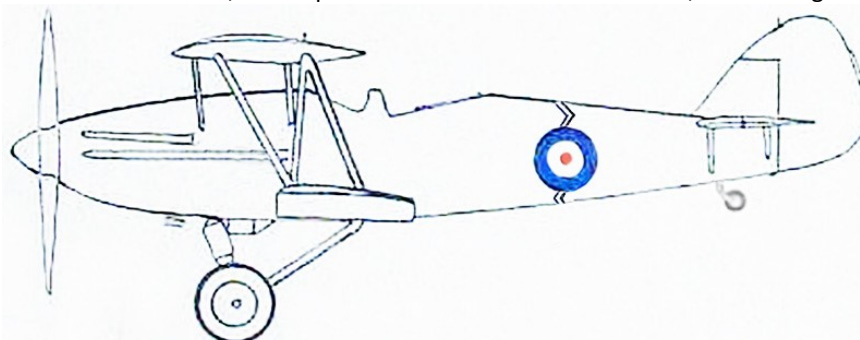
An interesting aspect of Demon operation at Pearce was in MAY 1939, several months after the unit had become 25SQN. A letter to RAAF Headquarters from the Pearce Station Commander addressed "Squadron Markings – No 25 (City of Perth) Squadron":<sup>87</sup>

Now that there are Avro Ansons both in No 14 (GR) Sqn and in No 25 (GP) Sqn, it would assist in the working of the squadrons if squadron markings were adopted in aircraft of one squadron.

In other Cadre Squadrons, it is noted that one or more straight bands are painted around the fuselage adjacent to the international marking, for instance No 21 Sqn has one band and No 22 Squadron two bands.

It is thought that with No 25 Sqn, to have five bands round the fuselage would be too much, and it is suggested, therefore, that either one or two zigzag bands be placed in a similar position to the straight bands in other cadre units.

If this recommendation is concurred in, it is requested that an instruction be sent, authorising the marking to take place.



### **An interpretation of the representative squadron marking, as suggested by 25SQN in MAY 1939**

This illustration is a representation of the marking proposed for 25SQN Ansons because of two units operating that type from the one base, but any 25SQN unit marking would have been implemented on all squadron aircraft. While A1-45 had already been damaged in 1938 and passed to 1AD, known Demons serving with 25SQN over this period were **A1-46, -48, -52, -54, -60**.

Although this 25SQN marking was discussed within RAAFHQ Directorate of Technical Services (DTS) during JUN 1939, it was not progressed. Within months, of course, consideration of aircraft marking schemes would be overtaken by the serious world turmoil.

## PREWAR 1 SQUADRON – 1935-1939

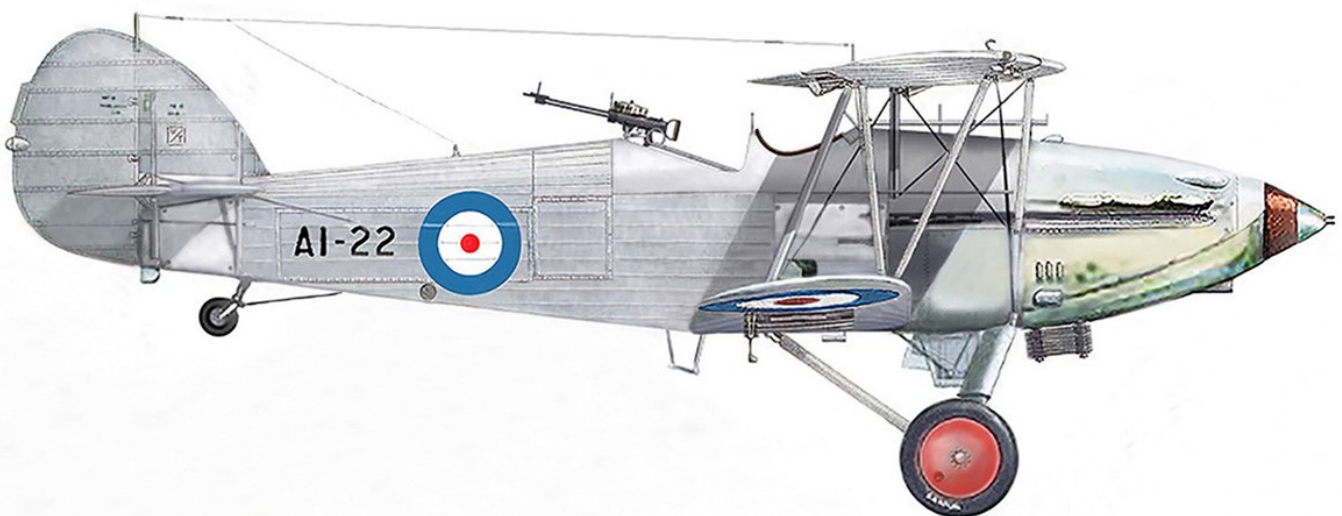
1SQN re-formed from its AFC roots at Point Cook in JUL 1925, moving across to Laverton in JUN 1928, and flying the obsolescent *Imperial Gift* types. Receiving army-cooperation Wapitis in 1929, 1SQN soon received Australia's first deliveries of Demons in MAY 1935 (A1-2, -3, -4, -9, -13, and -15). By the beginning of 1937, 1SQN had built to a strength of 12 Demons. The Squadron was engaged on a diverse range of activities - photographic survey work in Tasmania, Victoria and the northern parts of Australia for the Army and other public authorities, and numerous round-Australia survey flights. Additionally, bushfire and flood patrols were regularly carried out, with crop dusting and searches for lost aviators, stockmen and prospectors, and training for core aerial warfare skills were all undertaken. When war with Germany broke out in SEP 1939, the Demons were passed on to CAF units and training schools, leaving 1SQN equipped with Ansons.<sup>88</sup>



[Colourised from The Third Brother]

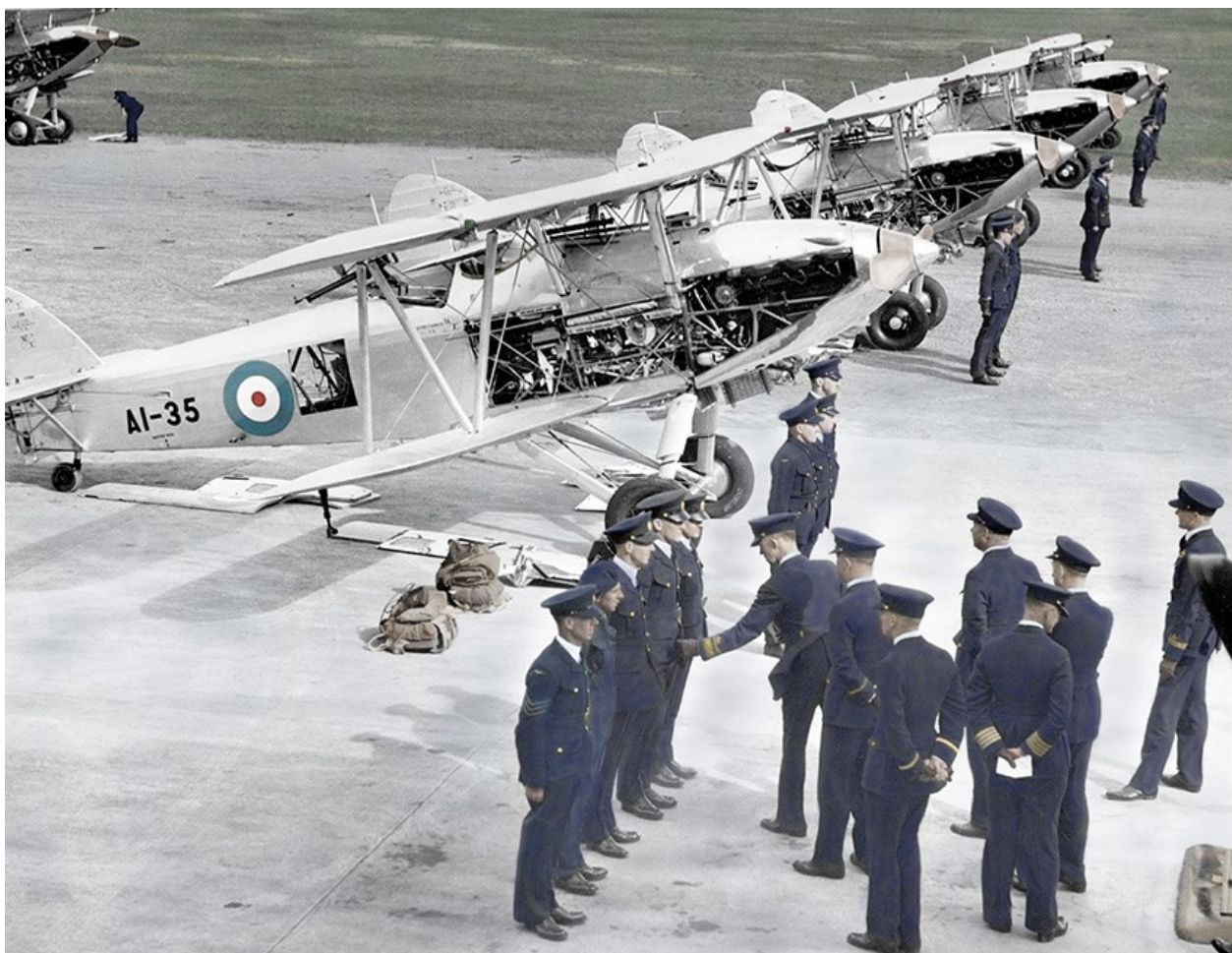
### 1SQN Demon A1-22 over Laverton 1937

The RAAF 1977 DAFS calendar featured this image of Demon A1-22 over Laverton, marked with *Red* wheel hubs. In addition, the CAS 1927 Laverton Inspection photograph of 1SQN Demons lined-up with A1-35 (next page) appears to show *Black* hubs – apparently *Red* and *Black* marked the two 1SQN Demon Flights.<sup>89</sup>



While 1SQN Demons had *Red* or *Black* wheel hubs for their Flight, there were evidently no specific painted or coloured markings for the other full-time Demon squadron, 3SQN Richmond. However, 3SQN Demons in 1935-39 carried a metal squadron badge screwed onto both sides of the polished cowling, incorporating the Unit "winged grenade" surmounted by larger spread wings.

All Demons from the production line were finished in highly polished metal-skinned areas, and *Aluminium* spray finish on the fabric covered parts of the airframe. 1936 was a year of change for RAF markings, which the RAAF followed slavishly, albeit with some delay. Receiving its full strength of 12 Demons by beginning of JAN 1937, 1SQN aircraft on strength were **A1-20 to A1-25**, and **A1-32 to A1-37**.<sup>90</sup> Below is the Chief of Air Staff (AVM Williams) on his annual inspection for 1SQN at Laverton in AUG 1937.



[Colourised from adf-serials]

1SQN Demons of this Flight at Laverton in AUG 1937 have Flight *Black* wheel hubs




**Camouflage.** With the introduction of RAF camouflage from 1936, some changes were made to RAF National Markings. In the late summer of 1938, the ‘Munich Crisis’ marked the deterioration of international affairs and the threat of war in Europe. With the RAF on a war footing, emergency camouflage schemes were put into effect. *Dark Green* and *Dark Earth* finish was applied to RAF Demons, the pattern being drawing “**A.D.1162 – Single-engined biplanes – army co-op aircraft, fighters**”.<sup>91</sup> RAAF camouflage instructions followed in SEP 1939.

**Roundels.** Firstly in 1936, the traditional **RAF Bright Blue** and *Bright Red* were replaced by the dull night flying shades of *Blue* and *Red*; and secondly, a *Yellow* outer ring was added to the *red/white/blue* roundels. Markings historian Paul Lucas observes the following apparent dichotomy of these changes:<sup>92</sup>

- the first measure of introducing the ‘dull’ shades was taken to try to avoid compromising the camouflage finish,
- and perversely, the latter of applying a *Yellow* outer ring, was made to make camouflaged aircraft more visible!

The *Yellow* outer ring was to be equal in width to the other coloured rings of the roundel, and was added to camouflaged aircraft (although its width sometimes varied). At the time of the SEP 1938 Munich Crisis, the roundels for camouflaged aircraft were converted to a *Blue/Red* roundel, the usual method of using the *Blue* ring as a marker and enlarging the *Red* centre to two-fifths of the overall diameter (a 2:5 ratio). The rest of the roundel was then filled in with *Blue*. This marking was defined by the RAF as “a *blue* ring surrounding a *red* centre” – with no designator but listed as roundel (i) – to be located on both sides of the fuselage and on upper mainplanes – postwar it became better known as the type-B roundel. A *red/white/blue* roundel – listed as (ii) – was to be marked on wing lower surfaces.<sup>93</sup>

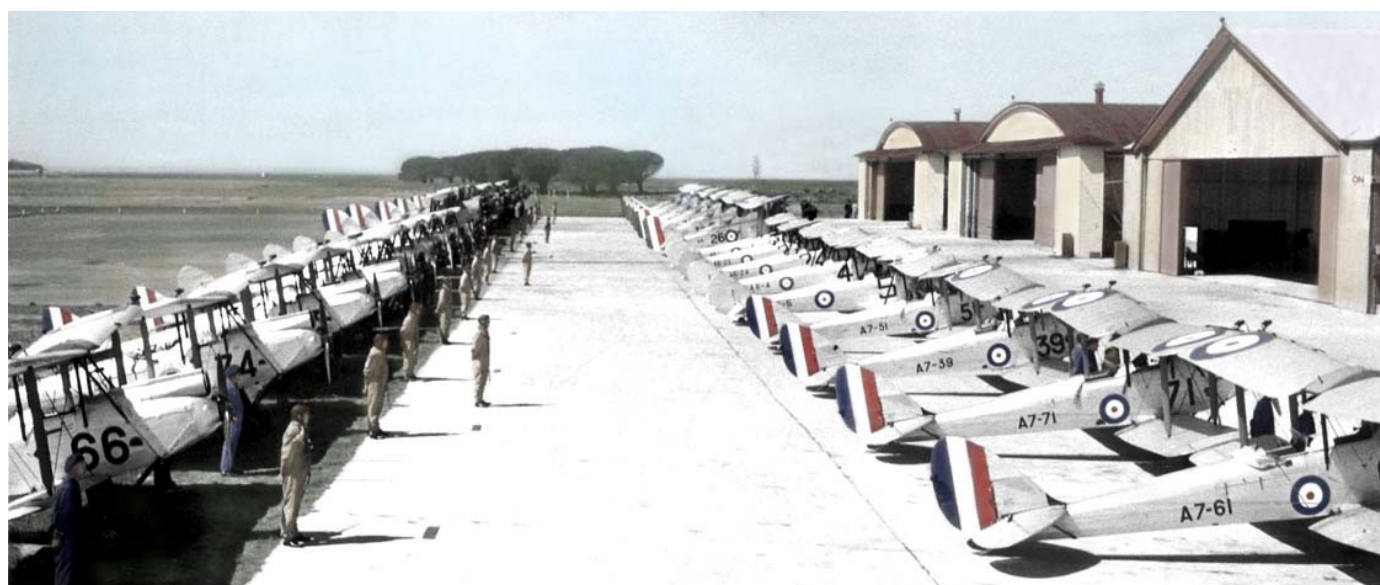
Parallels can be seen when these markings were implemented into the **RAAF** over 1939/1940 – the RAF *red/blue* (i) became RAAF National Marking ‘M.1’, RAF *red/white/blue* (ii) became RAAF ‘M.2’. When the RAF introduced a *Yellow*-surrounded roundel in MAY 1940,<sup>94</sup> this became the RAAF ‘M.3’. The change of ‘bright’ to ‘dull’ *Blue* in UK in 1936 would ultimately find its way to the RAAF, either through factory delivery of new aircraft which had changed production colours, or delays in implementing the RAF technical Air Ministry Orders.

	RAF Roundel 1938/40	RAAF Roundel 1939/40	Postwar simplified terminology
	<i>Blue</i> ring surrounding a <i>Red</i> centre (i)	Scheme M.1	<i>Type-B</i>
	<i>Blue</i> ring surrounding a <i>White</i> ring and the latter surrounding a <i>Red</i> centre (ii)	Scheme M.2	<i>Type-A</i>
	<i>Yellow</i> ring surround added in MAY 1940	Scheme M.3	<i>Type-A1</i>

**Fin Flashes.** The tricolour fin flash evolved from WWI rudder striping, which in the RAAF in 1930 had colours reversed so that *Red* was leading, with *Blue* against the trailing edge. Generally rudder striping was discontinued in Britain in 1934 as improved aircraft performance demanded smoother control surfaces free of paint to avoid balancing problems on surfaces and hinges<sup>95</sup> – and as can be seen on the earlier 1935 RAAF delivery images, the Demon, Cadet, and then Anson, carried no tail National Markings. Fighting the War in France from 1939, the RAF re-introduced *red-white-blue* stripes on the tail, but this time on the fin in 1940,<sup>96</sup> and ‘rudder striping’ became the ‘fin flash’.

**Serial Numbers.** With the delivery of British aircraft during the 1930s, the RAAF inherited underwing serial numbers – as had been the case too with the Imperial Gift aeroplanes in 1919-1920. On many inter-war *Aluminium*-painted single-engined aircraft, these serials were in *Black* 30” high.<sup>97</sup> Fuselage serials were in the standard 8” high and 5” wide characters, and these 8:5 proportions were retained for underwing serials, and if possible for other fuselage identification code and numbers, which would include **training numbers**. Underwing serials, which retained the RAF style of orientated under the starboard wing with the leading edge and under the port wing orientated with the trailing edge, appear to have been retained on the Demon while the undersides remained *Aluminium* and in training *Yellow*, but were not carried when camouflaged undersides went to *Sky Blue*.

**Training Numbers.** As related in this series regarding the Cadet and D.H.60 Moth in training service with 1FTS at Point Cook, large ‘training numbers’ were marked forward of the roundel, or on the nose, to identify recalcitrant trainees (or instructors!). These training numbers normal comprised the ‘last two’ of the aircraft serial number.



[Colourised from *adf*-serials]

**1938-1939 – The definitive 1FTS Moth/Cadet/Wapiti markings immediately prewar, with training numbers**

Point Cook: 8 Moths, 10 Cadets, 12 Wapitis. Overall *Aluminium*, typically 16” x 10” training number each side forward fuselage.

## DEMON WARTIME MARKINGS – 1939-1943

**Training Numbers.** In MAY 1940 with the immense buildup for EATS pilot training, 1SFTS was reformed as 1SFTS and its two component flights were Intermediate Training Squadron (ITS) and Advanced Training Squadron (ATS). (The third sub-unit had been the Instructors' Training Squadron which changed into Central Flying School (CFS) and moved to Camden on 14 MAY 1940.<sup>98</sup>) 1SFTS developed a unique coloured unit marking – **Red for ITS** and **Yellow for ATS**.<sup>99</sup> These colours applied to the new form of training number (below the front cockpit of the Demon, and the nose of the Anson) which were outlined thinly in *Black*. These training numbers were not necessarily the serial number 'last two' (see "16" on A1-60 below), and for the Demon, it appears that the specific 1SFTS colour was also applied to the propeller spinner, and to wheel hubs. By late 1940, the training number was positioned ahead of the fuselage roundel, and applied in *Black* on *Aluminium* coloured trainers.



[Colourised from image from Peter Malone Collection]

**A dual Australian Demon Mk.II A1-60, 1SFTS ITS 1940 with training number "Red 16", with leading edge slats extended**  
A1-60 was delivered (as part of the 1936 order for ten 'Australian Demon Mk.IIs') to 1AD in OCT 1937, serving with 23SQN then 25SQN at Pearce WA over 1938-1939. Being in the last batch of Demons – delivered over 1937-38 – the aircraft would have been delivered from the factory with the darker *Dull Blue* roundels. A1-60 returned to 1AD in JAN 1940, it appears at this stage to have been converted to dual configuration. Taken on strength by 1SFTS in MAY 1940 and serving with Intermediate Training Squadron (ITS), A1-60 wore '16' training number in *Red*, this was before the introduction of the *Yellow* trainer bands at 1SFTS later in 1940.



[Colourised from RAAF image]

**When one number is just not enough – 1SFTS A4-19 in mid-late 1940, '19' ahead of the roundel with the ITS Red '6' on the nose**  
This would be the changeover of numbers, cSEP 1940. Below is the 1SFTS request in JUL 1940, soon overtaken by the OCT 1940 AGI C.11 *Issue 3*, which called for training numbers "painted on both sides of the fuselage forward of the national markings".<sup>100</sup>

This image of Anson A4-19 shows the 'last two' numbers ahead of the roundel which was the more prevalent position – while the submission from 1SFTS (below) had suggested that the Anson training number be positioned aft

of the roundel towards the aircraft serial number. For the Demon, 1SFTS had suggested the number be applied to the engine cowling between the exhausts. While the *Red* and *Yellow* colours were instituted, the position of the numbers was still evolving and on Demons at this stage – A1-14 *Red* 2, A1-57 *Red* 14, A1-60 *Red* 16 and A1-21 *Yellow* 5 are known examples with the number further aft of the exhausts and narrow engine cowling, below the upper mainplane.

Encl. 9A. 1/50/269

COMMONWEALTH OF AUSTRALIA

ROYAL AUSTRALIAN AIR FORCE

HEADQUARTERS, SOUTHERN AREA, 25  
10 Irving Road, 2/172  
TOORAK. S.E.2.

27 JUL 1940

46A

Secretary,  
AIR BOARD.

AIRCRAFT IDENTIFICATION

1. I am directed to state that No. 1 Service Flying Training School consider that it is necessary to be able to easily distinguish aircraft in order to check any faults or irregularities in the flying of pupils.

2. It is requested, therefore, in view of A.F.C. 10/A/2, paragraph 5, that authority is given to mark No.1 Service Flying Training School aircraft as follows:-

- (a) All aircraft within Squadrons to be allotted a distinguishing number commencing from "one" for each type in each Squadron.
- (b) Intermediate Squadron to be RED numbers and Advanced Squadron YELLOW numbers.
- (c) Ancons to be numbered on either side of the fuselage between the cockade and the official Serial or Type number.
- (d) Demons to be numbered on either side on the engine cowling immediately below the exhausts.

DTS 30  
40

J. B. S.  
Squadron Leader,  
for Group Captain,  
SENIOR ADMINISTRATIVE STAFF OFFICER,  
(S.O.A.)

### HQ Southern Area letter 240/9/S (9A) of 27 JUL 40

**Trainer Bands.** The first reference for *Yellow* on trainers was in JAN 1940 by Amendment List No.5 (A/L.5) to the 1939 AGI C.11, with a new Paragraph 1(a) directing *Yellow* 36" bands for *elementary* trainers around the fuselage "at a convenient location between the rear cockpit and the leading edge of the tailplane".<sup>101</sup> Then in MAR 1940, RAAFHQ Director of Technical Services (DTS) discussed with AMOE for "*Yellow* bands" to be included in AGI C.11 (possibly in the unseen *Issue No.2*) and painted on training aircraft around the fuselage and wings. It was noted that this had not been done to date as supplies of *Yellow* paint had not been obtained. Also reference was made of Tiger Moths delivered from de Havillands in Sydney being finished in *Yellow*.<sup>102</sup>



[Colourised from RAAF image]

Dual Demon A1-16 trainer of 1SFTS ATS in 1941, with *Yellow* trainer band centred on the fuselage roundel

Release then of AGI C.11 *Issue No.3* in OCT 1940 stipulated two training schemes. **Scheme E.1** was to be the *permanent* scheme for training aircraft, the entire airframe to be finished in *Yellow*. **Scheme E.2** was an *interim* finish comprising “a *Yellow* band three feet in width” around the fuselage and around the mainplanes.<sup>103</sup> This was a significant change to the JAN 1940 A/L amendment which had only stipulated *elementary* trainers. These 36” E.2 trainer bands were now to be used by Demons and Ansons, in preference at this stage to overall *Yellow* (as “service aircraft” could be rotated through operational squadrons and be required to revert to a camouflage). For the Demon, camouflage would later be applied to 1SFTS and 3BAGS aircraft, with a variety of training numbers and *Yellow* trainer bands.

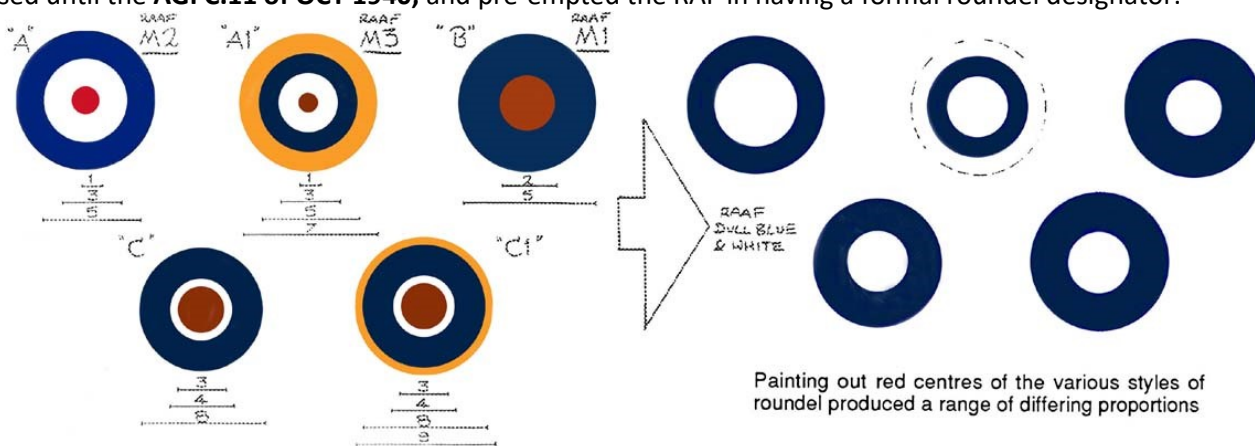
**Overall Yellow.** While Australian production Tiger Moths and Wackett Trainers had been delivered in overall *Yellow*, during 1941 the legacy training aircraft types – Gipsy Moths, Cadets and Demons – were gradually repainted during reconditioning in accordance with the OCT 1940 AGI C.11 *Issue 3* in **Scheme E.1**. This was “*the permanent scheme for training aircraft wherein the entire airframe is finished in yellow*”. However, there were still caveats. In DEC 1941, RAAFHQ AMOE advised all flying training establishments of the detailed camouflage of second line aircraft.<sup>104</sup> While this did not refer specifically to the Demon, it did note camouflage finish was RAAF *Earth Brown* (K3/178) and *Foliage Green* (K3/177), the undersides were to be *Sky Blue* (K3/195) and that *Yellow* and *Aluminium* finishes were no longer to be used. This prompted consideration in RAAFHQ (DTS and DCAS) to “adopt the English scheme for training aircraft under which the undersurfaces will remain yellow, but the uppersurfaces will be camouflaged”.<sup>105</sup> Hence over this 1941-1942 period, and even into 1943, camouflaged training aircraft could have *Sky Blue* or *Yellow* undersides.

### 1939 Change of National Markings

The designation of RAF national roundels we know as ‘A’, ‘B’, ‘C’, etc were developed in the 1950s, purely for simplicity. These British ‘non-official’ designators are attributed to author Bruce Robertson, used from his early benchmark *Harleyford Aircraft Camouflage and Markings 1907-1954*. The official terminology was both cumbersome and ambiguous – the same term could apply to different roundels at different times<sup>106</sup> – so Robertson’s invention has simplified this. There is a discussion of this in Paul Lucas’s fine book on the Battle of Britain camouflages which does use the official terminology, but sometimes at the expense of clarity.

As the RAAF followed markings policy of the RAF, major changes were about to occur from 1939. The Munich crisis, in SEP 1938, saw the RAF adopt camouflage finishes for the majority of its front line aircraft, and also the *Red* and *Blue* roundel on wings and fuselage as the wartime National Marking.<sup>107</sup> The RAF formalised this on **27 APR 1939** as **AMO A.154/39 – Identification Markings on Aircraft of Operational Units**.

RAF AMO A.154/1939 in its revision of the National Markings for all British military aircraft included a *Yellow* surround for roundels on camouflaged aircraft and introduced *Red/White/Blue* stripes on the fin.<sup>108</sup> National Markings of RAAF aircraft were then changed soon after declaration of war with Germany. On 12 SEP 1939, Directorate of Technical Services in RAAFHQ advised that for top surfaces and fuselage the roundel would be *Red/Blue* (i.e. what would become the “Marking M.1”), and roundels on undersides would be *Red/White/Blue* (“M.2”).<sup>109</sup> While this was formalised by the policy **Aircraft General Instruction (AGI) No.C.11 of 22 SEP 1939**, these ‘M-series designators’ were not used until the **AGI C.11 of OCT 1940**, and pre-empted the RAF in having a formal roundel designator.



Coloured from Ian Baker’s *AHCB #5, Roundels, Tail Stripes & Other Markings*

The RAAF “M.1” (the RAF type-B), the “M.2” (the standard red-white-blue type-A), and the “M.3” (M.2 with a *Yellow* ring around the outside, like converting the RAF type-A to the type-A1). 1SFTS Demons had unit designator “Y” removed in 1940 and substituted by training numbers. The M.1 was in a 2:5 ratio<sup>110</sup>, M.2 1:3:5. But soon into 1940, over APR-MAY, the RAAF fuselage roundel was reverted from M.1 roundels back to M.2 roundels.<sup>111</sup>



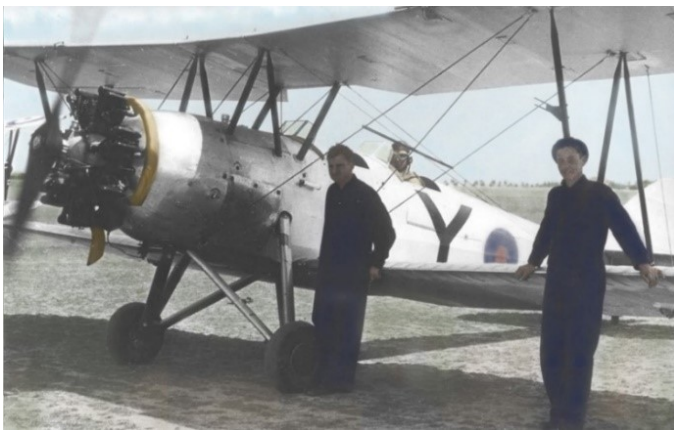
## RAAF NATIONAL MARKINGS – THE ‘M1’ ROUNDEL

The designation of RAF national roundels we know as ‘A’, ‘B’, ‘C’, etc were developed in the 1950s, purely for logic and simplicity. The RAAF “M1” roundel (what we refer to now as the RAF ‘B’ *red-blue* roundel) was for use on upper surfaces and the fuselage briefly over late 1939 into early 1940. In addition to training aircraft, operational types such as the Demon, Wirraway, Anson, Hudson, D.C.3, Seagull and Empire also were marked with the M.1 roundel.



[Colourised from AMOF image]

**A2-1 Seagull V at Point Cook red/blue M1 roundel.**



[Colourised from RAAF image]

**Avro Cadet A6- serial unknown, of 1FTS at Point Cook with Squadron letter “Y” assigned to 1FTS by AGI No.C11, 22 SEP 1939, and discontinued by *Issue 3* of the AGI in OCT 1940 which re-allocated “Y” to Comm Flt.**



[Colourised from AWM P07175.008]

**A7-71 M1 roundel Parafield 1EFTS 1940 D.H.60M.**



[Colourised from RAAF image]

**Anson A4-6 with application of the M.1 roundel with 1SQN late 1939. Front line Anson squadrons were camouflaged at this time and marked with M.1 roundels, which soon reverted to M.2 *red-white-blue* roundels over APR-MAY 1940.**

## WARTIME – 1 FLYING TRAINING SCHOOL (1FTS) – 1939-1940

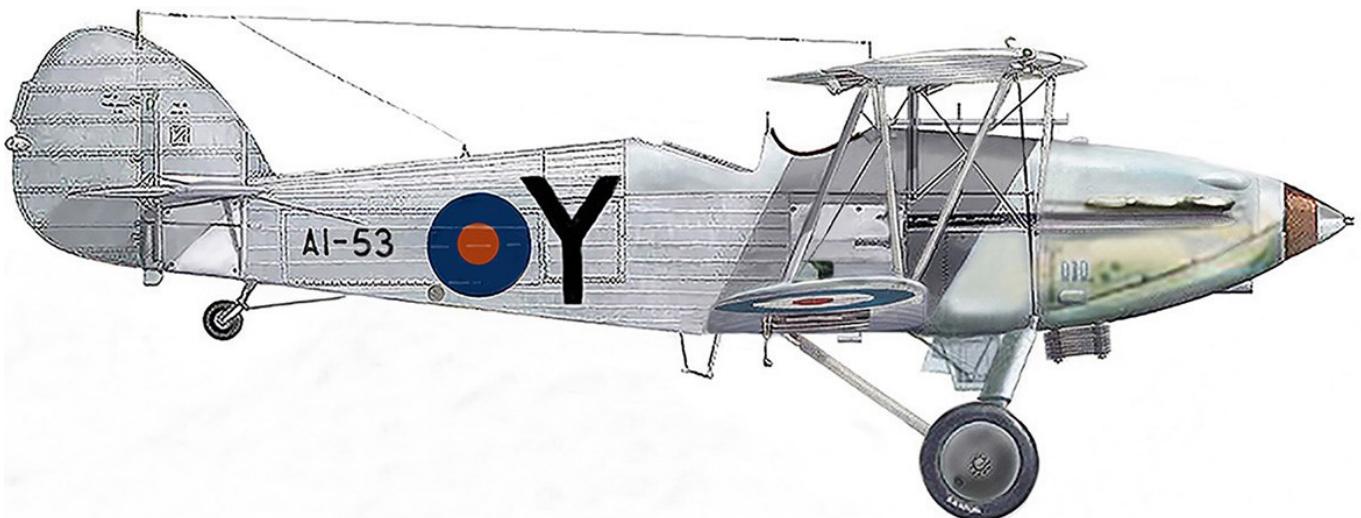
**1FTS** had been the RAAF's flying training unit at Point Cook since 1921. Originally equipped with the Imperial Gift aircraft, the School re-equipped with D.H.60 Cirrus Moths from 1928, the improved D.H.60G Gipsy Moths from 1930, then from 1935 with Avro Cadets and Demons. With the declaration of War, many aircraft that had been despatched to units around Australia were returned to 1FTS at Point Cook to bolster pilot training. **1SFTS** formed at Point Cook from 1FTS on 1 MAY 1940, as part of the major re-structuring of RAAF flying training to introduce EATS. As part of this development, 1FTS was renamed 1SFTS to be part of the EATS system. The School was initially to be involved in the training of some 150 pilots, using an advanced syllabus (for EFTS graduates), initially with a strength of 52 aircraft – comprising five Ansons, 12 Wapitis, seven Demons and 27 Avro Cadets.<sup>112</sup> All the Cadets were soon transferred to Central Flying School (CFS), which moved to Camden, and Demon strength was increased to build up Intermediate Training Squadron (ITS) and Advanced Training Squadron (ATS).



[Colourised from RAAF image]

### The 1939 AGI Changeover: A1-53 with M.1 roundel, and A1-57 with M.2 roundel, both with M.1 on wings

The 1SFTS unit letter 'Y' was 32" high in 4" stroke. The forward training number in this style only was used in 1940, and was soon replaced by the 'last two' training numbers ahead of the fuselage roundel in place of the unit 'Y'. This is also before the widespread introduction of *Yellow* trainer bands, and the aircraft serial number still is evidently under the mainplanes.



A1-53 1FTS with M1 roundel MAY 1940

The SEP 1939 AGI C.11 had specified the *blue-red* (M.1 or type-B) roundel on fuselages and upper surfaces. The three-colour (M.2 or type-A) roundel was retained on lower surfaces, with serial numbers. Wheel hubs were probably Black.<sup>113</sup> During MAY 1940, the M.1 was being withdrawn, reverting to the M.2, as in the image above on A1-57, which was also marked as "*Red 14*".

## WARTIME – 1 FLYING TRAINING SCHOOL (1FTS) – 1940

**1FTS** had been the RAAF's flying training unit at Point Cook since 1921. Originally equipped with the Imperial Gift aircraft, the School re-equipped with D.H.60 Cirrus Moths from 1928, the improved D.H.60G Gipsy Moths from 1930, then Avro Cadets and Demons from 1935. With the declaration of War, many aircraft that had been despatched to units around Australia were returned to 1FTS at Point Cook to bolster pilot training. **1SFTS** formed at **Point Cook from 1FTS on 1 MAY 1940**, as part of the major re-structuring of RAAF flying training to introduce EATS. As part of this development, 1FTS was renamed 1SFTS to be part of the EATS system. The School was initially to be involved in the training of some 150 pilots, using an advanced syllabus (after EFTS), initially with a strength of 52 aircraft – comprising five Ansons, 12 Wapitis, seven Demons and 27 Avro Cadets.<sup>114</sup> All the Cadets were soon transferred to Central Flying School (CFS), which moved to Camden, and Demon strength was increased to build up ITS and ATS – the Demon served as the “advanced fighter” within 1SFTS until replaced by the Wirraway in 1942.



[Colourised from adf-serials]

**Mid 1940 – Dual A1-14 with 1SFTS “Red 2” ITS training number and the 1939 1FTS ‘Y’ code, before the 1940 trainer band**  
The 1SFTS ‘Y’ appears thicker than the normal 4” stroke. The forward training number in this style only was used in 1940, and was soon replaced by the ‘last two’ training numbers ahead of the fuselage roundel in place of the unit ‘Y’. This is also before the widespread introduction of *Yellow* trainer bands, and the aircraft serial number still appears to be under the mainplanes.



**A1-14 “Red 2” dual trainer – ‘Y’ 1FTS marking of ITS mid 1940**

**A1-14** was previously with 3SQN in 1935 then 22SQN in 1936, before the dual conversion at 1AD in SEP 1939. Then serving with 21SQN, A1-14 joined 1FTS ITS in APR 1940, which changed to 1SFTS in MAY 1940. A1-14 was moved to 1SFTS ATS in JUL 1940.

## WARTIME – 1 SERVICE FLYING TRAINING SCHOOL (1SFTS) – 1940

**A1-21** shows some interesting markings. The date of the image is **18 SEP 1940**, after a storm had hit Cressy. A1-21 was on strength with Advanced Training Sqn at 1SFTS Point Cook and the damage was recorded on the E/E.88 as: “U/C collapsed, both lower mainplanes and port upper, starboard lower interplanes struts and elevator and tailplane damaged”.

- So by SEP 1940, 1SFTS aircraft still carried the SEP 1939 squadron “Y” code letter.
- Also *Yellow* trainer bands were now marked – this may be an early introduction which, while is 36” wide in accordance with Instructions, is not centrally aligned around the roundel, not on the mainplanes, and does not wrap around the fuselage, probably due to the shortage of *Yellow* dope.
- The training number ‘5’ was marked on the forward fuselage in *Yellow* denoting Advanced Training SQN, with *Yellow* wheel hubs, and possibly propeller spinner.

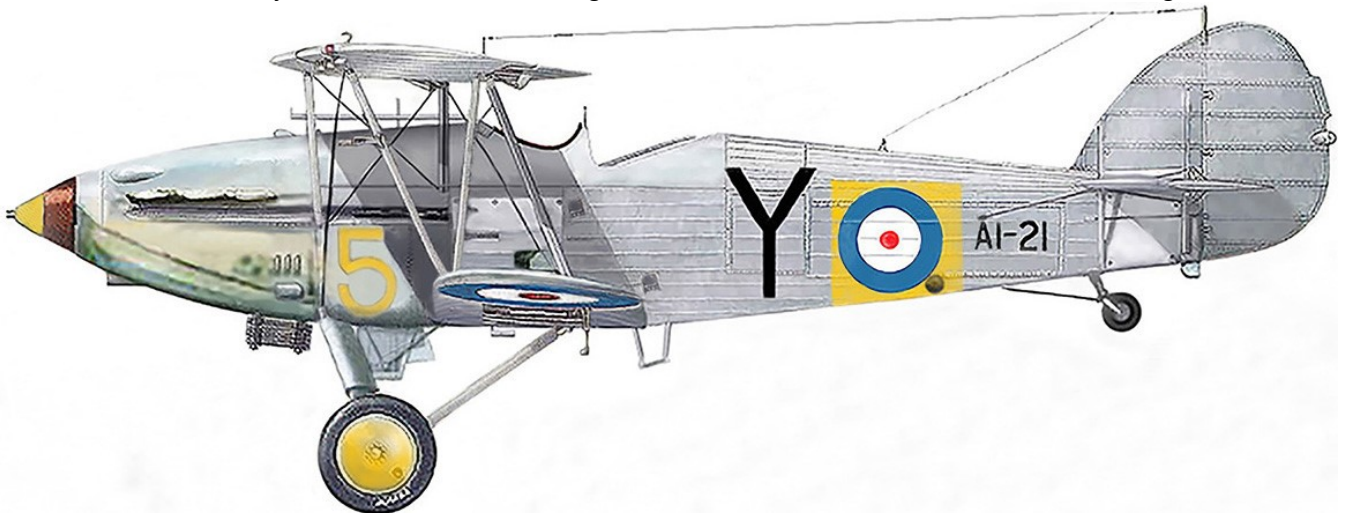
The original monochrome image shows a difference in tone of the *Blue* in the roundels – more than could be expected with lighting/shadowing conditions. The fuselage appears *light blue*, the upper mainplanes *dark blue*, which may have occurred with ongoing refurbishing, repair or modification.

This style of markings **changed at 1SFTS later in 1940**: the ‘Y’ squadron code for 1SFTS was dropped; there were no more **training numbers** in this forward fuselage format – instead, the ‘last two’ of the aircraft serial number was marked in *Black* immediately in front of the fuselage roundel; the *Yellow* trainer band would completely wrap the fuselage at the roundel, as well as on top of the upper mainplane and below the lower mainplane at mid-span.



[Colourised from RAAF image]

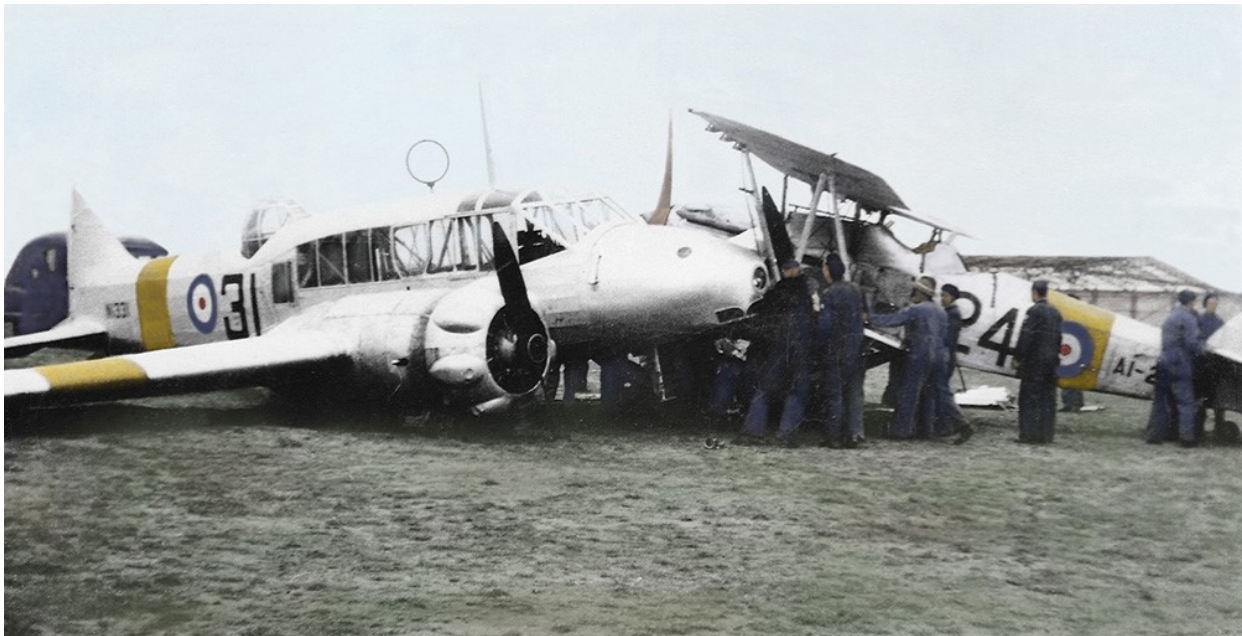
**SEP 1940 – A1-21 with 1SFTS “Yellow 5” ATS training number, still with 1939 1SFTS ‘Y’ code, and partial trainer band**  
In MAY 1940 A1-21 had joined 1SFTS ITS, before being transferred into 1SFTS ATS in JUN 1940 – this damage is SEP 1940.



The dark mark at the roundel’s 5 o’clock is CG ballast weights on a shaft through the fuselage if the rear cockpit is empty

**A1-24 shows the late 1940 revised 1SFTS markings.** The date of the image is **21 JAN 1941**, after a ground collision with Anson N1331 at Point Cook, the E/E.88 recording as: “*Collided with N1331. Lower port mainplane spar broken.*” In OCT 1940, 1SFTS aircraft had the SEP 1939 squadron ‘Y’ code letter deleted. *Yellow* trainer bands were 36” wide around the fuselage at the roundel, and on top of the upper mainplane and below the lower mainplane at mid-span. The earlier coloured training number marked on the forward fuselage (distinguishing ITS and ATS) had been replaced by a ‘last two’ of the serial number in large *Black* numbers ahead of the fuselage roundel. *Yellow* trainer bands had been formalised by policy **AGI No. C.11 Issue 3 in OCT 1940**, which specified the trainer scheme ‘E.2’ as not being overall *Yellow*, but with **36” Yellow trainer bands**. Note how in the image below from the orthochromatic film make the *Yellow* trainer bands on both Anson and Demon appear a dark shade.

**A1-24**, a ‘dual’, was converted like many Demons from SEP 1939 at 1AD. In JAN 1940 A1-24 was assigned to 1SFTS ITS – where many dual Demons were required for trainee pilot conversions – and then transferred across to ATS in AUG 1940, before this accident in JAN 1941. By this stage, there was some level of stability in 1SFTS trainer markings (as much as possible anyway in wartime) – National Markings had returned to *red-white-blue*, large *Black* training numbers (typically ‘last two’) were immediately forward of the fuselage roundel, and *Yellow* trainer bands were around the fuselage (and mainplanes), here on the Demon being applied at the roundel (and later would move further aft).



[Colourised from image from Peter Malone Collection]

**JAN 1941 – Dual A1-24 with 36” Yellow trainer bands and 1SFTS ‘last two’ training numbers ahead of fuselage roundel**

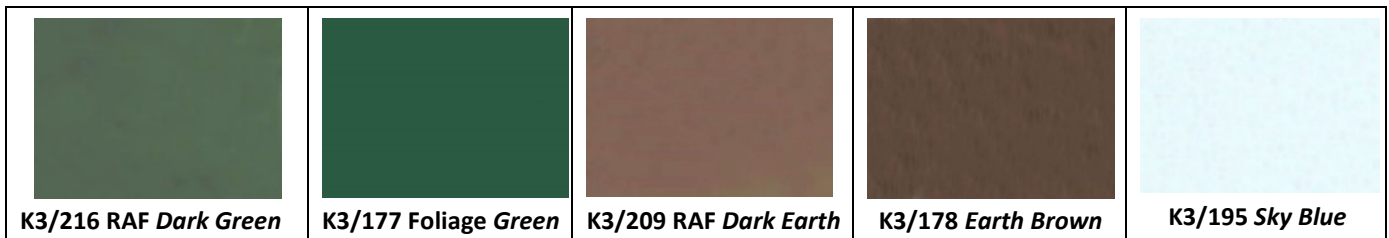
To accommodate the full use of *Yellow* trainer bands wrapping around the fuselage and mainplanes when sufficient supplies of *Yellow* dope did become available in late 1940, it was probable that underwing serial numbers were discarded.



## WARTIME RAAF CAMOUFLAGE 1939

**National Markings.** As War arrived, colours changed virtually overnight for the RAAF’s ‘service’ aircraft. First, roundels were toned-down to *Red/Blue* at the end of 1939, and camouflage replaced the *Aluminium* – introduced by the **AGI No. C.11 of 22 SEP 1939** (the first RAAF policy on markings), which specified the ‘service’ Demon was to be in “Scheme 1” camouflage per RAAF **Drawing A-1732**<sup>115</sup> – perhaps this was reprint of the 1939 RAF Air Ministry Diagram **A.D.1162 for ‘Single Engined Biplane Fighters’**. The AGI also specified the use of *Red/Blue* roundels (for the fuselage and upper surfaces) and *Red/White/Blue* below the mainplanes, with assigned single code letters to designated units (e.g. ‘A’ to 1SQN, ‘B’ to 2SQN etc). But by 1940 it was determined that the *Red/Blue* roundels on camouflage were too difficult to see, and CAS himself determined – like the RAF had done – to re-introduce *White* to the fuselage roundel, and the RAAF did over APR-MAY 1940.

**Camouflage Colours.** Across the whole RAAF, by **JUL 1940** camouflage had been applied and was being confirmed by the units to RAAFHQ. But where the RAAF did depart from RAF policy was with undersurface colours on operational aircraft – the RAF used *Sky*, or “duck-egg blue” for the European haze, but *Sky Blue* (K3/195) was adopted here, as the richer blue was required for the Australian clearer and brighter atmosphere. On imported aircraft from the UK, the overland *Temperate Land Scheme* camouflage in 1939 were the RAF colours *Dark Green* (DG) and *Dark Earth* (DE), with *Red* and *Blue* identification colours in *dull* colours.<sup>116</sup> RAF colours were identified by the name, but for inventory had stock numbers which varied with the amount that was ordered.<sup>117</sup> The RAF colours shown below are designated by their RAAF Ident Numbers. From 1941, the darker RAAF camouflage colours were replacing the lighter RAF colours – *Foliage Green* (K3/177) with a blueish hue, and *Earth Brown* (K3/178) with a more “chocolatey” shade of brown. While the RAF preferred *Yellow* (which was RAAF K3/185) on undersides of trainers, this was not always the case in the RAAF. Target-towers from 1941 had *Yellow/Black* striped undersides, while other camouflaged Demons serving into 1942-1943 appear to have had *Sky Blue* (K3/195) undersides at 3BAGS.



**1940 RAAF unique camouflage colours introduced for RAF Temperate Land Scheme (TLS)**

**Camouflage Patterns.** The RAAF adopted the RAF Air Diagram patterns for aircraft, these having been introduced in Britain as ‘A’ and ‘B’ “mirror” – or “handed” – schemes in 1937 as a guide to disruptive camouflage.<sup>118</sup> The RAF cancelled the requirement for mirror schemes in JAN 1941, and manufacturers then selected only one pattern as standard, with most manufacturers selecting the ‘A’ pattern, but with a **proviso**:

- For the Demon in the RAF, from 1938 A.D.1162 was the approved pattern.

- But irrespective of A.D.1162 ‘A’ or ‘B’, the **common theme** appears to have been for *green/brown* demarcation to ‘*slope forward on the port fuselage, and slope aft on the starboard*’ pattern was adopted (but records do not appear to have survived to determine whether this was the ‘A’ pattern, which it apparently was, or the ‘B’ pattern). This ‘*sloping forward*’ appears to be the case in the RAAF, and no documents survive that specify which “handed” scheme was to be applied.

- The RAF made several changes in camouflage policy in 1941 – “mirror” schemes were discontinued from JAN 1941, and in JUL 1941 the plethora of camouflage patterns was compressed into only five schemes.

- The AGI C.11 *Issue 4* in JUL 1942 specified that ‘second line aircraft’ were to have *Sky Blue* (K3/195) undersurfaces, and trainers *Yellow* (K3/185) undersurfaces – Demon target-towers had *Yellow/Black* striped undersides since 1940, and any camouflaged aircraft at 3BAGS over 1942-1943 probably had *Sky Blue* undersides.

**Trainer Bands.** In MAR 1940, reference is made by RAAFHQ Director of Technical Services (DTS) to AMOE regarding “**Yellow bands**” which were to be painted on training aircraft around the fuselage and wings. This was a carryover from the RAF by using *Yellow* markings on trainers, and bands around the fuselage and mainplanes had been used at 1FTS Point Cook on Avro Cadets introduced by **Amendment List No.5 (A/L 5)** to this AGI in JAN 1940 as an interim marking.<sup>119</sup> It was noted that this had not been done to date as supplies of *Yellow* paint had not been obtained.<sup>120</sup> The OCT 1940 AGI C.11 *Issue 3* then stipulated two training schemes: **Scheme E.1** was to be the *permanent* scheme for training aircraft, with the entire airframe to be finished in *Yellow*; and **Scheme E.2** as an *interim* finish

comprising “a **Yellow band three feet in width**” around the fuselage and around the mainplanes.<sup>121</sup> On some aircraft which were classified as “service” types, these 36” E.2 trainer bands were preferable to an overall *Yellow* airframe, so as aircraft could be rotated through operational units requiring reversion to a camouflage finish. The AGI C.11 *Issue 4* of JUL 1942 then formalised some of the earlier decisions that had been discussed, inter alia *Foliage Green/Earth Brown* upper surfaces and *Sky Blue* lower surface, and the 36” *Yellow* band around the fuselage and wings.<sup>122</sup>



[Colourised from *adf-serials*]

### **3BAGS Battles at West Sale MAR 1943 with *Yellow* training numbers**

3BAGS – which operated the Demon over 1942 into the first half of 1943 – showed markings similar to, but not always consistent with, other advanced EATS training schools or OTUs. There are no *Yellow* trainer bands, and the *Yellow* training numbers here are aft of the fuselage roundel. Shown here on 26 MAR 1943 are **L5763/63, L5754/54, 1OTU L5659/59, L5727/27, L5124/24**; L5659 appears to be wearing *Grey* ‘59’ codes visiting from nearby 1OTU East Sale, while the rest have 3BAGS *Yellow* codes.

**Training Numbers.** RAAF AGI C.11 *Issue 3* in OCT 1940 had covered: “training aircraft are to have the last two numbers of their identification numbers painted on both sides of the fuselage forward of the national markings”. Numbers were to be *Black* on E.1 *Yellow* or *Aluminium* finishes, and *Yellow* on camouflage. *Issue 4* of the AGI of JUL 1942, specified that training numbers were to be marked in *Medium Sea Grey (MSG)* – but over 1942/43, training numbers on various trainers varied from *Yellow, White* to *Medium Sea Grey*.



[Colourised from image from Peter Malone Collection]

### **A1-27 of 1SFTS airborne near Point Cook, c1941/42**

**Bringing it all together** – A1-27 was ex-3SQN, camouflaged at Richmond, then delivered to 1SFTS in JUL 1940. This is post APR 1940, so M2 (type-A) roundels in all positions, *Medium Sea Grey* serial numbers. At 1SFTS/ATS, 36” *Yellow* trainer bands with the *Yellow* ‘27’ training numbers added over late 1940, and it is believed A1-27 operated at Point Cook in this scheme until early 1942. In MAR 1942, A1-27 (with many other Demons) was transferred to 3BAGS at West Sale, crashing on 7 JUL 1942 and being converted to components. A similar scheme is shown later for A1-61 with 1SFTS, but carrying *White* training numbers.

## RAF AIR DIAGRAM CAMOUFLAGE SCHEMES

Aircraft Design Memorandum No.332 (Issue 3) of 15 NOV 1940<sup>123</sup> listed the RAF Air Diagram (A.D.) numbers for camouflage schemes for the different types of aircraft. The design of camouflage or other external colours scheme were to be in accordance with the appropriate A.D. The first three camouflage drawings were prepared in JUN 1936.<sup>124</sup> RAF Gloster Gladiators were camouflaged from 1938. Shown below are RAAF examples that were subsequently added from RAAFHQ messages SAS.9984 (DTS 368/41) in DEC 1941 (DC-2, Anson, Wirraway, Battle), then additionally SAS.7396 (DTS 280/42) in JUN 1942 (Hudson and B-17).<sup>125</sup> This final list was consolidated for all types by the AGI C.11 (*Issue 4*) in JUL 1942.<sup>126</sup> However, there was still a shortage of the drawings in Australia, and the AGI directed that some aircraft should use the closest drawing available. RAAF camouflage was added to Demons from SEP 1939, although not previously used, the appropriate drawing should have been **A.D.1162 (Single-engined biplanes – army co-op, fighters)** – but the 1939 AGI C.11 referred to A-1732 for the Demon.<sup>127</sup> The first reference to an A.D. in RAAF documentation was the Seagull's A.D.1174 in DEC 1939.<sup>128</sup> Some A.D. schemes were similar.

Air Diagram No.	Types of Aircraft	RAAF Examples
A.D.1157	JUN 1936. Twin-engined monoplanes – bombers, general reconnaissance, transports (span 75' and over)	Douglas DC-2, DC-3
A.D.1158	JUN 1936. Cancelled, and included in A.D.1160	
A.D.1159	JUN 1936. Twin-engined monoplanes – bombers, general reconnaissance, transports, army co-op aircraft (span less than 75')	Anson, Hudson, Beaufort, <sup>129</sup> Beaufighter
A.D.1160	MAR 1937. Single-engined monoplanes – army co-op aircraft, fighters	Wirraway, Battle, Hurricane <sup>130</sup>
A.D.1161	c 1938. Four-engined monoplanes – bombers, GR, transports	B-17 Fortress
<b>A.D.1162</b>	<b>c 1938. Single-engined biplanes – army co-op aircraft, fighters</b>	<b>Demon</b>



RAF Gloster Gladiator in 1939 in A.D.1162 – apparently 'A' Scheme

[du Plessis WWII Colour Collection]

A.D.1163	FEB 1939. Four-engined monoplanes – general reconnaissance (flying boats)	
A.D.1164	FEB 1939. Twin-engined monoplanes – general reconnaissance (flying boats)	Catalina
A.D.1165	FEB 1939. Twin-engined biplanes – general reconnaissance (flying boats)	Seagull V [prior to A.D.1174]
A.D.1166	FEB 1939. Twin-engined biplanes (sesquiplane) – GR (flying boat)	
A.D.1167	Single-engined monoplanes – communications aeroplanes, trainers	Wackett
A.D.1168	Twin-engined monoplanes – communications aeroplanes, trainers	Oxford
A.D.1169	SEP 1939. Single-engined biplanes – communications aeroplanes, trainers	Tiger Moth
A.D.1170	Single-engined monoplanes – target towing	
A.D.1171	FEB 1939. Single-engined biplanes – target, pilotless aeroplanes	
A.D.1172	Single-engined biplanes – Fleet Air Arm	
A.D.1173	Single-engined monoplanes – Fleet Air Arm	
A.D.1174	MAR 1939. Single-engined biplanes – general reconnaissance, FAA	Seagull V [A.D.1162 similar]
A.D.1175	Twin-engined biplanes – communications aeroplanes, trainers	
A.D.1176	Cancelled, and included in A.D.1159	
A.D.1291	Four-engined biplanes – communications aeroplanes, replaced A.D.1177	D.H.86

**"Mirror" and "Shadow Compensating"**. Where the Air Diagram showed two variations of the scheme, being **"mirror"** images of one another, the variations had been allocated to aircraft as directed in the manufacturers' contract instructions: this instruction was discontinued in **JAN 1941**. In addition, biplanes had a **"compensating scheme"** with lighter camouflage shades for the areas in shadow from the wings: this instruction was discontinued by the RAF in **DEC 1940**. When the first RAAF Demons were hurriedly camouflaged (3SQN in SEP 1939), probably neither of these provisos would have been followed.



## “Mirror” Schemes

In **JAN 1941**, the complex ‘A’ and ‘B’ alternating patterns – of this long list of 20-odd schemes introduced progressively from 1936-37 – was discontinued, whereby camouflage patterns were rationalised, and each manufacturer standardised on just one scheme, some on ‘A’ pattern, some on ‘B’. However, it appears that the overall policy was to use the *pattern that sloped forward* on the port side and *sloped aft* on the starboard side (e.g. typically the ‘A’ pattern for the Spitfire, but sometimes was the ‘B’ pattern, for the Oxford and Battle). When a manufacturer standardised on just the one scheme in JAN 1941, this was determined by – using our simple terminology – the fuselage pattern with the demarcation between upper disruptive colours as “sloping forward from the top on the port side”, or “sloping aft from the top on the starboard side”.

This simplification has hopefully provided an understandable description of each pattern, which has helped in researching post-1941 RAAF camouflage – i.e. new schemes **all sloped forward from** the top on the port side, *sloping aft* from the top on the starboard side. Most of these had been designated ‘A’ pattern, but a few had been the ‘B’,<sup>131</sup> and when only one pattern became standard, the overriding requirement was for the pattern to *slope forward* on the port side. To clarify the way ahead in RAAF for the camouflage, we will continue with this simplistic description of all future patterns *sloping forward on the port side*, as this appears to have been the determinant.

- The Anson retained the ‘A’ pattern (A.D.1159), maintaining this through to the major RAAF AGI changes in 1944.
- The Spitfire (A.D.1160) ‘A’ pattern that on the port side *sloped forward* was retained by the RAF beyond 1941; **but** confusingly, the Battle (again A.D.1160) had the ‘B’ pattern that on the port side *sloped forward*, and this was retained by the RAAF beyond 1941 until the major 1944 AGI changes. (The Kittyhawk was an exception, it should have complied with A.D.1160, but had a single scheme with port demarcation *sloping aft*.<sup>132</sup>)
- For the Oxford (A.D.1168), it was the ‘B’ port *sloping forward* pattern that was retained.
- By the time the Wackett was camouflaged from the beginning of 1942 (in A.D.1167), *sloping forward* was the only scheme then required. Therefore, it was apparently not decreed that the ‘A’ or ‘B’ pattern was to be retained in the RAAF, it was simply that scheme that ***sloped forward on the port side that became the RAAF standard***. This is obvious in the case, for example, of Douglas DB-7/A-20 Boston deliveries from 1942.<sup>133</sup>

Several art patterns for single-engined biplanes have been offered over the years by interpretations of these camouflage patterns for the RAF Demon, Fury, Hart and Audax (which should have all been the same, but these artworks differ). Also different interpretations are offered by the model decal producers. AHCB has produced several camouflaged RAAF Demon drawings, derived from blurred monochrome imagery without clear demarcations, and these determinations of Demon camouflage has been stated as being “mostly AHCB’s invention”.<sup>134</sup> Without the official A.D.1162 technical diagram, the clearest imagery available has been used to develop the RAAF Demon camouflage A.D.1162, sources include other RAF biplane fighter imagery which would have been in A.D.1162. Note that this pattern was similar to, but not the same as, other A.D. patterns – A.D.1159, A.D.1160, A.D.1169 and A.D.1174.

Firmer guidance came when RAF camouflage policy was simplified in **JUL 1941**, reducing the requirement to just five approved patterns. This came with the RAF AMO A.513/41 to ensure standardisation, stipulating: “A series of **five patterns** has been prepared defining the various camouflage and colouring schemes. They are applicable to all aircraft irrespective of the peculiarities of each type.”<sup>135</sup>

## Shadow Compensating Scheme

In the RAF, many biplanes – Furies, Gauntlets and Gladiators – were camouflaged during or just before the SEP 1938 Munich crisis, with apparent disregard of the shadow compensation scheme requirement for four colours. RAF biplanes appeared in only the basic *Dark Green/Dark Earth* colours, which was probably due to time restraints.<sup>136</sup> By **DEC 1940**, with issue in the RAF of AMO A.926/40, there was officially no shadow scheme: “The upper surfaces of the lower wing of biplanes are treated as upper surfaces.”<sup>137</sup> Therefore, the four-colour compensating scheme had been discontinued.

When RAAF aircraft were hurriedly camouflaged by the **AGI C.11 of SEP 1939**,<sup>138</sup> apparently the refinements of “mirror” and “shadow compensating” camouflage were not necessarily enforced. In JAN 1940, after a query from the newly-formed 12SQN, RAAFHQ informed the unit: “Schemes A and B are alternative and handed. Adoption is at discretion of Commanding Officer.”<sup>139</sup> Such a choice simplified implementation. In the RAAF, the lighter shadow compensating shades (*Light Green* and *Light Earth*) were not changed on the aircraft drawings by DTS until AUG 1942 to *Foliage Green K3/177* and *Earth Brown K3/178*,<sup>140</sup> and were subsequently deleted from the RAAF stores vocabulary.

## RAF AIR DIAGRAM A.D.1162 CAMOUFLAGE

As stated, Aircraft Design Memorandum No.332 (*Issue 3*) of 15 NOV 1940, listed the Air Diagram numbers for camouflage schemes for the different types of RAF aircraft, which also applied to RAAF types, with the design of camouflage or other external markings to be in accordance with the appropriate A.D. The first three camouflage drawings A.D.1157 to A.D.1159 were prepared in JUN 1936, and later RAF Gloster Gladiators were camouflaged from 1938 to the appropriate new drawing **A.D.1162 (Single-engined biplanes – army co-op, fighters)**. When camouflage was added to RAAF Demons from SEP 1939, this was the pattern that should have been used – but no surviving official technical copies or references to A.D.1162 have been located.

However, analysis of imagery that does survive shows camouflaged RAAF Demons and RAF single-engined biplanes (Gladiators, Gauntlets and the Hawker fighters), and RAAF Demons did evidently comply to this A.D.





*[du Plessis WWII Colour Collection]*

**RAF Gladiators in JUL 1938 in A.D.1162 – the first two are apparently ‘A’ scheme, the third in “mirror” ‘B’ scheme**

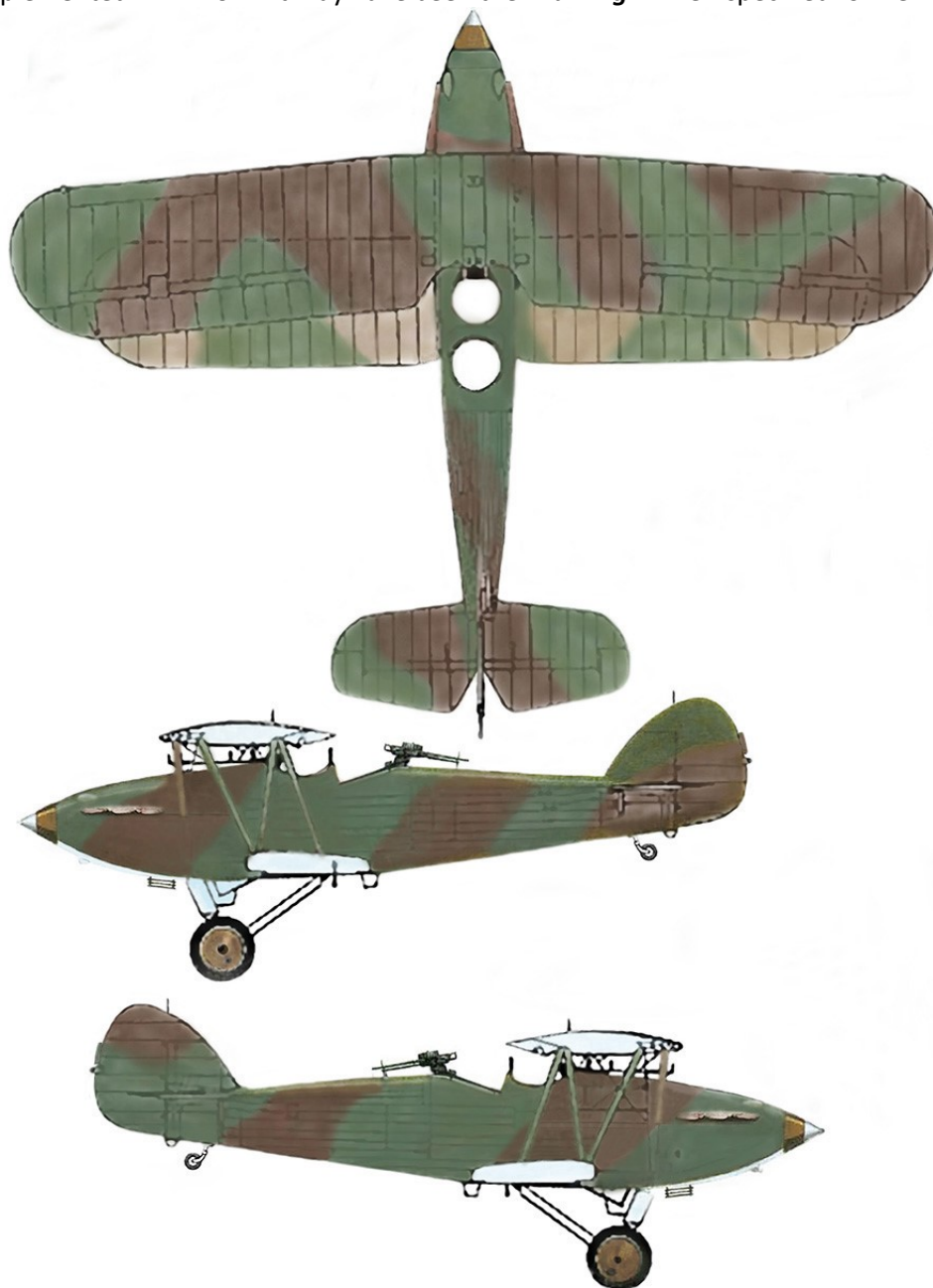
The front two have port side camouflage sloping forward (which is assumed to be ‘A’ scheme but no documentation survives to confirm this), and the rear aircraft has the port camouflage “mirror” sloping aft (therefore assumed as ‘B’). This image is useful as it also shows the camouflage on the upper mainplane (patterns reproduced below), and no lower shadow compensation. There appears to be a similarity between A.D.1162 and A.D.1160 (Single-engined monoplanes – army-coop, fighters).

### A.D.1162 CAMOUFLAGE – ‘A’ & ‘B’ EXAMPLES

Gloster Gladiator	Hawker Fury
<div style="text-align: center;">  </div> <p style="text-align: center; margin-top: 5px;">Upper assessed as ‘A’ scheme, ‘B’ scheme lower</p>	<div style="text-align: center;">  </div>
<p><b>Imagery of the “mirror” ‘A’ and ‘B’ top planes of 3SQN RAF Gladiators, MAY 1939.</b> These A.D.1162 patterns should have been adopted by RAAF Demons when camouflaged from 1939. Imagery suggests all RAAF Demons had <b>port side fuselage sloping forward</b> pattern – i.e. assumed to be the A.D.1162 ‘A’ scheme. In the RAF in JAN 1941, ‘A’ and ‘B’ “mirror” patterns of the long list of 20-odd A.D. schemes were discontinued.</p>	<p><b>Hawker Furies of 43SQN RAF 1939</b> <i>[colourised from Goulding &amp; Jones, p.118]</i> The first Fury is A.D.1162 ‘B’ scheme, the second is ‘A’ scheme (i.e. the probable scheme of RAAF Demons), the third ‘B’, and the fourth ‘A’, a useful comparison. The lower mainplane camouflage appears the same as the upper – perhaps compensation was no longer being used. By the 1938 Munich Crisis, RAF overwing roundels had been removed.</p>

## RAF AIR DIAGRAM A.D.1162 CAMOUFLAGE

To develop this pattern, known data points of the standardised fighter biplane A.D.1162 have been used.<sup>141</sup> While RAAF Demon imagery is a primary reference, often it is not clear. Fortunately, there exists RAF colour fighter biplane imagery, which is relevant if applied on the UK home front (where the appropriate A.D. would have been properly adhered to from 1938), but not necessarily if applied in far-flung Middle East or Khyber Pass outposts. This interpretation of the A.D.1162 scheme shows the more prevalent scheme, assumed to be 'A' pattern. Unconfirmed is when the RAAF implemented **A.D.1162** – it may have been the **Drawing A-1732** specified for Demons in the 1939 AGI.

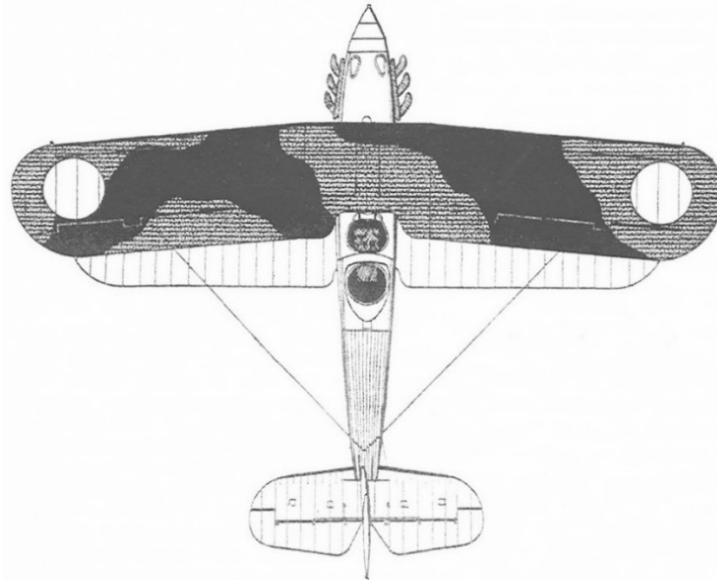


**Explanation of how this template is derived** – No surviving tech drawings of A.D.1162 have been found, and these series of official Air Diagrams (A.D.) drawings were used in the past for interpreting monochrome images. The best source of research has been contemporary imagery of aircraft camouflaged from 1938 in **A.D.1162 (Single-engined biplanes – army co-op, fighters)**. RAF Gladiators are the most numerous in this scheme, together with a few RAAF Demon images, however the upper camouflage demarcation of the latter is often not clear. This diagram is validated against some examples of RAF Gladiators and Furies, and the better RAAF Demon images showing camouflage: target-tower **A1-1** c1940 with camouflaged uppers and *Yellow/Black* TT lower surfaces, and faded **A1-11 Dirty Dora** later in the war in 1943 at Richmond.<sup>142</sup> The plan view I have shown above has the lighter “shadow compensation” colours **only for clarity**. In reality, in 1939 for simplicity and speed of application, *shadowing* appears not to have been used by 3SQN, and similarly undersides may have been left as *Aluminium*. As *shadowing* was discontinued from 1940, it would not have been relevant to any further RAAF camouflaged aircraft.

## RAAF DRAWING A-1732 CAMOUFLAGE

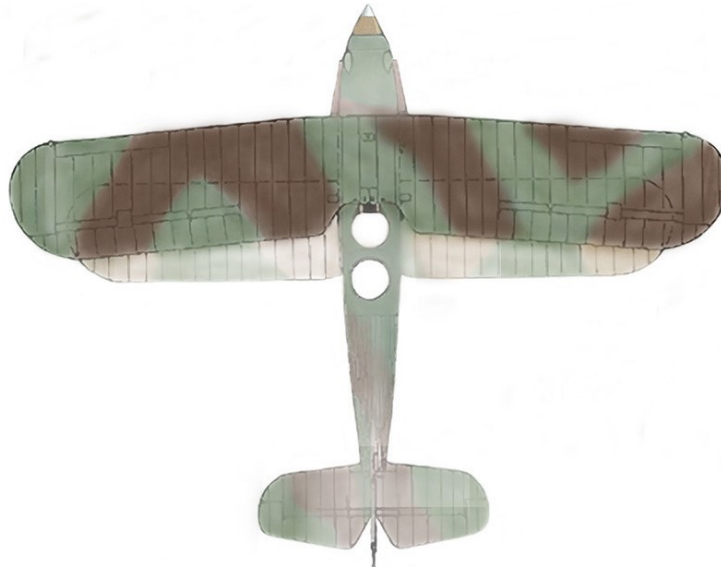
Now for drawing the long bow. The first RAAF policy into camouflage and markings was **Aircraft General Instruction No.C.11 Technical Order** (AGI C.11), of SEP 1939. This specified a 'Scheme No.1' for the Demon as RAAF **Drawing Number A-1732**.<sup>143</sup> No documentation survives to show what A-1732 may have been.

AHCB 67 gives a monochrome pattern, derived from a photograph, of the top plane of an assessment of A-1732, reproduced below which AHCB calls "**A glimpse of A-1732?**", also warning that drawings of 3SQN camouflaged Demon A1-30 as: "*the camouflage design shown in this drawing is mostly AHCB's invention*". AHCB has also referred to RAAF drawing A-1813 for single-engined biplanes possibly adapted from A.D.1162 or from A.D.1174 "Single Engine Biplanes (GR – FAA)" – note that both A.D.s do show a similar camouflage pattern;<sup>144</sup> furthermore the SEP 1939 AGI specifies **A-1813 for the Seagull and RAAF documentation of DEC 1939 refers to this as A.D.1174**. As the A.D.1174 pattern was similar to A.D.1162, it is therefore probable that A-1813 was similar to A-1732.



**AHCB interpretation of RAAF Drawing A-1732** [image from AHCB 67, p.9]

There is some similarity (if you squint !!) with my A.D.1162 'A' pattern of the general flow of the colours, although of course with minor differences. But we are probably getting closer with the A-1732 / A.D.1162 dilemma.

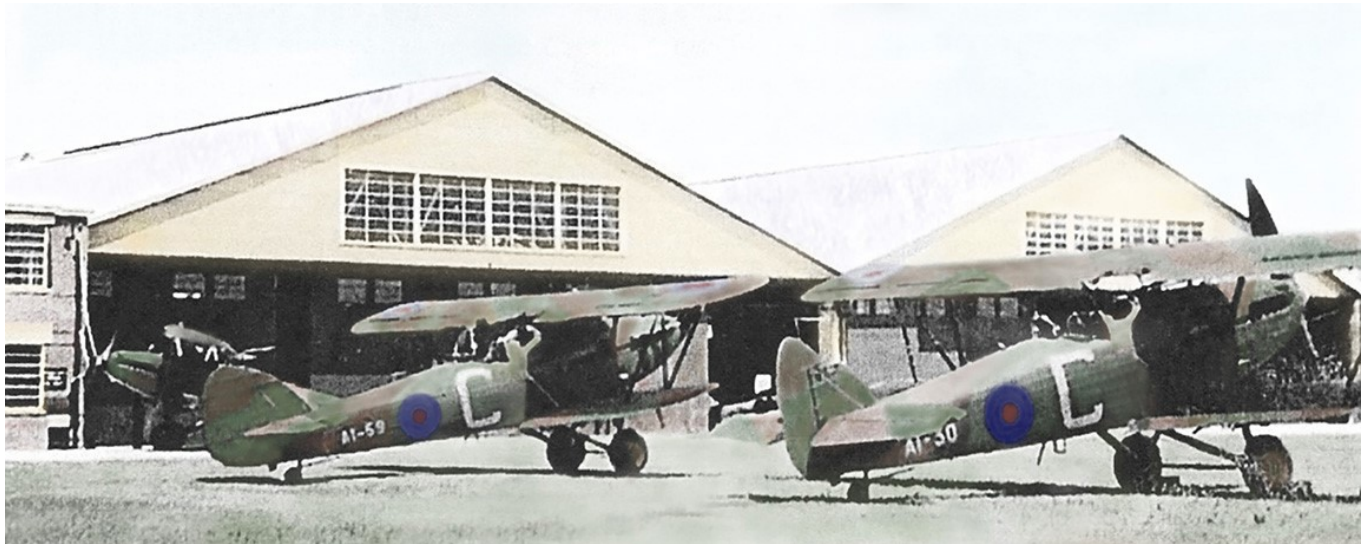


**Comparison with my RAF A.D.1162**

With the general similarity of AHCB's interpretation of A-1732 and mine of A.D.1162, I suggest that Australia's first attempt at camouflage diagram A-1732 was largely adapted from A.D.1162, itself being similar to the other A.D.s. Probably the RAAFHQ area responsible for camouflage and markings policy (Directorate of Technical Services, DTS) had no expertise in designing camouflage patterns from scratch, but merely copied them from other drawings. (As an example of this lack of ability, DTS issued the out-of-date A-5524 drawings for years with minimal changes to obsolete aircraft.) Designing a whole new pattern in 1939 – for the first time – was probably beyond the capability of DTS.

## WARTIME CAMOUFLAGED DEMON – A1-59 3SQN 1940

**3SQN** had formed on 1 JUL 1925 at Point Cook, but moved soon after to Richmond NSW. 3SQN consisted of three flights: an Army Co-Operation (equipped with D.H.9s), one with S.E.5a fighters, and a bomber flight with D.H.9As. During 1929, the unit was re-equipped with the Wapiti, and in 1935 it received its first Hawker Demon. At the outbreak of hostilities in SEP 1939, 3SQN had 12 serviceable Demons – **A1-26, A1-27, A1-30, A1-31, A1-39, A1-41, A1-43, A1-44, A1-50, A1-57, A1-61, A1-62 and A1-63**; **A1-59** was added a week later as replacement for A1-39 and A1-41 which went to 1AD for overhaul. On 28 FEB 1940 the Australian Government decided that for national and training reasons the 6th Australian Division, 2nd AIF, should have an army co-operation squadron. By APR 1940, 3SQN still had five Demons left to be camouflaged, and RAAFHQ directed that this was no longer required.<sup>145</sup> In JUL 1940, 21 3SQN officers and 271 airmen (most of whom were permanent members but with some CAF and wartime volunteers) sailed from Sydney, and on 23 AUG arrived at Suez, Egypt.<sup>146</sup>



[Colourised from RAAF image]

### Demons A1-59 and A1-30 at Richmond in late 1939

In the haste following the SEP 1939 directive to camouflage aircraft in A-1732 (which was probably A.D.1162 'A' pattern for all aircraft), 3SQN did so, and apparently left undersides *Aluminium*. As there had not been a previous requirement for Demon fin flashes, marking these would not have been considered.



### A1-59 in the 1939 A.D.1162 'A' pattern *green/brown* camouflage, with the 1939 AGI 'C' code for 3SQN

M.1 roundels on fuselage and upper mainplanes, M.2 on the undersides. Colours were the Australian *Camouflage Green* and *Camouflage Brown* which soon were renamed *Foliage Green* and *Earth Brown*. Undersurfaces were evidently left in *Aluminium*, with the prewar underwing serial numbers in *Black* (assessed by Ian Baker in AHCB 67). The wheel hubs on the camouflaged aircraft were probably *brown*. The interplane struts were the colour from which "they sprang",<sup>147</sup> i.e. if from *green* on the lower mainplane as for this A.D. pattern, they would be *green*. Code letter 'C' and aircraft serial number were in *grey*, later re-termed as *Medium Sea Grey*.

## ARMAMENT TRAINING STATION (ATS) – 1939-1941

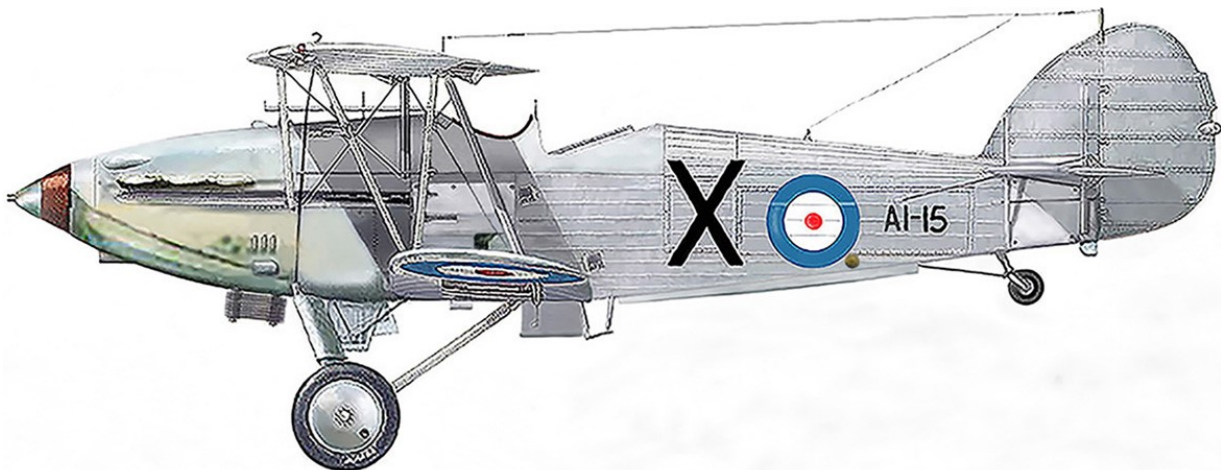
**No.1 Armament Training Station** (sometimes incorrectly referred to as Armament Training School) was established at Laverton on 26 JUL 1939, and moved to **Cressy VIC** at the end of the month, under FLTLT 'Archie' Tindal (later the Tindal airbase at Katherine in NT would be named in his honour). Three aircraft were allocated initially – two Demons **A1-15** and **A1-17** for target towing, and a Cadet A6-25 for communications.<sup>148</sup> The RAAFHQ AGI C.11 of SEP 1939 referred to both No.1ATS and also "No.2ATS" both being allocated the aircraft code letter "X" – a step towards further expansion, but 2ATS was never formed. By OCT 1939, four Demons (**A1-7**, **A1-15**, **A1-17** and **A1-19**) were on strength with the Cadet, and participating with the gunnery training of Air Observer courses. **A1-1** was with 1ATS from FEB 1940 until APR 1942 – A1-1, A1-15 and A1-17 are the only aircraft confirmed to have been fitted with TT banner panniers and winch box. Training also then concentrated on gunnery training in 1940 of active squadrons (2, 6, 3, 1, 22, 21, 23) and 1SFTS trainees over AUG-SEP 1940 as units cycled through Cressy for their "annual armament training". **A1-48**, a dual Demon, was briefly on strength from 1SFTS ITS over OCT-DEC 1940.

By FEB 1941, to mark some permanency of the base, two Bellman hangars had been delivered<sup>149</sup> – by MAR 1941 a further three Bellmans (Hangar Numbers 28-32, in all) were approved,<sup>150</sup> and by AUG 1941 **A1-53**, **A1-55** and **A1-57** were also on strength. However, in APR 1942 1ATS was disbanded, personnel were merged into General Reconnaissance School (GRS) at the base. Then over MAR 1942 to FEB 1943, a small detachment of Demons was maintained at "**Armament School**" at **Hamilton VIC** for training in support of 1SFTS – Demons operated here included **A1-23**, **A1-35**, **A1-53**, while **A1-1** was transferred to 7SQN at Bairnsdale. (The main RAAF gunnery role was assumed by Central Gunnery School (CGS) at Sale in JUN 1942, which moved to Williamtown in JUL, and then to Mildura in NOV 1942. It was not until 28 JUL 1943 that CGS moved to Cressy.<sup>151</sup>)



[from Peter Malone Collection]

**A1-15** an original 1ATS Demon TT with ventral flag pannier and winch from JUL 1939, was joined here by **A1-1** in FEB 1940



The 'X' code had been allocated to 1ATS as a "squadron letter" in SEP 1939 by the AGI C.11.<sup>152</sup> Fuselage roundels remained the M.2 (type-A) Red-White-Blue in six positions, until Red was eliminated from all RAAF aircraft markings in SEP 1942.

## 1 ARMAMENT TRAINING STATION – 1941-1942

**No.1 Armament Training Station** moved to **Cressy VIC**, at the end of JUL 1939, with three aircraft Demons **A1-15** and **A1-17** for target towing, and a Cadet A6-25 for communications. By OCT 1939, four Demons had been received (**A1-7, A1-15, A1-17** and **A1-19**), and were joined by **A1-1** (on strength over FEB 1940-APR 1942). A1-1, A1-15 and A1-17 are the only aircraft confirmed to have been fitted with TT panniers and winch box (although **A1-26** is also possible). On 17 JUL 1941 A1-1's wheels became bogged and nosed over, but according to the E/E.88 with no damage to the airframe – but here the mainplane looks a bit mangled. On 20 APR 1942 1ATS was disbanded, and General Reconnaissance School (GRS) with Ansons became the lodger unit at Cressy, and **A1-1** was transferred to **7SQN**. While with 7SQN on 3 JUL 1942, A1-1 had a forced landing incurring damage which required overhaul – so perhaps there is a query here over whether this image is the JUL 1941 or JUL 1942 accident. <sup>153</sup>



[Colourised from RAAF image]

### **A1-1 nose over with 1ATS Cressy JUL 1941**

Apart from 3SQN at Richmond in 1939, one of the first RAAF Demons to be camouflaged in 1941 was A1-1, complete with fin flash (not applied to the 3SQN aircraft at Richmond). In the haste following the SEP 1939 directive to camouflage aircraft (in A.D.1162, and probably 'A' pattern for all aircraft), it is logical that just the one scheme that was applied to all Demons (without the proviso of "mirror" or "shadow compensation"). The *Yellow/Black* TT scheme on the lower fuselage, ventral panner and under the wings comprised 36" wide *Black* stripes on the *Yellow*, and *Black* elevators with *Yellow* horizontal stabilisers. The fin flash for a Demon was unusual, and may have been applied at 1SFTS – it appears to be 24" high, with 10" wide colours and the *Red* slightly wider extending to the fin leading edge.



The target banner (or 'flag') panner was mounted along the bottom of the fuselage, and was painted in TT stripes with the rest of the lower airframe. This panner was mounted aft of the mainplane and immediately ahead of the tailwheel self-centering device. The winch box under the centreline is presumed to be *Aluminium*, but alternatively could have been *Yellow*. The TT stripes joined in a 'V' along the centreline of the fuselage underside. <sup>154</sup>

## WARTIME TRAINER YELLOW DEMON – A1-63 1SFTS 1940-1941

1SFTS at Point Cook over 1940 and 1941 accepted trainees from the various EFTS units to continue their instruction initially in Intermediate Training Squadron, and then in Advanced Training Squadron. The trainer aircraft were Demons (which consolidated the skills for prospective single-seat pilots) and Ansons (for multi-engine training). Soon the Wirraway would equip the single-engined SFTS units, with Oxfords and Ansons for the multi-engine training. The AGI C.11 *Issue 3* of OCT 1940 had specified for training aircraft the schemes 'E.1' (overall *Yellow*) or 'E.2' (an interim scheme with 36" *Yellow* bands). During 1940 there had been insufficient supplies of *Yellow* dope, as noted on a Minute from DCAS to CAS in APR 1940: "Of our present training aircraft...are silver finished. Although existing orders require these to be painted yellow, difficulty in obtaining materials has delayed execution of this order and *nothing has yet been done.*"<sup>155</sup> Accordingly, it was not until into 1941 that those elementary and intermediate trainers in service and required repainting – Demons, Cadets, Gipsy Moths and Ansons – appeared in allover *Yellow*. Still with a mixture of schemes for training aircraft, the MAY 1944 markings policy, **AGI Part 3(C)1**, was a thorough revision to standardise RAAF colours, and the **Appendix E** of this Instruction was more specific in directing allover trainer *Yellow* – although, by this stage of course, the Demon had been retired from service.



[Colourised from adf-serials]

### Dual Demon A1-63 1SFTS ATS in 'E.1' allover *Yellow* 1941

Undercarriage too assumed to be all *Yellow*, as the OCT 1940 AGI C.11 *Issue 3* specified that scheme 'E.1' was "the permanent scheme for training aircraft wherein the entire airframe is finished in yellow".<sup>156</sup> Shortages of *Yellow* dope during 1940 delayed the widespread repainting of RAAF trainers in allover *Yellow* until into 1941. Known all-*Yellow* Demons included **A1-7**, **A1-21**, **A1-35**, **A1-56** as well as **A3-63**. An image of A1-7 flipped on its back in JAN 1941 shows no underwing serials.





## WARTIME CAMOUFLAGED DEMON – A1-61 1SFTS 1941-1942

**1SFTS** at Point Cook over 1940 and 1941 accepted trainees from the various EFTS units to continue their instruction initially in Intermediate Training Squadron, and then in Advanced Training Squadron. Prior to the OCT 1940 AGI C.11 *Issue 3*, which specified for training aircraft the schemes 'E.1' (overall *Yellow*) or 'E.2' (an interim scheme with *Yellow* bands), some Demons had been camouflaged, those of 3SQN being notable examples. A1-61 had served with 3SQN at Richmond from 1937, and as that unit departed for the Middle East, some Demons were transferred to the new 4SQN then forming. With the urgent need for advanced trainers at 1SFTS Point Cook for EATS instruction, A1-61 was sent south to the strength of 1SFTS ATS in JUL 1940. At this stage, training numbers were being applied to Demons of the unit (and in the case of A1-61 were marked forward of the fuselage roundel in *White*). The OCT 1940 AGI C.11 *Issue 3* specified: "training aircraft are to have their last two numbers (one if the number is under ten) of their identification numbers painted on both sides of the fuselage forward of the national markings. The numbers shall conform in size and colour to the code letters laid down in paragraph 2b, note I of this order."<sup>157</sup> Para 2b note (i) had detailed that camouflaged aircraft were to have *Grey* letters/numbers for 'service' aircraft, and *Yellow* for training aircraft in the 'E.2' scheme. The reason why the serial number and training number of A1-61 were marked in *White* (which is quite apparent in the monochrome image) is not known.



[Colourised from adf-serials]

### Demon A1-61 1SFTS ATS in 1941 – camouflaged with *Yellow* trainer bands IAW the OCT 1940 AGI

This OCT 1940 AGI did not specify undersurface colours for the 'E.2' interim scheme, and may have remained *Sky Blue* or *Aluminium* from 3SQN. The undercarriage appears to be all *Yellow* (with original camouflaged brown wheel hubs), the same as for Demons in the allover 'E.1' scheme. While some aircraft *may* have had *Yellow* undersides, it was not until the *Issue 4* of this AGI that formally detailed that for trainers "the undersurfaces of all aircraft are to be camouflaged *Yellow* (K3/185)".<sup>158</sup>



## WARTIME CAMOUFLAGED DEMON – A1-53 3BAGS 1942-1943

On 12 JAN 1942 3BAGS was formed at **West Sale** VIC within 1 (Training) Group, and also formed **53(R)SQN** as part of its Reserve Squadron commitment. This School was to carry out the completion of the training of air gunners with instruction in gunnery, and to train air observers in bombing and gunnery. The first Battle arrived on 2 FEB 1942, and training commenced on 8 MAR with 43 trainees arriving from Mount Gambier. Over MAR/APR 1942, 3BAGS became a major operator of the Demon receiving 14: **A1-4, A1-6, A1-14, A1-18, A1-19, A1-26, A1-27, A1-31, A1-34, A1-37, A1-38, A1-44, A1-46, A1-59**. These were supplemented by **A1-41** in MAY, **A1-16, A1-24** and **A1-42** in JUN, **A1-15** and **A1-17** in SEP from 7SQN, **A1-53** and **A1-60** in OCT, and a late replacement **A1-48** in APR 1943. A series of accidents had greatly reduced Demon strength by OCT 1942, and Demon training tapered off, with the last few aircraft leaving the unit in mid-1943 to be converted into Instructional Airframes (**I/A.13 to I/A.17**) for ATC cadets.



[Colourised from RAAF image]

### A1-53 was with 3BAGS from OCT 1942 until JUL 1943

**A1-53** camouflaged with *Yellow* trainer band and training number "53" – undersides were probably *Sky Blue*, but may have been trainer *Yellow*. Wheel hubs probably *Yellow*. The Pacific national markings would have been added before transfer to West Sale in OCT 1940; the fin flash was probably IAW the RAF AMO A.926/40 of 12 DEC 1940 by being 27" high by 16" wide (i.e. 8" per colour).<sup>159</sup> With the other 3BAGS Demons in JUL 1943, A1-53 was retired to be delivered to 1AD 'Dispersal Area' and converted to components.



3BAGS continued operating until disbandment on 9 DEC 1943 with a strength of 67 Fairey Battles, 24 Ansons and 33 Oxfords<sup>160</sup> At this stage all the RAAF gunnery schools were combined as the **Air Gunnery School (AGS)** to train all air gunners, WAGs and other RAAF personnel in air gunnery. As Oxfords were allotted away, AGS strength at the end of 1943 was 79 Battles and 39 Ansons.<sup>161</sup> AGS ceased to function on 31 DEC 1945 and its aircraft went to storage at the local Care and Maintenance Unit.

## WARTIME CAMOUFLAGED DEMON – A1-11 RICHMOND 1943

**A1-11** was received at Richmond on 8 MAY 1942 as a unit “hack”. The term “hack” is rather disparaging as it did provide useful functions in support of Richmond operations. The Demon flew the regular morning weather reconnaissance patrol, local camouflage inspections, and army-cooperation for AA units. A1-11, which had been converted into a dual in SEP 1939, had supplemented by other Richmond Demons: **A1-48** from FEB-APR 1942 until crashing and to Butler Air Transport for repair; and **A1-61** used by the Parachute Training Unit (PTU), crashing on 21 JAN 1943 at Coolamon satellite strip near Wagga, and written-off. A1-61 was then replaced immediately at PTU Richmond by **A1-37** which was operated until MAY 1943 when it was converted into I/A.20. Meanwhile, A1-11 was supplemented in these tasks by a Moth Minor, Wapiti and Wirraway.

Two camouflaged aircraft are shown here at Richmond in early 1943. While A1-11 is clear in the image, the background aircraft was probably ex-3BAGS **A1-37**. The previous Richmond Demon A1-61 had been with 1SFTS up to MAR 1942 and may possibly have retained its *Yellow* trainer bands for its trials role while at PTU.

- **A1-11 Dirty Dora** was received by Station HQ Richmond in MAY 1942, and flown as a met/weather ship until late 1943; on 14 JAN 1944 it was ferried to Benalla,<sup>162</sup> being the last RAAF Demon to fly and converted into I/A.21.
- The background aircraft **Sloppy Joe** was probably **A1-37** which received at Richmond in JAN 1943 from 3BAGS after a complete overhaul by 1SFTS, and operated by PTU until MAY 1943 when it was converted into I/A.20.



[Colourised from RAAF image]

### Faded A1-11 dual Demon *Dirty Dora*, with probably A1-37 *Sloppy Joe*, at Richmond c early 1943

A.D.1162 ‘A’ pattern appears to be prevalent on camouflaged RAAF Demons. These two aircraft in early 1943 camouflaged with 3:5 ratio *Blue/White* roundels and both with fin flashes – the fin stripes on the rear aircraft appear wider than those on A1-11: A1-11 stripes appear to be 24” high x 16” wide (8” per colour). As they were not specific trainers, both probably had *Sky Blue* undersides.<sup>163</sup> Serial number apparently *Medium Sea Grey*, with the name ‘*Dirty Dora*’ in *White*.



## DEMON INSTRUCTIONAL AIRFRAMES

21 aircraft were converted to Instructional Demons, with most disposed of by 1945. These were used initially for technical training at 1 Engineering School (1ES), Ascot Vale Melbourne, and then from 1943 many going to ATC units.



*[Colourised from AWM 139774]*

### Unidentified I/A Demon, top left, at 1ES Ascot Vale in SEP 1943

**Camouflaged instructional airframes:** D.H.94 Moth Minor in foreground in A.D.1167 with trainer stripes on wings only, no upper roundels (possibly A21-6); two aircraft in scheme A.D.1169 (left is Avro Avian VH-UKD "Instructional Avian No.1" taken over 2 JUL 1940, and right is a D.H.60), the Avian has a fuselage trainer band, the D.H.60 apparently trainer bands on wings only and no upper roundels; a **Hawker Demon (top left) in A.D.1162**, and (at far right) a D.H.82A Tiger Moth in A.D.1169 with no trainer bands; above that is a Battle in A.D.1160. These markings did not represent previous units as they were relatively freshly painted by the trainee surface finishers – and not necessarily IAW extant policy – Avian VH-UKD had been painted as a Moth.

Demon I/A No	Serial	Date	Details
I/A No.1	A1-10	23 JUN 1940	23/10/39 Trg Depot PCK for instruct, 23 JUN 1940 to 1ED, 22 NOV 1940 CTC
I/A No.2	A1-25	23 JUN 1940	1AD, allotted Eng School 19 JAN 1940, I/A.2 held at 1ES, CTC 2 MAY 1945
I/A No.3	A1-30	19 JUN 1940	2AD to 1ES, became I/A.3 28 OCT 1940, auth W/O 29 MAY 46, CTC 26 NOV 47
I/A No.4	A1-13	10 JUN 1940	1AD conversion to dual SEP 1939, to 1AD JUN 1940 as I/A.4, CTC 15 JUL 1942
I/A No.5	A1-50	18 JUN 1940	2AD conversion to I/A.5, to 1ES only to be CTC 20 JUL 1940
I/A No.6	A1-28	19 AUG 40	Apparently to be converted to dual but U/S 2AD 1939, so I/A, CTC 17 OCT 1945
I/A No.7	A1-43	6 NOV 1940	Approved at 1AD 14 OCT 1940 completed 6 NOV, approval CTC 5 APR 1944
I/A No.8	A1-21	8 OCT 1941	1SFTS I/A.8 8 OCT 1941, CTC 13 JUL 1944
I/A No.9	A1-58	8 OCT 1941	1SFTS crashed SEP 1941, I/A.9 8 OCT 1941, CTC 5 JUN 1944
I/A No.10	A1-57	5 MAY 1942	1SFTS issued to Armament School Hamilton as I/A.10, CTC 18 DEC 1942
I/A No.11	n.k.	1942	possibly was A1-20, see below
I/A No.12	A1-55	27 JUL 1942	issued Armament School Hamilton as A/I.12, CTC 7 MAY 1945
I/A No.13	A1-48	16 JUN 1943	3BAGS, issued to 2 Cdt Wg Mascot 25 JUN 1943, CTC 21 MAR 1945
I/A No.14	A1-31	23 JUN 1943	3BAGS, issued to 4 Cdt Wg Point Cook, I/A.14 20 JUL 1943, CTC 3 DEC 1945
I/A No.15	A1-19	16 JUN 1943	3BAGS, issued to 13SQN ATC Warrnambool 25 JUN 1943, CTC 24 JUL 1945
I/A No.16	A1-24	JUL 1943	3BAGS, issued to 10SQN ATC Yallourn 17 AUG 1943, CTC 22 OCT 1946
I/A No.17	A1-6	10 JUL 1943	3BAGS, issued 9SQN ATC Ballarat 10 AUG 1943, CDC to Mines School MAY 1947
I/A No.18	A1-38	16 JUN 1943	7AD 26 JUN 1943, 1 AUG 1943 Recruit Centre Shepparton, CTC 8 JUN 1945
I/A No.19	A1-41	16 JUN 1943	7AD 26 JUN 1943, 1 AUG 1943 Recruit Centre Shepparton, CTC 8 JUN 1945
I/A No.20	A1-37	MAY 1943	PTU, 34SQN ATC Inverell JAN44, CDC disposal 18DEC45, 22FEB46 Yates Inverell
I/A No.21	A1-11	14 JAN 1944	Stn HQ Richmond until JAN 1944, to 11EFTS Benalla I/A.21, CTC 19 SEP 1945

#### Notes:

**I/A.11** may have been **A1-20** which was authorised for conversion to components 22 NOV 1941, received at 1ES 30 JAN 1942 for CTC, but no further record. Perhaps components used for training purposes.

**I/A.21.** The purpose of a Demon I/A on an EFTS might have been for a bit of fun. The Unit A.50 states in MAR 1945 that Armament Section had fitted a Browning MG demo mount to a renovated "rocking fuselage" and made serviceable.<sup>164</sup>

RAAFM POINT COOK A1-8

**A1-8** was delivered to 3SQN Richmond in JUN 1935. It was damaged when the pilot became disorientated in cloud and crash landed near Wisemans Ferry. The aircraft was recovered back to Richmond and repaired. In FEB 1937 3SQN undertook an army-cooperation task to Tasmania, which was to include photography and participation in the annual Regatta celebrations.<sup>165</sup> On 3 FEB 1937, both **A1-3** and **A1-8** encountered heavy cloud over the Bass Strait, preventing their refuelling at Waratah (near Wynyard) and A1-3 forced landed, and A1-8 crashed near Mount Cleveland – all crew were uninjured. In 1977, the remains of A1-8 were recovered by the RAAF and transported to Point Cook for restoration. In 1986, the project moved to 2AD at Richmond, where the restoration was completed, and on 3 FEB 1987 – 50 years to the day after the crash – A1-8 was formally handed over to the RAAF Museum for static display.<sup>166</sup> A1-8 is quoted as c/n **41H/60050** by [Hawker Demon I, A1-8 / 41H/60050, RAAF Museum : ABPic](#)



[RAAF]

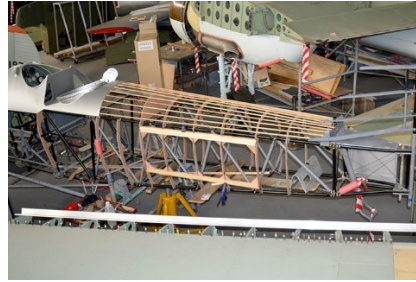
A1-8 on display at RAAF Museum Point Cook



[RAAF]

## EX-RAAF DEMON AT CABOOLTURE

Jack McDonald's Demon undergoing restoration at the museum at Caboolture is an amalgam of holdings of old parts that belonged to no particular aircraft and new components, so an identity is uncertain,<sup>167</sup> however there is a dataplate for the rebuild, claiming it as Hawker c/n 41H 75930. The Demon fuselage breaks down into three major assemblies – the forward fuselage/engine mount, the cockpit assembly and the rear fuselage. Work commenced on the aircraft in 2014, when the fuselage was in one piece with all assemblies formed into a single structure which originally had been restored in the 1980s. However, since then the aircraft had moved several times and suffered as a consequence, this original work had to be redone.<sup>168</sup> Refurbishment over 2014/15 also included the wooden "Dog House" upper cockpit section which was fully restored, covered in fabric and painted. The Hawker practice of connecting steel tubes with joining brackets to form the structure of the fuselage had made the process of dismantling, refurbishment and reassembly relatively straightforward. The Dog House was not refitted permanently until the cockpit was complete to allow access to the restricted space in that area. The aircraft's Rolls-Royce Kestrel was in good condition, and a fixed-pitch, two-bladed propeller was also available to the project, but it too required a proper inspection prior to being deemed usable. Work commenced in 2016 on constructing a set of wings using many components previously sourced from Australian wrecks, with a set of new-build spars made some years ago.



[Warbirds online images]

SEP 2016 – 'Warbirds' coverage of the cockpit and fuselage

By 2021, the bracing for the Demon's undercarriage had been completed allowing the aircraft to be wheeled around. The Demon was moved from the storage hangar to the workshop at the back of the museum so that work could be done around the engine. See TAVAS CONTACT – [Contact Issue 37.pdf](#) APR 2021, p.8.



[TVAS Contact Issue 37 images]

APR 2021 – fitting and adjustment to the cowls to allow the top and chins to be formed, and the cockpit almost complete



While 'Jack Mac' is rebuilding this aircraft to airworthy standards, it is not clear at present whether it would actually be a flyer or a ground engine-runner.

## SHUTTLEWORTH DEMON K8203

The world's only airworthy Demon is with the Shuttleworth Collection at Old Warden aerodrome at Biggleswade, Bedfordshire, marked as **K8203** and registered as **G-BTVE**. K8203 was from a batch of 37 RAF Demons K8181 to K8217. It was able to survive, as like 22 Demons of this batch, by becoming an RAF training aid and ending its RAF service as Instructional Airframe, as number **2292M**.<sup>169</sup>



*[Shuttleworth Collection]*

RAF Demon K8203/G-BTVE restored with the Shuttleworth Trust at Old Warden aerodrome, Beds in 2009

## SHUTTLEWORTH HIND 'K5414'

This Hind was one of a batch of 20 delivered to the Royal Afghan Air Force in 1938 (8 new, and 12 ex-RAF including K5409, K5457 and K5554), which are thought to have been in service until 1956!! The Hind was one of the last and among the most successful derivatives of the Hart, procured against Specification G.7/34 to replace the Hart itself. In 1968, one was offered to the RAF Museum and a second to the Shuttleworth Collection. While the RAFM example was able to be collected by RAF Hercules, retrieval of the Shuttleworth aircraft was more complex and only made possible by assistance of the Ford Motor Company during 1971. After a ten-year restoration program, registered as **G-AENP**, the Hind was flown again in Afghan colours in AUG 1981. It was later repainted in 15SQN RAF colours, given the RAF serial '**K5414**', with c/n '41H-81902' presumably for CAA registraion.<sup>170</sup>



*[Shuttleworth Collection]*

## RAF MUSEUM HART J9941

Operated from 1931 by the Hawker Company as a demonstrator and engine testbed, Hart **G-ABMR** operated as a photographic platform during the War. It flew intermittently through the 1950s at displays and garden parties, and in 1959 it was restored in military markings as first production Hart, 'J9933'. In 1972 it was transferred still airworthy to RAF Museum Hendon, on loan from Hawker Siddeley Aviation Ltd, and displayed in "Camm Hall" with the Hart trainer and ex-Afghan Hind components. Now preserved with the RAFM in 57SQN markings as Hart 'J9941'.<sup>171</sup>



[flugzeuginfo.net]

Hart 'J9941' in suspended display at RAFM Hendon in 2008

## RAF MUSEUM HART TRAINER K4972

**K4972** was one of a batch of 167 aircraft (K4886-K5052) built by Armstrong-Whitworth in 1935 to Specification 8/35, as a Hart Mk.IIA with 510hp Rolls-Royce Kestrel X (derated) engine and fitted with dual control. Entering service with 2FTS at RAF Digby in NOV 1935, it completed its flying service to become Instructional Airframe **1764M** in JAN 1940 at 12MU. Passed on in 1943 to the Air Training Corps, it was discovered in 1962 by members of Solway Group of Aviation Enthusiasts, and given to the RAF Museum in 1963. After storage at RAF Henlow, in 1968 it was transferred to RAF St Athan for restoration, being displayed at St Athan until 1972 when it was displayed in the "Camm Hall" at RAF Museum Hendon.<sup>172</sup>



[flugzeuginfo.net]

Hart T.IIA K4972 at RAFM Hendon in 2008



## CANADIAN HIND L7180

The RCAF obtained four Hinds which were used as utility aircraft during the War, however this example in the Canada Aviation and Space Museum (CASM) was recovered from Afghanistan. Three Hinds that went to the Afghan Air Force in 1939 were L7180, L7181 and L7191.<sup>173</sup> Canada's Hind Mk.I was built by Hawker at Kingston, Surrey, as L7180 in 1937. Serving in the RAF with 211SQN in UK, it was then received by 102MU at Aboukir Egypt in 1938, and delivered to the Royal Afghan Air Force in JUL 1939. It was known to be derelict at the Civil Aeronautics School at Kabul during the 1950s, and when Canadian personnel found there were Hind airframes and engines derelict at Kabul airport, negotiations led to the gifting of two Hinds and engines to Canada. Recovered by RCAF C-130 in NOV 1975, **L7180** and parts of RAF Hind **K6618** were returned to the Canadian National Aeronautic Collection, to be put on display at the National Aviation Museum (now CASM) in Ottawa, Ontario, in JUL 1989.<sup>174</sup>



[CASM]

Canadian Hawker Hind L7180

## SOUTH AFRICAN HARTBEES 851

Developed from the Audax, the Hartbees was built to a South African Air Force (SAAF) requirement for a close support aircraft. 65 were built under licence near Pretoria, as the first military aircraft to be built in South Africa. The Hartbees saw war service as a light bomber against Italian forces in the East Africa and Abyssinian campaigns in 1940, and with the arrival of more modern aircraft, was returned to South Africa for training duties. This SAAF Hartbees **851** is in the Museum in Saxonwold, Johannesburg.



[BAE Systems]

SAAF Hawker Hartbees at the Museum of Military History, Johannesburg

## FLYING HAWKER BIPLANE SURVIVORS

Other surviving Hawker biplanes – linked to the Fury lineage – are Duxford-based airworthy Fury and Nimrods. The Historic Aircraft Collection Ltd (HAC) at Duxford has been associated with these three Hawker biplanes, that were acquired for restoration from very interesting sources.<sup>175</sup> These Hawker '41H' c/ns are from the UK CAA website.

### HISTORIC AIRCRAFT COLLECTION FURY I

Fury Mk.I **K5674** (c/n 41H-67550) is operated by HAC and registered **G-CBZP**, in 43SQN RAF colours. Fury K5674 had been sent to the SAAF in AUG 1940, becoming **215**, forced-landing in South Africa in 1941 to be stored and scrapped. However, work was started in its recovery in 1992, and the first post-restoration flight was at Goodwood in JUL 2012.



[warbirdtails.net]

### FIGHTER COLLECTION NIMROD I

Nimrod I **S1581/573** (c/n 41H-43617), registered **G-BWWK**, was the naval equivalent of the Fury I and delivered to the RN with interchangeable wheel/float undercarriage. Serving from 1933 with 803NAS aboard *Glorious*, written-off in 1938 – and recovered from a scrapyards in the early 1970s in West London! Acquired by Aero Vintage in 1994, it flew in JUL 2000 at Henlow, and operated by HAC from 2000 until it was swapped for the Fighter Collection's Hurricane in 2004, still residing at Duxford.<sup>176</sup>



[warbirdtails.net]

### HISTORIC AIRCRAFT COLLECTION NIMROD II

Another carrier-borne fighter, Nimrod II **K3361/562** (c/n 41H-59890) is operated by HAC, registered **G-BURZ**. Much like the Nimrod Mk.I restoration, this airframe was discovered on a scrap heap in Ashford, Kent, in the 1970s and donated to the RAFM. Sold by RAFM, restoration began in 1992 by Aero Vintage and a Kestrel engine was found in Canada, and the aircraft flew again at Duxford in NOV 2006. Nimrod II differs from the Mk.I in having swept wings, a more powerful Kestrel VI and a tailwheel.



[warbirdtails.net]

## HAWKER 41H/ DATAPLATE NUMBERS

The UK CAA provide the above airworthy Fury/Nimrod aircraft with Hawker '41H' constructor's numbers (c/ns), and the RAF Museum also list some of their Hind components with 41H c/ns. "41H/" was the British Air Ministry/MOD designator for the Hawker Company at Kingston. Several examples of 41H/ numbers are evident for RAAF Demons, one below is **41H/59730** on the starboard fuselage below the rear cockpit of the crashed **A1-10**.



[Enlarged from RAAF image]

**A1-10 of 22SQN which crashed in DEC 1937, showing Hawker number 41H/59730 beside the 'W/T' stencilling**  
A1-10, delivered to the RAAF on 29 JUL 1935 and serving at Richmond with 3SQN and 22SQN, crashed on a met observation flight near Gosford on 7 DEC 1937. Seen above stored at 2AD, it was converted to an instructional airframe, becoming I/A.1 in 1940.

Key.Aero has run a forum on Hawker dataplates and constructor numbers from JUL 2013 to MAR 2020. The site notes that the 41H prefix referred to manufacture at Hawker Kingston-on-Thames, with other Hawker plants designated by numbers such as FL-41H- (for Folland Ltd at Hamble), B3-41H- (for Blackburn at Brough), 41H-HABL (for Hawker A/c Blackpool Ltd).<sup>177</sup> The RAF Museum has assessed several Afghan Hind c/ns – RAFM has Hind 41H-81899 on display at Cosford in Afghan markings, the Shuttlesworth Hind c/n is 41H-81902 flying as 'K5414'.<sup>178</sup> Also a dataplate has been unearthed for the Australian Demon hybrid restoration as 41H 75930, shown below.

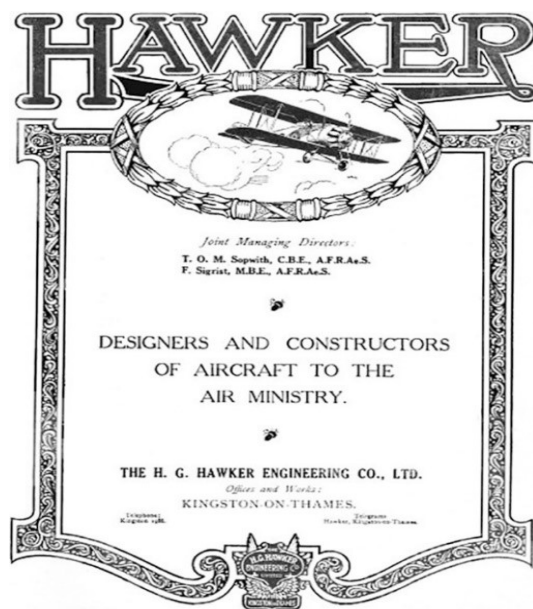


[both images from Key.Aero Forum]

**Hawker dataplate 41H 75930, being used for the Caboolture rebuild... and a tag on this Demon's Scarff Ring**  
The build date shows 17-8-36 – according to *adf-serials* database, is after manufacture of the first RAAF Demons A1-1 to A1-18.

Note sometimes this number is recorded as "41H", "41H-" or "41H/". These numbers as c/ns did continue postwar for Furies, Hunters, Harriers and Hawks. In *Warbirds Directory*, Geoff Goodall lists some of these types with 41H/ c/ns – of Australian interest are ex-RAN Sea Fury FB.11s WH587 to WH589 as c/n 41H/636334 to 41H/636336.<sup>179</sup>

**The author thanks Ian K Baker, Peter Malone and Ron Cuskelly for their assistance in the preparation of this article.**



## Hawker Demon on Silver Wings

“Even as the RAAF took delivery of the Demon, a new generation of designs which included the Spitfire and the Hurricane were already in development and would render the Demon obsolete.” – *The Third Brother* <sup>180</sup>

In 1939, the Demon – only a few years old – was Australia’s front-line fighter but hopelessly outclassed as a modern warplane, and the RAAF’s parlous situation would remain until the dark years of 1942, only to be rescued by US intervention with an aircraft supply line through to the end of the War.

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# AsYouWere

## Corrections Arising from our Previous Issue

Alright you lot. If any of you were paying attention, you would have spotted Mark's deliberate mistakes in his article from last issue, "*Douglas DB-7/A-20 in RAAF Service, Part 1: DB-7B/Boston III*" [ADF-Serials Telegraph Volume 11, Issue 2, pp4-28]. For those of you who were NOT paying attention, Mark has kindly offered to take the time to spell it out for you.

On p5: "A28-19 was also lost when...". It was, in fact, A28-17 which suffered an engine fire (starboard engine) after landing at Mascot and overshot the runway. The aircraft was written off. It was not A28-19.

The first sentence of the second paragraph on p12 should read, "Four aircraft were lost before operations started. A28-2 crashed thru the boundary fence at Richmond, -17 had a landing incident/engine fire at Mascot, -19 crashed in South East Queensland after engine problems and A28-12 was blown up by its own 20-lb bombs during a training flight."

The photograph on the bottom of p17 shows Wing Commander Emerton exiting A28-9, not A28-8.

The caption for Juanita Franz's profile of A28-9/DU-K, "SHE'S APPLES" at the bottom of p20 should read, "... the usual aircraft of Wing Commander Learmonth. This aircraft flew a total of 77 missions in its operational life, with Learmonth flying approximately 50 of them, before it was scrapped at 15ARD, Port Moresby in early 1945. It received the name "SHE'S APPLES" because it was so reliable. When ground crew asked Learmonth and his gunner "Buzz" Burn after a mission how the aircraft was, Buzz Burns usual reply was "She's Apples". When the Lion artwork was added to the nose, "She's Apples" was also applied below the Gunners position on the L/H side. With 60 missions marked on the aircraft, gives an approx. date of Aug 43 when based on Goodenough Island. The "DU" codes were added to 22SQN Boston about the time of the move from Port Moresby to Goodenough Island, the RAAF roundel sizes also changed then and serials went from Black to Sky Blue.

This aircraft is also often quoted as having completed 186 missions – a SW Pacific record; this, however, is untrue. The inflated figure originated from a newspaper article in "The Argus" in January 1944 to boost the morale of people at home and to talk up the exploits of 22SQN. As mentioned in the caption (correct, above), A28-9 flew 77 combat missions during its service.

Additional information for the table on p25: regarding A28-13/O, those lost in the crash on 01/06/43 were – Pilot, FLTLT P.C. (Rocky) Mullens; WAG, FSGT A.J. Collins; and two passengers, SGT N.H. Sale (Wireless Mechanic) and LAC J.R. Moore (Armourer).

On p28: A28-5, -9 and -11 were Converted to Components (CTC) at 15ARD Port Moresby not Morotai.

# DOUGLAS DB-7/A-20 in RAAF service.

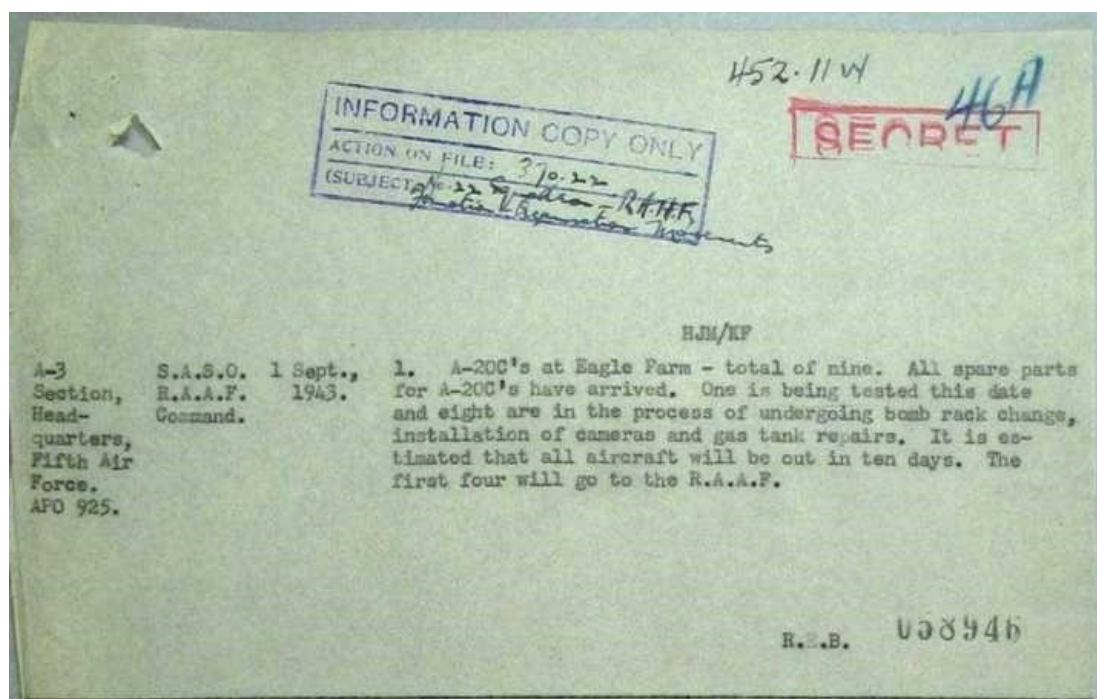
## Pt 2 A-20A/C Boston

Mark Harbour

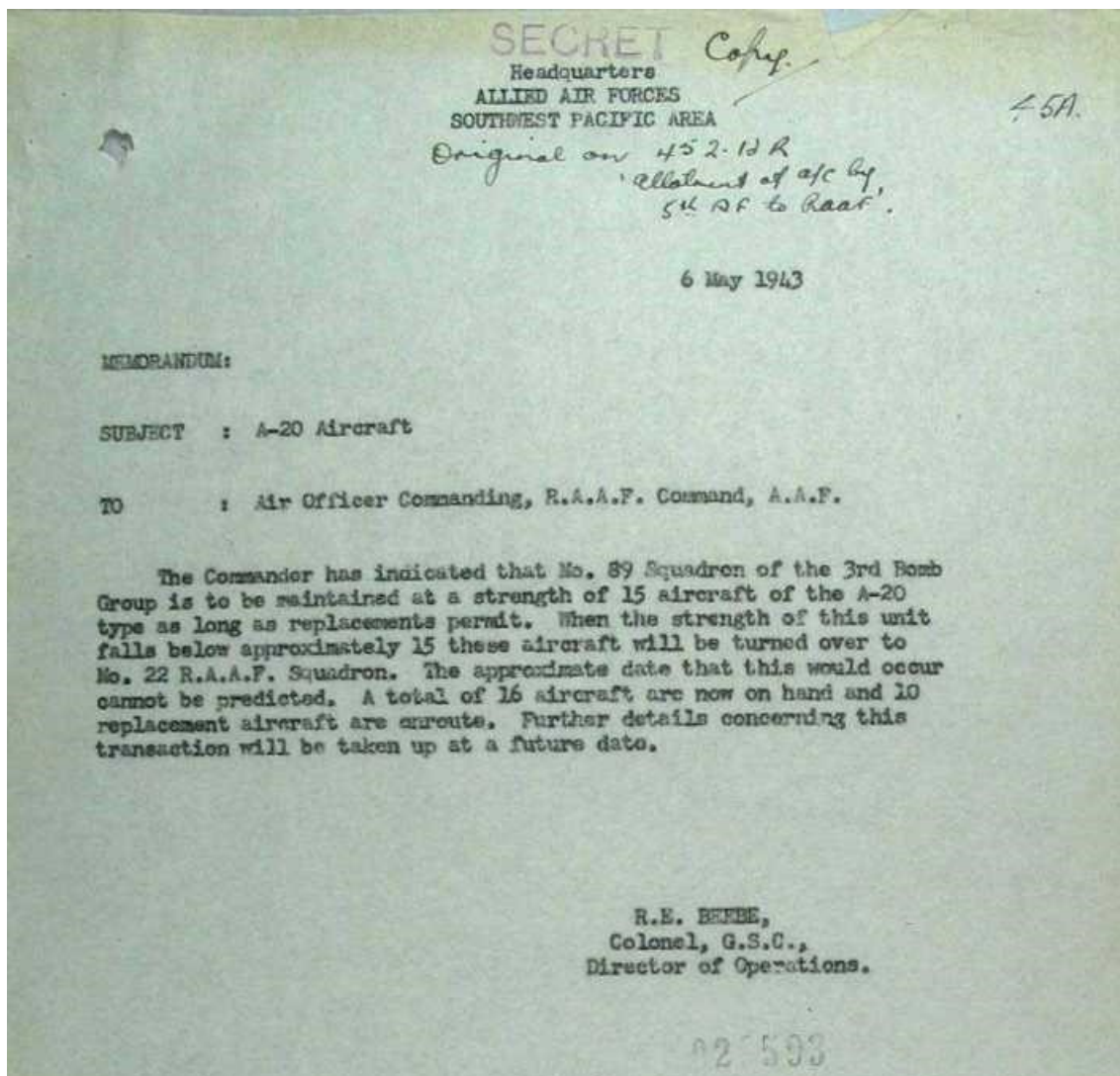
The A-20C and A-20A aircraft operated by 22 Sqn were all second hand aircraft acquired as attrition replacements, September 1943 and 22 Sqn is in dire straits, of the 22 DB-7B's the Sqn started with in early 1942 losses have taken them down to 8 aircraft, 6 operational at 22 Sqn and 2 at 3AD Amberley undergoing overhaul/repair, the raid on Gasmata on 12 Sep 43 was the most costly in the Sqn's operational history at that time, 3 aircraft lost two of them with crews, 22 Sqn is barely operational with the 6 remaining aircraft.

Steps had been taken earlier in 1943 by RAAF HQ to source additional aircraft with agreements with the 5<sup>th</sup> AF to take over ex 89<sup>th</sup> BS A-20A's and A-20C's were made available by the US, these A-20C aircraft arrived at the US Air depot at Eagle Farm Brisbane in early Sep 43 9 X A-20C's arrived initially 4 were made available to the RAAF and 5 going to US air depot in NG as attrition aircraft but as large numbers of new A-20G's were about to arrive in Townsville to completely re equip US units these A-20C's were considered surplus to requirements and also got handed over to the RAAF over the following couple of months. These A-20C aircraft leftovers from and partly converted by the P-70 program had no guns and no bomb racks, part of the P-70 conversion was removing the cheek blisters with 4 x .30 MG's and replacing them with 2 x .50MG's, also 2 x .50 nose guns were installed in the nose from kits developed by Douglas for P-70 and A-20B's in North Africa, on the P-70 modification in between these 2 nose guns an AI (Airborne Interception) radar antenna was installed, this position was filled with a third .50 in RAAF A-20C's and a strike Camera installed in the nose behind the bomb aimers glass which was retained in this Strafer conversion. The A-20C's ran a total of 5 x .50 MG's, 3 x in the nose and 1 in each cheek position's where the cheek pods for 2 x .30 MG's each side had been removed and replaced with a single .50, the A-20C also ran single .50 MG's in the upper and lower rear gunners positions, the A-20C also had long range tanks fitted and unlike the earlier DB-7B and A-20A still retained a 2000 lb bomb load even after the Strafer conversion, they were also the fastest version of the A-20 and could do almost 300 knts at low level.

In addition to these A-20C's in May 43 negotiations with 5<sup>th</sup> AF agreed that when the 89<sup>th</sup> BS 3<sup>rd</sup> BG dropped below a sustainable rate of aircraft (15) their A-20A's would also be transferred over to the RAAF, this level was reached at 89<sup>th</sup> BS in Oct 43 and as new A-20G's were coming 9 x A-20A's also came on strength, some A-20A's were kept as hack and training aircraft by 3<sup>rd</sup> BG as the whole group was to convert to A-20G's.



Transfer of first A-20C's to RAAF September 1943. [NAA: A11093, 452/A28].



**Agreement on transfer of A-20A to RAAF May 1943.** [NAA: A11093, 452/A28].

The dire need to get these A-20C's on line as soon as possible meant while technically serviceable and more capable than the DB-7B's and fully operational looked very rough as no time was allowed for repaints, these aircraft operated in their originally applied Olive Drab over Neutral Grey with only the US Star/Bar and serial roughly painted over and RAAF Markings and serials applied which by the time they were issued to 22 Sqn looked quite rough, these A-20C's became the primary aircraft at 22 Sqn being faster, longer ranging and able to carry a heavier bomb load than the DB-7B's, the DB-7B's while still mainstays became secondary to the "New" A-20C's, also in late 43 the A-20A's handed over to the RAAF came on strength at 22 Sqn these were older than the original DB-7B's and were war weary having all flown 50-60 plus missions with the 89<sup>th</sup> Bs from late 42 all thru 1943 before coming to the RAAF, these aircraft did serve an important role at 22 Sqn taking the training away from the operational A-20C's and remaining DB-7B's and also being broken up for parts to keep the A-20C and DB-7B's going.

The introduction of the A-20C saw the tempo of ops increase at 22 Sqn and now that operations over New Britain were the primary task area for 22 Sqn the increased range and navigation equipment (ADF etc) fitted to the A-20C's was needed. Also in early 1944 as WAG's were coming up on end of tours and being posted out they were replaced with Navigators, a core of WAG's were kept at the Sqn to train the Navigators in Gunnery and Radio but as little to no aerial opposition was being encountered it was more useful to have Navigators on the long overwater operations 22 Sqn was now doing.

### **The Great Race.**

Not long after receiving the new longer range A-20C's 22 Sqn conducted some missions over New Britain where 30 Sqn Beaufighters were assigned as escorts, 22 Sqn's pride was hurt that they needed escort as they believed the A-20C was faster than the Beaufighter or any Japanese fighter they may encounter, twice Boston's had beaten Beaufighters home to base after joint missions and a race was organised for Melbourne cup day 1943 to see which

was faster , both Sqn's prepared aircraft , 30 Sqn prepared Beaufighter Ic A19-54 LY-V (as Ic's were faster than VI's and XI's which were replacing the Ic's)and 22 Sqn prepared A28-24 DU-P ,Wing Commander Townsends usual aircraft , both Sqn's went to work with zeal stripping all armament , armour , radio's and all non essential equipment from the aircraft and polishing them to a high shine , 30 Sqn stripped approx 2500 lb's out of their Beaufighter and 22 Sqn did similar with the Boston , the race was to be adjudicated by Sqn Ldr Geoff Atherton CO of 75 Sqn also on Goodenough Island in his Kittyhawk , unfortunately for the Boston overzealous ground crew removed intake scoops for the carburettors thinking it would reduce drag , but was to cause problems . On the day of the race Sqn Ldr Boulton of 30 Sqn flew by himself in A19-54 while Wing Commander Townsend took his WAG FO McClymont with him, the aircraft flew approx a 50 mile race from the Trobriand islands back over Vivigani strip on Goodenough , both aircraft applied full throttle and dove on the mark of Sqn Ldr Atherton and soon left him behind , the aircraft were clocked at 305 knts at sea level now the problems started for the Boston because the intake scoops had been removed the engines were running too rich and black smoke from unburned fuel was streaking out behind , this doomed the Boston to lose but only by about 400 yards over the course distance , the Kittyhawk was left several miles behind which led Sqn Ldr Atherton to say why did either Sqn need fighter escort, both engines on A28-24 were damaged in the race and had to be replaced , a re-race never happened as Wing Commander Townsend was shot down in A28-29 the next day.

Wing Commander Woodman CO of 22 Sqn when they converted from Boston to Beaufighter flew both Boston and Beaufighter in operational configuration at top speed and said the speed difference of both was almost identical with only pilot skill and conditions deciding which was faster. Of note during the race a speed of 305 Knts (350 MPH) was recorded by the Boston and Beaufighter and an operational configured aircraft top speed of 280 Knts (322 Mph) a Spitfire VIII has a recorded top speed at sea level of 295 Knts (330 MPH), so the Boston and Beaufighter were truly fast aircraft at sea level.

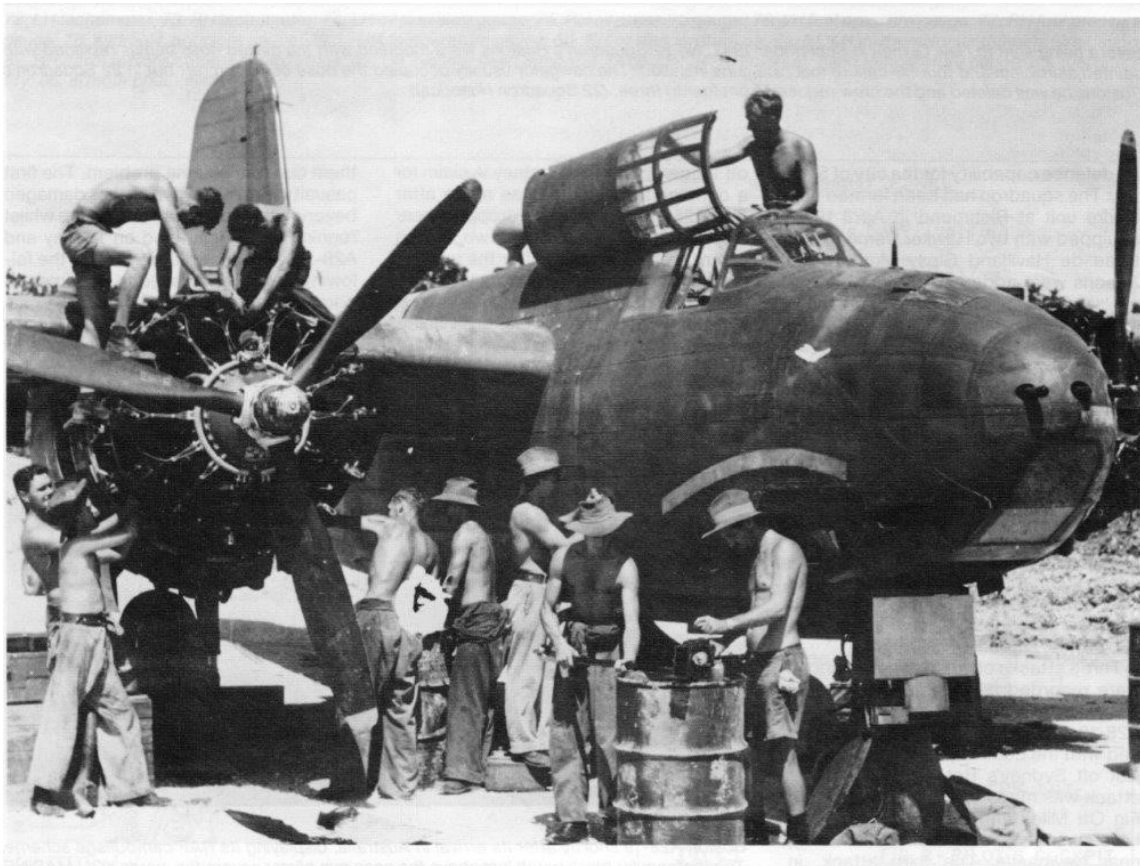


**Painting of the Great Race.** [The Whisperer newsletter of the Beaufighter & Boston Assoc QLD].





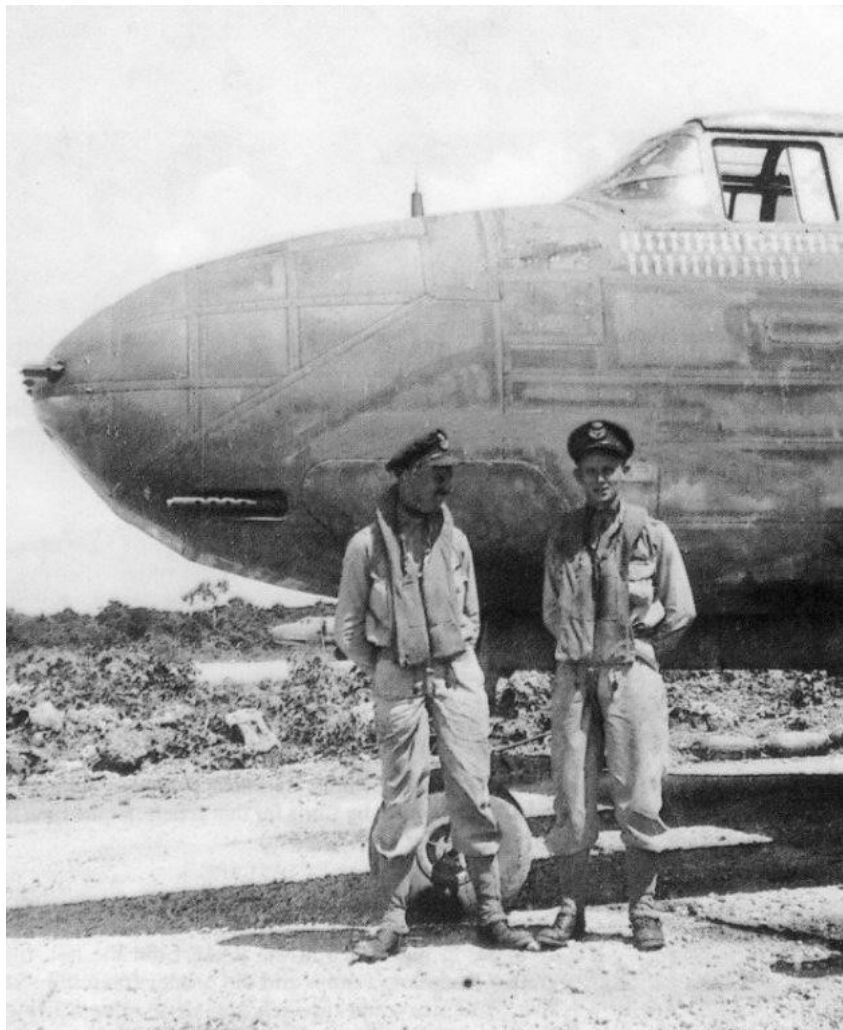
3 x .50 nose gun installation on RAAF A-20C, centre gun replacing AI radar antenna. [AWM OG 0374].



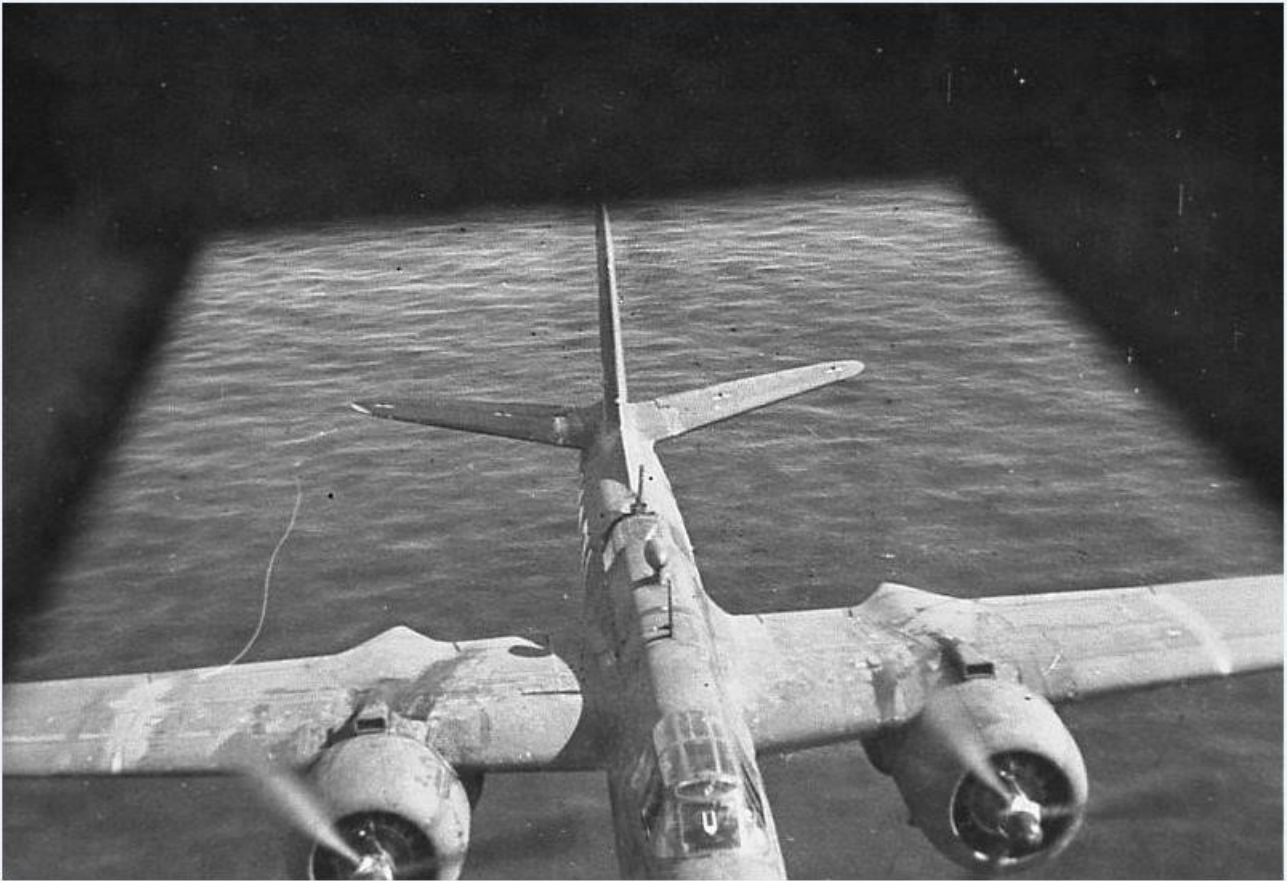
22 Sqn A-20C undergoing maintenance, note strike camera in nose behind bomb aimers glass. [AWM OG 0370].



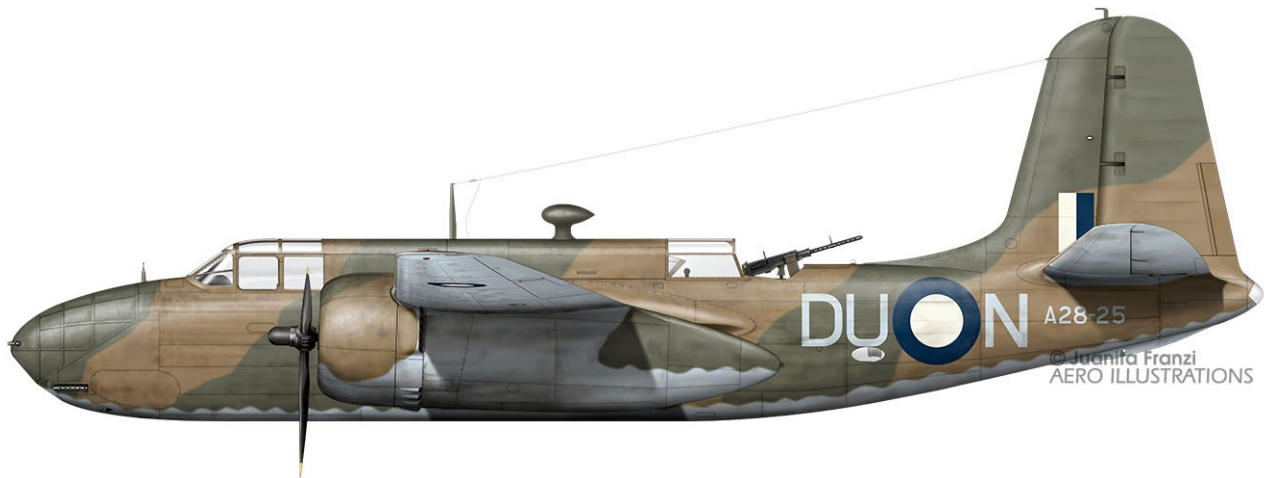
47<sup>th</sup> BG USAAF North Africa A-20B with twin gun nose installation developed by Douglas and bomb aimers glass still retained. [47<sup>th</sup> BG assoc.].



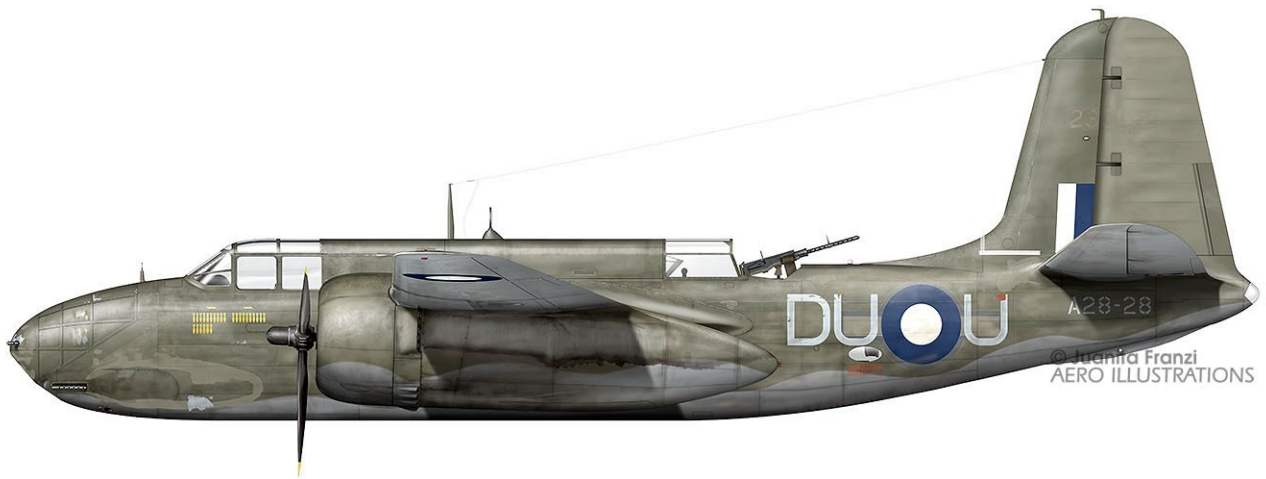
A-20C either A28-23 DU-O or A28-24 DU-P, note how far the .50 sticks out in the cheek position. SqN Ldr Chris Sugden Pilot (right) and Flt Lt Dick Whitford, WAG. [Chris Sugden].



Unidentified A-20C Boston taken from lower gunners position from another Boston. [Aviation Heritage Museum WA].



**A28-25**, the only A-20C to run the std Boston scheme of Dark Green/Dark Earth over RAAF Sky Blue, like all the A-20C's it was rushed to 22 Sqn after only a week at 3AD in late September 43 in its original Olive Drab over Neutral Grey scheme but on a mission on 05 Nov 43 a 250lb bomb with an 11 sec delayed action fuse when dropped had a faulty fuse which blew up directly below the aircraft causing major damage to both inner wings, port outer wing, both stabilisers and fuselage, it was at 26RSU for 6 weeks getting repaired and was fully repainted at this time served with 22 Sqn till sent to 15 ARD for servicing and repair and kept at 15ARD as a spare as this aircraft was not one with long range tank fitted, eventually approved for conversion to components in Feb 45. Standard RAAF roundels size for late 1943 with Sqn codes in Sky Blue. [Copyright Juanita Franzi, Aero Illustrations].



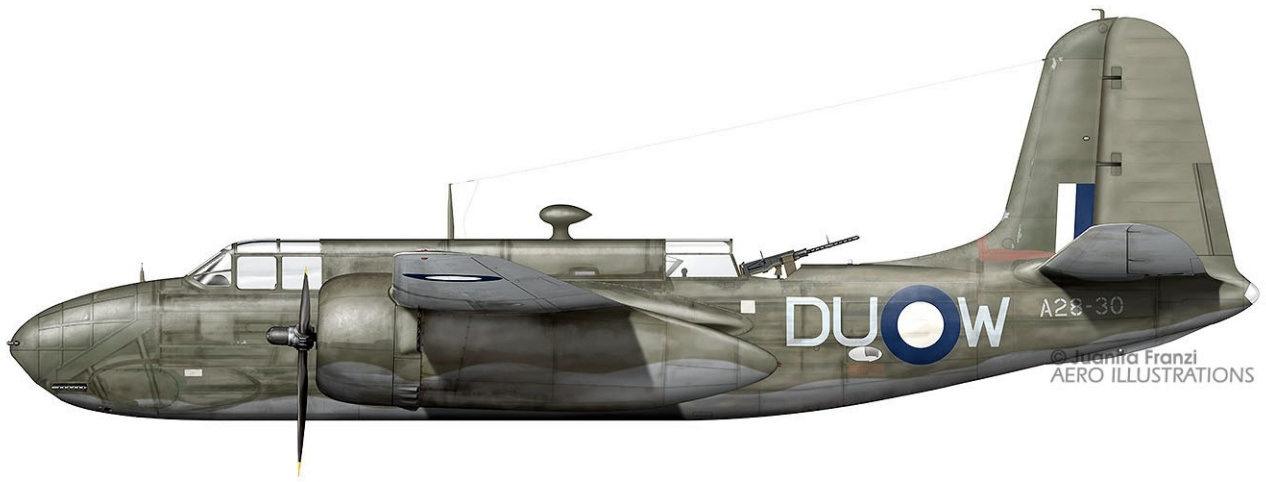
**A28-28, one of the work horse A-20C's which flew 38 missions with 22 Sqn credited with 2 coastal freighters, issued to 26 RSU as a spare aircraft in Oct 43 no longer needed by 22 Sqn but returned to 22 Sqn after the raid on Morotai 22 Nov 44 damaged most of the A-20G's, flew at least one more mission before eventually converted to components 15 ARD Feb 45. [Copyright Juanita Franzi, Aero Illustrations].**



**A28-28 DU-U Kamiri Strip, Noemfoor, August, 1944. [AWM OG 1517].**



**Ground crew gather round A28-28 DU-U landing back at Kamiri Strip, Noemfoor, with bombs hanging from racks and bomb doors jammed open, Aug 44. [AWM OG 1609].**



**A28-30, same configuration and worn look as A28-28, this A-20C had an accidental discharge of the top .50 into the tail requiring a new vertical fin, repaired at 26RSU but not returned to 22 Sqn sent to 15ARD where it was converted to components in Feb 45. [Copyright Juanita Franzi, Aero Illustrations].**



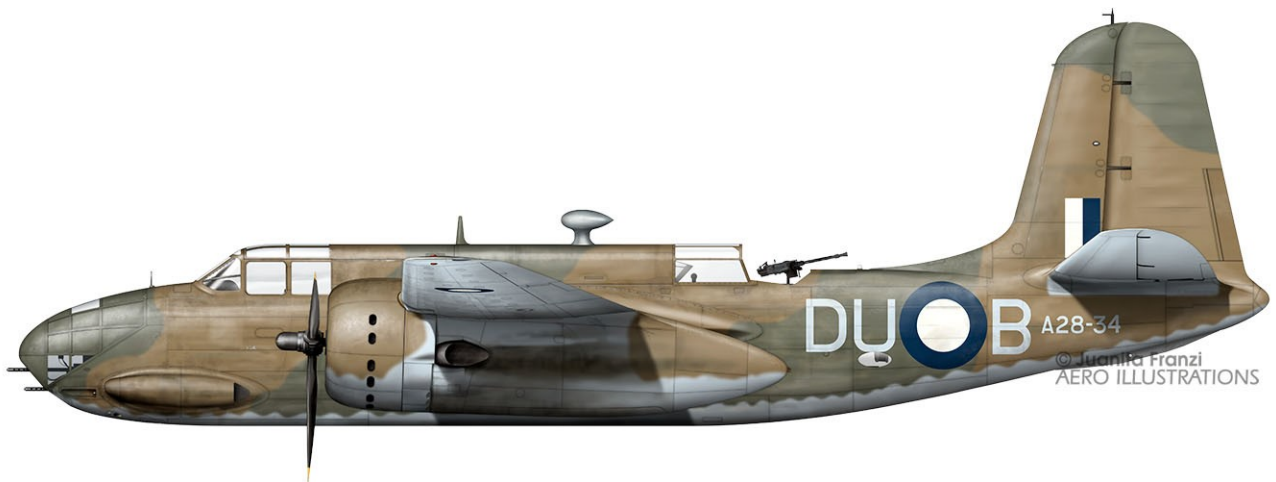
**A28-30/DU-W in flight. [AWM OG 038].**



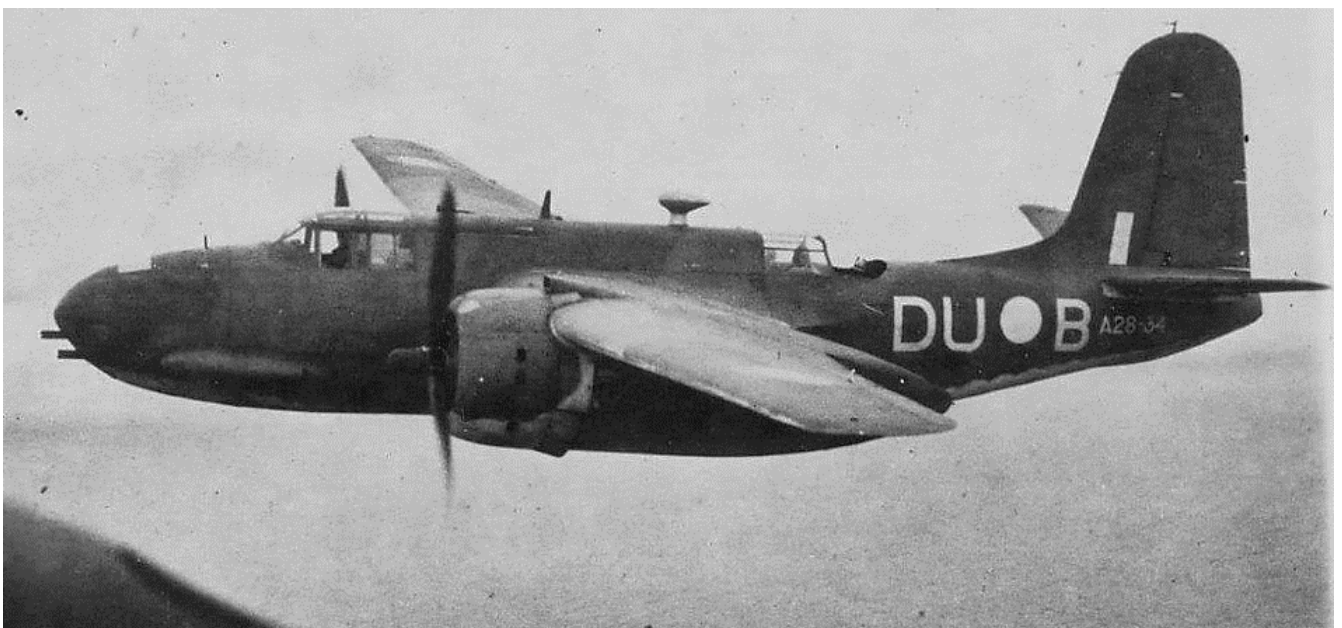
**A28-31, A-20C never served with 22 Sqn damaged on delivery and sent to 3AD for repairs, as the new scheme for attack aircraft came in June 44 was repainted at 3AD in new std all-over Foliage Green with new 5/2 ration 32" "Fighter" roundels used as training and test aircraft at 3AD until eventually sent for Conversion to Components at 7 CRD Tocumwal in May 45, only Boston in RAAF service to run Tropical filters. [Copyright Juanita Franzi, Aero Illustrations].**



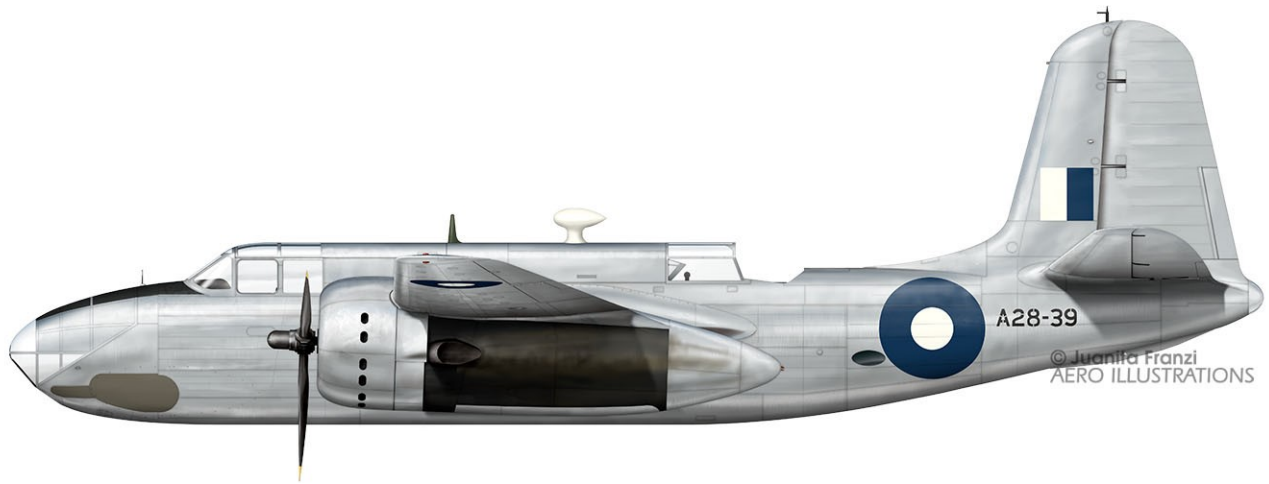
A28-31 3AD Amberley late 1944. [ADF serials].



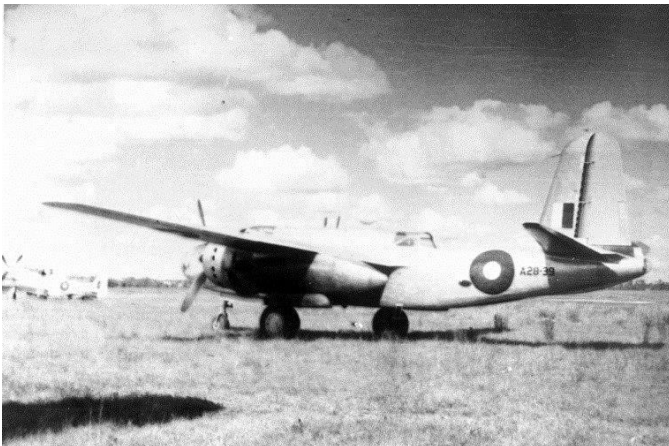
A28-34, A-20A ex 89<sup>th</sup> BS 3rd BG, this A-20A was repainted before issue to 22 Sqn in std RAAF Boston scheme in 1943, Dark Green/Dark Earth over RAAF Sky Blue, used primarily for training at 22 Sqn to release A-20C's and DB-7B's for operations but was used on at least one operation, as no photo's exist of other RAAF A-20A's at 22 Sqn it is not known if any others were repainted or stayed in OD/NG scheme, went to 15 ARD and CTC in Feb 45. [Copyright Juanita Franzi, Aero Illustrations].



A28-34 DU-B 22 Sqn mid 1944. [RAAF Official].



**A28-39 in Natural Metal Finish having had paint, armour and armament removed by 3AD at Amberley. [Copyright Juanita Franzi, Aero Illustrations].**



**A28-39 3AD Amberley June 1945. [RAAF Official].**



**And at 6AD Oakey. [Ian K Baker].**

### Markings and schemes.

The A-20C's and A-20A's ran std 36" 5/3 roundels though there was some variation on the ratio of white to blue in the field, Sky Blue sqn codes and serials and std fin flash, it is generally believed except for A28-25 and A28-34 all A-20C and A-20A's at 22 Sqn remained in std OD over NG and as so few photo's exist of these two types it is believed they never got the later all over Foliage Green scheme as applied to DB-7B's at the Sqn post Jun 44.

The two oddities A-20A, A28-39 and A-20C, A28-31 were the only ones to have the later post Jun 44 markings applied, A28-39 had the markings applied as per the instructions with 48" 5/2 "Bomber" roundels, later square fin flash and serial out from under the horizontal stab, A28-31 had modified markings it has the 32" "Fighter" roundel applied which suited the Boston better and serial back under the horizontal stab as it was realised Sqn codes wouldn't fit unless they went over the serials. As happened with the first batch of A-20G's. A28-31 was also the only Boston to be properly painted in the all over Foliage Green scheme, DB-7B's repainted were done crudely in the field with old colours showing thru.

ADF SERIAL	AIRCRAFT TYPE	USAAF SERIAL	CONST. #	SQN. CODE	MISSION TALLY	AIRCRAFT HISTORY/ NAME
A28-23	A-20C-5-DO	42-33154		DU-O	58	Received from US Air depot New Caledonia 16/9/43 to 3AD Amberley prepared for RAAF service and issued 22 Sqn 30/09/43 received 22 Sqn 02/10/43 09/10/44 Crash landed Kamiri strip broken main U/C leg strut and damage to tail wings and fuselage 18/11/44 issued 26 RSU assessed damaged beyond repair and approved Conversion to components 22/02/45
A28-24	A-20C-5-DO	42-33163		DU-P	51	Received from US Air depot New Caledonia 16/9/43 to 3AD Amberley prepared for RAAF service and issued 22 Sqn 30/09/43 received 22 Sqn 02/10/43 17/03/44 Crashed in sea, short of fuel approx 30 miles NE of Kiriwina Island. Crew Pilot Flt Lt Daly and Navigator P/O Hill rescued by Dornier Do-24 A49-1 uninjured. 27/03/44 Aircraft written off.
A28-25	A-20C-5-DO	42-33172		DU-N	30	Received from US Air depot New Caledonia 16/9/43 to 3AD Amberley prepared for RAAF service and issued 22 Sqn 24/09/43 received 22 Sqn 26/09/43 05/11/43 Badly damaged by premature bomb explosion under aircraft Issued 26 RSU 07/11/43 for repair, damage to fuselage ,port and stbd wing, port outer wing , port and stbd stab Issued 22 Sqn 15/12/43 post repair 27/08/44 issued 10 RSU for replacement elevators and repairs Issued 22 Sqn 14/09/44 Issue to 22 Sqn cancelled as no long range tank fitted range to short. Issued to 15 ARD 15/09/44, remained 15ARD till approved Conversion to components 22/02/45.
A28-26	A-20C-5-DO	42-33180			Nil	Received from US Air depot New Caledonia 16/9/43 to 3AD Amberley prepared for RAAF service and issued 22 Sqn 26/09/43 received 22 Sqn 28/09/43 11/10/43 Taking off on training mission nose wheel tyre blew nose strut collapsed and aircraft flipped over , aircraft caught fire , pilot F/O J.B.Knight trapped in cockpit and killed when 100 lb practice bombs on board blew up.
A28-27	A-20C-5-DO	42-33134			24	27/09/43 Received 15 ARD from USAAF aircraft pool New Guinea Issued 22 Sqn 28/09/43 30/01/44 hit by Japanese AA fire Port engine caught fire , aircraft crashed approx 300 yards from Japanese Gun position mouth of Kabu River New Britain believed pilot hit by ground fire. crew Pilot W/C J.G. Emerton , Navigator P/O T. Gawne killed.



ADF SERIAL	AIRCRAFT TYPE	USAAF SERIAL	CONST. #	SQN. CODE	MISSION TALLY	AIRCRAFT HISTORY/ NAME
A28-28	A-20C-5-DO	42-33142		DU-U	38	27/09/43 Received 15 ARD from USAAF aircraft pool New Guinea Issued 22 Sqn 28/09/43 19/10/44 issued 26 RSU 30/11/44 issued 22 Sqn 10/01/45 issued 15ARD Approved conversion to components 22/02/45
A28-29	A-20C-10-DO	42-33211		DU-V	3	14-15/10/43 Received 15 ARD from USAAF aircraft pool New Guinea Issued 22 Sqn 14-15/10/43 03/11/43 shot down by Japanese AA fire into sea Jacquinot Bay New Britain. Pilot W/C W.Townsend and Navigator F/O D. McClymont survived the ditching and helped by locals returned to Allied lines a month later by US Submarine.
A28-30	A-20C-5-DO	42-33174		DU-W	44	15/10/43 Received 15 ARD from USAAF aircraft pool New Guinea Issued 22 Sqn 21/10/43 28/08/44 accidental discharge of upper .50 MG badly damages tail, aircraft cannot be flown till replacement available , received 26 ARU 19/10/44 for repair 09/01/45 issued 15ARD from 26ARU Approved conversion to components 22/02/45
A28-31	A-20C-5-DO	42-33168			Nil	04/11/43 issued to 13ARD from USAAF aircraft pool Received 13ARD 25/01/44 Allocated 15ARD 26/01/44 20/03/44 On transfer to 15ARD Port Moresby aircraft damaged at Cooktown , damage to nose and nose gear actuator. Aircraft temp repaired and returned to 13 ARD RAAF Breddan . 25/09/44 aircraft issued to 3AD and be held at 3AD when serviceable 06/10/44 received 3AD and used as test and training aircraft 16/02/45 aircraft to be returned to USAAF No3 Depot Biak Issued 7AD 06/05/45 Issued 7 CRD ex 7AD 06/05/45 for conversion to components
A28-32	A-20A-DO	40-085			Nil	05/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment Received 22 Sqn 09/02/44, 31/03/44 nose gear retracted on landing Kiriwina strip 01/04/44 issued 10 RSU for repair , 04/04/44 10 RSU unable to repair , repairs carried out at 22 Sqn 08/06/44 allotted 15ARD for engine O/H 13/06/44 received 15ARD , remained 15ARD till approval for conversion to components 22/02/45 Called "SHE'S RIGHT!" in 89 <sup>th</sup> BS service.

ADF SERIAL	AIRCRAFT TYPE	USAAF SERIAL	CONST. #	SQN. CODE	MISSION TALLY	AIRCRAFT HISTORY/ NAME
A28-33	A-20A-DO	40-143			Nil	05/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment, to be issued to 22 Sqn at completion of task's at 15ARD. Allocation cancelled 15/02/44, remain at 15 ARD to be Converted to Components as spares source for other aircraft. CTC 09/05/44 Called "CRACKER JAP" in 89 <sup>th</sup> BS Service.
A28-34	A-20A-DO	40-3160		DU-B	1	05/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment, to be issued to 22 Sqn at completion of task's at 15ARD. 19/12/43 received 22 Sqn 06/07/44 Issued 15 ARD for fuel system checks and fuel cell replacement. 11/08/44 Aircraft undergoing repairs at Dobodura 17/10/44 received 15 ARD ex 22 Sqn 22/02/45 approved for C-C 15 ARD. Called "HELLS FIRE", "FIFI" "ACES UP" in 89 <sup>th</sup> BS Service.
A28-35	A-20A-DO	40-162			1	05/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment, to be issued to 22 Sqn at completion of task's at 15ARD. Received 22 Sqn 23/12/43 07/08/44 Issued 15 ARD ex 22 Sqn awaiting decision on use as training aircraft. Remained at 15 ARD till converted to components 22/02/45 Called "THE SHADOW", "KENTUCKY RED" in 89 <sup>th</sup> BS service.
A28-36	A-20A-DO	40-077			Nil	05/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment, to be issued to 22 Sqn at completion of task's at 15ARD. 09/02/44 Received 22 Sqn. 07/06/44 received 10 RSU for engine change 24/07/44 issued 15 ARD post engine change, 02/08/44 received 15 ARD remained 15 ARD till conversion to components 22/02/45 Called "BABY DUMPLING", "WAR BOND" "SPECIAL" in service with 89 <sup>th</sup> BS
A28-37	A-20A-DO	40-118			Nil	17/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment 09/02/44 Received 22 Sqn. 13/05/44 issued 10 RSU for Sponson and engine change 24/07/44 issued 15 ARD 02/08/44 received 15 ARD, remained 15 ARD till converted to components 22/02/45 Called "Jr's Joy", "BLOODY BUCKET" in service with 89 <sup>th</sup> BS.
A28-38	A-20A-DO	40-139			Nil	17/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment allotted 22 Sqn 08/06/44, 06/07/44 allotment to 22 Sqn cancelled, remained 15 ARD till approval for conversion to components 22/02/45 Called "MAID IN JAPAN" in 89 <sup>th</sup> BS service.

ADF SERIAL	AIRCRAFT TYPE	USAAF SERIAL	CONST. #	SQN. CODE	MISSION TALLY	AIRCRAFT HISTORY/ NAME
A28-39	A-20A-DO	40-144			Nil	17/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment 13/03/44 received 22 Sqn 14/07/44 received 3 AD Amberley all armour , armaments , gun blisters and paint removed , used for pilot conversion training and test pilot training and chase aircraft on test flights 16/02/45 to be returned to USAAF FEAF #3 depot Biak if serviceable , aircraft deemed U/S. 19/03/45 allocated 3 Crash and Recovery Depot Amberley received by 3 CRD 21/12/45, 29/09/46 Allocated Air force cadet unit as Instructional airframe #1. 02/12/48 approved for conversion to components 10/01/49 transferred back to 3 AD for disposal handed over to DAP for tender and sale , sold and picked up by buyer 13/09/49 , scrapped and melted down. Called "SALOME" in 89 <sup>th</sup> BS service.
A28-40	A-20A-DO	40-3159			Nil	17/11/43 received 15 ARD ex 89 <sup>th</sup> Bs 3rd BG for servicing and operational fitment 17/04/44 received 22 Sqn 07/08/44 issued 15 ARD ex 22 Sqn awaiting decision on use as training aircraft. Remained 15 ARD till converted to components 23/02/45

#### A-20C/A-20A BOSTON LOSSES

DATE 1943	Serial #	CODE	REASON FOR LOSS	PLACE OF LOSS	NOTES
11 October	A28-26		Nose wheel tyre blew and nose gear collapsed on takeoff, aircraft flipped over caught fire and blew up	Goodenough Island	A/C taking off on a training mission when nose wheel tyre blew and nose gear collapsed and aircraft flipped over, aircraft burned and 100lb practice bombs on board blew up.
03 November	A28-29	DU-V	Hit by Japanese AA fire crashed in sea	Jacquinet Bay New Britain	Crashed onto shallow reef allowing crew to escape

DATE 1944	Serial #	CODE	REASON FOR LOSS	PLACE OF LOSS	NOTES
30 January	A28-27		Hit by Japanese AA fire crashed at mouth of Cabu river	Cabu River New Britain	L/H engine burst into flames when hit also believed pilot hit as aircraft crashed without any evasive action after being hit.
17 March	A28-24	DU-P	Ran out of fuel and ditched	approx 30 miles NE of Kiriwina Island	Crew picked up by Dornier A49-1
04 May	A28-33		Converted to components	15 ARD Port Moresby	Converted to components for spares source for other aircraft
09 October	A28-23	DU-O	Crash landed Kamiri strip	Noemfoor Island	Damaged beyond repair CTC 22/02/45

DATE 1945	Serial #	CODE	REASON FOR LOSS	PLACE OF LOSS	NOTES
22 Febuary	A28-25	DU-N	Aircraft no longer required, CTC	15 ARD Port Moresby	Remaining A-20C/A not returned to USAAF scrapped
	A28-28	DU-U			
	A28-30	DU-W			
	A28-32				
	A28-34	DU-B			
	A28-35				
	A28-36				
	A28-37				
	A28-38				
	A28-40				
06 May	A28-31		Aircraft no longer required, CTC	7 CRD Tocumwal	A-20C not returned to USAAF scrapped

Date 1949	Serial#	CODE	REASON FOR LOSS	PLACE OF LOSS	NOTES
13 September	A28-39		Aircraft no longer required, CTC	Amberley	Aircraft sold for scrap

Thank you to Juanita Franzi, Aero Illustrations, for her illustrations.

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WOFF Dennis Doggett

WOFF Moss Bailey (WAG) 22 Sqn

Ian K. Baker

Peter Malone

Dick Hutchinson (22 Sqn Historian) the man who started me down the Boston rabbit hole in the early 90's.

# Notes Regarding No. 2 Squadron B-25s

Garry Shepherdson

## **General**

The last Beaufort operations flown by 2SQN occurred on 22<sup>nd</sup> May, 1944, with one aircraft each flying missions Hughes 24, 25 and 26. This was followed by the squadron's first B-25 operations on 11<sup>th</sup> June, 1944, when A47-13 and A47-7 each flew an Armed Shipping Reconnaissance (missions Hughes 29 and 30 respectively). On 20<sup>th</sup> December, 1945, it was noted that the, "only remaining Mitchell aircraft departed Balikpapan, Borneo for Laverton, Victoria transporting 17 personnel including the nucleus of No. 2 Squadron consisting of 2 Officers and 3 other ranks".<sup>181</sup> That aircraft was A47-35/KO-R, VMZAOR.<sup>182</sup>

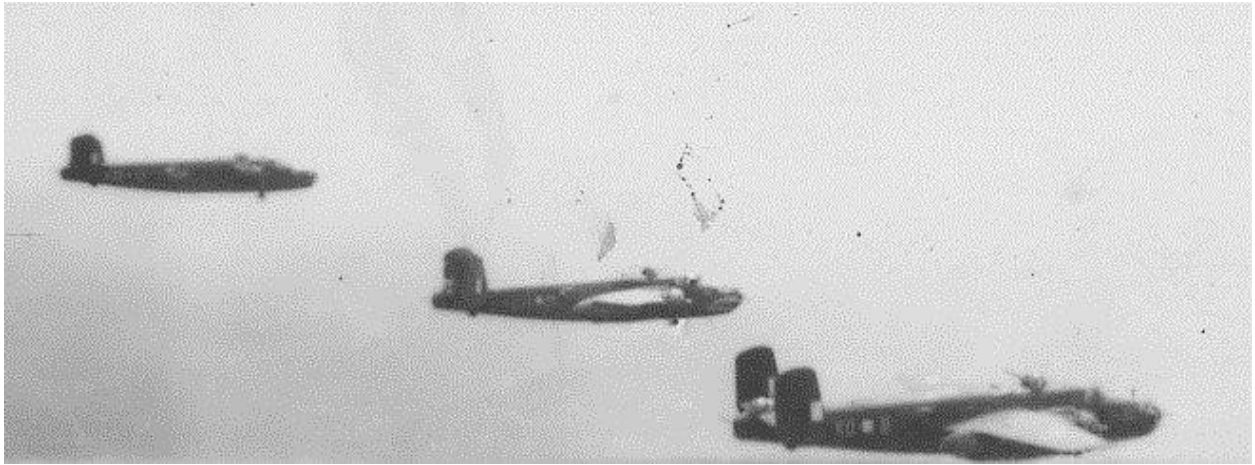
All B-25D aircraft taken over by the RAAF were North American model NA-100s, the so-called B-25D2 aircraft. See the previous edition of "Notes Regarding" [Notes Regarding No.18 (Netherlands East Indies) Squadron B-25s, ADF-Serials Telegraph Volume 11, Issue 2, pp71 – 103] for a description of these aircraft compared with earlier B-25Cs and Ds and the subsequent B-25J.

## **Camouflage**

At the end of April 1944, due to the influx of aircraft arriving from the USA in an uncamouflaged condition, a revised camouflage policy was released, cancelling the then current provisional Aircraft General Instruction, Part 3, Section (c), Instruction No.1, Issue No.2 and superseding all previous instructions. In accordance with paragraphs 3(b), 4 and 6 of that revised policy, all Medium Bomber aircraft (used for strafing) and General Reconnaissance aircraft (amongst other types) were to be finished in a single colour overall, being "GREEN" (Foliage Green, RAAF K3/177).<sup>183</sup> This was formalised with the publication of a new AGI, Pt3, Sec(c), dated 26 May, 1944.<sup>184</sup> In this new version, B-25 Mitchell aircraft were to receive the camouflage scheme as outlined in Appendix B of that instruction.<sup>185</sup> The Appendix "B" scheme was, "Uncamouflaged" and applied to, amongst other types, Medium Bombers. It, however, noted certain exceptions which included, "Medium Bombers used for strafing and G.R. Roles ...".<sup>186</sup> Those exceptions were dealt with in Appendix "C", which stated that the upper and lower surfaces of those aircraft were to be Foliage Green.<sup>187</sup>

All B-25D and B-25J aircraft that were received by 2SQN from Dutch stocks would have been finished in US Olive Drab 41 over Neutral Grey 43 (no Medium Green 42 splotches). Some were later stripped completely of camouflage in accordance with the Medium Bomber category of Appendix B, of the new AGI's; A47-11, -36 and -37 are known examples (interestingly, A47-36 was later re-painted in Foliage Green). Some were repainted in overall RAAF Foliage Green in accordance with the General Reconnaissance/Bomber category of Appendix C referred to above; A47-34 and A47-35 are two examples that spring to mind. Additionally, two hybrid schemes were also apparent. The first being the partial repainting of machines wearing US Olive Drab 41 over Neutral Grey 43 with the Neutral Grey 43 being over-painted with Black; A47-27 is one well-known example of quite a few. The second was the seemingly superfluous addition of Black to the under surfaces of the machines which had already been repainted in overall RAAF Foliage Green; evidenced by A47-19 during mid-1945 and A47-43 immediately post war. This scheme seems to have been influenced by a suggested alteration made by AOC NWA in a memo to the Air Board dated 28<sup>th</sup> June, 1944, relative to Beauforts, in which the application of "dead black" was to be applied to the under surfaces of otherwise Foliage Green machines. A similar suggestion that NMF B-25s also receive "dead black" undersides seems not to have been taken up.<sup>188</sup> A47-41 and -43 were delivered to Number 3 Aircraft Depot (3AD) from the United States and, given the delivery time frame and the fact that they weren't Dutch orders, would most likely have been delivered in Natural Metal Finish. Given, then, that the only photographs of those two aircraft show them in camouflage finish suggests that 3AD painted them in RAAF Foliage Green – evidenced by the next photo. That makes five schemes:

1. Original US Olive Drab 41 over Neutral Grey 43,
2. Original US Olive Drab 41 over RAAF Black,
3. Overall RAAF Foliage Green,
4. RAAF Foliage Green over RAAF Black and,
5. Natural Metal Finish (NMF).



Three of 2SQN's B-25Js – all camouflaged. Unfortunately, it's almost impossible to see in this version of the image, but the nearest aircraft is A47-43/KO-B, in the middle is A47-29/KO-D and in the distance is A47-41/KO-U. It shows that A47-41 and -43, which would have been delivered from the USA in NMF, have been painted (by 3AD) and that could ONLY be in RAAF Foliage Green (there is zero chance that they would have been painted by an RAAF unit in US colours); A47-29 was delivered in Olive Drab 41/Neutral Grey 43 and retained that finish throughout its 2SQN service. [Peter Jackson Collection, SLA image PRG/1614/2/29].

The month of November 1944, seems to be the critical month because photographic evidence shows that machines delivered during or after that month, such as A47-34, clearly wearing the overall Foliage Green scheme, whilst photographs of machines delivered in September and October 1944, specifically A47-31 and -32, clearly show them in factory OD over NG. It is not known at this stage if the three known Natural Metal machines, A47-11, -36 and -37, were delivered to 2SQN that way – having had their OD over NG camouflage stripped by 3AD – or if they were stripped after arrival. It is known, though, that A47-36 was re-camouflaged Foliage Green after it went to Borneo; perhaps A47-37 was also. This also suggests that Black wasn't applied to the under-sides of RAAF B-25s until after the arrival of the first Foliage Green examples (i.e. during or after November 1944).



Delivered on 03SEP44, 2SQN's A47-31/KO-P, at Hughes displaying its factory OD/NG scheme. [AWM image NWA0666].



This is B-25J-10-NC, A47-32/KO-Y, "BITOVA-MENACE". Delivered to 2SQN on 19OCT44, it is seen here wearing its original, factory, Olive Drab 41 over Neutral Grey 43. I reckon the name is in yellow, outlined in black and the lady's bikini is dark blue. One wonders if it was named as a result of an incident that occurred on the bombing range only 10-days after being received by 2SQN when, during a 100-foot pass, two 250-lb A/S bombs with 11-second delay fuses were dropped; one immediately detonated causing quite a bit of damage. That certainly would have been "a bit of a menace"! [Al Henry via John Bennett].



2SQN's B-25D-30-NC, A47-34/KO-E, "My Favourite". It was received by 2SQN on 8<sup>th</sup> November, 1944, and is seen here wearing overall Foliage Green camouflage with (I believe) Sky Blue code letters and serial number. Whilst the camouflage scheme is in accordance with the current AGI's, the code letters and serial number should have been Medium Sea Grey. [Peter Jackson Collection, SLSA image PRG/1614/2/69].



This is A47-19/KO-G sometime during 1944. It is wearing its original OD41 over NG43. Overpainting of its former Dutch flag is visible on the starboard aft fuselage. The code letters are out lined in a dark colour which I believe to be Black. The actual colour of the letters is difficult to determine; compare it though, with the propeller tip markings and also the name on A47-32, (previous page). When the aircraft entered service with 2SQN the official code letter colour was RAAF Sky Blue, RAAF K3/195 (SB), changing to Medium Sea Grey, RAAF K3/183 (MSG) after the end of May 1944. This style of code letter had been used on some of the squadrons Beaufort's and will be discussed later. [AHM of WA image P970077].



Compare the previous photo of A47-19/KO-G with this one. Here it is, this time during July 1945, at the end of a line-up and can be seen parked next to B-25J, A47-27/KO-A. "KO-A" is still wearing its original factory applied OD41 except that by the time this photo was taken, the under-surface colour had been over-painted with RAAF Black. Notice how the tone of the fuselage colour of "KO-A" in this shot is virtually identical to that displayed by A47-19/KO-G in the previous image – and also to that displayed by A47-32/KO-Y on the previous page. Notice then that, in this shot, the tone of the fuselage colour of A47-19/KO-G is now very obviously different to that of "KO-A" parked next door. I believe that this shows "KO-G" has been re-painted in RAAF Foliage Green; any repainting would have been in RAAF colours, not American. [AWM image NWA0943].





The AWM caption for this image calls out “KO-S, KO-E, KO-V, KO-A and KO-G” as appearing in the image and that the photograph was taken on 19<sup>th</sup> July, 1945, at Hughes. In fact, the noses visible from extreme left to right belong to: B-25J-5-NC, A47-28/KO-M (formerly KO-B) which is wearing Foliage Green over Black (see p96 for an explanation); it later received a circular nose art depicting a Disney style cartoon character in a ten-gallon hat and a trench coat (see p98 for a photo). Next in line is B-25D-30-NC, A47-7/KO-S which is in OD41 over Black (see also p99). Next is B-25D-25-NC, A47-37/V in Natural Metal Finish. Then B-25D-30-NC, A47-34/KO-E, “My Favourite” wearing overall Foliage Green. B-25J-1-NC, A47-27/KO-A in OD41 over Black is next; code letters are a very pale colour (I believe they are RAAF Sky Blue) thinly outlined in black. It already has its Disney “Fangs of Fire” nose art. Bringing up the right-hand end of the line is B-25D-35-NC, A47-19/KO-G which here is wearing Foliage Green over Black; again, code letters in, I believe, SB but not outlined. This image therefore shows four of the five (known) camouflage schemes worn by 2SQN B-25s – the only one missing is the original US OD41 over NG43. [AWM image AWM0943].



I have no doubt that this is A47-37/V photographed during the same line-up; its individual identification letter was marked on the nose in black. A47-7/KO-S would be the aircraft next in line. [AWM image NWA0948].



This is the other end of the same line-up as pictured on the previous page. The complete line totals twelve aircraft, six B-25Ds and six B-25Js. The nearest aircraft in this shot is B-25D-25-NC, A47-35/KO-R, which was delivered to 2SQN on 12MAY45 after operational service with 18(NEI)SQN with whom it flew on 17 operations and was 2SQN's very last B-25 in service (see "General" at the start of this article). After serving as N5-168 in its factory finish of OD41 over NG43 (see also profile illustration in Vol 11, Iss 2, p90), it was taken over by the RAAF on 28AUG44 and sent to 3AD in early September. Here it was repainted (overall Foliage Green in accordance with AGI Part3, Section C, Instruction No.1, Appendix C of 26MAY44), and later sent on to 2SQN. It is difficult to be certain, but the paleness of the serial number and code letters suggests that they are in Sky Blue rather than the Medium Sea Grey as stipulated by that instruction. The next four aircraft in this view are all B-25Js, the fourth of which (i.e. the fifth aircraft in line) is A47-29/KO-D, identifiable by its unique shark-mouth nose-art. The next aircraft beyond "KO-D" is a D-model (currently unidentified), then a J – which is A47-28/KO-M (the "M" is just visible when enlarging the copy this version of the image was taken from), and beyond that is as per the caption for the image on the previous page. Order confirmation between the two images is supported by the fourth last aircraft here being in NMF (which would be A47-37/V) and the second last aircraft in the line-up being a J-model (A47-27/KO-A). Whilst enlarging the "original" image file, from which this lower resolution version has been made, has enabled the identifications that I have claimed, frustratingly, it wasn't possible to identify the next three closest aircraft after "KO-R". If the AWM's date for their image taken from the other end of this line-up is correct, then there were seven B-25Js with 2SQN on that date. Three have already been identified which means that the three unknown B-25Js in this image must be drawn from A47-26/KO-K, A47-31/KO-P, A47-41/KO-U and A47-43/KO-B. All four are known to have served later at Sepinggang, Borneo. [Argus Newspaper Collection of Photographs, SLV image H98.104/3913].

### Turrets

Two types of Upper Turret canopy were apparently fitted to D-models; an all plexiglass canopy or a reinforced one with lateral ribs extending from one side to the other and two ribbed gun slots.<sup>189</sup>

The all plexiglass canopy was fitted to A47-1, -2, -3, -5, -9, -10, -11, -16, -17, -18, -19, -21, -22 and -23. The reinforced canopy was fitted to A47-25, -26, -27, -28, -29 and -31.<sup>190</sup> The all plexiglass unit was also fitted to A47-33, -34, -35, -36 and -37.<sup>191</sup> Confusingly, A47-4 was reportedly fitted with an all plexiglass canopy, but with a reinforcing lateral rib,<sup>192</sup> presumably, despite the mixed terminology, a reinforced canopy was being referred to.

### Exhaust Flame Dampers

All of 2SQN's B-25Ds were fitted with "Clayton S-type" exhaust stacks, one per cylinder, which protruded around two-thirds of each engine cowl.

## Empty Shell Deflector

In the previous instalment of “Notes Regarding”, I discussed possible uses of the “Empty Shell Deflector” and the reasons why I am sceptical of it having been a fume extraction device. It’s actual purpose notwithstanding, here I’m attempting to determine which 2SQN B-25s may or may not have had one of these things fitted.

The following table lists RAAF B-25s in their former US serial number sequence and groups them under two main columns. The left-hand (green) column lists those aircraft which either have photographic evidence showing the aircraft fitted with an Empty Shell Deflector (dark green) or, despite a lack of photographic proof are believed (by me) to have been equipped with one because of their former US serial number (pale green). Similarly, the right-hand (tan) column lists those aircraft that have photographic evidence showing that the device was NOT fitted (dark tan) and those that I suspect did not have one fitted (pale tan).

“Empty Shell Deflector”					
Yes Probably Yes			No Probably No		
A47-7	D-30-NC	43-3607	A47-36	D-25-NC	42-87255
A47-8	D-30-NC	43-3613	A47-37	D-25-NC	42-87258
A47-9	D-35-NC	43-3621	A47-33	D-25-NC	42-87259
A47-10	D-35-NC	43-3623	A47-35	D-25-NC	42-87416
A47-11	D-35-NC	43-3624	A47-1	D-30-NC	42-87607
A47-12	D-35-NC	43-3625	A47-34	D-30-NC	42-87608
A47-13	D-35-NC	43-3626	A47-2	D-30-NC	43-3422
A47-14	D-35-NC	43-3766	A47-3	D-30-NC	43-3423
A47-15	D-35-NC	43-3767	A47-4	D-30-NC	43-3424
A47-16	D-35-NC	43-3768	A47-5	D-30-NC	43-3426
A47-17	D-35-NC	43-3769	A47-6	D-30-NC	43-3427
A47-18	D-35-NC	43-3770	A47-40*	J-25-NC	44-30888
A47-21	D-35-NC	43-3789	A47-41	J-25-NC	44-30889
A47-19	D-35-NC	43-3790	A47-42*	J-25-NC	44-30890
A47-20	D-35-NC	43-3791	A47-43	J-25-NC	44-30895
A47-22	D-35-NC	43-3830	A47-44*	J-25-NC	44-30896
A47-23	D-35-NC	43-3832	A47-45*	J-25-NC	44-30897
A47-24*	D-35-NC	43-3867	A47-48*	J-30-NC	44-31253
A47-25	D-35-NC	43-3868	A47-47*	J-30-NC	44-31254
A47-26	J-1-NC	43-27689	A47-46*	J-30-NC	44-31255
A47-27	J-1-NC	43-27691	A47-50*	J-30-NC	44-86855
A47-28	J-5-NC	43-27927	A47-49*	J-30-NC	44-86859
A47-29	J-5-NC	43-27928	-	-	-
A47-32	J-10-NC	43-28181	-	-	-
A47-31	J-10-NC	43-28183	-	-	-
A47-30*	J-10-NC	43-28185	-	-	-
A47-38*	J-15-NC	44-29021	-	-	-
A47-39	J-15-NC	44-29024	-	-	-

Serial numbers marked with an asterisk (\*) weren’t 2SQN machines. Some of them have appeared in photographs and those photographs show either the presence or not of an Empty Shell Deflector. They (and those without photographic evidence) have been included to help illustrate those serial numbers/production blocks that may or may not have been equipped with the device.

A47-39 has been included in the “Probably Yes” side of the table because a photo exists (see ADF-Serials Telegraph Vol 11, Iss 2, p83) of an 18(NEI)SQN B-25J-15-NC, N5-237 (ex 44-29030), with the device fitted. These two aircraft were from the same production block and, since their former US serials were only 6 numbers apart, were very close together on the production line (5 aircraft separating them). Therefore, since the higher number was fitted, it seems

reasonable to assume that the aircraft a few places ahead of it on the line would also have been similarly equipped so, I've included it as a "probable".

This table shows us, then, that this "Empty Shell Deflector" was fitted to B-25D's during the production block-30 run somewhere between serial number 43-3426 (definitely not fitted; it is assumed that the next aircraft, 43-3427, also wasn't fitted with it) and 43-3607 (definitely fitted). It was then a fixture on subsequent B-25D-30s and (presumably) all B-25D-35s, B-25J-1s, -5s, -10s and into the block-15 run at least as far as 44-29033.<sup>193</sup> However, it did not appear (so far as I can tell) on B-25J-20s or later production blocks.

If any reader can supply proof by way of primary source documentary evidence or additional photographs that categorically shows the exact purpose, the method of operation and which serial numbers would have been so fitted, then please make contact (see page 3 for contact details).

#### ***AN/APN-4 [also known as LORAN (LOng RANGE Navigation)]***

According to their respective E/E88s, AN/APN-4 equipment<sup>194</sup> was fitted shortly after delivery to Australia to A47-41 to -49 inclusive. Therefore, insofar as 2SQN machines were concerned, only A47-41 and -43 arrived on the squadron with that equipment installed. It seems highly unlikely that any other 2SQN B-25s were so modified.

As far back as 19<sup>th</sup> April, 1944, RAAF Command had felt that it was, "an operational requirement that airborne Loran equipment be installed in all R.A.A.F. aeroplanes". Only specific types were actually meant, the highest priority of which was considered to be Heavy Bombers and General Reconnaissance/Flying Boats, followed then by Medium Bombers and PRU aeroplanes. The third (and last) priority was stated as being night fighters and attack aeroplanes, but only, "when the commitment arises".<sup>195</sup> However, General Reconnaissance/Bombers failed to rate a mention. That role, though, wasn't exempt from a requirement which existed (in addition to that referred to above) for General Reconnaissance aircraft, "to obtain a fix free from weather and enemy interference without disclosing the position of the aeroplane to the enemy with a range of 0 to 800 N.M. with accuracy within 16 square miles".<sup>196</sup>

As remarked above, the LORAN system was considered suitable for fitment to a variety of aircraft types. Despite falling short of the requirement in certain areas in that it was susceptible to degradation due to weather and potential deliberate jamming, the fact that its use didn't reveal the location of the aircraft was an obvious advantage and was therefore seen to best fit the General Reconnaissance aircraft requirement.<sup>197</sup> However, some concerns still lingered. Most of these seemed to revolve around the installation of AN/APN-4 and SCR729<sup>198</sup> rather than just the LORAN equipment on its own. Weight and time being the issues. The combined weight of the two systems, the time necessary to acquire sufficient quantities of both systems, time to prototype the equipment (especially with regard to the B-25s precedence in the queue with other aircraft and equipment at 1APU), time to fit to all squadron aircraft and the viability of that effort given the likely in-service time remaining for B-25 aircraft with the squadron were specifically raised.<sup>199</sup>

In terms of the weight with both systems installed, it was noted that current "J" models were already slightly overweight with full 999-gallon fuel and a 3000-lb bomb load (by 11-lbs). If both systems were then installed, it would require a reduction of 27 gallons of fuel (162-lbs).<sup>200</sup> This seems to be an easily achieved reduction however, it was noted that, "there [was] a tendency for both ground and aircrew to fill the tank[s] in spite of any instructions to the contrary, leading to the taking of unnecessary risks in flying an overloaded aeroplane".<sup>201</sup>

As of July 1945, there were plenty of AN/APN-4 units available in Australia. It was felt that it would take 2 weeks for it and SCR729 to be installed together as a prototype fitout in a B-25. Assuming satisfactory trials, another 6 weeks would be required to draft a Technical Order, 3 months to assemble modification kits with squadron aircraft then undergoing fitment during their next major inspection – which would, in itself, require a protracted period of time to cycle all of the squadrons aircraft through with the installation taking an extra 100 man hours for SCR729 and 60 man hours for LORAN per aircraft.<sup>202</sup>

It was decided that the time and effort required wasn't justified<sup>203</sup> and it was therefore proposed that LORAN not be fitted to RAAF B-25 aircraft.<sup>204</sup> In the end, a prototype installation of SCR729 in an RAAF B-25 (A47-40) didn't occur until October 1945.<sup>205</sup> There is no evidence to suggest that any other RAAF B-25s received SCR729.



This is B-25J-25-NC, A47-40, after its take-off accident on 12OCT45 whilst with 1APU at RAAF Laverton. Circled in Red is the port-side receive antenna array, AN-148-A, (the two vertical dipoles – technically: “a vertical dipole with a director mounted on a single standard with a bakelite housing”) for the SCR729. The single dipole transmit antenna, AN-147-A, isn’t clearly visible but would have been mounted in a horizontal position on the forward fuselage; in all likelihood, it is within the dark rectangle at the angle between the vertical and horizontal edges of the nose glazing at the left-hand edge of the Red circle. It seems apparent that this fit would have interfered with the firing of the package guns. The section of cockpit windscreen surrounded by the Blue oval will be discussed below. [Image: ADF-Serials Gallery. Quote: AN 08-40SCR729-S, Handbook of Operating Instructions for Radio Sets SCR-729-A and SCR-729-AZ (1944), Sec 1, Para 3 (2) d and e.].

### **Fixed Forward Firing Package Guns**

See, “Notes Regarding No. 18 (NEI) Squadron B-25s”, ADF-Serials Telegraph Vol 11, Iss 2, pp85, 86.

### **Waist Gunner’s Positions**

See also, “Notes Regarding No. 18 (NEI) Squadron B-25s”, ADF-Serials Telegraph Vol 11, Iss 2, pp87, 88.

### **Fin Flashes**

Despite the number of images that have survived of 2SQN B-25s, not too many actually show whether fin flashes were painted on the inwards facing surface of the vertical stabilizers.

Those aircraft that are known to have had fin flashes in “all four” positions (i.e. on the outward and inward facing surfaces of both vertical stabilizers) are: A47-1, -2, -5, -7, -8, -11, -13, -14, -15, -17, -25 (as “KO-U”), -26, -27, -28 (as “KO-B”), -29, -31 and -43. Those aircraft that are known to have only had fin flashes on the outward facing surfaces of their vertical stabilizers are: A47-19, -25 (as “KO-J”), -34, -35, (-36) and -37. As far as I can tell, only one of 2SQN’s B-25s was devoid of fin flashes. That aircraft was: A47-20.

### **B-25J Windscreen Armour**

The lower half of the quarter glass (surrounded by the Blue oval in the picture above) on the left-hand side of the cockpit was armour on B-25J-1, J-5, J-10 and J-15 aircraft. It seems to have been clear (as above) on J-20s. On J-25s photos show both armour or clear an example being 18(NEI)SQN’s N5-252 (armour in 1945 and clear in 1946).

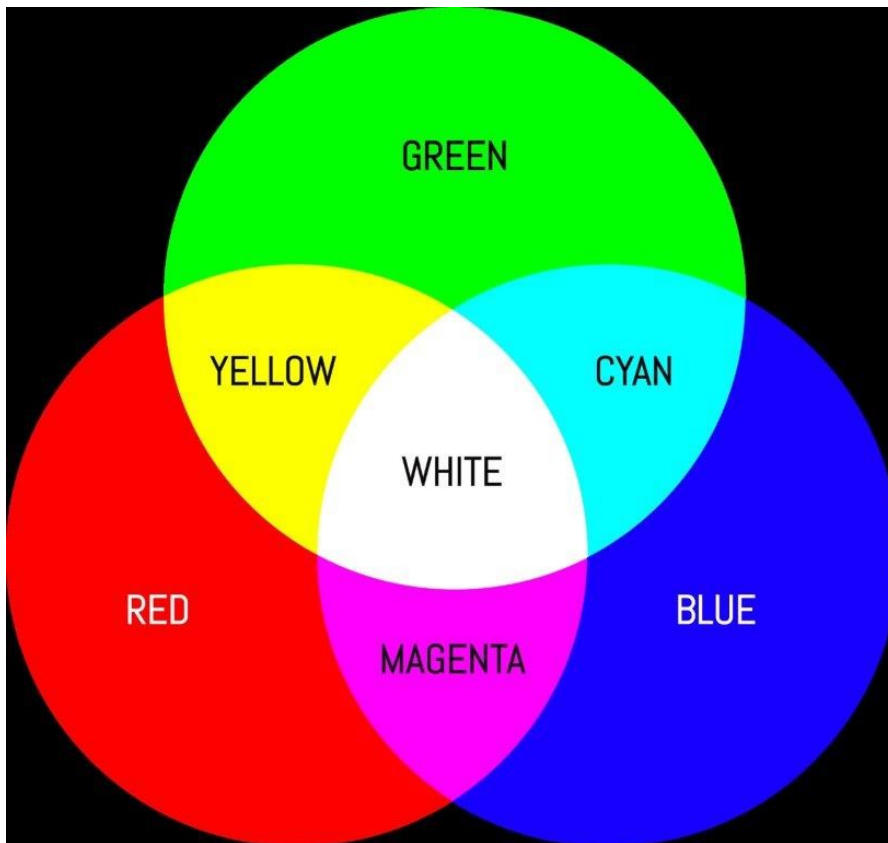
## B-25 Models and Serial Numbers

Former NEI B-25 models and serial numbers taken over by the RAAF, most of which went on to serve with 2SQN.<sup>206</sup>

<u>Model</u>	<u>Former NEI Serial</u>	<u>Former US Serial</u>	<u>RAAF Serial</u>
B-25D-25-NC			
	N5-168 / GM-Y	42-87416	A47-35
	N5-171 / GM-V	42-87255	A47-36
	N5-174 / GM-C	42-87258	A47-37
	N5-175	42-87259	A47-33
B-25D-30-NC			
	N5-181	43-3423	A47-3
	N5-183	42-87607	A47-1
	N5-186	42-87608	A47-34
	N5-187	43-3422	A47-2
	N5-189	43-3424	A47-4
	N5-192	43-3426	A47-5
	N5-193	43-3427	A47-6
	N5-194	43-3607	A47-7
	N5-195	43-3613	A47-8
B-25D-35-NC			
	N5-190	43-3830	A47-22
	N5-196	43-3621	A47-9
	N5-197	43-3623	A47-10
	N5-198	43-3624	A47-11
	N5-199	43-3625	A47-12
	N5-200	43-3626	A47-13
	N5-201	43-3766	A47-14
	N5-202	43-3767	A47-15
	N5-203	43-3768	A47-16
	N5-204	43-3769	A47-17
	N5-205	43-3770	A47-18
	N5-206	43-3790	A47-19
	N5-207	43-3791	A47-20
	N5-212	43-3832	A47-23
	N5-213	43-3789	A47-21
	N5-215	43-3869	A47-25
	N5-216	43-3867	A47-24
B-25J-1-NC			
	N5-220	43-27689	A47-26
	N5-219	43-27691	A47-27
B-25J-5-NC			
	N5-224	43-27927	A47-28
	N5-225	43-27928	A47-29
B-25J-10-NC			
	N5-227	43-28181	A47-32
	N5-229	43-28185	A47-30
	N5-231	43-28183	A47-31
B-25J-15-NC			
	N5-232	44-29021	A47-38
	N5-235	44-29024	A47-39

## Code Letter Colours

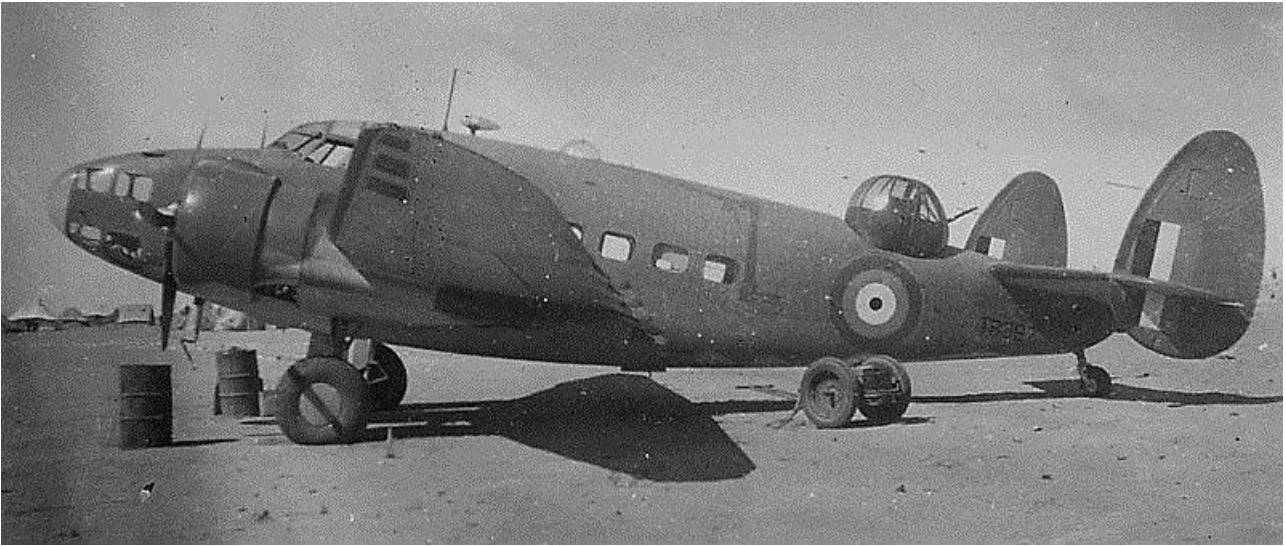
The colour interpretation of black and white photographs is difficult and can be complicated. There are all sorts of variables which affect the way that black and white film represents the light of various wavelengths (i.e. white light) that it is exposed to. Visible light is a fairly narrow portion of the electromagnetic spectrum. You may have heard of “R-G-B” (Red-Green-Blue, the primary colours) as an elementary way of defining the range of colours in their respective positions within the visible spectrum. The red end of the spectrum is that light which is of the lowest frequency and longest wavelength (in terms of thermal radiation, it is also the “coolest” colour). Green is mid-range. Blue (or violet) is the opposite end of the visible spectrum to red, it therefore is that light which is of the highest frequency and shortest wavelength – and is the “hottest” colour. This also hints at terms such as “infrared” (below red) and “ultraviolet” (above violet) as being neighbouring, although invisible (to us), portions of the electromagnetic spectrum to visible light.



A simple diagram illustrating the three primary colours: Red, Green and Blue. It shows that by combining (say) Red and Green the result is the secondary colour, Yellow. In that example, the “complementary” colour to Yellow is therefore, Blue. Green and Blue together produce Cyan; the complementary colour to Cyan is Red. The complementary colour to Green is Magenta, etc. By combining all three primary colours, the result is White. [Public domain].

Black and white film, obviously, can only represent colour in shades of grey but how those shades are represented isn’t necessarily in accordance with how we would normally expect to see them. Factors affecting this inconsistent representation of colour include the type of film being used and the use, or not, of filters of various colours.

Orthochromatic film was common early in the last century. Examples of images of RAAF aircraft taken with that sort of film were relatively common until the early 1940s. Orthochromatic film was most sensitive to the blue end of the visible spectrum, rendering those colours as pale and washed out. Greens were represented as neutral and reds were often displayed as dark to very dark or even black due to that type of films insensitivity to those wavelengths. You may have seen images of RAF or RAAF aircraft in which the colours of the roundel seemed opposite to what you’d expect. For example, an RAAF M.3 (or RAF type-A1) Red/White/Blue/Yellow roundel appearing with an evidently black dot in the middle of the white disk which is surrounded by a pale grey ring which, in turn, is surrounded by a very dark grey ring. The colours of the roundel weren’t incorrect or faded, it was just evidence of the short wavelength sensitivity – the bias or susceptibility to higher frequencies of the visible spectrum – of orthochromatic film.



This is a Hudson III. At first glance it might seem as if this machine has acquired French markings, with the fuselage roundel having a red ring around the white disk and a dark blue dot in the middle; perhaps the former yellow outer ring has been over-painted with green. The fin flash, too, looks like it has the blue stripe leading with the red stripe at the rear. Not so. It is Hudson III, T9397, of 459SQN RAAF. It is wearing standard RAF markings. The fuselage roundel is a standard RAF type-A1 roundel with the normal red dot in the middle of the white disk, surrounded by a dark blue ring, surrounded again by a yellow ring. The red dot and the yellow outer ring have the appearance of being very dark, with the red darker than the yellow. This is due to the relative proximity of these two colours to each other in the visible spectrum. The fin flash is standard RAF – with the red stripe leading. The illusion of reversed colours is exclusively a function of the type of film used. [adf-serials gallery].

Panchromatic film was more sensitive to the red end of the visible spectrum than ortho film and accordingly its shades of grey visually represented colours in a much more “natural” sense. Panchromatic film, whilst less sensitive to blue colours was still very sensitive to blue light (i.e. UV) which would render the sky as white and frequently obliterate clouds.

The use of coloured filters was relatively common with black and white film and the selection of which colour to use depended on the intended application and, in some circumstances, whether orthochromatic or panchromatic film was loaded. The main applications were for contrast (i.e. to correct the shades of grey to better represent certain colours) or haze penetration; although there were others. Using a filter of a certain colour would alter the amount and wavelength of light being transmitted by the filter which would accordingly alter the rendering of colours in shades of grey on the exposed film. Common filter colours were various shades of Yellow, Green, Red or Blue. All coloured filters lighten like colours and, to varying degrees, darken opposite (also known as “complementary”) colours. Haze penetration could be accomplished by using colour correction filters or it could be achieved by using a Pola-screen (what we now call a polarizing filter).<sup>207</sup> Since using colour correction filters will always distort (to a greater or lesser degree) the rendering of some colours, a polarizing filter could (depending on its alignment) reduce glare (for example, darken a sky-scape so as to reveal clouds) without altering the monochromatic rendering of other colours because it allowed the transmission of polarized visible light but absorbed UV.

A common filter colour to use was Yellow because that colour allows Red and Green to pass through (which together make Yellow) but increasingly absorbed Blue. With a Yellow filter, yellow objects will appear lighter than normal and the opposite colour, Blue, will be darker than normal with Violet (and therefore UV light) being largely absorbed. A photographer will know that, by using a coloured filter, the exposure of the film for any particular shot will have to be further adjusted (by either opening up the aperture or slowing down the shutter speed) to compensate for the reduction in the amount of visible light being admitted because of the filter in order to correctly expose that frame. That in turn means that, depending on the sensitivity of the film, those colours will become (to varying degrees) over exposed and will correspondingly be represented by paler shades of grey, hence, with the typical use of a Yellow filter, yellow will be overexposed compared to greens and, to a lesser extent, reds.

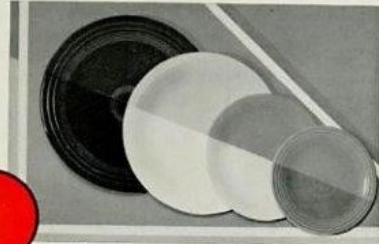


## COLOR RENDERING with VARIOUS FILTERS

Type B Panchromatic Film Photoflood Illumination



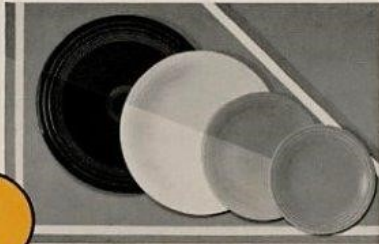
COLOR REPRODUCTION OF ORIGINAL



NO FILTER



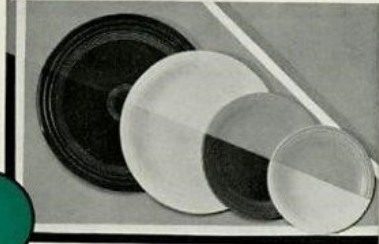
WRATTEN A FILTER (No. 25)



NO FILTER



WRATTEN G FILTER (No. 15)



NO FILTER



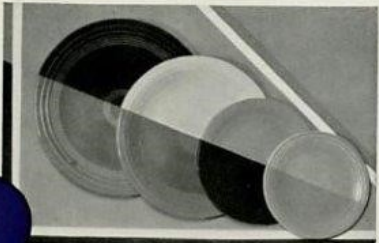
WRATTEN B FILTER (No. 58)



NO FILTER



WRATTEN X1 FILTER (No. 11)



NO FILTER



WRATTEN C5 FILTER (No. 47)

This spread illustrates the effect of various coloured filters when used with panchromatic black and white film. The original subject, in colour is at top left and filters of various colours have been used to illustrate the effect of each compared to the unfiltered result. Notice with the Yellow filter (Wratten G No.15) that, when compared to the unfiltered version, the green plate is virtually unchanged, the red plate has apparently become much lighter, the yellow plate has become virtually white and the dark blue plate is now (almost imperceptibly) darker. Notice also that in the unfiltered version, there is very, very little contrast between the green and the red plate. [Eastman Kodak Company, *Kodak Data Book, Filters and Pola-screens (1944)* pp20, 21 via <http://archive.org/details/filterspolascreen00east> at 13MAY21].

The reproduced Kodak image (above) used 5 filters as examples. They were a selection of Wratten filters being specifically, Wratten G Filter No.15 (Deep Yellow), Wratten X1 Filter No.11 (Light Green), Wratten A Filter No.25 (Red), Wratten B Filter No.58 (Green) and Wratten C5 Filter No.47 (Blue).<sup>208</sup> According to the Kodak Data Book, those filters had the following properties:<sup>209</sup>

Wratten Filter	Filter Colour	Absorbs Uses	Colour Rendering Blue/Blue Green/Green/Yellow/Red/Magenta
G No.15	Deep Yellow	UV, violet, most of the blue rays. Outdoors, "renders a blue sky darker ... darkens the water surface. The bluer the water appears, the more pronounced is the effect. Red and yellow subjects ... are rendered lighter than the eye sees them. Blue subjects are rendered darker than the eye sees them".	
X1 No.11	Light Green	UV, violet, some blue, some deep red. "[Used] to obtain correct monochromatic rendering of multicolored [sic] subjects ... photographed in daylight".	
A No.25	Red	UV, blue-violet, blue, green. Outdoors, "similar to those of the G filter, but effects more pronounced".	
B No.58	Green	UV, violet, blue, red. "Contrast filter useful in rendering green subjects lighter than blue and red".	
C5 No.47	Blue	UV, red, yellow, green. "Contrast filter when blue subjects are to be rendered as light as possible".	

It was also noted that the colour rendering was “of brilliant printing inks under tungsten light” on panchromatic material.<sup>210</sup> The Yellow and Dark Blue filters were suitable for all panchromatic and orthochromatic materials, Light Green was for “Type B and C” panchromatic, Red and Green for all panchromatic films. As a point of interest, one of the colour names used by Kodak in their colour rendering tables was “Blue-Green” (the second colour from the left). Today we’d call that Cyan, a colour which might also be described as being very similar to Aqua. Cyan is a combination of the two primary colours of Blue and Green and the “complementary” colour of Red.

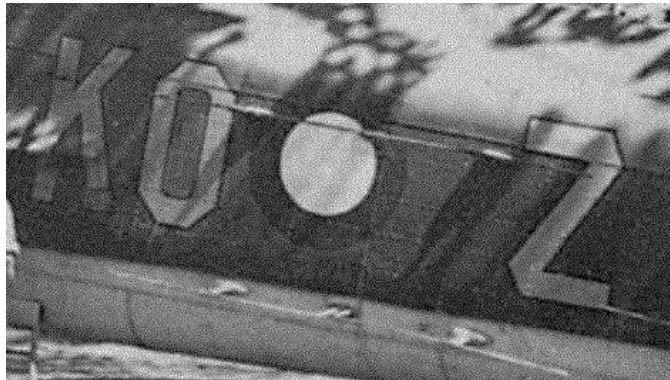
Amongst the yellow filters offered by Kodak were two specifically for aerial photography, the Wratten Aero 1 Filter No.3 and the Wratten Aero 2 Filter No.5. Both of these could be used with all orthochromatic and panchromatic materials. The No.3 filter was light yellow in colour and absorbed UV, violet and some blue and was useful in penetrating slight haze or for use at low altitude to better facilitate very short exposures due to rapid relative motion of the aircraft over the ground. The No.5 filter was a deeper yellow colour and similarly absorbed UV, violet and some blue. It had better haze penetration qualities but required a longer exposure and so was of greater use at higher altitudes.<sup>211</sup>

What, then, has all of this got to do with the colours used for code letters on 2SQN’s B-25s? At the time of the introduction of the first few B-25s at 2SQN, the officially approved colour for code letters was Sky Blue (K3/195). This was stipulated, “for all aircraft”, in AFCO A3/43, paragraph 8.<sup>212</sup> The approved colour for serial numbers had been “grey” since AGI C.11 Issue 3 of 3<sup>rd</sup> October, 1940,<sup>213</sup> and renamed Medium Sea Grey (K3/183) since AGI C.11 Issue 4 of 31<sup>st</sup> August, 1942.<sup>214</sup> On 26<sup>th</sup> May, 1944, a new AGI regarding aircraft camouflage and markings was released and in it, Medium Sea Grey (K3/183) was stipulated for all identification markings (i.e. code letters and serial numbers).<sup>215</sup> This was reinforced when AFCO A11/45 was released on 26<sup>th</sup> April, 1945, superseding AFCO A3/43. Paragraph 9 of AFCO A11/45 stated that code letters were to be black on uncamouflaged aircraft and Medium Sea Grey on Foliage Green machines.<sup>216</sup> I don’t believe that those various orders were rigidly adhered to and that, occasionally, other colours were used.



This is an image of 13SQN’s Beaufort VIII, A9-380/SF-H, as it appeared in the 1989 book, “*RAAF Camouflage & Markings 1939-45 Vol 2*” by Geoffrey Pentland. I’ve included it here because the author of that book believed that the code letters were yellow, thinly outlined in black and that that was, he claimed, “a practice in the squadron”. He repeated the claim on p87 with reference to 13SQN Ventura’s. The officially approved code letter colours at the time the photograph was taken would have been (either) Medium Sea Grey (IAW the 1940 version of AGI C.11 and an implied extension of the 1942 version) or, Sky Blue (IAW AFCO A3/1943). Conveniently, this image shows White (the centre of the national marking), Medium Sea Grey (the serial number) and Sky Blue (the under-surface camouflage). [Geoffrey Pentland, *RAAF Camouflage & Markings 1939-45 Vol 2* (1989) p67].

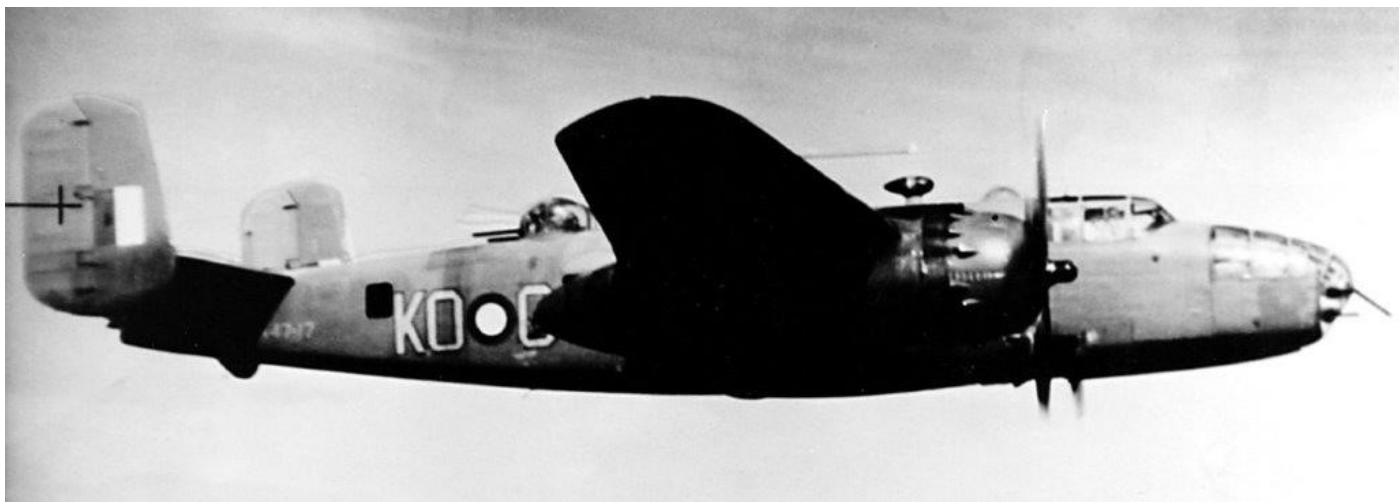
The use of panchromatic film with a deeper yellow coloured filter similar to the “ Wratten G No.15” described earlier may be the case with the image of the 13SQN Beaufort (previous page) which Mr Pentland had described as having yellow code letters. If those code letters were indeed yellow, then their very pale appearance compared even to the RAAF Sky Blue under-surfaces (which was notoriously pale) and the “normal” appearance of the Dark Blue roundel, Medium Sea Grey serial number and Foliage Green (the darker of the two upper camouflage colours) and Earth Brown (the slightly lighter) camouflage would be accounted for by the use of a yellow colour correcting filter of that sort – remember a filter will lighten like colours. A pale-yellow filter might not produce the same result, unless of course the letters were a pale yellow.



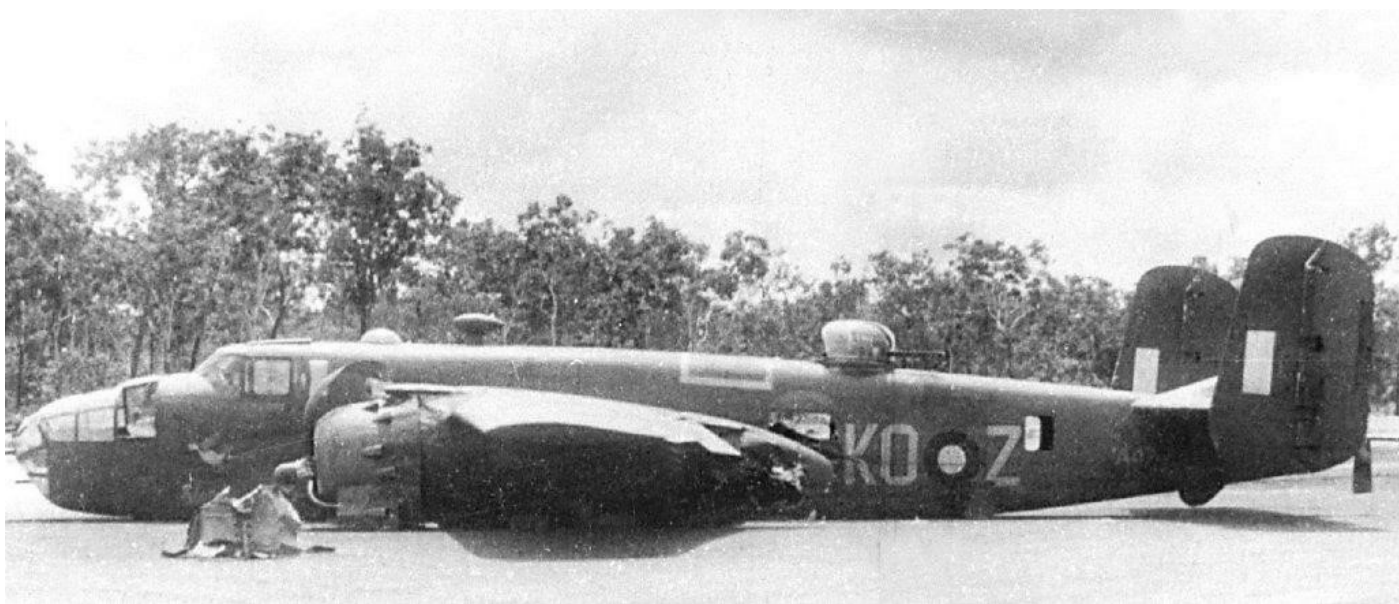
Here, we see the code letters on 2SQN Beaufort VIII, A9-576. The aircraft is camouflaged in a disruptive pattern of RAAF Foliage Green and Earth Brown over Sky Blue – in the same way as the 13SQN machine on the previous page. According to AFCO A3/1943, the code letters were supposed to be Sky Blue. In this image, the letters should be the same shade as the under-surface camouflage; clearly they're not. Notice also that there is virtually no contrast between the Foliage Green and Earth Brown (which colour contains red) – take another look at the “no filter” segment of the black and white plates in the image on p89 and see how the same applies with panchromatic film without a filter. Accordingly, I believe this image was taken using panchromatic film and no filter thereby showing (what I believe are) the golden-yellow of the code letters in a more natural sense. Given the claim made by Pentland as to the practice of 13SQN with their Beaufort's, I think that this image (rather than the one used by Pentland) lends more credence to that suggestion and that it was copied by 2SQN. [AHM of WA image P030086].



I've repeated this image of A47-19/KO-G from p80 to help illustrate the discussion relative to the code letter colours. As a reminder, the aircraft here is wearing US Olive Drab 41 over Neutral Grey 43 camouflage and, given the comments regarding the appearance of it, along with A47-27 and A47-32, that surface finish isn't likely to be as faded as it appears. The code letters are out lined in (I believe) black. The shade of the code letters is noticeably darker than the white centre of the roundel and seems extraordinarily similar to the shade of the code letters of the 2SQN Beaufort (above) – which, in that particular circumstance, clearly weren't Sky Blue. Compare their colour also with the name on A47-32/KO-Y on p79. These letters, as is the case with the Beaufort image above, seem too light to be Medium Sea Grey and seem to be remarkably similar to the yellow propeller tip markings which are visible (the near freezing of the propellers indicating a fast shutter speed). I believe this shot to have been taken using *either* a pale-yellow filter of the sort described earlier as being an “Aero 1 No.3” *OR* with a polarising filter. [AHM of WA image P970077].



Often mis-quoted as “KO-D”, this is 2SQN’s A47-17/KO-O. It is camouflaged US Olive Drab 41 over RAAF black. The serial is Medium Sea Grey. The code letters are outlined in black and the main colour is, I think, the same colour as displayed on A47-19/KO-G in the previous image. Here it is pretty obvious that, whatever colour they are, they aren’t the same colour as the serial number. [Ron Jones via John Bennett].



A47-2/KO-Z “Stinka”. The aircraft was finished in US OD 41 over NG 43, the serial number is in Medium Sea Grey, the code letters, clearly, are not. Again, I believe they are the same colour as on A47-17 (above), A47-19 and on the 2SQN Beaufort (both previous page). [M. Long via D. Vincent in Phil H. Listemann, *Allied Wings No.9, The North American B-25 in RAAF Service* (2011) 25].

Still not convinced? And I know that most of you are not. Well, what about this:



Two images of 41SQN’s A70-7/G. The aircraft is camouflaged in Foliage Green overall. Looking at the black and white image on the left: conventional wisdom would result in most people saying that that letter “G” was painted in Medium Sea Grey. Evidently not. It seems that it was a golden-yellow colour and the colour which I believe some 2SQN code letters were painted. [(L) G Pentland via *adf-serials gallery* and (R) via Gordon Birkett].



This is A47-5/KO-N, a non-Empty Shell Deflector B-25D-30-NC. It is seen here during 1944 displaying its factory applied OD41 over NG43 camouflage, 2AD applied Medium Sea Grey serial number (in deep shadow of the horizontal stabiliser) and 2SQN applied Medium Sea Grey code letters. [*adf-serials gallery*].



This, then, is a third quarter 1945 image of A47-5/KO-N taken at Sepinggang, Borneo, with A47-14/KO-F parked next door. Both machines are still wearing their factory OD41 camouflage and “KO-F” has had its under-surfaces repainted in black – it’s virtually impossible to tell from this image but, the likelihood is that “KO-N” has too. Notice though, that whilst the code letters on “KO-F” are Medium Sea Grey, those on “KO-N” are now very light (I believe that they’re Sky Blue). [*Image via Stuart Kirkham, adf-serials facebook*].

It might seem to be a controversial claim to suggest that 2SQN used a non-approved colour for some of their code letter applications. But it should be remembered also that 2SQN used the “forbidden” code letters of “C” and “I” for individual aircraft identification (in direct contravention of AFCO A3/43) and the application of black borders to some of their code letters is another obvious but incorrect deviation that is clearly visible on many photographs. Additionally, North Western Area, the formation under which 2SQN served, weren’t averse to ignoring RAAF Commands camouflage instructions from time to time so, the loose adherence to official instructions with regard to camouflage and markings wasn’t exactly unknown territory for the Squadron.

**Aircraft Code Letter Allocations**

<b>KO-</b>	<b>May-Dec 1944</b>	<b>Jan-Jun 1945</b>	<b>Jul-Dec 1945</b>
<b>A</b>	27	27	27
<b>B</b>	12 / 28	28 / 43	43
<b>C</b>	11 / 39	39	-
<b>D</b>	13 / 29	29	29
<b>E</b>	8 / 34	34	34
<b>F</b>	14	14	14
<b>G</b>	19	19	19
<b>H</b>	[4]	[4]	[4]
<b>I</b>	21	21	-
<b>J</b>	18	18	18 / 25
<b>K</b>	26	26	26
<b>L</b>	16	16	21
<b>M</b>	23	23	28
<b>N</b>	5	5	5
<b>O</b>	17	17	(-)?
<b>P</b>	6 / 31	31	31
<b>Q</b>	1	1	1
<b>R</b>	15 / 33	-	35
<b>S</b>	(13) / 7	7	7
<b>T</b>	22	22	22 / (18)?
<b>U</b>	25	25	41
<b>V</b>	9	37	37
<b>W</b>	10	10	(10)
<b>X</b>	(7) / 15	15	15
<b>Y</b>	3 / 32	32	32 / (23)?
<b>Z</b>	2	36	36
none	20	-	-
unconfirmed			18 / 23

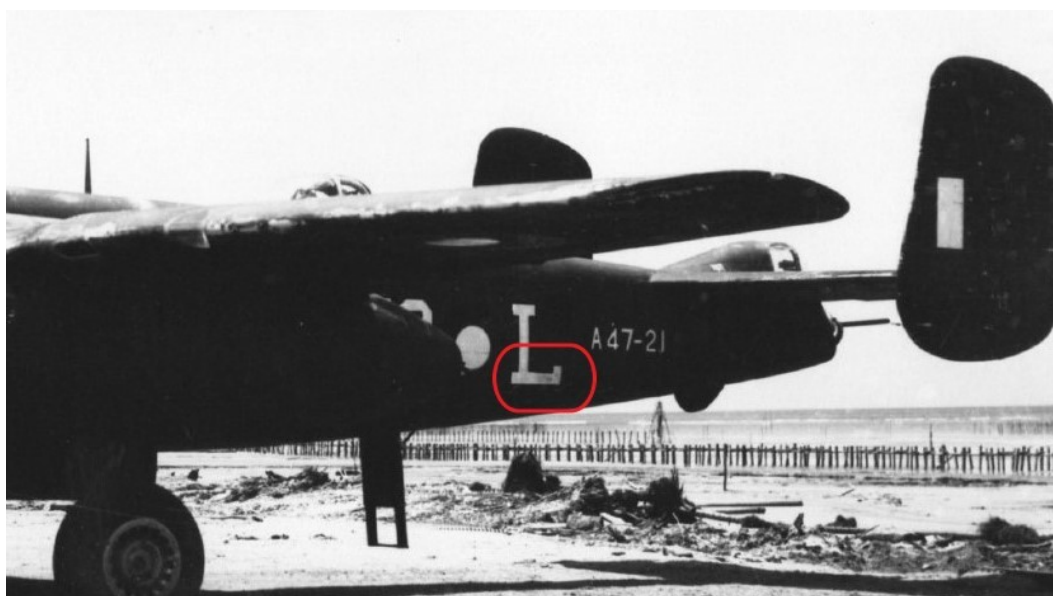
## Code Letter Re-Assignments

It would seem that eight of 2SQN's B-25s had more than one identification letter assigned at some point during their service.

A47-7	KO-X	became	KO-S
A47-13	KO-S		KO-D
A47-15	KO-R		KO-X
A47-18	KO-J		[unknown]
A47-21	KO-I		KO-L
A47-23	KO-M		[unknown]
A47-25	KO-U		KO-J
A47-28	KO-B		KO-M

Three of those initial assignments, on A47-7, -13 and -15 were very brief. Why their initial letter allocation was changed isn't clear. Something must have driven the change but, what? A47-7 last flew operationally as "X" on June 12<sup>th</sup> and began flying as "S" on June 14<sup>th</sup>, 1944. A47-13 last flew an operation as "S" on June 13<sup>th</sup>, that letter was then taken over by A47-7 who began flying as "S" the next day, June 14<sup>th</sup>. A47-13 then began flying operationally as "D" on June 17<sup>th</sup>. A47-15 last flew as "R" on June 22<sup>nd</sup> and began flying as "X" the next day, June 23<sup>rd</sup>.

For the other re-allocations: A47-18 was KO-J until it left 2SQN for 14ARD during early July 1945. The letter "J" was taken over by A47-25 which returned to 2SQN from 14ARD a few days after -18's departure. A47-18 returned to 2SQN during early August 1945. Its new letter hasn't been positively determined however, the only letters available were "C", "H", "I", "O", "T" and "Y". If it is accepted that the prohibition of the forbidden letters "C" and "I" was enforced in Borneo (see A47-21, below), then those two letters could be discounted. That leaves "H", "O", "T" and "Y" as being the only available assignments. I have a sneaking suspicion that "H" was actually assigned to A47-4 so, only "O", "T" or "Y" would have been up for grabs. "O" had been vacant for a long period of time and is therefore a certain possibility although, it had seemed to have fallen out of favour by that time (who knows why ...) with several machines either joining or re-joining the Squadron who could have acquired that letter but didn't. "T" and "Y" both became available during mid-July and I strongly suspect that A47-18 picked up one or the other of these two letters. I would speculate that it might have acquired the letter "T", but there isn't any evidence that I've found to support that view other than "T" comes before "Y" in the alphabet.



This is a cropped version of a well-known image of No. 2 Squadron's A47-21/KO-L taken at Sepinggang Airfield, Borneo, during the third quarter of 1945. It is one of those not too common examples of a period photograph clearly showing both serial number and code letter – and one which leads many to assume that the evidence that they can clearly see in the image translates into, "if it was so when the photograph was taken, then it must have always been so". Notice the extension of the serif to change the "l" into an "L". A47-21 spent the majority of its 2SQN life as "KO-I". I believe that the code letters and serial number are in RAAF Sky Blue. [AHM of WA image P017044].

A47-21 was KO-I and became KO-L in lieu of A47-16 sometime after 30<sup>th</sup> June, 1945, when 2SQN was officially informed that A47-16 wouldn't be returning to the Squadron. This is something of an anomaly because it was re-coded whilst still actively serving with the Squadron. Every other example of a 2SQN B-25 being re-coded during 1945 was after the subject airframe returned to the Squadron from 14ARD – which also suggest that, in those circumstances, the airframe had been repainted. AFCO A3/43, which was still current, stipulated that “... [a]ircraft under repair or being reconditioned ... which require to be repainted, are not to have code letters applied”<sup>217</sup> A47-21 did not receive a full re-paint, only receiving an application of Black over its original US Neutral Grey 43 and the application of the letter “L” is visible in photographs as being merely a simple modification of the pre-existing letter “I”.

A47-23 was KO-M until it left the Squadron for 14ARD after mid-March, 1945. The letter “M” was then taken over by A47-28, the former KO-B, when it returned to the Squadron from 14ARD during early June. When A47-23 eventually got back to 2SQN around mid-August, 6-days after A47-18 had returned, it was assigned a new, as yet undetermined, letter. I would speculate that it might have received the letter “Y” but I have no evidence to support that other than as discussed for A47-18, on the previous page.

A47-25 was KO-U until it was sent off to 14ARD during early-March, 1945. When it returned to 2SQN, repainted in overall Foliage Green, in July, 1945, it was assigned the recently vacated letter “J”, see A47-18, above.

A47-28 was KO-B until it left 2SQN for 14ARD towards the end of March, 1945. As mentioned above, when it returned in June, now no doubt repainted in overall Foliage Green, it was assigned the vacant letter “M”.

### 2SQN B-25 Initial Delivery Sequence

#### 1944

25 <sup>th</sup> April	A47-16, A47-17, A47-20
9 <sup>th</sup> May	A47-4 <sup>218</sup>
10 <sup>th</sup> May	A47-19
20 <sup>th</sup> May	A47-5, A47-10, A47-15
22 <sup>nd</sup> May	A47-9
27 <sup>th</sup> May	A47-14
3 <sup>rd</sup> June	A47-6, A47-13
6 <sup>th</sup> June	A47-7, A47-18
12 <sup>th</sup> June	A47-12
18 <sup>th</sup> June	A47-3
27 <sup>th</sup> June	A47-1
29 <sup>th</sup> June	A47-26, A47-27 [first two B-25J's]
7 <sup>th</sup> July	A47-11
17 <sup>th</sup> July	A47-8, A47-23
24 <sup>th</sup> July	A47-22
29 <sup>th</sup> July	A47-25
6 <sup>th</sup> August	A47-2
20 <sup>th</sup> August	A47-21, A47-29 [29: third B-25J]
3 <sup>rd</sup> September	A47-31 [B-25J]
7 <sup>th</sup> September	A47-28 [B-25J]
19 <sup>th</sup> October	A47-32 [B-25J]
8 <sup>th</sup> November	A47-34
1 <sup>st</sup> December	A47-33
6 <sup>th</sup> December	A47-39 [B-25J]

#### 1945

22 <sup>nd</sup> March	A47-37
22 <sup>nd</sup> April	A47-36
12 <sup>th</sup> May	A47-35
26 <sup>th</sup> June	A47-43 [B-25J]
27 <sup>th</sup> June	A47-41 [B-25J]



Here is a tabular analysis of the accuracy of the identification letter to serial number associations for each of 2SQN's B-25's in NWA for which an identification has been made. Entries for aircraft that flew on operations with 2SQN *after* it left NWA are not included in this table because of the lack of suitable primary source documentation (within which the necessary information was extracted) to compare with the Squadrons A50/A51 entries. Some aircraft are missing from the table altogether and they are those that didn't fly on operations with 2SQN prior to leaving NWA, specifically: A47-4, -35, -36, -41 and -43. The aircraft that flew on operations with 2SQN after leaving NWA but with a different alphabetic identity were: A47-18 (letter unknown), -21 (as "L"), -23 (letter unknown), -25 (as "J"), and -28 (as "M"). Accuracy equals "Tasked and Recorded" divided by the sum of "Tasked and Recorded", "Tasked but Not Recorded" and "Not Tasked but Recorded", multiplied by 100.

Serial	Letters	Tasked	Known Cancellations	Tasked and Recorded in A51 as Flying	Tasked but Not Recorded (Apparently replaced by...)	Not Tasked but Recorded (Apparently replaced...)	Accuracy (%)
A47-1	KO-Q	45	6	38	1	0	97.4
A47-2	KO-Z	35	2	32	1	0	96.9
A47-3	KO-Y	27	3	24	0	0	100
A47-4	KO-H	1	0	0	1	1	0
A47-5	KO-N	46	8	38	0	0	100
A47-6	KO-P	23	2	21	0	0	100
A47-7	KO-X	3	1	2	0	0	100
	KO-S	46	7	37	2	1	92.5
A47-8	KO-E	11	1	10	0	0	100
A47-9	KO-V	38	4	34	0	0	100
A47-10	KO-W	44	2	41	1	0	97.6
A47-11	KO-C	29	1	28	0	1	96.5
A47-12	KO-B	14	0	14	0	0	100
A47-13	KO-S	2	0	2	0	0	100
	KO-D	17	0	16	1	0	94.1
A47-14	KO-F	43	5	38	0	0	100
A47-15	KO-R	3	0	3	0	0	100
	KO-X	24	2	24	0	0	100
A47-16	KO-L	54	1	51	2	1	94.4
A47-17	KO-O	28	4	22	2	3	81.4
A47-18	KO-J	54	6	46	2	1	93.8
A47-19	KO-G	50	9	41	0	1	97.6
A47-21	KO-I	27	2	24	1	0	96.0
A47-22	KO-T	41	2	38	1	1	95.0
A47-23	KO-M	27	6	21	0	2	91.3
A47-25	KO-U	46	6	38	1	1	95.0
A47-26	KO-K	47	3	43	1	1	95.5
A47-27	KO-A	24	2	22	0	0	100
A47-28	KO-B	16	1	13	2	0	86.6
A47-29	KO-H	1	0	1	0	0	100
	KO-D	33	3	30	0	0	100
A47-31	KO-P	25	2	23	0	2	92.0
A47-32	KO-Y	20	0	20	1	0	95.2
A47-33	KO-R	2	0	2	0	0	100
A47-34	KO-E	21	6	15	0	0	100
A47-37	KO-V	1	0	1	0	0	100
A47-39	KO-C	15	1	14	0	0	100

As mentioned on the previous page, aircraft that were either delivered, or which received additional individual identification letter assignments, after the period covered by the primary source documents used to compile this work cannot be included in the above table because of a lack of evidence to show whether a particular machine was tasked, cancelled, or otherwise replaced or not. Since the only available source of information for that period is the units A50/A51 (which does not give the necessary type of information), there is nothing to compare.

The highest accuracy figure recorded was 100% on 18 occasions. The lowest accuracy figure recorded was 0%. Except for A47-4 (used on one occasion as a replacement and therefore receiving a serial number to tasked aircraft letter accuracy of 0%), none of the individual accuracy figures comes close to being low enough to attribute to chance.



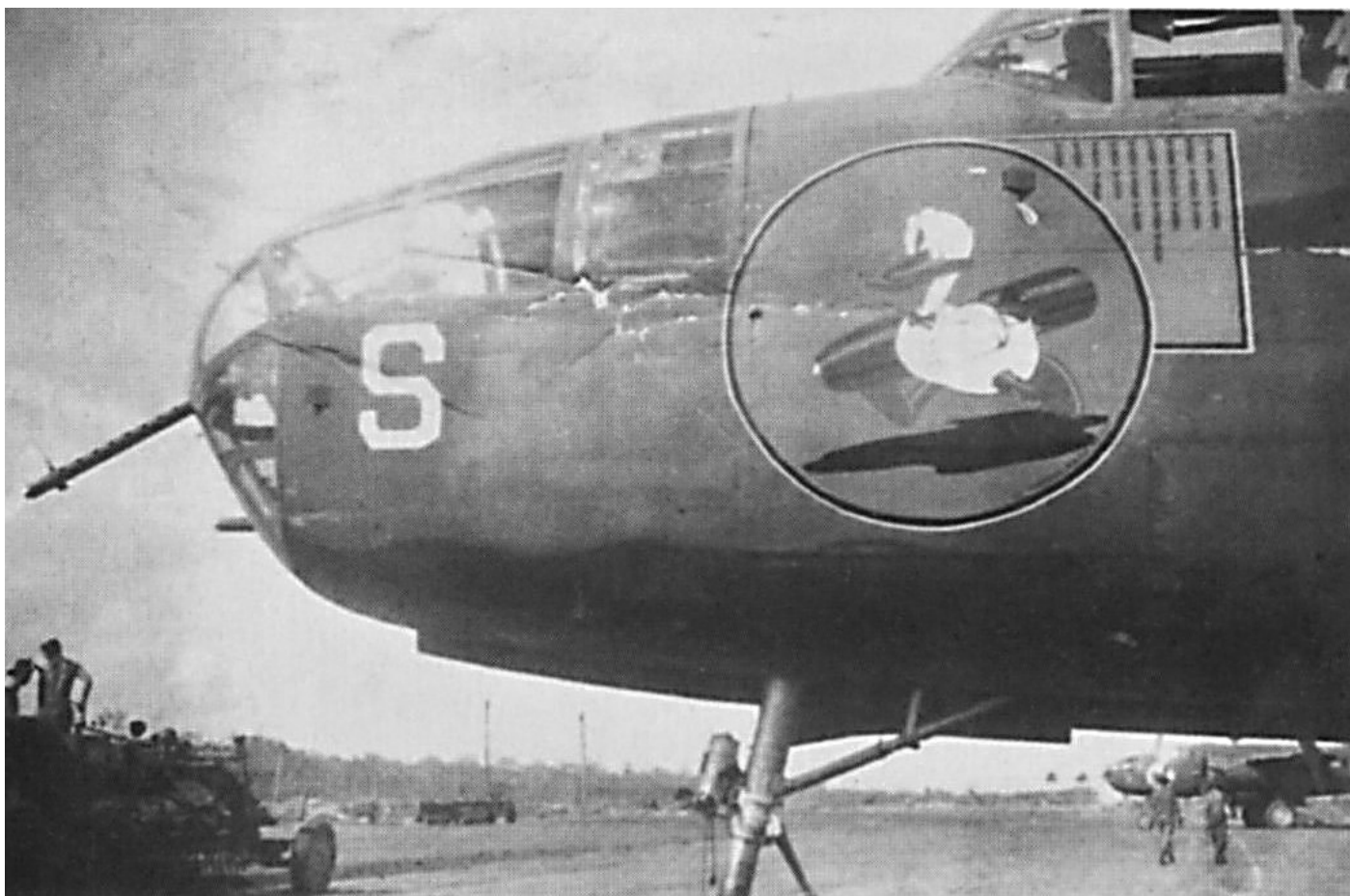
Although the quality of the image is poor this is, believe it or not, A47-25/KO-J, pictured at Sepinggang, Borneo, after the end of hostilities. As “KO-U”, A47-25 was sent to 14ARD during March, 1945, and was returned to 2SQN, freshly repainted in overall Foliage Green, in July and re-coded “KO-J”. Another image of this machine, taken at a northern Australian airfield after re-coding, showed the codes in a very light (although not white) colour – presumably RAAF Sky Blue with the individual identification letter repeated (again in Sky Blue) on the nose. Here, its relatively recently applied Disney “Goofy” nose art is plain to see. [AHM of WA image P015253].



Another poor-quality shot but, interesting never the less. Taken at Sepinggang, Borneo, after the cessation of hostilities, this line up of 2SQN B-25s shows A47-28/KO-M (the former “KO-B”) wearing Foliage Green over Black camouflage and displaying a Disney type nose art which seems to depict a 10-gallon hat wearing character. Next in line is, I think, A47-14/KO-F, followed by A47-25/KO-J “Goofy” and then A47-21/KO-L. [AHM of WA image P015252].



This is a cropped version of the 2SQN line up taken at Hughes on 19JUL45. On the right is A47-37/V in Natural Metal Finish, then A47-7/KO-S, thought to be wearing US Olive Drab 41 over Black and then A47-28/KO-M, the former "KO-B" re-camouflaged in RAAF Foliage Green. The focus here is on A47-7/KO-S. Its former name, "Salome" is still visible between the individual identification letter "S" on the nose and the new, although incomplete, Disney style nose art which can be compared with the image below. [AWM image AWM0943].



Here is A47-7/KO-S a number of weeks later at Sepinggang, Borneo. The name "Salome" has been obliterated and the Disney Donald Duck type character has been embellished. A bomb log has also been added – but remember, counting bombs in a bomb log is not an accurate way of date fixing a photograph. [Image via Steve Mackenzie].



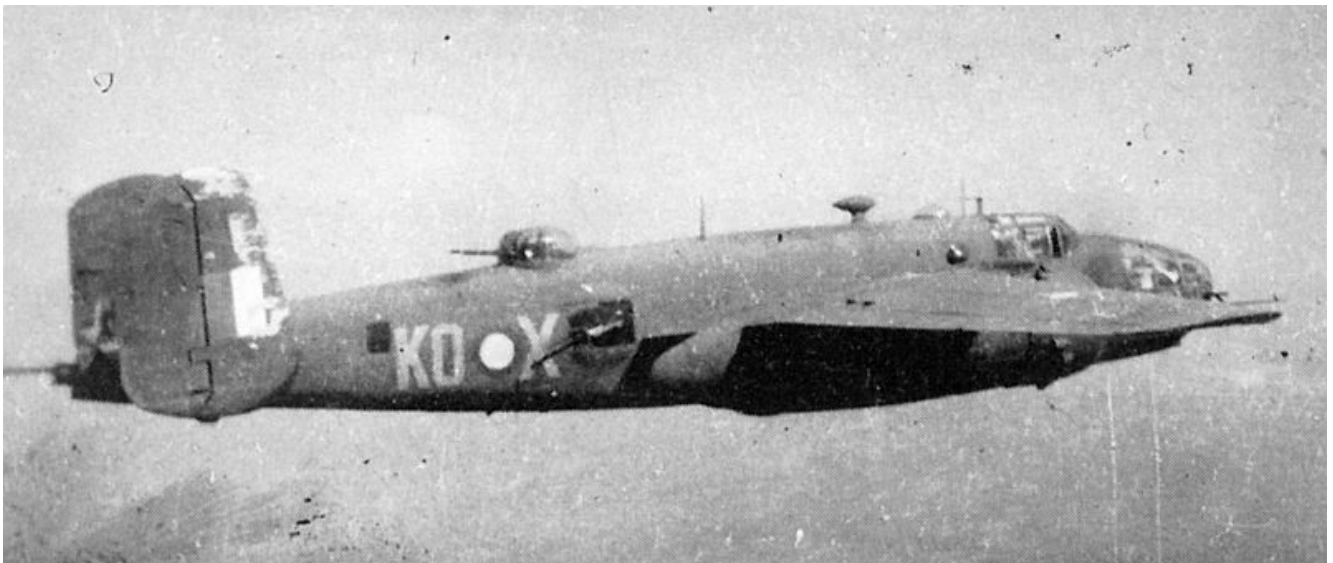
A line up of 2SQN B-25's at Hughes (not Truscott as captioned by AHMWA) looking just about directly south with B-25D, A47-14/KO-F and B-25J, A47-27/KO-A, closest to the camera. Next *might* be A47-25/KO-U (or it might be a sneaky shot of A47-4/KO-H) followed then by A47-13/KO-D; the remainder of the line-up is unidentified. The first six aircraft appear to be in original US OD41. It isn't possible from this shot to determine if the undersides were still NG43 or of any of them had received an application of black. The code letters on "KO-F" and "KO-A" do not seem to be the same colour as each other, on the third aircraft they are nearly impossible to see and on "KO-D" they are very low contrast, very similar to "KO-A". I reckon that "KO-A" and "KO-D" are likely MSG (Medium Sea Grey). "KO-F" seems to be slightly lighter but not light enough to be SB (Sky Blue) – perhaps another example of a golden yellow colour? "KO-A" later received SB codes outlined in black and images of "KO-F" after it received black undersides clearly show MSG codes and serial. The very pale rendering of the dirt in the foreground – which looks like beach sand but isn't because it's actually a dark reddish-brown – and the good haze penetration suggests to me the use of a red filter similar to a Wratten B No.25. The duty pilot's tower is on the other side of the runway, right of centre. [AHM of WA image P920771].



Same line up, viewed from the tower side of the strip and looking south east – the tower has been cropped out, but was at the extreme right of the shot; the pole in the foreground at the extreme left of the image supports a windsock. It is difficult to see in this rendering of the photograph, but the two aircraft parked at the extreme left-hand side of the photo (on the other side of the runway) are "KO-F" and "KO-A" and the closest aircraft of the two parked on the extreme right-hand side of the photo (on this side of the runway) is A47-23/KO-M and the aircraft behind it is a "J" model. Fourteen B-25s are in this shot, two are in Natural Metal Finish. Three of the B-25s appear to be "J" models. Excellent haze penetration and the near white rendering of the red dirt in the foreground again suggests the use of a red filter. [AHM of WA image P920770].



Unfortunately of relatively poor quality, this is however a very useful image showing the 2SQN flight line at Sepinggang, Borneo during the third quarter of 1945. Considering the six aircraft in the closest half of the shot – the two on the left are B-25D's A47-5/KO-N and A47-14/KO-F (see also p93). The four on the right start with B-25J's A47-26/KO-K and A47-27/KO-A then B-25D's A47-(unknown) and A47-25/KO-J. The closest two, B-25J's A47-26/KO-K and A47-27/KO-A, are both wearing their original OD41 camouflage and both now have black undersides. Both have SB codes and serials although the individual identification letter of "K" has been repeated on the nose in black, unlike "KO-A". A47-27/KO-A usually appears very pale in most shots but see here that it is very similar in hue to "KO-K" and to both "KO-N" and, especially, "KO-F" (which often appears quite dark) parked opposite (see previous image). Compare that, though, with the two B-25D's in this image. These two appear very dark and are both wearing RAAF Foliage Green. The closest of those is, unfortunately unidentified, but the farthest is A47-25/KO-J, the former "KO-U" and the very last B-25D built. [Image via Stuart Kirkham, [adf-serials facebook](#)].



This is A47-15/KO-X in US OD41 over RAAF black. It was received by 2SQN on 20MAY44 and initially coded "R". It flew its last operation as "R" on June 21<sup>st</sup> and its first as "X" the next day. And yes, I reckon they're probably golden-yellow code letters. During a strafing attack on a Japanese vessel on 19JUL44, it was struck by machine gun calibre anti-aircraft fire which killed the turret gunner, WOFF I.S. McCallum and seriously injured the other Wireless Operator Air Gunner, WOFF V.A. Muir. Fuel and hydraulic lines were ruptured and the rudder cables shot away. The attack was broken off and the aircraft was escorted back to base. [Image via Mike Mirkovic, [adf-gallery.com.au](#)].



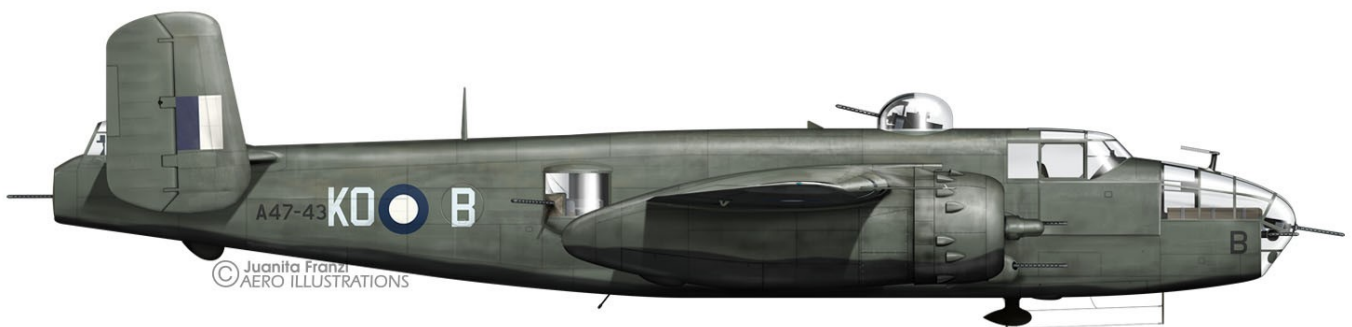
A47-13/KO-D was received by 2SQN on 03JUN44 and initially coded "S". It was re-coded "D" between the 14<sup>th</sup> and 16<sup>th</sup> of June. On 6<sup>th</sup> August, it was destroyed when it crashed fatally about 18 km's east of Adelaide River. The aircraft was one of three aircraft conducting bombing practice with 250-lb Armour Piercing bombs. Individual bombs had been successfully dropped on two previous passes, but on the third, the selected bomb failed to release. A fourth pass was made in order to salvo the bombs which seemed to occur normally until the bombs had fallen 50 to 100 feet below the aircraft when an explosion occurred. The aircraft burst into flames and, with the undercarriage down, the aircraft entered a gentle dive, giving the appearance of an attempt at a forced landing, but which continued until the aircraft struck trees and exploded. Miraculously, two of the seven on board survived, although seriously injured. [*Aviation Heritage Museum of WA image P025874 via Mike Mirkovic*].



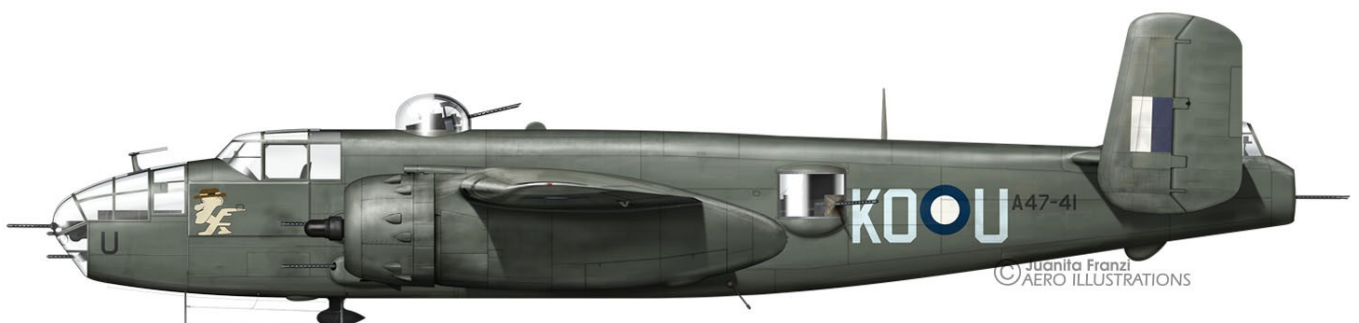
A47-25/KO-J, the former "KO-U". This was the very last B-25D off the production line and is seen here evidently in Australia and presumably post-war (all armament removed). [*via ADF-Serials facebook*].



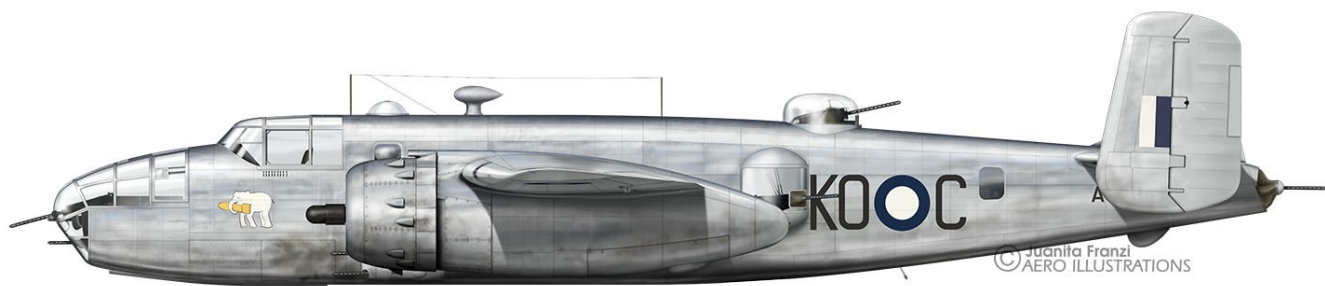
A post-war shot of A47-29/KO-D in storage at, presumably, Amberley. Whilst most other 2SQN B-25s either had their NG43 undersides repainted in black or lost their original factory scheme altogether by being either stripped of paint or being repainted in Foliage Green, this picture shows that A47-29 retained its original factory camouflage scheme of OD41 over NG43 throughout its 2SQN service; perhaps the only machine to do so. The Empty Shell Deflector is evident underneath the nose. [Via Wayne Greer, *adf-serials* facebook].



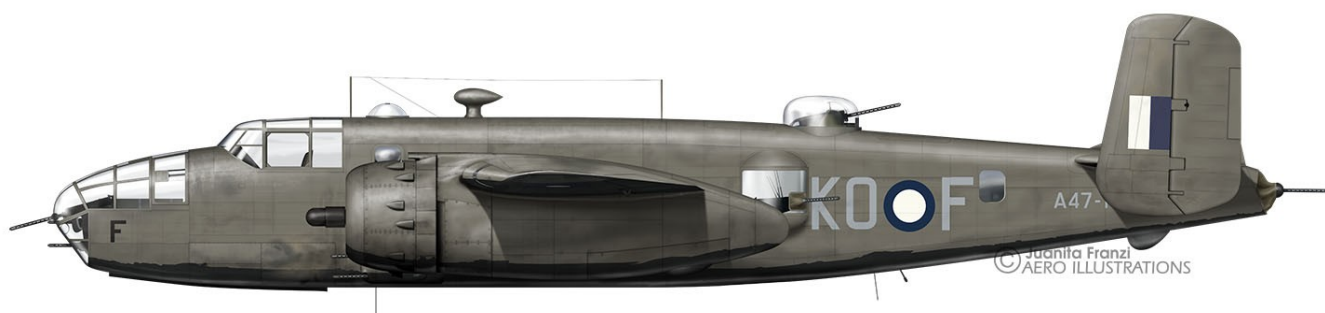
This is an illustration of B-25J-25-NC, A47-43/KO-B. The reference photo showed the aircraft wearing RAAF Foliage Green over Black with the serial number and individual identification letter (on nose) in Black and Sky Blue code letters. It arrived at 2SQN towards the end of June, 1945 and wasn't used operationally until September, flying 8 operations during that month. It arrived too late to be covered by the documentation used in this research. [Copyright Juanita Franzi, Aero Illustrations, drawing B25J-172].



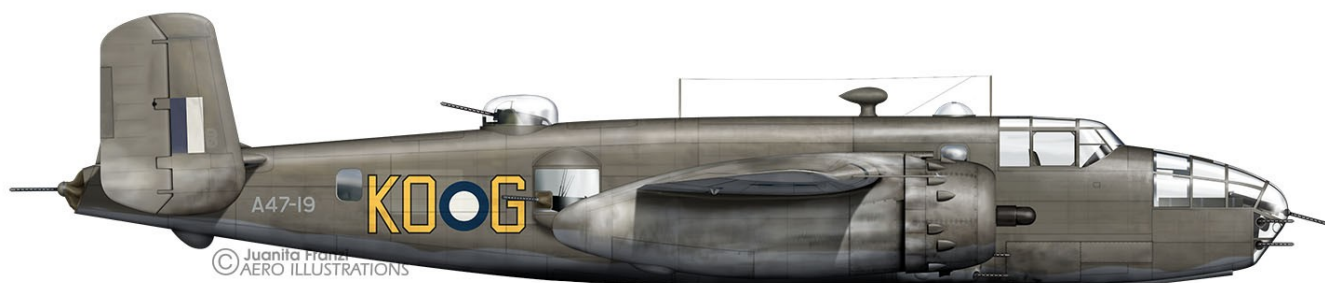
B-25J-25-NC, A47-41/KO-U in overall RAAF Foliage Green with RAAF Sky Blue codes and Black serial number. This aircraft was received by 2SQN at Hughes, late in June, 1945 and did not fly operationally from Australia. After deploying to Borneo, it flew 5 operations during August and an additional 9 in September. This activity occurred too late for it to be included in the data from which this research has been based and therefore, it doesn't appear in the previous tables. Juanita has done a tremendous job interpreting the nose art. [Copyright Juanita Franzi, Aero Illustrations, drawing B25J-161].



B-25D-35-NC, A47-11/KO-C, “*Petunia*”, was the earliest of three (known) Natural Metal Finish B-25s to serve with 2SQN. It flew its first operation on 25JUL44. By the time it force landed on Bathurst Island on 05DEC44, it displayed a bomb log of nine bomb symbols – by which time it had successfully completed 27 operations. It was during the course of its 28<sup>th</sup> operation that it was hit by Japanese Anti-Aircraft fire whilst strafing a beached barge. Fuel tanks in the starboard wing were ruptured as were hydraulic lines. The starboard engine was shut down as a precaution due to the risk of igniting the fuel streaming from the damaged tanks. Fuel was pumped from the starboard side until the generator on the port engine failed. The port engine eventually stopped due to fuel starvation and the aircraft was successfully force landed (wheels and flaps up due to hydraulic failure) on a mud flat on Bathurst Island; the aircraft skidded for about 400 meters and came to rest in mangroves at the edge of the mud flat. No injuries were sustained by the crew. In addition to the bomb log, the aircraft carried nose art of an elephant holding a yellow bomb with its trunk. It isn’t known if the name “*Petunia*” was displayed or not – it wasn’t visible on the nose art reference photo; but that didn’t show the entire area below the cockpit. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-031].



B-25D-35-NC, A47-14/KO-F, was received by 2SQN on 27MAY44 and flew its first operation on 13<sup>th</sup> June. It flew its 44<sup>th</sup> and last operation in September, 1945. It is illustrated here as it would have appeared after returning to the Squadron in mid-January, 1945, wearing its original US factory applied Olive Drab 41 (OD41) camouflage but with RAAF Black applied over the original Neutral Grey 43 (NG43). Code letters and serial number here are RAAF Medium Sea Grey (MSG – RAAF K3/183). It had RAAF roundels in all six positions. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-041].



A47-19/KO-G, a B-25D-35-NC, shown here as it appears in the photograph (pp80 and 91) in its delivery scheme of US OD41 over NG43. Most, if not all, B-25s delivered to 2SQN prior to November, 1944, would have been in this factory camouflage scheme. A47-19 was initially received by 2SQN on 26APR44 and flew its first operation on 23JUN; it had been replaced by other machines for its first two tasked operations on 21 and 22JUN. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-062].





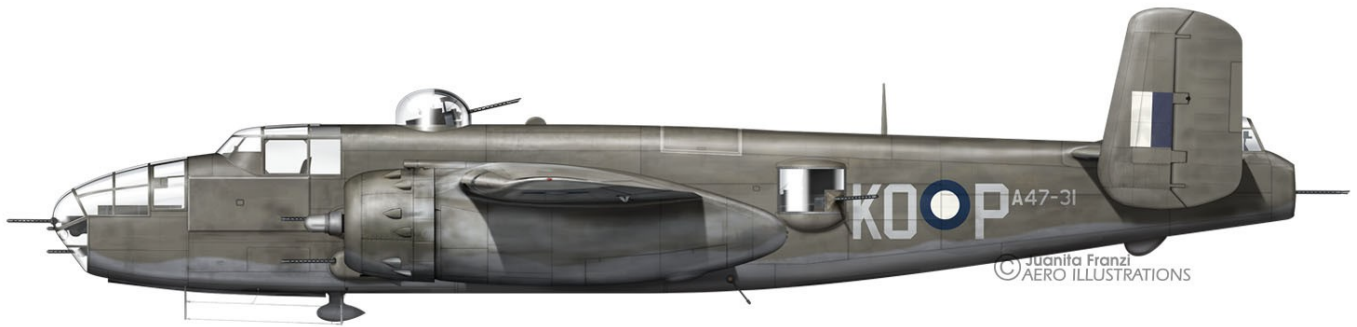
A47-19/KO-G again, this time as it appeared in mid-1945. Between June and November, 1944, this aircraft had successfully completed 35 operations (including being damaged in action on its 19<sup>th</sup>) and had RTB'd from another 3. It had had some serviceability issues and was tasked but replaced on another 6 operations. By mid-November, it had fallen due for a 240-hourly and was sent to 14ARD at Gorrie who subsequently placed the aircraft in storage. 2SQN received it back again on 19FEB45, now finished in RAAF Foliage Green – it isn't known when the Black would have been applied (by 14ARD or 2SQN?). It was weather cancelled at its first two attempts at operations after returning to the Squadron and eventually flew 4 ops (1 in March and 3 in April, 1945). It is shown here as it appeared in the photograph reproduced on px. It carried a 24-symbol bomb log (it had flown 39 by this stage) and was soon to receive a machine-gun carrying winged-bug nose art (see below). The aircraft deployed with the Squadron to Sepinggang, Borneo, and completed a further 5 operations during September, 1945, until it was destroyed in a fatal accident during the course of its sixth, on 15SEP45, killing everyone on board: the crew of six and two passengers. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-071].



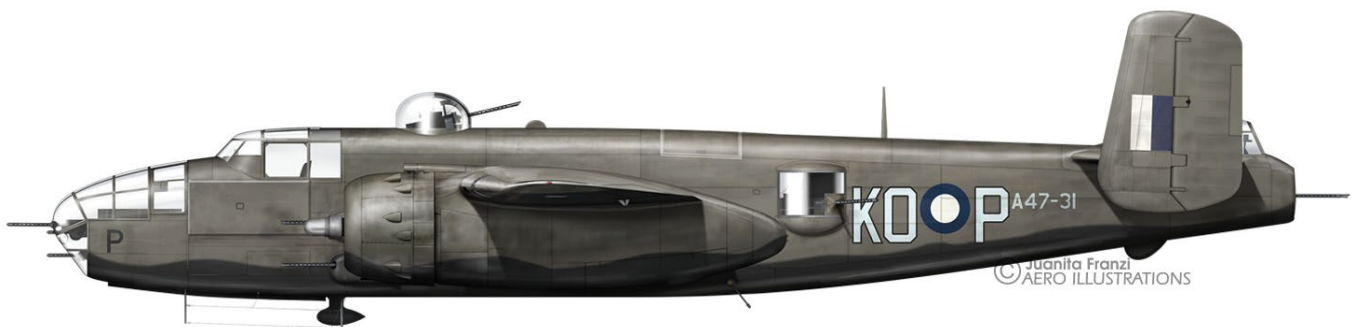
This is the nose art that A47-19/KO-G received shortly before deploying to Sepinggang. The colours are not certain. I'm confident that the bomb log was Yellow. It seems reasonable to assume that the bug was green, but the back ground colour, whilst similar in tone to the bomb log, was slightly darker – was it Yellow, a more orange colour, maybe even a shade of Green? Whatever the background colour, the art work has been beautifully rendered by Juanita. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-0811].



Another B-25D-35-NC, A47-25/KO-J, ex N5-215 and 43-3869. This aircraft was the very last B-25D Mitchell built. It was initially received by 2SQN on 29JUL44 and was coded "KO-U". During its early service it would have been finished in standard factory camouflage of OD41 over NG43. An image of this machine appears in Phil H Listemann, *Allied Wings No.9, The North American B-25 in RAAF Service* (2011) 9, and shows it wearing OD41 over Black with mid-toned codes (too dark to be Sky Blue and too light to be MSG and obviously completely different from the serial; see discussion on pp87-93) and MSG serial. The fact that it served continuously with the Squadron until early-March suggests that the Black under-surface camouflage was applied by 2SQN; this suggests a similar likelihood for other aircraft similarly treated. After a period with 14ARD from early-March, it returned to 2SQN in July, 1945, camouflaged in Foliage Green (FG – RAAF K3/177) over-all and received the new individual identification letter "J" applied in Sky Blue (SB – RAAF K3/195). The serial number was very pale and may or may not have been MSG. It would have received its Disney "Goofy" character nose art around about the time the Squadron deployed to Sepinggang from where it flew its final 3 operations, making a total of 41 completed operations. The colours of the nose art, as depicted, are not certain. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-051].



**B-25J-10-NC, A47-31/KO-P.** Shown here in its original delivery scheme of US OD41 over NG43 wearing MSG codes and serial number. It was received by 2SQN on 02SEP44 and commenced operational flying two weeks later. It flew 19 operations between then and the end of 1944. [Copyright Juanita Franzi, Aero Illustrations, drawing B25J-141].



**A47-31/KO-P** again. This time as it appeared during the third quarter of 1945, still wearing US OD41 upper camouflage but now with Black undersides and Black bordered Sky Blue codes; the serial number may or may not have been Medium Sea Grey. This aircraft flew 6 operations during March/April, 1945, from Hughes. It deployed with the rest of the Squadron to Sepinggang, Borneo and flew a further 12 operations during the August/September, 1945 period. [Copyright Juanita Franzi, Aero Illustrations, drawing B25J-151].

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- Camouflage of Aircraft; NAA: A11095, 107/4/AIR PART A.
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## Curtiss Corner: P-40E A29-29

In a rush, no time for RAAF insignias!

Gordon Birkett



A29-29 "I" April 1942 Gordon R Birkett @2021

During February 1942, experienced No 23 Squadron pilots had been converted on the P-40E/E-1 in exchange for providing dual instruction on Wirraways for around 20 USAAF pursuit pilots. After some 6 weeks of sea travel from the United States, all had little currency in flying and had extremely low hours accrued in their flight logs on high performance aircraft. Those RAAF Pilots included F/Lt M V Lewis Serv#224 (*Ex 24 Sqn replacing Sqn Ldr Kingwell as 23Sqn's CO*), F/Lt L D Jackson Serv#520, F/Lt K W Lloyd Serv#736 and F/Sgt A C Davis Serv#406124 who had also been used to test fly erected USAAF P-40E/E-1 aircraft at Amberley between dual training.

"The U.S.A.F.I.A. Headquarters have made available 5 P40s at Archerfield.  
One S.S.F. Squadron is to be formed at Archerfield using as a basis the personnel of 23 (G.P.) Squadron. After the formation of this fighter squadron 23 squadron is to be built up to strength by posting action.  
After forming, the squadron will move to Townsville (R.A.A.F. Station) for further training and operations.  
The 5 P40s will be available as from 10th March at Archerfield for conversion sources. A.M.P. is to arrange for competent instructors on the type to be available to supervise conversion flying training and familiarisation of ground personnel."

Page 53 Provision of Aircraft for Australian Defence. [NAA: A5954, 229/2].

Though no details coming to light on the P-40E/E-1 aircraft serials flown during that time, those RAAF pilots did have available at Archerfield, some 5 P-40E/E-1 aircraft for that purpose from 10 March 1942. Their use may have continued as both No 75 and No 76 Squadrons were to be formed, but the events of war soon outpaced this requirement with the latter squadron becoming the replacement and training pool for the former squadron, after it had departed for Port Moresby from 22 March 1942.

No 1 Aircraft Depot(1AD) had advised 2EFTS to assign A29 Serials for these 5 P-40E/E-1 aircraft (USAAF Fiscal Serials 41-5336, 41-5508, 41-5586, 41-5612 and 41-24825) in out of sequence numbering as; A29-28/26/27/29/30,

respectively, following on from the original "25" A29 serials and were now to be issued to 75 Sqn as attrition aircraft. No 75 Sqn losses included already those four lost to accidents on delivery or prior to 14 March 1942, allotted in sequence as A29-1 to A29-4.

With their addition of the original 75 P-40E/E-1s that were to equip three original RAAF Fighter Squadrons, a total of 80 aircraft had now been transferred from United States Army Forces in Australia (USAFIA) Reserve Stocks by late March 1942.

One of those 5 aircraft, located also at Archerfield, P-40E 41-5508,<sup>219</sup> was not ready because of its damage and incomplete repairs at the time to become A29-26 due to a ground collision with an Avro Anson, and was therefore replaced by another locally sourced ex USAAF aircraft, P-40E 41-5395. Of interest, P-40E 41-5508 was seemingly allotted yet again by 1AD, as the original A29-76 on that E/E-88 Card, before being replaced by another aircraft, P-40E 40-663, which became the final A29-76 on 6 April 1942, after being delivered from USAFIA Reserve stocks, located at Bankstown. Aircraft P-40E 41-5508 would eventually be numbered A29-81; that being its eventual third and final A29 serial allocation, as the last of the original 80 USAFIA Reserve Stock P-40E/E-1 aircraft transferred to the RAAF during this period.

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March 11, 1942  
CAS - LEM

AGWAR WASHINGTON

FOLLOWING IS PARAPHRASED VERSION OF MESSAGE:

HAVE COME TO AGREEMENT WITH RAAF TO TURN OVER TO THEM A TOTAL OF SEVENTYFIVE P-40'S, TO BE TAKEN FROM THOSE ON HAND AT PRESENT, OR ARRIVING. THESE ARE TO BE REPLACED BY FIRST CONSIGNMENT OF P-40'S TO COME TO AUSTRALIA EITHER FOR THE PURCHASING COMMISSION FOR BRITISH OR FOR AUSTRALIANS. CITE ACS 971 IN REPLY

BRETT

OFFICIAL:

**RAAF First 75 agreement Acceptance dated 11 March 1942. [USAF AHRA Reel A7440 Page 998]**

*These 75 aircraft of the above agreement ranged from A29-1 to A29-25 (1<sup>st</sup> 25 aircraft allotment) and A29-31 to A29-81(3<sup>rd</sup> 50 aircraft allotment), with A29-73 not being assigned. The missing A29-73 aircraft was perhaps 1 of 23 P-40Es from the SS Mormac Star that had arrived in Geelong on 20 February 1942. That aircraft remained a USAAF P-40E as it was lost on a test flight in late March 1942 by a USAAF Pilot from 4 Air Depot (USAAF) when being "slow timed" (engine run in) on a return flight from Canberra.*

*All the remaining 22 P-40Es of that SS Mormac Star shipment were allotted to the RAAF within the A29-31 to A29-78 serial allocations, with another exception being noted. Aircraft P-40E 41-5556 (originally allotted as the first A29-77 serial allocation), was repossessed by the USAAF on 23 March 1942 ex Archerfield.*

*Redirected RAF Defence Aid 3(DA3) P-40E-1s to the RAAF from the RAF, starting at A29-82, started arriving after a fortnight gap were allotted from the end of the second week of April 1942 from 1AD, Laverton. There again a similar circumstance of duplicate allotments of A29 serials occurred when a number of these 20 DA3 P-40E-1s were redirected to the USAFIA as attrition replacements for the 49<sup>th</sup> Pursuit Group. In summary, as explained above, these 5 aircraft (of the 2<sup>nd</sup> aircraft allotment) for training predated the deliveries of the second lot of 50 aircraft and the start of the later intended 125 DA3 P-40E-1s.*

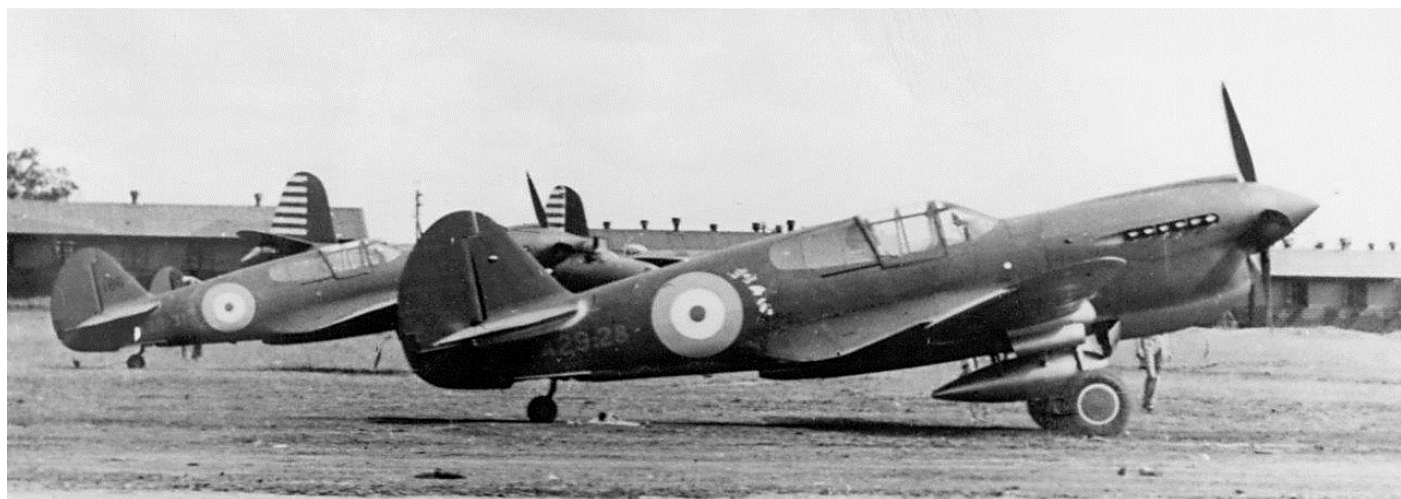
Interestingly, there are some examples of prehistory of some of those 5 aircraft: P-40E A29-27 (ex 41-5586 #184 Black) was damaged during landing at Williamstown on 12 February 1942 when piloted by 2<sup>nd</sup> Lt Ken L. Glassburn USAAF #0-425075 of the 13th PS (Prov), who because of that accident broke his wrist whilst getting out of the aircraft. The aircraft was repaired at Williamstown and allotted to RAAF after being flown back up to Archerfield.

Another, P-40E A29-28 (ex 41-5336 #18), was an ex-Hangar Queen for the 17<sup>th</sup> Pursuit Squadron (Prov) which had remained at Amberley in January 1942 when that squadron left for Java as it had arrived ex USA by ship with a damaged rudder and had been used as a source of spare parts for the remaining 17 P-40Es.

The supply of the second USAFIA Reserve allocation of 50 P-40E/E-1s also proceeded at no lesser pace than the first batch of 25 in the same week, with aircraft supplied immediately from 1AD Laverton commencing and with some locally repaired aircraft from Amberley and Archerfield also included. These were used to equip the second Squadron forming at Archerfield, No 76 (F) Squadron, RAAF. On 24 March 1942 at Archerfield, these intended 5 training aircraft, A29-26, A29-27, A29-28, A29-29 and A29-30, were issued to No 75 F Squadron RAAF as urgent replacement aircraft after their initial deployment there. It was intended on 30 March 1942 that these 5 were to be ferry up to Port Moresby.

However, on take-off A29-27 ran off the runway on landing into soft ground at Archerfield and tipped on its nose, damaging considerably the airscrew and starboard wing. It was not until the 6 April 1942 that it was received by 75 Squadron RAAF officially. This seems to be purely administrative, as it was issued to 2AD from the 10 April 1942 and that its E/E-88Card shows, it never flew again.

This time also coincides with 2EFTS being disbanded and it seems from the second week of March 1942 moved, all Staff and aircraft had been transferred south and north, as Archerfield was slowly being taken over by the Americans.



A29-28 and A29-31 in rear above at Archerfield, shows the hurried application of roundels (yet no fin flashes) and the previous owner's Olive Drab. Circa dated 24 March 1942 over a two-day period of preparations. A29-28 has a respray of sky under the tailplane, but the fuselage still has the Neutral Grey paint lines. Two of four B-26s arrived on the 22 March 1942 at Archerfield are seen at the back. A further four and then, a further three B-26s arrived ex Hawaii (reflects tail stripes) on the 24 and 25 March 1942 respectively with one of the latter crashing on landing. [Buz Collection ex RAAF].

The roundel in the above picture of A29-28 has been applied over a previous personal Pursuit Pilot's Fuselage Motif. A29-31 at rear, sans fin flash, it still has its Black Box number in fin, and had been prepared and marked by 1AD, Laverton whereas A29-28 was prepared by 2EFTS at Archerfield and received by No 76 Squadron RAAF on the 24 March 1942, around the same time as A29-31. A29-29 was also received by No 76 Squadron on 24 March 1942 from 2EFTS and then six days later had been received by 75 Squadron RAAF as an attrition aircraft after it was ferried up to Port Moresby.

### A hectic day at 7 Mile

Orders were received on 24 April 1942 to move, within 36 Hours, to a new landing strip know as Eleven Mile (at Bomana). After three morning security patrols (0604Hrs with three P-40Es, 0809Hrs and 0930Hrs with only two P-40Es), a further four P-40Es were scrambled at 1046Hrs to intercept Zeros reportedly inbound to strafe the strip.

The 0930Hrs security flight was made up of Flt Lt Les Jackson (A29-41 "M") and Flt Sgt R W Crawford (A29-76 "T") who were informed by radio of this raid. They provided cover whilst the flight of four aircraft scrambled but were soon required to land a refuel since they had been airborne for some time. With Seven Mile under attack, they diverted to Kila Strip where they could be refuelled by the 8th BS (Lt). However, on approach to Kila airstrip, a returning B-26 Marauder was sighted as being under attack from Zeros. The B-26 was saved, but the resultant combat saw A29-76 "T" being ditched in Port Moresby Harbour with Flt Sgt R W Crawford suffering light injuries to the neck, arms, and legs. The other flight of four also lost two aircraft when they intercepted 2000 feet below and straight ahead and dived from 26000 feet head on. As a result of this air action, F/O O J Channon, in A29-43 "P" was shot down and killed near Porabada.

F/Sgt Michael Seymour "Mick" Butler (407220) in A29-29 "I" performed a head on attack with a Zero which had pulled up into a stall turn when he fired two bursts with no visible result. Later he came out of a cloud when a Zero came down at the top of him and fired onto him as he ducked back into the cloud. A lucky round hit his oil cooler which resulted in the engine overheating and running rough. He forced landed his aircraft some 8 miles northwest of 7-mile Aerodrome.



**A29-29 "Seething Dagger Eye" with Salvage Crews.** [Still from Geoffrey Robertson documentary "44 days"].



**A29-29 "I" without fuselage roundels.** [Still from Geoffrey Robertson documentary "44 days"].

The aircraft was deemed salvable at the time, as entered on the E/E-88 as of the 26 April 1942. By the 10 July 1942, as above, A29-29 was stated as being complete write off by 75 Squadron RAAF.

No Roundel/Cockades on any P-40E/E-1s flying around in Australia during 1942?



Above is another un-identified shot during the period March-May 1942 P-40E of 75 Squadron at Moresby after an accident and nosing over. Perhaps glare of shot angle but appears to have no fuselage roundel and a very roughly painted wing roundel. A Rough "B" would indicate its A29-23 when it aborted its take-off 3 May 1942. [Still from Geoffrey Robertson documentary "44 days"].

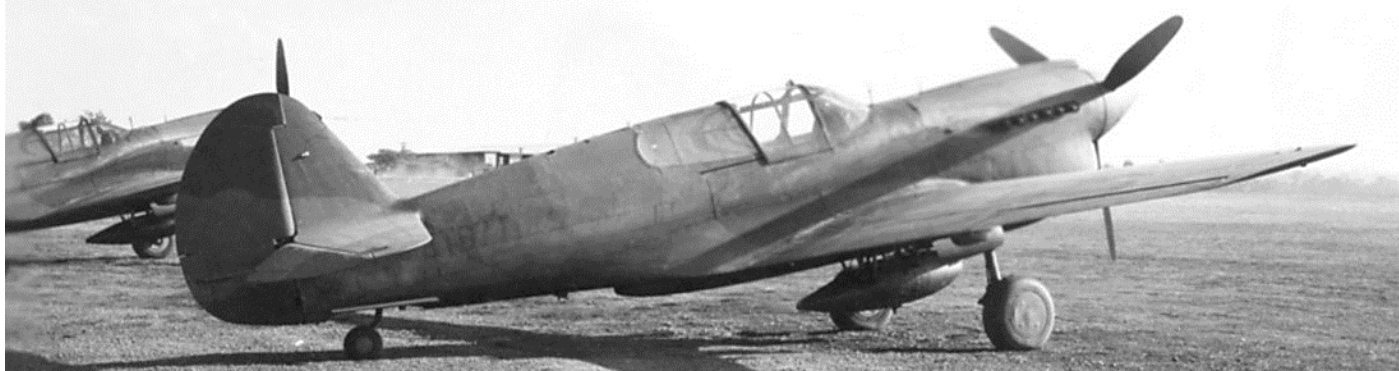
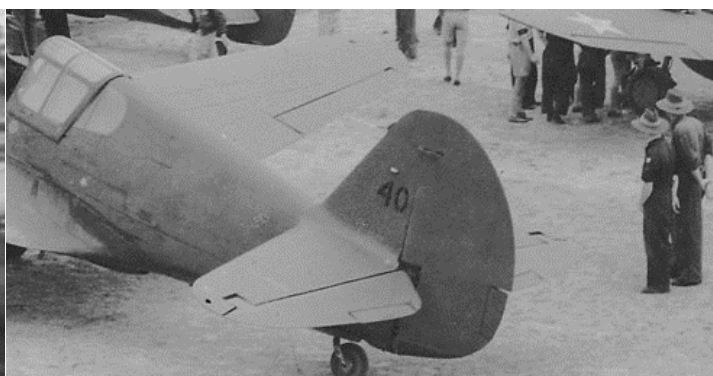


A quick check of my Pics, Townsville pre move to Moresby, A29-23 did have a flash but seemingly as this picture shows, that there is seemingly no fuselage roundel. [GRB Buz Library].

There were several more it seems, and at times quite a few pictured, below are photographed examples Feb/Mar/April 1942.



Possibly the same P-40E-1 ET877 now pictured at Cloncurry? May 1942. An ex RAAF DA3 reversal (payback) 2<sup>nd</sup> Lt Clyde Barnett crouched centre. [Clyde Barnett 8FS/ 49FG GRB Collection].



Round the clock, "X" stated P-40E-1 A29-10, 13<sup>th</sup> PS (Prov) P-40E #40 at Richmond and P-40E-1 ET877 at Laverton. [Clyde Barnett 8FS/ 49FG GRB Collection].





**Confused by many; will the real A29-29 stand up! No, it's not this one. Often tabled as A29-29, this is P-40E-1A29-129, "29" pictured at 2OTU Mildura with Sept 1942 RAAF Roundels. [RAAF Official].**

## Sources

Movement of Squadron of P.40 Aircraft to Port Moresby.1942 – 1942; NAA: A1196, 60/501/88.

Subject registration booklets for Department of Air correspondence files (CRS A705, 1922-1960) - Subject: Conversion of aircraft engines -; NAA: A2408, 9/16 PART 1.

RAAF Unit History sheets (Form A50) [Operations Record Book - Forms A50 and A51] Station Headquarters Archerfield Aug 40 - May 42; NAA:

File No 1. Redisposition of Empire Air Forces. (Following outbreak of War with Japan). Provision of Aircraft for Australian Defence. (To Organisation of SWPA Command April 1942) NAA: A5954, 229/1.

USAF AHRA Reel A7440 Page 999 RAAF First 75 agreement Acceptance.jpg.

RAAF Unit History sheets (Form A50) [Operations Record Book - Forms A50 and A51] Elementary Flying Training School 1 to 7 Jan 39 - Aug 45; NAA:

E/E-88 Cards: A29-26 to A29-30

Further Reference material: ADF-Telegraph and prior ADF Serials Newsletter Articles: P-40 In RAAF Service Pt1 to Pt 8 GRB.

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## End Notes

### RAAF WW2 in Colour No.11 – RAAF Demons

- <sup>1</sup> J Bennett, *The Imperial Gift*, Banner Books, Maryborough, 1996, p.29.
- <sup>2</sup> Air Board Agenda No. 1368 of 29 JAN 1930, approved by the Minister for Defence on 4 FEB 1930.
- <sup>3</sup> [ADF Serials - Bristol Bulldog \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>4</sup> G Pentland, *RAAF Camouflage & Markings 1939-45 Vol 1*, Kookaburra, Melbourne, 1980, p.9.
- <sup>5</sup> These ten Demon IIs are often quoted as two-seat trainers with dual controls (D/C), and provision for target towing (T/T). But the E/E.88 Aircraft Status Cards and imagery reveal there were nearly 30 Demons fitted with D/C, and other earlier aircraft fitted for T/T. Imagery confirms some of these conversions.
- <sup>6</sup> A1-11 was the last flying RAAF Demon, flown only intermittently over late 1943 at Richmond as the base met/weather ship, to be finally ferried to Benalla in JAN 1944 for conversion to an I/A. RAAF Richmond Unit History A.50, 1943-1944.
- <sup>7</sup> Indent Order (I.O.) No. from A1 Aircraft Status Cards E/E.88.
- <sup>8</sup> N Parnell & T Boughton, *Flypast*, AGPS, Canberra, 1988, p.118; C D Coulthard-Clark, *The Third Brother*, Allen & Unwin, Sydney, 1991, p.180.
- <sup>9</sup> A1 Aircraft Status Cards E/E.88.
- <sup>10</sup> [ADF Serials - Hawker Demon \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>11</sup> NAA A14487 10/AB/1817 ABA No.1817 of 30 OCT 1935.
- <sup>12</sup> Most sources quote this order of Australian Demon IIs being dual-control and provision for target-towing. This was not the case, as seen by the number of Demon IIs that were converted to these roles.
- <sup>13</sup> [Hawker Demon | BAE Systems | International](http://www.aeroflight.co.uk/)
- <sup>14</sup> R Rimell, *The Hart Family*, Linewrights, Ongar, Essex, 1989, p.4.
- <sup>15</sup> J Goulding & R Jones, *Camouflage & Markings RAF Fighter Command 1936-1945*, Doubleday, New York, 1971, pp.50, 118.
- <sup>16</sup> J Sweetman, "The Great Monoplane Gamble", in *Aeroplane*, Key Aero, Stamford, MAR 2020, p.41.
- <sup>17</sup> F K Mason, *Hawker Audax & Hardy*, Profile No.140, Profile Pubs, Leatherhead Surrey, 1966, p.3.
- <sup>18</sup> [Hawker Demon | BAE Systems | International](http://www.aeroflight.co.uk/)
- <sup>19</sup> Rimell, p.6.
- <sup>20</sup> Rimell, p.12.
- <sup>21</sup> <http://www.aeroflight.co.uk/>
- <sup>22</sup> D Luff, *Bulldog, The Bristol Bulldog Fighter*, Airline Pubs, Shrewsbury, 1987, pp.121-123.
- <sup>23</sup> Luff, p.125.
- <sup>24</sup> Parnell & Boughton, p.118.
- <sup>25</sup> Coulthard-Clark, p.180.
- <sup>26</sup> [ADF-Serials Telegraph \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>27</sup> [ADF Serials Telegraph \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>28</sup> R Sturtivant, *The Anson File*, Air Britain, Tonbridge, 1988, p.153.
- <sup>29</sup> CAC Wackett Trainer article in [ADF-Serials Telegraph \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>30</sup> C H Barnes, *Bristol Aircraft since 1910*, Putnam, London, 1994, p.34.
- <sup>31</sup> C F Andrews & E B Morgan, *Supermarine Aircraft since 1914*, Putnam, London, 1989, pp.8-9.
- <sup>32</sup> Goulding & Jones, p.2.
- <sup>33</sup> Parnell & Boughton, p.66.
- <sup>34</sup> [ADF Serials - Hawker Demon \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>35</sup> Coulthard-Clark, p.184.
- <sup>36</sup> Rimell, pp.8,26.
- <sup>37</sup> Rimell p.19.
- <sup>38</sup> Coulthard-Clark, p.329.
- <sup>39</sup> [ADF Serials - Hawker Demon \(adf-serials.com.au\)](http://adf-serials.com.au)
- <sup>40</sup> Parnell & Boughton, p.167.
- <sup>41</sup> Coulthard-Clark, p.345.
- <sup>42</sup> This report clarified that "the cooling system is specially constructed to permit the engine to run successfully with the water at or slightly above boiling point. The fact that steam may be seen coming from this aircraft in flight is not necessarily that the engine is not running correctly. Provided that the engine is not maintained at boiling point for a prolonged period, no damage to the engine should result from the boiling." Cited in Parnell & Boughton, p.167.
- <sup>43</sup> Parnell & Boughton, p.167.
- <sup>44</sup> Parnell & Boughton, p.175.
- <sup>45</sup> The reference here to a **Central Training Establishment** was reflected by the AGI C.11 of 22 SEP 1939, where in para.3 the *squadron letter* of "Z" was allocated to CTE. To take responsibility for the training of flying instructors from 1FTS, **Central Flying School** (CFS) would ultimately be formed in APR 1940.
- <sup>46</sup> AM Sir Richard Williams, *These Are Facts*, AWM, Canberra, 1977, p.237.
- <sup>47</sup> Coulthard-Clark, p.348.
- <sup>48</sup> Williams, p.244.
- <sup>49</sup> J Bennett, *Highest Traditions 2SQN AFC/RAAF*, AGPS, Canberra, 1995, p.375.
- <sup>50</sup> *Units of the RAAF, A Concise History, Vol.3 Bomber Units*, AGPS, Canberra, 1995, p.22.
- <sup>51</sup> *Units of the RAAF, Vol.3*, p.33.
- <sup>52</sup> 21SQN A.50 Unit History DEC 1939-JUN 1940.
- <sup>53</sup> RAAF Accident Report Forms IAW AFO 10/D/2 and 18/E/1. These forms over FY 1939/1940 are stored as NAA A9845/185 and /186.
- <sup>54</sup> RAAF HQ Air Board Minute 121/24/118 of 17 MAR 1937 for insertion as AFO 10/A/2, and repeated at Weekly Order No.415 of 19 APR 1937.
- <sup>55</sup> Cited in J Tanner, *British Aviation Colours of World War Two*, Arms & Armour Press, London, 1986, p.1.
- <sup>56</sup> RAAF London advised that Admiralty Air Diagram 1174 applied to the Seagull/Walrus, London AB.2426, 1/501/281(25A) of 4 DEC 1939; AD.1174 was distributed in the RAAF as A.1813, 1/501/281(29A) of 27 FEB 1940.
- <sup>57</sup> Cited in Tanner, p.9.
- <sup>58</sup> The Hurricane 'B' scheme was abandoned in JAN 1941 and future Hurricanes were produced in the 'A' scheme only. Goulding & Jones, p.64. For the Spitfire, on 14 JAN 1941 the 'A' and 'B' mirror scheme merged to become the 'A' scheme only; Morgan & Shacklady, p.624. However, the choice of which pattern to use as standard was left to individual companies, and for the Oxford in 1941 the 'B' scheme became the sole pattern.

- <sup>59</sup> RAAFHQ AMEM D/DTS 1/501/329 SAS 13552 of 8 JUL 1943, specified 32" *Blue* roundel, 12" *White*, i.e. 3:8 (approx 2:5); fin flash 24" (high), 16" wide (8" each colour). If hurriedly repainted, the type-C flash would be asymmetric with 13" *White*, 11" *Blue*.
- <sup>60</sup> NAA CRS A705/1 69/4/126 Pt.5. In addition, Air Board Agenda No.268, of 28 JUL 1922, provided similar details to amend Technical Order No.11.
- <sup>61</sup> P Lucas, *Camouflage & Markings No.2*, Scale Aircraft Monographs, Guideline, Luton, Beds, 2000, p.13.
- <sup>62</sup> I K Baker, *Aviation History Colouring Book 1, Westland Wapiti*, Melbourne, 1995. I K Baker, *Aviation History Colouring Book 3, Hawker Demon*, Melbourne, 1995.
- <sup>63</sup> I K Baker, *Aviation History Colouring Book 66, RAAF Colour Schemes & Markings Part 2*, Queenscliff Vic, 2009, p.7.
- <sup>64</sup> Lucas, pp.13, 69.
- <sup>65</sup> Goulding & Jones, p.119.
- <sup>66</sup> Lucas, p.69.
- <sup>67</sup> Lucas, p.13.
- <sup>68</sup> Goulding & Jones, p.5.
- <sup>69</sup> AMO A.154/39 of 27 APR 1939, cited in J Tanner, p.1.
- <sup>70</sup> I K Baker, *Aviation History Colouring Book 4, Roundels, Tail Stripes (1)*, Melbourne, 1995, p.3.
- <sup>71</sup> I K Baker, *Aviation History Colouring Book 12, Avro Anson (1)*, Melbourne, 1995, p.2.
- <sup>72</sup> Lucas, p.88. Peter Malone identifies the following in Britmodeller, 18 FEB 2021: The original light blue was BESA 2.D.103 similar to *French Blue* BS381C-166, which is claimed to be K3/54 in the RAAF K5 Spec. When the darker gloss blue was introduced in the later 1930s, this was K3/171 similar to the later BS381C-110 *Roundel Blue*. The wartime RAAF roundel blue was *Dull Blue* K3/197.
- <sup>73</sup> Bennett, *Imperial Gift*, p.196.
- <sup>74</sup> RAAFHQ Routine Order No 248, of 24 OCT 1930.
- <sup>75</sup> K Baker, *AHCB 66*, p.4.
- <sup>76</sup> Goulding & Jones, p.51.
- <sup>77</sup> Baker *AHCB 66*, p.12.
- <sup>78</sup> Lucas, p.13.
- <sup>79</sup> Lucas, p.88.
- <sup>80</sup> RAAFHQ DTS SIG/96 of 14 Jan 1948, introduced three-colour National Markings in 'glossy' shades - filed as 9/1/1595 (25A). We have a discussion on the postwar shades of *blue* in our Summer 2017 Newsletter Vol 7, Issue 5, where for its roundel the RAAF adopted the richer BS381C-105 *Oxford Blue*: [SILVER TO GREY – RAAF AIRCRAFT MARKINGS SINCE 1950 \(adf-serials.com.au\)](https://www.adf-serials.com.au)
- <sup>81</sup> RAAF Richmond Minute 121/24/118 of 26 AUG 1936, filed by RAAFHQ as 62/1/234 "Markings of Demon Aircraft".
- <sup>82</sup> RAAF HQ Air Board Minute 121/24/118 of 17 MAR 1937 for insertion as AFO 10/A/2, and repeated at Weekly Order No.415 of 19 APR 1937.
- <sup>83</sup> RAAF Pearce letter 1/9 of 29 MAY 1939, filed as RAAFHQ 9/1/396(8A).
- <sup>84</sup> *Units of the RAAF, Vol.3*, p.56.
- <sup>85</sup> *Units of the RAAF, Vol.3*, p.63.
- <sup>86</sup> *Units of the RAAF, Vol.3*, p.70.
- <sup>87</sup> RAAF Pearce letter 1/9 of 29 MAY 1939, filed as RAAFHQ 9/1/396(8A).
- <sup>88</sup> *Units of the RAAF, Vol.3*, p.2-3.
- <sup>89</sup> While 1SQN Demons evidently had *Red* or *Black* wheel hubs denoting their Flight, it was perhaps coincidental that postwar when 21SQN became the Laverton-based squadron, *Red* was adopted as the squadron colour for detailing Wirraways and Vampires of 21(F)SQN.
- <sup>90</sup> 1SQN A.50 Unit History NOV 1936-JAN 1937; A1 Demon E/E.88 Aircraft Status Cards.
- <sup>91</sup> RAF ADM.332 (*Issue 3*) filed as RAAFHQ 150/4/852(12).
- <sup>92</sup> Lucas, p.13.
- <sup>93</sup> Lucas, p.13; implemented by AMO A.154/39 of 27 APR 1939 in Tanner, p.1.
- <sup>94</sup> RAF *Yellow* outer ring adopted by Air Ministry signal X485 of 1 MAY 1940, Lucas, p.44. This was then accepted by the RAAF as National Marking Scheme 'M.3'.
- <sup>95</sup> Bennett, *Imperial Gift*, p.196.
- <sup>96</sup> AMO A.926/40 of 12 DEC 1940, cited in Tanner, p.11.
- <sup>97</sup> Goulding & Jones, p.51.
- <sup>98</sup> *Units of the RAAF, Vol.8 Training Units*, pp.137-138.
- <sup>99</sup> Letter HQ Southern Area to RAAFHQ 1/501/269(9A) of 27 JUL 1940.
- <sup>100</sup> RAAFHQ AGI No. C.11, *Issue 3*, para. 4(b) Training Aircraft, of 3 OCT 1940.
- <sup>101</sup> RAAFHQ AGI No. C.11, A/L.5, para. 1(a) Elementary Types, of 26 JAN 1940, filed as 150/4/658. Mention is made of K3/185 *Camouflage finish yellow*, BALM S.13987.
- <sup>102</sup> DTS Minute to AMOE 62/3/431(31A) of 26 MAR 1940.
- <sup>103</sup> RAAFHQ AGI No. C.11, *Issue 3*, para. 1(a) Training Aircraft, of 3 OCT 1940.
- <sup>104</sup> RAAFHQ AMOE Letter S.A.S.9984, DTS 368/41, of 23/12/41 filed as 1/501/329(53A).
- <sup>105</sup> RAAFHQ Minute Sheet for 1/501/329 M.1 of 29 DEC 1941, M.2 of 6 JAN 1942, and M.3 of 6 JAN 1942.
- <sup>106</sup> For example, official references for roundels were generally a description of the colours, but from OCT 1944 referred to roundels as Type I, Type II, Type III, etc (which related to the postwar invented 'non-official' references B, C, C1 respectively); AP 2656A Vol 1 Sect 6 Chap 2, and Chap 2 Table 1 of OCT 1944, Tanner p.49.
- <sup>107</sup> Lucas, p.13.
- <sup>108</sup> The *Yellow* was introduced to the RAF roundel on 1 MAY 1940; Lucas, p.45. The RAAF policy AGI C.11 of SEP 1939 used AMO A.154 as a main reference, which introduces the type-B roundel to fuselages (which would become the RAAF "M.1" roundel) in 1939; AMO A.154/39 of 27 APR 1939, cited in Tanner, p.1. The RAAF revised AGI C.11 policy of OCT 1940 introduced the outer *Yellow* ring to the "M.2" as the "M.3" roundel, and the tri-colour fin flash as the "M.4" marking. *Yellow* shows as a light colour on panchromatic film, but as a dark colour on orthochromatic.
- <sup>109</sup> RAAFHQ DTS 9/1/442 of 12 SEP 1939.
- <sup>110</sup> RAF 2:5 type-B wing roundels varied in size with aircraft type, and with some as 25":63", 22":56", 20":50", or 16":40"; Goulding & Jones, *Camouflage & Markings 1936-1945*, Doubleday, New York, 1971.
- <sup>111</sup> The 1940 policy changed the M.1 roundels, in general, back to the M.2 – the only exception was for the Wirraway which retained the M.1 on upper wings. This was mandated by AGI C.11 *Issue 3* (note that *Issue 2* earlier in 1940 has been unavailable); RAAFHQ AGI C.11 *Issue 3*, of 3 OCT 1940, filed on 1/501/329.
- <sup>112</sup> *Units of the RAAF, Vol.8 Training Units*, p.100.
- <sup>113</sup> I K Baker, *Aviation History Colouring Book 67*, Queenscliff VIC, 2009, p.14.
- <sup>114</sup> *Units of the RAAF, Vol.8 Training Units*, p.100.
- <sup>115</sup> RAAFHQ AGI C No.11 of 22 SEP 1939, filed as 9/1/396(13B), and which referred to the RAF AMO A.154.
- <sup>116</sup> RAAFHQ S.A.S. 2699 1/501/329(55A), undated but c JUL 1940.
- <sup>117</sup> Lucas, p.79. The MAP 33B stores reference series are stock numbers with the last three digits identifying the size of the paint can – so on the RAF Directorate of Technical Development (DTD) 314 scale, *Dark Green* 33B/201 was for a half-gallon can of varnish, 33B/202 a one-gallon can, and 33B/203 a five-gallon container. Similarly the various size cans for *Dark Earth* were 33B/198 to 33B/200. The DTD specifications for compliance were DTD 314 (matt pigmented oil varnishes), DTD

308 (matt cellulose finish), or DTD 83A (aeroplane doping schemes); *Aircraft Design Memorandum No.332 (Issue 3)*, CD44/41, para.4, of 15 NOV 1940, filed on RAAFHQ 150/4/852(12).

<sup>118</sup> Lucas, p.9.

<sup>119</sup> AGI No. C.11 *Issue 1, A/L 5*, of 26 JAN 1940, RAAF file 150/4/658. See the Avro Cadet article, [ADF-Serials Telegraph \(adf-serials.com.au\)](http://adf-serials.com.au)

<sup>120</sup> DTS Minute to AMOE 62/3/431(31A) of 26 MAR 1940.

<sup>121</sup> RAAFHQ AGI No. C.11, *Issue 3*, para. 1(a) Training Aircraft, of 3 OCT 1940.

<sup>122</sup> RAAFHQ AGI No. C.11, *Issue 4*, of 31 JUL 1942, filed as 150/4/852(1A). This AGI lists all the British A.D. numbers (in Appendix I) for the various types.

<sup>123</sup> RAF ADM.332 (*Issue 3*) filed as RAAFHQ 150/4/852(12), and also referenced as CD44/41.

<sup>124</sup> Lucas, p.9.

<sup>125</sup> RAAFHQ file 1/501/329(53A), SAS.9984 also listed as DTS 368/41, of 23 DEC 1941. This message also directed that RAAF *Earth Brown* (K3/178) and *Foliage Green* (K3/177) be used instead of RAF *Dark Earth* and *Dark Green*. RAAFHQ file 1/501/329(63A), SAS.7396 also listed as DTS 280/42, of 18 JUN 1942

<sup>126</sup> RAAFHQ Aircraft General Instruction No.C.11 (*Issue 4*), Appendix I, of 31 JUL 1942.

<sup>127</sup> RAAF AGI C.11 of 22 SEP 1939 specified under '**Scheme No.1**' the Demon to use Australian "Diagram Drawing **No.A-1732**", the Wirraway to use "Diagram Drawing No.A-1732 *and* Drawing No.C.A.01-01001", which could imply these last two drawings for the Wirraway were not necessarily the same, but perhaps CAC refinements to A-1732. Similarly the AGI for '**Scheme No.2**' specifies for the Anson to use "Diagram Drawing No.A-1733 and Drawing No.Z-1152", but for the "Douglas" (i.e. DC-3) only specifies "Diagram Drawing No.A-1733". Ian Baker in his AHCB series attempts to rationalise these different series of numbers, e.g. whether A-1732 was C.A.01-01001, or Z-1152 was A.D.1159, or a further one A-1813 (for the Seagull/Walrus, as '**Scheme No.3**') was A.D.1174. Lack of surviving documentation, in particular the drawings, still makes some correlation speculative, but documentation does suggest that A.D.1174 was A-1813.

<sup>128</sup> Australia House London letter AB.2426 700/27, filed as RAAFHQ 1/501/281(25A), of 4 DEC 1939.

<sup>129</sup> Australian DAP production of the Beaufort was unique – odd serial-numbered aircraft were built at Fisherman's Bend, the even numbers at Mascot. Also Fisherman's Bend aircraft had the A.D.1159 'A' pattern, and Mascot aircraft had 'B' pattern, with both schemes retained into 1943 production, until replaced by overall *Foliage Green* in 1944.

<sup>130</sup> In this RAAF 1941 list, of course, neither the Kittyhawk nor Vengeance were listed.

<sup>131</sup> With the Hurricane, the mirror 'B' scheme was abandoned in JAN 1941 (having been used since 1937) and future Hurricanes were produced in the 'A' scheme only. Goulding & Jones, p.64. For the Spitfire, on 14 JAN 1941 the 'A' and 'B' mirror scheme merged to become the 'A' scheme only; Morgan & Shacklady, p.624; Goulding & Jones, p.18. However, the choice of which pattern to use as standard was left to individual companies, with the Defiant being continued in the 'B' scheme only; Goulding & Jones, p.176. Similarly, for the Oxford and Battle in 1941, the 'B' scheme became the sole pattern.

<sup>132</sup> This unique P-40 scheme of only one pattern may have been for simplicity, as the aircraft were supplied from the US, painted in US DuPont equivalent paints.

<sup>133</sup> See images in *adf-serials Newsletter* Vol 11, No.2, Autumn 2021: [ADF-Serials Telegraph](http://adf-serials.com.au)

<sup>134</sup> Baker, *Aviation History Colouring Book 3*, p.2; *AHCB 67* pp.14-15; *AHCB 70* p.22.

<sup>135</sup> AMO A.513/41 of 10 JUL 1941, cited in Tanner, p.14. Appendix I of this Order refers to the Patterns without diagrams: Pattern No.1 and No.2 operational aircraft; Pattern No.3 trainers, comms and prototype aircraft; Pattern No.4 target-towers; Pattern No.5 for night fighters, p.18.

<sup>136</sup> *Britmodeller*, comment regarding RAF biplane camouflage, 17 JAN 2016.

<sup>137</sup> AMO A.926/40 of 12 DEC 1940, para.5(iii), cited in Tanner, p.9.

<sup>138</sup> RAAF AGI C.11 of 22 SEP 1939 specified which aircraft were to be camouflaged: Demon, Wirraway, Anson, 'Douglas' (DC-3), and Seagull V.

<sup>139</sup> RAAFHQ Message T.466 to 12SQN of 30 JAN 1940, filed as 1/501/281(23A).

<sup>140</sup> Minute M.66 by DTS TS.1(F), 1/501/329 of 21 AUG 1942.

<sup>141</sup> Over MAY 2021 I have consulted with both Ian Baker and Peter Malone and shared my research on RAAF Demon camouflage. What is detailed here is my best assessment from surviving documentation and contemporary imagery.

<sup>142</sup> The pattern of A.D.1162 on the upper mainplane is similar to that for A.D.1160, *Single-Engined Monoplanes – Army Co-op, Fighters*.

<sup>143</sup> This 1939 'Scheme No.1' also included the Wirraway, but was amplified by specifying 'Diagram Drawing A-1732 *and* Drawing C.A.01-01001'. This latter drawing number was obviously a CAC diagram for the Wirraway; the connection and necessity for the two is uncertain.

<sup>144</sup> Baker *AHCB 67*, p.10. In *AHCB 69*, pp.6-7, the A.D.1174/A-1813 camouflage scheme for the Seagull V appears very similar to what I have unearthed for A.D.1162.

<sup>145</sup> RAAF Richmond letter 2543/27/S of 12 APR 1940; RAAFHQ Message T.95, of 1 MAY 1940.

<sup>146</sup> *Units of the RAAF, Vol.2 Fighter Units*, p.2.

<sup>147</sup> Baker *AHCB 67*, p.15.

<sup>148</sup> No.1 ATS Unit History A.50 for JUL 1939, and E/E.88 Aircraft Status Cards.

<sup>149</sup> Air Board Agenda 3186/1941, of 21 FEB 1941.

<sup>150</sup> NAA A14487 17/AB/3208 Sheet 11, of MAR 1941.

<sup>151</sup> CGS Unit History A.50 for 1942-1943.

<sup>152</sup> AGI C.11, para.3, of 22 SEP 1939, filed as 9/1/396(13B).

<sup>153</sup> A1-1 E/E.88 records a forced-landing on 3 JUL 1942, with repairs being beyond Unit capability; there is no mention of this accident in the 7SQN A.50 Unit History.

<sup>154</sup> Baker, *AHCB 43*, p.47.

<sup>155</sup> RAAFHQ Minute 62/3/431 M.3 CAS from DCAS, of 18 APR 1940.

<sup>156</sup> AGI C.11, *Issue 3*, para.1(a) (i), of 3 OCT 1940.

<sup>157</sup> AGI C.11, *Issue 3*, para.4(b), of 3 OCT 1940.

<sup>158</sup> AGI C.11, *Issue 4*, para.1(c) (ii), of 31 JUL 1942.

<sup>159</sup> RAF AMO A.926/40, 12 DEC 1940, stated 27" high by 24" wide (8" per colour) for three colours, Tanner,p.11. However, by this stage the RAAF disregarded *Red*.

<sup>160</sup> 3BAGS A.50 Unit History, 8 DEC 1943.

<sup>161</sup> AGS A.50 Unit History, 31 DEC 1943.

<sup>162</sup> RAAF A.50 Unit History Station HQ Richmond, 1943-44.

<sup>163</sup> Baker, *AHCB 3*, p.4.

<sup>164</sup> 11EFTS A.50 Unit History, MAR 1945.

<sup>165</sup> Coulthard-Clark, p.329.

<sup>166</sup> [RAAF Museum: Hangar 180: Hawker Demon \(airforce.gov.au\)](http://airforce.gov.au)

<sup>167</sup> [ADF Serials - Hawker Demon \(adf-serials.com.au\)](http://adf-serials.com.au)

<sup>168</sup> Warbirds site, FEB 2015, <http://warbirdsnews.com/warbirds-news/hawker-demon-resurrected-australia.html>

<sup>169</sup> B Robertson, *British Military Aircraft Serials 1878-1987*, Midland Counties, Leicester, 1987, p.64.

<sup>170</sup> [Hawker Hind | Shuttleworth](http://www.hawkerhind.co.uk); this c/n is given at the CAA G-INFO registration site [Aircraft register \(G-INFO\) | Civil Aviation Authority \(caa.co.uk\)](http://www.aircraftregister.co.uk)

<sup>171</sup> [A/C SERIAL NO \(rafmuseum.org.uk\)](http://rafmuseum.org.uk)

<sup>172</sup> [A/C SERIAL NO \(rafmuseum.org.uk\)](http://rafmuseum.org.uk)

<sup>173</sup> Robertson, p.99.

<sup>174</sup> [CASM-AircraftHistories-HawkerHindMKI.pdf \(techno-science.ca\)](http://techno-science.ca)

<sup>175</sup> [HAC: Air Information \(historicalaircraftcollection.ltd.uk\)](http://historicalaircraftcollection.ltd.uk)

<sup>176</sup> [Hawker Nimrod Mk.I S1581 \(G-BWWK\) - The Fighter Collection \(fighter-collection.com\)](http://fighter-collection.com)

- <sup>177</sup> [Hawker dataplate and constructor numbers | Key Aero](#)  
<sup>178</sup> [A/C SERIAL NO \(rafmuseum.org.uk\)](#)  
<sup>179</sup> [Microsoft Word - HAWKER HAWKER SIDDELEY.doc \(goodall.com.au\)](#)  
<sup>180</sup> Coulthard-Clark, p.345.

## Notes Regarding 2SQN B-25's

- <sup>181</sup> RAAF Form A50, Unit History Sheet of No.2 (G.R/B) Squadron, Balikpapan entry of Dec 20 (1945) in RAAF Unit History Sheets, Number 2 Squadron May 37 – May 46; NAA: A9186, 5.
- <sup>182</sup> Control Officer's Watch Log, Truscott, entries of 170400Z, 0430Z, 190500Z, 0610Z, 2342Z and 200231Z Dec 45; AWM66, 22/1/22.
- <sup>183</sup> SAS7091, "Camouflage Policy – Revised" dated 29 APR 1944 copy in Camouflage of Aircraft; NAA: A11095, 107/4/AIR PART A.
- <sup>184</sup> Air Force Headquarters Technical Order, Aircraft General Instruction, Part 3, Section (c), Instruction No.1, "Camouflage Schemes and Identification Markings" in DTS – Publication of Technical Order – Publication of Aircraft General Instruction – Part 3 – Section C – Instruction No 1 – Camouflage Schemes and Identification Markings; NAA: A705, 150/4/5056.
- <sup>185</sup> Air Force Headquarters Technical Order, Aircraft General Instruction, Part 3, Section (c), Instruction No.1, "Camouflage Schemes and Identification Markings", Appendix "A", "Aircraft Roles in Respect to Camouflage Schemes" in DTS – Publication of Technical Order – Publication of Aircraft General Instruction – Part 3 – Section C – Instruction No 1 – Camouflage Schemes and Identification Markings; NAA: A705, 150/4/5056.
- <sup>186</sup> Air Force Headquarters Technical Order, Aircraft General Instruction, Part 3, Section (c), Instruction No.1, "Camouflage Schemes and Identification Markings", Appendix "B", "Camouflage Scheme – Uncamouflaged" in DTS – Publication of Technical Order – Publication of Aircraft General Instruction – Part 3 – Section C – Instruction No 1 – Camouflage Schemes and Identification Markings; NAA: A705, 150/4/5056.
- <sup>187</sup> Air Force Headquarters Technical Order, Aircraft General Instruction, Part 3, Section (c), Instruction No.1, "Camouflage Schemes and Identification Markings", Appendix "C", "Camouflage Scheme : Foliage Green" in DTS – Publication of Technical Order – Publication of Aircraft General Instruction – Part 3 – Section C – Instruction No 1 – Camouflage Schemes and Identification Markings; NAA: A705, 150/4/5056.
- <sup>188</sup> Memorandum titled, "Camouflage Schemes and Identification Markings of Aircraft", dated June 28<sup>th</sup>, '44, from AOC NWA to the Air Board; 1/501/329 (174A) via John Bennett.
- <sup>189</sup> RAAF Headquarters postgram T448/PGM of 8 Sep (1944) in Directorate Technical Services – B25 General – Technical – Mitchell Instruction Number 13; NAA: A705, 9/41/37 PART 1.
- <sup>190</sup> 2SQN signal T181 of 16 Sep (1944), *ibid*.
- <sup>191</sup> 3AD signal T996 of 21 Sep (1944), *ibid*.
- <sup>192</sup> 2AD postgram T309/PGM of 14 Sep (1944), *ibid*.
- <sup>193</sup> Max Schep & Luuk Boerman, *B-25C/D/J 'Mitchell' ML-KNIL/RNEIAAF 1942-1945* (2014) p53. On that page are two colour photographs (evidently still frames from a (perhaps) 8mm hand-held movie camera), one of B-25J-20-NC, N5-246 and one of B-25J-15-NC, N5-240. The image of N5-240 clearly shows the "Empty Shell Deflector". The image of N5-246 is such that it is impossible to tell if the device was fitted or not, however, on the preceding page is an image of another B-25J-20-NC, N5-247, which clearly shows that the device was not fitted.
- <sup>194</sup> Along with Norden M9 bomb-sights.
- <sup>195</sup> Enclosure 71A, Air Force Headquarters memorandum SAS6280, "Fitment of Loran in Mitchell (GR/B) Aeroplanes" date stamped 16 JUL 1945, paragraph 1, in B-25 Aircraft North American Mitchell A47; NAA: A11093, 452/A47.
- <sup>196</sup> *Ibid*.
- <sup>197</sup> *Ibid*, para 2.
- <sup>198</sup> SCR729 was a radio navigation system in which the airborne component, also known as "Rebecca", interrogated a (mobile) ground station, also known as "Eureka", the result being displayed on a radar screen. It remained in use, in various versions, for many years.
- <sup>199</sup> Enclosure 71A, Air Force Headquarters memorandum SAS6280, "Fitment of Loran in Mitchell (GR/B) Aeroplanes" date stamped 16 JUL 1945, paragraph 3, in B-25 Aircraft North American Mitchell A47; NAA: A11093, 452/A47.
- <sup>200</sup> Multiply US Gallons by 6 to give the (approximate) fuel weight in pounds. The resulting value is approximate because it is based on a SG (Specific Gravity) of AVGAS (Aviation Gasoline) being 0.72 which is based on ISA (International Standard Atmosphere) at MSL (Mean Sea Level). Fuel weights will therefore vary for temperatures other than 15°C. But it's close enough for Government work.
- <sup>201</sup> Enclosure 71A, Air Force Headquarters memorandum SAS6280, "Fitment of Loran in Mitchell (GR/B) Aeroplanes" date stamped 16 JUL 1945, paragraph 5, in B-25 Aircraft North American Mitchell A47; NAA: A11093, 452/A47.
- <sup>202</sup> *Ibid*, para 7.
- <sup>203</sup> *Ibid*, para 8.
- <sup>204</sup> *Ibid*, para 9.
- <sup>205</sup> RAAF Form E/E.88, Record Card – Airframes, Aero Engines, Mechanical Transport & Marine Craft for B-25J, A47-40 in Aircraft Status Cards – Mitchell A47-1 to A47-50; NAA: A10297, BLOCK 345. The card noted that A47-40 had been allotted to 1AD ex 3AD for prototype SCR729 installation on 6<sup>th</sup> June, 1945 and was received by 1AD on 15<sup>th</sup> June. The allotment from 1AD to 1APU for the installation trials was recorded as being on 17<sup>th</sup> September, 1945 with the aircraft being noted as actually received by 1APU on 7<sup>th</sup> October. The aircraft crashed immediately after take-off from Laverton on 12<sup>th</sup> October, suffering substantial damage.
- <sup>206</sup> Joe Baugher web site [http://www.joebaugher.com/usaf\\_bombers/b25\\_23.html](http://www.joebaugher.com/usaf_bombers/b25_23.html) at 18th October 2013.
- <sup>207</sup> Eastman Kodak Company, *Kodak Data Book, Filters and Pola-screens* (1944) p38 via <http://archive.org/details/filterspolascreen00east> at 13MAY21.
- <sup>208</sup> *Ibid* pp20, 21.
- <sup>209</sup> *Ibid* pp29, 31, 32, 34 and 35.
- <sup>210</sup> *Ibid*.
- <sup>211</sup> *Ibid* p27.
- <sup>212</sup> AFCO A3/43 – Code Letters for Operational and Reserve Squadrons dated 4.1.43 in Air Force Confidential Orders – Series A and B – and Index, 1943; NAA: A7674, 3.
- <sup>213</sup> Air Force Head-Quarters, Aircraft General Instruction No. C.11, Issue 3, Technical Order, Standard Aircraft Finishes, Markings, and Markings of Unit Equipment in AGI C11 Standard Aircraft Finishes Markings; NAA: A705, 150/4/852.
- <sup>214</sup> Reproduced in full in Ian K Baker, *Aviation History Colouring Book No.73 – RAAF Colour Schemes & Markings, 1921-1951 Part 6b* (2011) pp13-18.
- <sup>215</sup> Air Force Headquarters Technical Order, Aircraft General Instruction, Part 3, Section (c), Instruction No.1, "Camouflage Schemes and Identification Markings", paragraph 8 (b) and Appendices "C", "D" and "G" in DTS – Publication of Technical Order – Publication of Aircraft General Instruction – Part 3 – Section C – Instruction No 1 – Camouflage Schemes and Identification Markings; NAA: A705, 150/4/5056.
- <sup>216</sup> AFCO A11/45 – Code Letters for Operational Squadrons and Flights dated 26.4.45 in Air Force Confidential Orders – Series A and B 1945-1946; NAA: A7674, 5.
- <sup>217</sup> AFCO A3/43 – Code Letters for Operational and Reserve Squadrons dated 4.1.43 in Air Force Confidential Orders – Series A and B – and Index, 1943; NAA: A7674, 3.
- <sup>218</sup> This was the date recorded for its "Allotment" to 2SQN which was subsequently recorded as being cancelled. This aircraft, however, is believed to have been delivered to NWA and to 2SQN possibly during May, 1944.

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### **Curtiss Corner**

<sup>219</sup> On 12 March 1942, an Avro Anson piloted by Squadron Leader le Good, AW665, abandoned its night take-off and collided and slightly damaged a P-40E, (In all likelihood it was P-40E 41-5508, as one of only five there) and finally a camp building at Archerfield. E/E-88 Card for 2 Aircraft Park(2AP) Anson AW665 confirms it had a collision with a P-40E on 12/03/42. [*RAAF History Section*]. Station Headquarters Archerfield Aug 40 - May 42 [*NAA: A9186, 190*]