



# ADF Serials Telegraph



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

*Plus Special Guest appearances by, David Vincent.*

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## **Special Thanks:**

**Juanita Franzi (Aero Illustrations) for her fantastic profile illustrations.**

**Message Traffic:** Please address any questions to: [question@adf-serials.com.au](mailto:question@adf-serials.com.au)



## Curtiss Corner: P-40N-20 A29-603

Gordon R Birkett @2020



Rendition is an indication only, comparable to Ex NEI A29-6\*\* series delivered to No 82 Sqn RAAF in 1944. Code unknown.  
[Source GRB Art Works].

### Background

This P-40N-20, A29-603, is of a different ilk to RAAF Contracts, meaning it's part of a reverse Lend Lease repayment of 22 ex NEI P-40N-20s to the RAAF.

This follows an original issue of 22 redirected RAAF P-40N-20s for 120Sqn MLKNIL (*Militaire Luchtvaart Koninklijk Nederlands Indisch Leger*), earlier in the beginning of December 1943 – January 1944. Under RAAF Command, this Squadron was generally known in Australia as No 120 Squadron NEIAF (Netherlands East Indies Air Force).

Two original Batches of MLKNIL P-40N-20s, in standard 1943 modified USAAF Olive Drab (with darker Green splotches) and Neutral Grey scheme were the first 34 aircraft earmarked for the initial assignment for 120Sqn NEIAF had arrived in four shipments in December 1943, considered a little late, to equip this squadron.

They were supplied under the following requisitions<sup>1</sup> under the Lend Lease Munitions Advisory Commission (Air):

- Lend Lease NEI; Indent N-2040 Diversion 521 (Dutch)D-9 for 24 a/c (D9-#1 to #24) which were delivered 14/12/43 to 1AP (12 NEIAF )/2AD (12 to RAAF)
- Lend Lease NEI; Indent N-2040 Diversion 620 (Dutch)D-22 for 10 a/c (D22-#1 to #10) which were delivered 15/02/44 to 1AD (10 to RAAF)

Assembly of these aircraft should have coincided with a previous influx of RAAF P-40N-20 aircraft in November and December 1943.

The RAAF following discussion and in agreement with the MLKNIL, per RAAF HQ File#9/42/132 dated 28/12/43, stated that earlier assembled and held aircraft in reserve were to be transferred to the NEIAF to expedite the initial Unit equipment of No 120 Squadron and its reserve Training Pool requirements.

Some 22 ex-contracted RAAF P-40N-20s were added after the first 10 NEI Contracted P-40N-20 aircraft delivered (C3-501 to C3-512) had been delivered (C3-513 to C3-532).

In return, those replaced 22 ex MLKNIL Lend Lease Contract P-40N-20s were accepted into the RAAF a few weeks later after assembly by 2AD and 1AD respectively per the following table.



ADF.Serial	A/c.Type	USAF.Serial	Contract#	BSC Release#	Shipping Port and Name	Delivered and Assembled
<b>A29-603</b>	P-40N-20	43-23205	Diversion 521	<b>D-9#13</b>	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-604	P-40N-20	43-23207	Diversion 521	D-9#14	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-605	P-40N-20	43-23209	Diversion 521	D-9#15	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-606	P-40N-20	43-23211	Diversion 521	D-9#16	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-637	P-40N-20	43-23213	Diversion 521	D-9#17	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-638	P-40N-20	43-23215	Diversion 521	D-9#18	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-639	P-40N-20	43-23217	Diversion 521	D-9#19	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-640	P-40N-20	43-23218	Diversion 521	D-9#20	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-641	P-40N-20	43-23219	Diversion 521	D-9#21	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-642	P-40N-20	43-23220	Diversion 521	D-9#22	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-643	P-40N-20	43-23222	Diversion 521	D-9#23	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-644	P-40N-20	43-23224	Diversion 521	D-9#24	Ex New York MV Gefion	2AD ex NEI 31/12/43
A29-600	P-40N-20	43-23539	Diversion 620	D-22#1	Ex New Jersey MV#??	1AD ex NEI 08/02/44
A29-601	P-40N-20	43-23540	Diversion 620	D-22#2	Ex New Jersey MV#??	1AD ex NEI 08/02/44
A29-607	P-40N-20	43-23542	Diversion 620	D-22#3	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-634	P-40N-20	43-23543	Diversion 620	D-22#4	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-645	P-40N-20	43-23545	Diversion 620	D-22#5	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-646	P-40N-20	43-23794	Diversion 620	D-22#6	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-648	P-40N-20	43-23901	Diversion 620	D-22#7	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-650	P-40N-20	43-23903	Diversion 620	D-22#8	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-654	P-40N-20	43-23904	Diversion 620	D-22#9	Ex New Jersey MV#??	1AD ex NEI 15/02/44
A29-662	P-40N-20	43-23905	Diversion 620	D-22#10	Ex New Jersey MV#??	1AD ex NEI 15/02/44

### A29-603

She was the 13th Dutch Aircraft of the first batch of 24 delivered to Australia under contract for the NEIAF, of which only a/c D-9#1 to #12 actually ending up in the NEIAF as C3-501 to C3-512 in sequence.

NEI Contracted a/c D-9 #13 to D9-#24 in sequence, were transferred and renumbered within a serial range of A29-603 to A29-644, with gaps filled by actual RAAF Lend Lease Contract aircraft.

The airframe was delivered to 2AD Richmond on the last day of 1943, following being unloaded at Wharf #9 Sydney from the Dutch owned Cargo Vessel, the SS Gefion. The vessel had sailed from New York Harbour, via Panama Canal, to Sydney with 12 P-40N-20s.

Following assembly, some modifications at 2AD, it was received by No 82 Squadron, RAAF, then based at Bankstown, NSW, on 17th April, 1944.

First pilot noted flying the aircraft was F/Lt Stott on the 17<sup>th</sup> April 1944, then from the next day F/Sgt Richard C O'Neill for a few flights then on. There appeared to be some airframe or engine issues for a week or more until it was test flown on the 30<sup>th</sup> April 1944.

The Squadron was earmarked to move to Hughes Strip in the Northern Territory in early April 1944. The air element of 23 P-40N arriving at Archerfield on the 4<sup>th</sup> May 1944, were given orders to proceed to Townsville instead of Hughes Strip. In fact, ground elements had boarded a ship early in April 44 to sail there.

It was there that the 24<sup>th</sup> aircraft, A29-603 piloted by F/Sgt O'Neill had remained there overnight until an oil issue was resolved. It would arrive at Ross River the following day. It seemed the aircraft was held as a reserve aircraft, as it was no flown again until the 28<sup>th</sup> May 1944 by F/O Vance.

Another gap of time, and the next time it was flown was on the 2<sup>nd</sup> June 1944 by Sgt Ryan. Its next flight was on the 4<sup>th</sup> June 1944 with F/Sgt Rothwell and two days later by Sgt Rea. There still seem to be more issues with the aircraft, following its last flight for it wasn't in the air again until the 13<sup>th</sup> June 1944 on an air test, again flown by F/Sgt O'Neill. Apparently, this flight was unsuccessful.

More days on the ground, with the aircraft again on a test flight on the 24<sup>th</sup> June 1944, again flown by F/Sgt O'Neill. It seems more repairs and adjustments, and it was only aloft again on the 26<sup>th</sup> June 1944, yet again flown by F/Sgt O'Neill in line astern formation training.

A29-603's next flight was with F/Lt Muirhead at the controls, on the 28th June 1944, to Cape Upstart and then returns to base. A few days on, on the 1<sup>st</sup> July 1944, now W/O O'Neill flew A29-603 on an Anti Aircraft sortie. The next flight, a high-level dive bombing sortie on Hopkinson Reef off the coast, was on the 4<sup>th</sup> July 1944 with F/O Davies.

Again, there appeared to be some service issues that required fixing for it did not fly until W/O O'Neill flew it on a test flight. A29-603 was flown again on the 7<sup>th</sup> and 8<sup>th</sup> July 1944 on Section Formation practice, by W/O O'Neill and F/O Davies, respectively. The following day on the 9th, W/O O'Neill flew the aircraft on a high-level dive-bombing sortie on Hopkinson Reef.

At 2345hrs on the 11<sup>th</sup> July 1944, an eight aircraft formation was tasked as acting as enemy aircraft covering a landing invasion by barges on an Army Co-operation Mission, with a further four being tasked as top cover for defence forces on the beach. A29-603, again flown by W/O O'Neill, was part of the latter four aircraft top cover. On completion of the exercise at 0220hrs 12<sup>th</sup> July 1944, night-time, was orbiting base in preparation to landing when he noticed his motor cough and splutter as if it was out of fuel. He changed to another tank and it picked up again for a short time. However on the downward leg from the strip at Ross River, the engine completely cut out through a lack of fuel, but O'Neill had checked his fuel gauge which showed 20 gallons in the left auxiliary wing tank.

It necessitated that he make a forced landing in a paddock, adjacent to the strip. Witnesses and the Commanding Officer did not consider he could have made the strip in his glide.

In his unpowered descent, he lopped off limbs of trees and parts of his port and starboard wings, and then on skidding through the paddock, colliding and killing three grazing bullocks. The owner of the cattle, a Mr Keiry, who lived at 400 Flinders Street, West, Townsville, was advised.

11.7.44 A night invasion co-operation exercise was carried out, No. 3 Repair and Salvage Unit carrying out an invasion landing in barges. Eight aircraft of this squadron acted as air support, and a further four aircraft acted as defence. It was a very good show and all participating were congratulated by the Air Officer Commanding. Warrant Officer O'NEILL in A29-603 force landed near the strip due to petrol shortage. The pilot was uninjured but the aircraft was a "write off". The new pilots carried out a sea navigation exercise.

12.7.44 A29-645, Wing Commander CRESSWELL, departed south. Wirraway A29-603

Appendix A  
Photograph of  
aircraft.



The morning after A29-603 was forced landed. [Source RAAF Official per Appendix A indicated per A50 File, Copy Held].

By month's end of July 1944, No 82 Sqn RAAF A50 History notes state that they had began stripping the paint off their P-40N-20s at Ross River, and it is noted that now commissioned P/O O'Neill had resumed flying again in the unit on the 5<sup>th</sup> August 1944 in A29-605 FA-L, following the Court of Inquiry of the accident.



A P-40N-20 coded FA-A, but the resolution of this image fails to let us know the serial. Possibly A29-625 in July 1944. But I'm not convinced unless a clearer picture is supplied. It looks like it ends with a "6". I think another time perhaps. Note no glare panel (Black or Green), has been paint at this stage. *[Source Personal Picture collection]*.

As for A29-603, it was issued to 13 Aircraft Recovery Depot on the 14<sup>th</sup> July 1944 and was written off per AMSE Approval to write off per File#9/16/1806, on the 18<sup>th</sup> July 1944. Installed engine, V1710-99 #36914, was written off as well.

## Sources

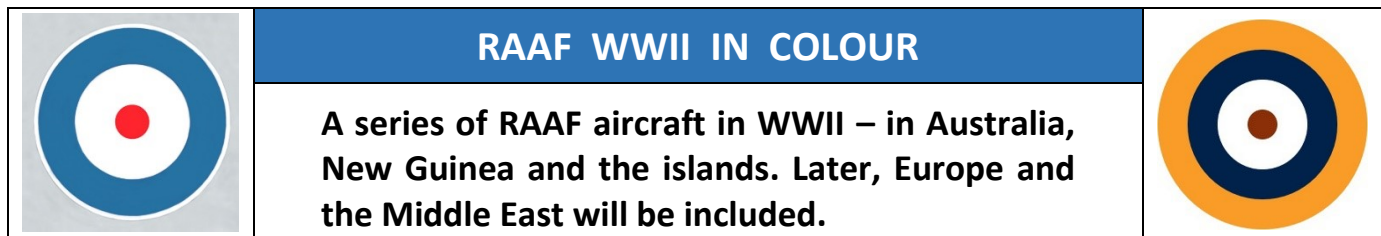
E/E-88 Card for A29-603

Accident records held ex NAA Kittyhawk A29 [Accidents Part 17] A9845 Item barcode 7127511

Unit History 82 Sqn RAAF per File 0184.TIF ex RAAF Historical Section

Data Sheets and research held per author over twenty years





## No.8 – RAAF D.H.60 Moths

by John Bennett

The formation of the RAAF at Point Cook in 1921 had been enabled by the generous post Great War “Imperial Gift” of aeroplanes and equipment made possible from huge British surplus stocks. By the close of that decade, the surviving aircraft were well and truly ‘war weary’ and were in need of replacement.<sup>2</sup> The last “Gift” aircraft in service were the D.H.9As, which the RAAF Air Board, somewhat rudely and ungraciously, submitted in JAN 1930: “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>3</sup>

The trainer supplied as part of the Imperial Gift was the WWI instructional stalwart, the Avro 504K. But this type was now seriously worn out and was replaced as the RAAF’s basic trainer by the de Havilland D.H.60X Cirrus Moth. Two early D.H.60s had been bought for evaluation and delivered in 1926 (and serialised **A7-1 and A7-2**), powered by the 65hp 4-cylinder Cirrus Mk.I – described as “the original light aero-engine of its type”.<sup>4</sup> The Chief of Air Staff, Air Marshal ‘Dicky’ Williams, saw the advantages of the Moth and recalled in his autobiography:<sup>5</sup>

“We obtained two Cirrus Moths fitted with dual controls to try out and found them very suitable for preliminary flying instruction but obviously they would be better with a more powerful engine. De Havillands realised the need for more power and had produced an engine of the same type as the Cirrus but with about twice the horsepower. This was known as the Gipsy.”

The strengths of the Moth as an ab-initio trainer evaluation resulted in twenty D.H.60Xs being ordered, and delivered in 1928, serialised **A7-3 to A7-22**. An alternative had been the Avro Avian, but the D.H.60 was cheaper.<sup>6</sup> This batch of Moths were also powered by the Cirrus, the still underpowered 80hp Cirrus II, and retrospectively designated D.H.60X due to the split axle (or ‘X’-shaped) undercarriage of later 1928 production Moths.<sup>7</sup> While the Moth had the characteristics needed for preliminary training – an engine that could be handled simply (in exactly the same way as those to which the pilot pass from his preliminary training) and with flying characteristics more similar to the *Service* types than those of the rotary-engined Avro 504K<sup>8</sup> – it was just too docile. It was a simple, elementary trainer, as the Tiger Moth later proved too in the World War Two, but was too underpowered and probably just too “basic” for a primary military trainer. These twenty Cirrus II Moths were soon a stepping stone to standardising with larger orders for more powerful D.H.60G Gipsy Moths, and by just 1930, the RAAF already began disposing of the D.H.60X Cirrus Moth in favour of the more powerful D.H.60G Gipsy Moth.



[Grahame Higgs image from adf-serials]

**A7-9/VH-UAO Cunderdin 2003 – this beautiful aeroplane served first as Cirrus Moth A7-9, later impressed as Gipsy Moth A7-92**



[colourised from RAAF image]

**1926 – A7-1 the first RAAF D.H.60 Moth delivered for evaluation, on the southern hangar line at Point Cook**

### RAAF D.H.60 Moths – Serial Summary

1. A main reference for the D.H.60 is Bruce Winley's, *Aussie Moths – D.H.60 Moths in Australia*.<sup>9</sup>
2. Furthermore, the *adf-serials* website has summarised the surviving E/E.88 Aircraft Status Cards.<sup>10</sup>
3. The serials A7-56 to A7-60 were left vacant – some sources state allocated to wrecked D.H.60s rebuilt by DHA Mascot, but not supported by any documentation.

Type	Quantity	Delivery	Serials <sup>11</sup>
<b>D.H.60</b> <b>Cirrus I Moth</b> Evaluation	2	1926	<b>A7-1, A7-2</b> (c/ns 199 and 200)
<b>D.H.60X</b> <b>Cirrus II Moth</b> Avro 504K Replacement Order	20	1928-1929	<b>A7-3 to A7-22</b> ordered JAN 1928 (c/ns 542, 545, 546, 549, 544, 541, 613, 543, 550, 551, 614, 540, 596, 597, 599, 598, 600, 601, 602 and 603) To standardise on the more powerful D.H.60G, nine sold 1930-1932, of which four were later impressed in 1940.
<b>D.H.60G/M</b> <b>Gipsy Moth</b> Major Local Orders	32	1930-1931	<b>Larkin Aircraft Supply Co Ltd (LASCO) of Coode Island, Melbourne</b> , Contract 19506 to RAAF Specification A.C.43. <b>A7-23 to A7-54</b> (LASCO c/ns possibly 6 to 37) Ordered MAR 1929, all D.H.60G Gipsy Moths with Gipsy I engines supplied by de Havilland.
	1	1933	<b>Cockatoo Island Naval Dockyard D.H.60G</b> <b>A7-55</b> One ordered SEP 1932 to test manufacture capability, flown APR 1933. Seaplane, used on 1936 Antarctic voyage.
	5 not allocated		<b>A7-56 to A7-60</b> serials left vacant. <sup>12</sup>
	8	1930	<b>UK built D.H.60M Metal Moths</b> , Order O.I.262 <b>Assembled by DH Aircraft (DHA) Pty Ltd Mascot</b> Gipsy Is <b>A7-61 to A7-68</b> (c/ns 1354 to 1361) delivered JAN 1930.
	6	1935-1936	<b>D.H.60M Munitions Supply Board, Ordnance Factory Maribyrnong (OFM)</b> , ordered MAR 1934, Contract A.10662. <b>Australian built in Melbourne</b> UK- supplied Gipsy I engines. <b>A7-69 to A7-74</b> (c/ns sometimes given as 8655/1 to 8655/6) <sup>13</sup>
<b>D.H.60G/M</b> <b>Gipsy Moth and</b> <b>Moth Majors</b> Impressments	48	1940	<b>A7-75 to A7-122</b> Primarily D.H.60G, but some D.H.60GIII Moth Majors and D.H.60M Metal Moths – refer to impressment list. A further two accepted for spare parts.

# "MOTH"

THE DE HAVILLAND TWO SEATER  
LIGHT AEROPLANE  
27-60 H.P. CIRRUS ENGINE.



"The completion of the Club's first 100 hours' flying on two D.H.60 Moth Machines, with no replacements other than two tail skid shock absorbers, is, I consider, a fitting occasion to comment upon the complete suitability of this type as a training machine. Its stability, ease of control, manoeuvrability, economic and trouble-free running place it in the front rank of its Class."

*Major S. A. PACKMAN, Instructor of  
the Newcastle-upon-Tyne Aero Club.*

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## The Early Moths

The sturdy fuselage of the Moth was a plywood box built around four square-section spruce longerons, with the flat sides and bottom stiffened by vertical and horizontal cross members screwed to the plywood. Two occupants sat in tandem, the front cockpit being fitted with a generous luggage shelf under the decking. The engine was bolted to the top longerons in an elevated position where the cylinders protruded prominently from the close fitting cowling. There was no oil tank, all oil (1½gallons) being carried in the engine sump. The centresection, built up of four vertical and two sloping streamlined section hollow steel struts, supported a 15-gallon fuel tank of aerofoil section. Large diameter wheels with narrow tread, high pressure tyres were fitted to a straight steel axle. For storing, the wings could fold about the rear spar, to reduce overall width to that of the tailplane.<sup>14</sup>

The first flight of Moth prototype G-EBKT was made by CAPT Geoffrey de Havilland at Stag Lane, Edgware London, on Sunday 22 FEB 1925. Changes from the prototype to the early production Moths included silver doped wings, a horn balanced rudder, and the long exhaust pipe changed to the port side. Initially equipping newly-founded English aero clubs in 1925, the 1926 production aircraft were fitted with a locker behind the rear cockpit – nine civilian aircraft were supplied to Australia for flying clubs and QANTAS.

Evaluation by the RAAF of its two 65hp powered pre-production Cirrus I Moths (**A7-1 and A7-2**) over 1926-1927 at 1FTS demonstrated the suitability of the design as an elementary trainer, so the Moth was selected to replace Point Cook's Avro 504Ks. Stag Lane's improved 1927 Moth had the more powerful 80hp Cirrus II, which was mounted lower to improve forward visibility by bringing the cylinder heads more into line with the fuselage decking.<sup>15</sup> The RAAF's twenty Cirrus II Moth trainers (**A7-3 to A7-22**), ordered in JAN 1928, were delivered and assembled by de Havilland Aircraft at Essendon later in the year.



[colourised from RAAF image]

### **A7-3, the first RAAF D.H.60X Cirrus II Moth, used for training by 1FTS at Point Cook 1928-1932**

**A7-3** was received in mid 1928 and appears to have served only with 1FTS for flying training. Transferred to the Civil Aviation Branch (CAB) as **VH-UAN** on 23 AUG 1932, and loaned to the QLD Aero Club at Archerfield. On 19 JUN 1937, VH-UAN collided mid-air with Moth VH-UAV near Archerfield, and was struck off the register.<sup>16</sup> Being from 1927 and early 1928 production, seen here the RAAF Moths **A7-3 to A7-22** had the straight axles (before the X-axle) and the Cirrus II engine (before the Cirrus III).

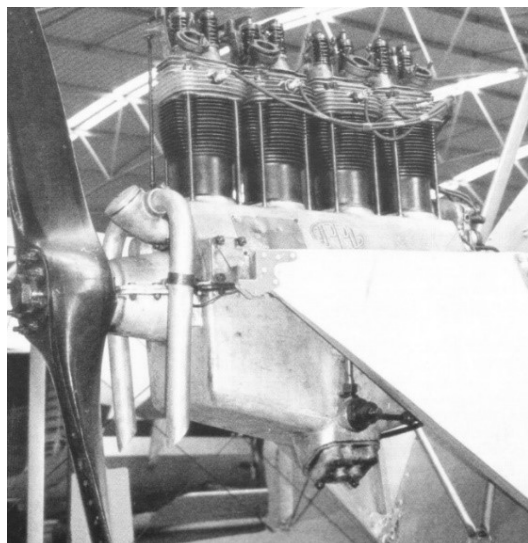
Improvements made during 1928 production, *after* the despatch of the twenty for the RAAF, included the 90hp Cirrus III engine and the split axle (or 'X') – that gave the designation D.H.60X, which was also applied retrospectively to the earlier Cirrus II Moths. 1928 production amounted to 403 machines.<sup>17</sup>

## Moth Engines

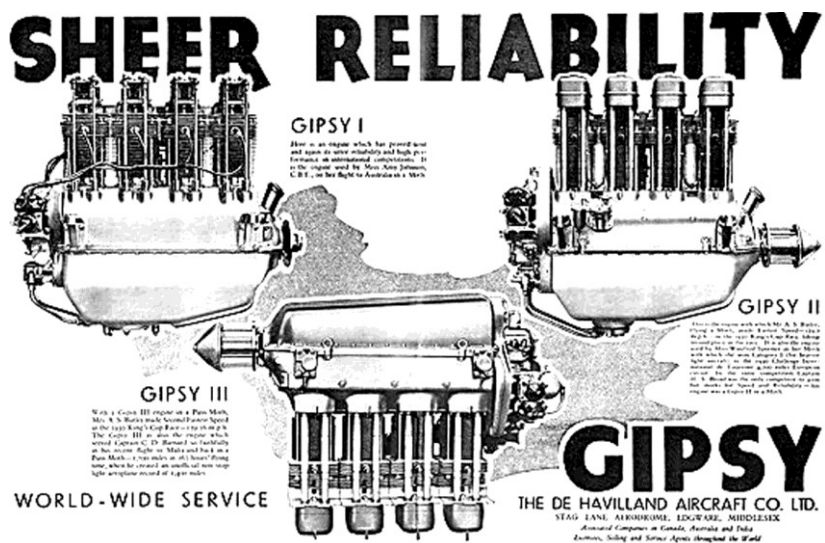
Cirrus availability was exhausting wartime stocks at Stag Lane, so an entirely new engine was designed and tested by JUL 1927. This 135hp Gipsy, which was derated for the Moth, was delivered as the 'Gipsy I' in JUN 1928.<sup>18</sup> This Cirrus I engine c/n 12 (below) came from an unidentified early D.H.60, **possibly A7-1 or A7-2**, and was photographed in the then Airworld Museum in Wangaratta.<sup>19</sup> The majority of RAAF Moths were D.H.60G or D.H.60M



variants, with the Gipsy I.<sup>20</sup> Some impressed civil aircraft had uprated Gipsy II, and the inverted Gipsy III or 'Gipsy Major'. The uprated 120hp Gipsy II and Gipsy III were similar, the latter being inverted and fitted with a dry sump – the outward appearance of the Gipsy III and 130hp Gipsy Major was almost identical.<sup>21</sup>



Early 65hp Cirrus I [images from 'Aussie Moth', p.40] Gipsy variants: 98hp Gipsy I, 120hp Gipsy II, the inverted 120hp Gipsy III



## D.H.60G Gipsy Moth

The Gipsy-powered D.H.60G retained the control characteristics of the Cirrus Moth, but added higher wing loading and for ground handling, a steerable tail skid. In UK, the 1928 King's Cup Race was easily won by the first production Gipsy Moth G-EBYZ (c/n 801). Then a proving and publicity program saw Captain Geoffrey de Havilland set a record altitude of 19,980 feet in JUL 1928; an endurance test in AUG 1928 over Stag Lane of G-EBWV with extra tanks, remained aloft for 24 hours. In DEC 1928, G-AAAL broke the 100km closed circuit record at 119.84mph.<sup>22</sup>

The engine's extraordinary reliability was proven over 1928-1929. One of the Company's earlier Moths was fitted with a Gipsy I taken at random from the production line, and flown for 600 hours over DEC 1928 and SEP 1929, covering a distance of 51,000 miles. Over this period the Gipsy received only routine attention and at the end of the test the cost of replacement parts was a mere £7/2/11 (\$14.30). This permitted a dramatic increase in the between-overhauls life of the engine. All these events made a considerable impact, making the Gipsy Moth overnight the best known of all contemporary aeroplanes.<sup>23</sup> At £650 ex works the popularity of the Gipsy Moth saw Stag Lane production increase to almost three aircraft per day by the end of 1929.

**Long Distance Flights.** The Gipsy Moth will forever be associated with the trail blazers flying England to Australia. In 1930, Amy Johnson flew the long-range G-AAAH "*Jason*" from Croydon on 5 MAY 1930, landing in Darwin on 24 MAY; G-AAAH is now displayed at London's Science Museum. Francis Chichester was the first male pilot to complete the journey in a Moth, arriving at Darwin in G-AAKK on 25 JAN 1930, five weeks after leaving Croydon. G-ABEN made a more leisurely outward flight between OCT-DEC 1930. In APR 1931 it was bought by aviatrix Loes Bonney, and as VH-UPV "*My Little Ship*", she made the return journey to UK over APR-JUN 1933. This historic aircraft was impressed by the RAAF on 10 JAN 1940 to bolster the EATS with 1SFTS at Point Cook as **A7-81**. At the time of impressment it had flown 2,500 hours,<sup>24</sup> being relegated to ground training in JUL 1940 as *Instructional Moth No.8*.

The wooden Gipsy Moth continued in production until 1934, with British Gipsy Moth production totalling 595 aircraft. Cirrus Moth **A7-9/VH-UAO** was re-engined in 1936 with a Gipsy I, and impressed on 22 JUL 1940 as **A7-92** at Maylands, Perth, and served with 4SFTS. Sold by Disposals in APR 1945, it returned to the Register in JUL 1945 as VH-UAO. Fortunately, it is still airworthy in Western Australia. The next UK and Australian Moth production was in metal.

## Later Moth Variants

**D.H.60M Metal Moth.** Although Australian production was centred on the Gipsy I powered wooden D.H.60G, de Havilland introduced in 1928 a strengthened Gipsy Moth with a welded steel tube fuselage, the D.H.60M – soon to become known as the Metal Moth. This variant had wider cockpit doors and a larger locker, and the first pre-production aircraft was G-AAAR, with the first two production D.H.60Ms coming to Australia in 1929 as VH-UKC and VH-ULL (c/n 711 and 712).<sup>25</sup> The metal fuselage was 62lb (28kg) heavier, but still a doped fabric patch was sufficient

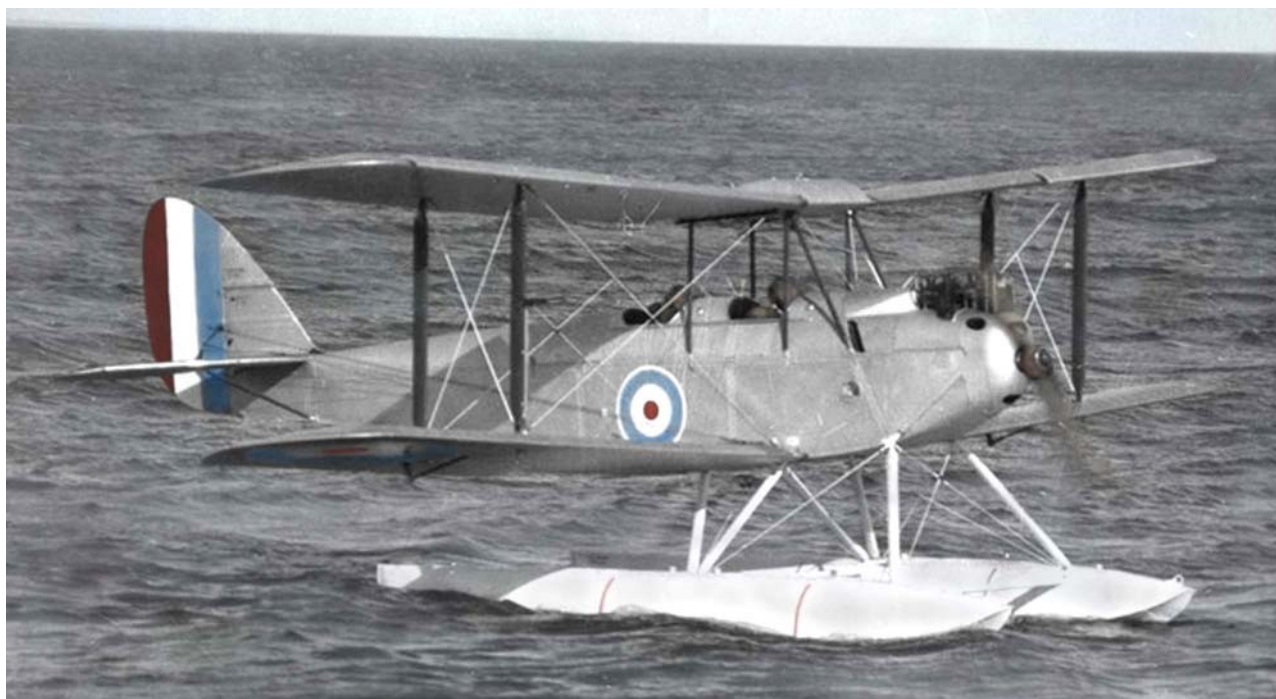


to cover holes, and the interior was more readily accessible for inspection and maintenance.<sup>26</sup> Unlike the flat-sided wooden Moths, the metal fuselage was distinguishable by a number of prominent longitudinal stringers. Eight D.H.60Ms were imported by the RAAF in 1930 (**A7-61 to A7-68**), then six were built by the Munitions Supply Board OFM over 1935-1936 (**A7-69 to A7-74**). Record attempts to Australia continued during the early 1930s with the D.H.60M, and in MAY 1934, Jean Batten broke the women's record in G-AARB arriving in Darwin in just under 15 days.

**D.H.60GIII Moth Major.** Another Moth variant to find its way into RAAF service, when large numbers were impressed in 1940, was the D.H.60GIII. Some Gipsy I engines had been replaced by the more powerful Gipsy II, and this was followed by the inverted Gipsy – the Gipsy III engine (which became the Gipsy Major). In 1931, de Havilland *inverted* the 120hp Gipsy II engine to be upside down, redesignated the Gipsy III, and fitted to the Moth to create the D.H.60GIII Moth, which first flew in MAR 1932. Fifty-seven of this new variant were built, then from the 1934 58th example, the engine was uprated to 130hp and name *changed* to the Gipsy Major – the resulting variant became the D.H.60GIII Moth Major with a further 154 being built.<sup>27</sup> The DH c/ns in the 5,000 series were entirely reserved for the D.H.60GIII. Four would be impressed into RAAF service.<sup>28</sup>

## Moth Seaplanes

While RAAF Moths were flown primarily as landplanes, many were converted to seaplanes with metal floats from Short Brothers, which had soon become the standard Moth design and adopted whenever seaplane conversions of landplanes were required.<sup>29</sup> The first RAAF Moth seaplane was Cirrus II **A7-13**, which took over the float training role at 1FTS Seaplane Training Flight (STF) at Point Cook from the Fairey IID. Later conversions included Gipsy-powered landplanes **A7-24, A7-26, A7-36, A7-40, A7-54, A7-55, A7-62, A7-63** and **A7-111** being operated as seaplanes at some stage. In the UK, Shorts also developed an amphibian undercarriage – consisting of two wing top stabilising floats and one large central float through which passed a steel shaft carrying retractable wheels. While both operated for several years, this concept was not pursued.



[colourised from adf-serials]

**A7-13** D.H.60X Cirrus II Moth, first of many RAAF Moths on floats, used by 1FTS STF at Point Cook 1928-1932

## RAAF EVALUATION D.H.60 CIRRUS I MOTHS

The two pre-production D.H.60s bought for evaluation (**A7-1** and **A7-2**) were delivered in 1926 and powered by the 65hp Cirrus Mk.I. **A7-1** (c/n 199): UK Certificate of Airworthiness issued on 31 JAN 1936,<sup>30</sup> shipped to Australia and accepted at 1FTS Point Cook in MAR 1926, crashed MAY 1927. Conversion to components approved 12 JUL 1927.<sup>31</sup>

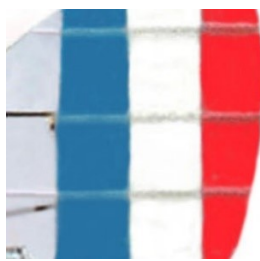


[colourised from RAAF]

**A7-1** – gravel heaps show this when extending the tarmac along the southern hangar line. Behind is a 504K in P.C.10 scheme.



21" type-A2 roundel with thin ½" White circle<sup>32</sup>



Rudder stripes – Blue leading<sup>33</sup>



MOTH logo both sides, A7-1 and A7-2

**A7-2** (c/n 200): UK C of A issued on 3 FEB 1926, shipped to Australia, accepted in MAR 1926 by 1FTS. Served with 1FTS and 3SQN Richmond, uneconomic for repair, conversion to components was approved 2 MAY 1928.<sup>34</sup>



[colourised RAAF image]



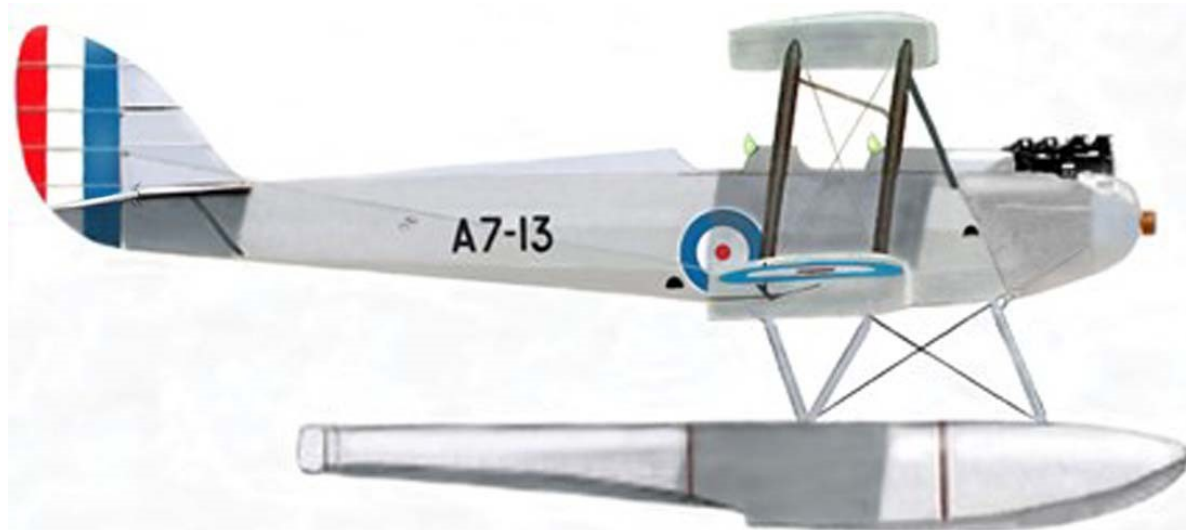
## D.H.60X Cirrus II Moth (A7-3 to A7-22)

After the evaluation of the first two D.H.60 Cirrus I Moths, the RAAF found this type suitable for the elementary training role and placed an order for twenty in JAN 1928. These machines were shipped from England in a knocked-down state and assembled in Melbourne, and concurrent to being delivered a larger order for 32 aircraft was placed with LASCO of Coode Island.<sup>35</sup>



[colourised from adf-serials]

**JUN 1928** – Early delivery D.H.60X Cirrus II Moths from UK, identifiable are A7-5, A7-4, A7-6 and A7-7 – possibly at Essendon



**A7-13 D.H.60X Cirrus II Moth, used by 1FTS Seaplane Training FLT at Point Cook 1928-1932**

National markings sizes: fuselage type-A2 roundel 21", i.e. *Blue* 20" diameter, wing roundels appear 50" diameter, rudder striping approximately 9" width per colour – imagery shows that the A2 roundel was also marked on the mainplanes, the larger roundel would have had a 1" *White* outline, until this type of roundel was discontinued in the mid-1930s. **A7-13** is a survivor at the Sydney Powerhouse Museum (Museum of Applied Arts and Sciences) restored as **VH-UAU**, in Tasmanian Aero Club colours of the 1930s.

The first deliveries were received from JUN 1928. A RAAFHQ Minute of 26 JUN 1928 recorded the condition of these aircraft as they were received out of the cases: "The general standard of finish is not as good as that usually associated with aircraft construction, but in view of the low price I do not see that we can expect anything better".<sup>36</sup> A later query from the CAS (Williams) in FEB 1929 regarding the additional £40 option cost of wing slots from DH, was confirmed that these 20 D.H.60X aircraft had been delivered with Handley Page slots (i.e. the leading edge extensions that we now call 'slats'), and that those royalty cost of the slots had been included in the DH price.<sup>37</sup>



## A7-18 – 3SQN D.H.60X MOTH 1929

**A7-18** (c/n 598) was received in mid 1928, and was operated by 1FTS at Point Cook and 3SQN Richmond. The image below shows the auto-slot on the upper wing in the open position. Also the aircraft has some rear fuselage and tail damage, which is not recorded in the 3SQN Unit History.



[colourised from RAAF image]



### **A7-18 following an incident at Richmond c1929-1930, and with the 3SQN fin marking**

The reason for the darker colour along the upper fuselage decking is not known, and it is assumed to be *Red*. The 3SQN fin marking is of interest, one of a very few RAAF squadron marking in the late 1920s, and it is assumed to be *Black*. Also marked on the fin of Wapiti A5-14, which did not join 3SQN until NOV 1929. Therefore: this marking was applied after its move from 1FTS (where it carried the older style/period serial in AUG 1929), and at a similar time as Wapiti A5-14 (from NOV 1929) – so late 1929/1930.



A7-18 at 1FTS in AUG 1929, it appeared with a gun camera mounted on the forward starboard fuselage. This may have been the first RAAF trials with a gun camera. Note the period (.) behind the serial, used in the 1920s.



[colourised from AWM P00448.074]

**1929 – A7-18 1FTS with gun camera 29 AUG 1929**



[bureau of aircraft accidents archives]

**1931 – VH-UPX served with the CAB for civil aviation checks and inspections**

**A7-18** was released to the CAB (then part of the Dept of Defence) on 8 MAY 1931 – one of the nine D.H.60X Cirrus Moths transferred to the CAB mainly for aero club use. While with the CAB, VH-UPX fatally crashed on 8 JUN 1931 at Tallarook VIC (90km north of Melbourne).<sup>38</sup>

# TEACHING THE WORLD TO FLY



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## AUSTRALIAN PRODUCTION

The need for a relatively large number and continuous supply of training aircraft for the RAAF saw several innovative actions taken for indigenous assembly and production of D.H.60 Moth variants. While the batch of D.H.60X Cirrus II Moths (A7-3 to A7-22) had been imported and assembled at de Havilland company's depot at Essendon, the later assembly of UK-supplied D.H.60M Metal Moths would be completed at de Havilland Aircraft (DHA) P/L's Mascot works. Several too were made for commercial customers, and carried 'DHA' c/ns. The first local RAAF Moth manufacturing contract was with **Larkin Aircraft Supply Co Ltd (LASCO) of Coode Island**, Port Melbourne, while other Moths would be built by Cockatoo Shipyards in Sydney and the Munitions Supply Board at Maribyrnong in Melbourne. Moth production activity continued from 1929 until 1936 at these facilities, with brief details summarised below.



[collections.museumvictoria.com.au]

### **LASCO factory and Murray Valley Aerial Services Ltd hangar at Coode Island, Port Melbourne, in 1928**

A panoramic view of workers outside the Larkin Aircraft Supply Company Ltd (LASCO) at Coode Island. Visible inside the hangar is a S.E.5a (with British reg G-EBVB), belonging to the UK firm Savage Skywriting Co Ltd. In MAR 1928, two of Savage's S.E.5as and pilots were brought to Australia to demonstrate skywriting as an advertising technique, and were based at Coode Island during their stay in Melbourne. The first official demonstration over Melbourne was flown by George Lingham on 14 APR 1928 when he wrote 'HELLO' at about 12,000 ft in letters seven miles long. Lingham, born in Melbourne, had practised for his display the previous day over Sunshine. Soap manufacturer Lever Bros contracted the aircraft to write 'Lux' over Melbourne and Sydney, but other work was scarce, and the two S.E.5as were shipped back to UK on 28 DEC 1928. 'Jimmy' Larkin is seated third from right.

### **Larkin Aircraft Supply Co (LASCO) D.H.60G Gipsy I Moth (A7-23 to A7-54)**

The contract with LASCO, near Fisherman's Bend, was for 32 D.H.60G Gipsy Moths to be delivered over 1930-1931, serialised **A7-23 to A7-54**, and was at that stage the largest order placed with the Australian aviation industry. Still of wooden construction, the Gipsy Moth offered the RAAF with an improved and more powerful 98hp Gipsy I engine compared to the Cirrus, and also provided the opportunity for local participation in assembly and production.

### **Cockatoo Island Naval Dockyard (Codock) D.H.60G Gipsy I Moth (A7-55)**

Cockatoo Island Naval Dockyard Seaplane Repair Section built a single D.H.60G Gipsy I Moth (**A7-55**) under the supervision of Lawrence Wackett, his Randwick Experimental facility having closed down. The task of building only one aircraft was to check the viability of aircraft construction.

### **Munitions Supply Board (MSB) Ordnance Factory, Maribyrnong D.H.60M "Metal" Moth (A7-69 to A7-74)**

After the supply of eight D.H.60Ms from UK (A7-61 to A7-68), in SEP 1934 RAAF Contract A.10662 was let to the MSB at Maribyrnong for six Australian-built D.H.60Ms **A7-69 to A7-74** (c/ns 8655/1 to 8655/6), which were delivered from OCT 1935 to JUN 1936.





## LARKIN AIRCRAFT SUPPLY COMPANY LTD. (LASCO)

In MAR 1929, Defence announced that LASCO had been contracted to supply 32 Moths over three years.<sup>39</sup> Initially the order had been for 14 D.H.60X Cirrus Moths, but as availability of the improved Gipsy Moth became apparent to the RAAF and to Larkins, the order was increased – first to 27 aircraft in FEB 1929, and then in MAR 1929 to 32 D.H.60Gs.<sup>40</sup> These aircraft were built under Contract 19506 to RAAF Specification A.C.43. The 32 licence-built Gipsy Moth order was announced in *Flight* magazine in DEC 1930.<sup>41</sup> The last aircraft of the contract, A7-54, was delivered to the RAAF ahead of schedule in MAR 1931. LASCO had been formed by Herbert Joseph ‘Jimmy’ Larkin, a WWI fighter pilot, and his brother Reg Larkin as an agency for Sopwith in 1919 (as the Larkin-Sopwith Aviation Co of Australia Ltd) and a manufacturer of aircraft components.<sup>42</sup> The original company went into liquidation and Herbert Larkin started the Larkin Aircraft Supply Company (known as LASCO) in 1921. The company’s early manufacture included the rebuild and re-engining of two Avro 504Ks (G-AUFP and G-AUGP), and assembled a D.H.50J (VH-UMN).



*[State Library of Vic no.1652357]*

**Aerial view of the LASCO facilities on Coode Island beside the Yarra, with the then Melbourne Aerodrome**

Then more intensive manufacture and design commenced over 1927-1929. From 1927, three ANEC III biplanes (powered by the 375hp RR Eagle) were refurbished as the LASCO **Lascowl** – G-AUEZ (c/n 1 ‘Diamond Bird’), G-AUFC (c/n 2 ‘Satin Bird’) and G-AUGF (c/n 3 ‘Lovebird’). Over 1928-29, LASCO designed and manufactured Australia’s first all-metal aircraft the **Lascoter** (VH-UKT) with a 230hp Puma, and then the three-engined **Lascondor** (VH-UMY), powered by 150hp Armstrong Siddeley Mongoose engines. With the Moth contract and its own designs, 1929 was a highmark for LASCO, and in 1931 opened the Larkin Flying School, but the withdrawal of a government subsidy and the general economic Depression caused the company to shut in the 1930s. Of the 32 DH Moth airframes built for the RAAF over 1929-1931, it is possible this D.H.60G production was allocated **c/ns from 6**, continuing from the previous five aircraft manufactured. Although speculation, this is supported by **A7-44/VH-AFN** (now registered N168G, resident in Holland) having c/n 27<sup>43</sup> – so the 32 LASCO D.H.60G Moths, **A7-23 to A7-54**, may have been c/n 6 to c/n 37.

CABLES AND TELEGRAMS: "LARKAIRSUP"  
CODES: A B C (5TH EDITION) AND BENTLEY'S



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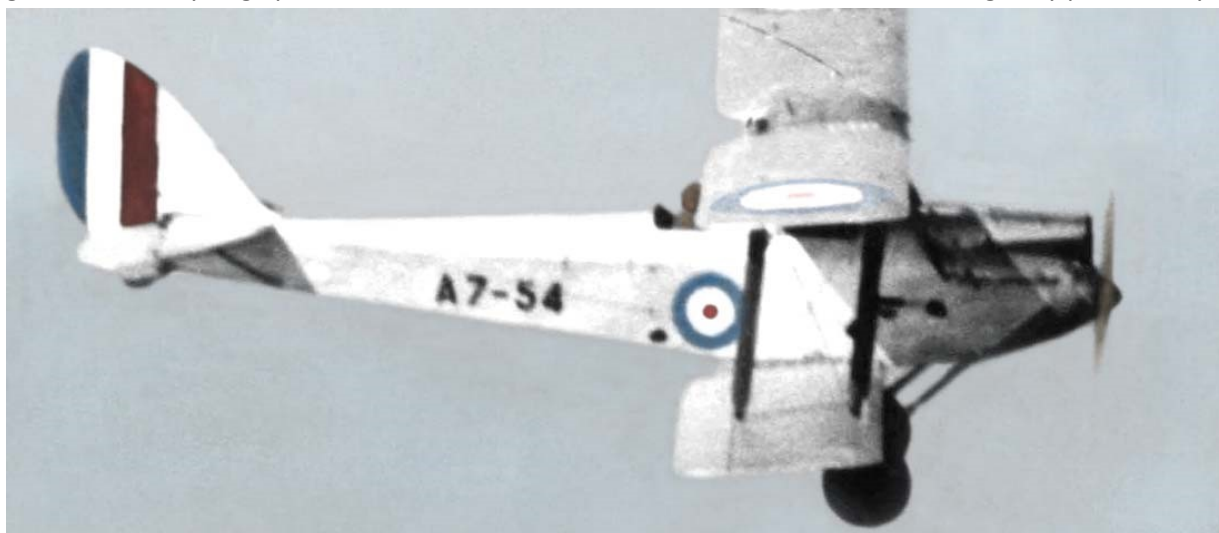
[colourised from adf-serials]

**A7-25 was the third LASCO-built D.H.60G Moth, delivered mid-1930**

**A7-25** was taken on charge c JUN 1930, and crashed at Point Cook on 10 OCT 1934, approved for components on 30 OCT 1934. Status Cards (E/E.88s) survive for **A7-27**, **A7-30** and **A7-32**, which were accepted by the RAAF in JUL 1930. Once underway, LASCO production proceeded quickly – three more Moths (including **A7-36**) were tested and accepted by the RAAF on 25 SEP 1930.<sup>44</sup> Here **A7-25**, at Coode Island prior to RAAF delivery, is marked on the forward fuselage with the LASCO transfer, similar to the logo shown below, claiming 'Made in Australia' – but this had to be removed before RAAF acceptance.<sup>45</sup>



**A7-54** was the last LASCO-built D.H.60G, delivered to the RAAF in MAR 1931. Larkins undoubtedly achieved the challenge of a relatively large production run of 32 Moths, all delivered well inside the originally planned 3-year plan.



[colourised from RAAF image]

**A7-54, the last LASCO Moth delivered to the RAAF on 18 MAR 1931**

**Markings.** The order of colours in the rudder stripes had changed during the LASCO 1930-1931 deliveries, with *Red* leading against the rudder post. **A7-54** was fitted with floats with 1FTS c1937, and became *Instructional Moth No.5* in JUN 1940. The RAAF Specification A.C.43 for this LASCO contract directed the colours as two coats of V.84 (*Aluminium*) dope, and identification markings IAW RAAF Drawings A7-489 and A-129, in colours *Blue* V.B.2, *Red* V.R.3, *White* V.W.3, '*Blackmat*' V.Bl.4, with transparent covering V.114.<sup>46</sup> In AUG 1929, RAAFHQ advised that the serial numbers allotted for LASCO production were **A7-23 to A7-54**.<sup>47</sup>



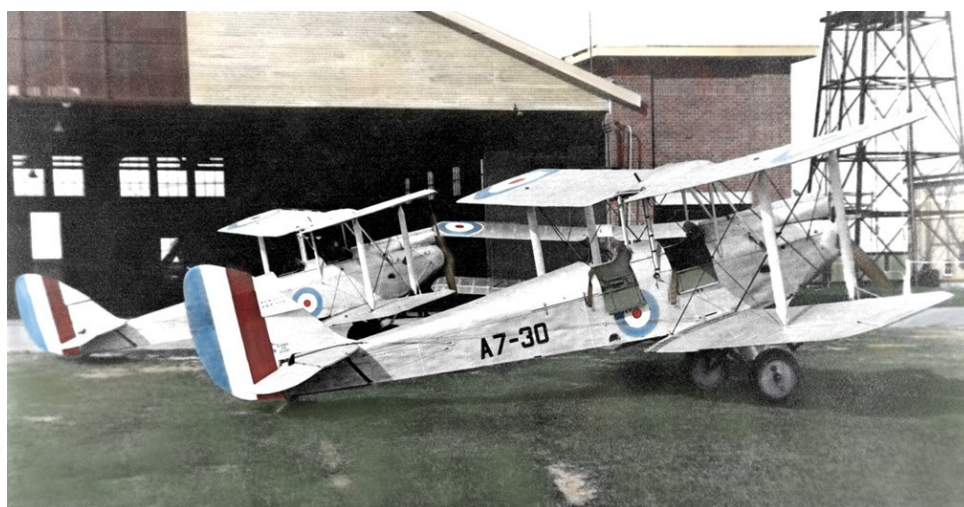
## LASCO MOTHS

Several of the 32 LASCO-built D.H.60G Moths were converted at one stage with floats, mainly for **seaplane training** at Point Cook – **A7-24, A7-26, A7-36, A7-40 and A7-54.**



*[colourised from RAAF image]*

**A7-24, the second LASCO Moth, converted at Point Cook with Shorts floats to a seaplane**



*[colourised from RAAF image]*

**Long-serving Moth – A7-30 delivered in JUL 1930, serving with 3SQN Richmond to 1934, probably when this was taken**

In 1934, **A7-30** was refurbished by Tugan Aircraft Ltd at Mascot, returning to 3SQN in NOV 1934. Transferred to 22SQN CAF in APR 1936, it remained at Richmond when moved to 4SQN in JUL 1938, which became 6SQN in JAN 1939. In AUG 1939 it was required at Point Cook (its E/E.88 entry for 30 JUL 1939 “to be converted to landplane” indicating briefly service on floats). With EATS introduced, on 14 FEB 1940 it moved on 1EFTS formation to Parafield, then over 1942-1944 saw out its service with 1SFTS Point Cook. With the reorganisation of Point Cook in SEP 1944, A7-30 was issued to RVAC at Essendon in OCT 1944 as **VH-AFO**.



*[colourised from NSW State Library]*

**A7-36 at Richmond with 3SQN, probably c1935 with type-A roundels**

The earlier type-A2 roundels had been discontinued. A7-36 was transferred to 1FTS in MAR 1935 and was fitted with floats.

## COCKATOO ISLAND NAVAL DOCKYARD (CODOCK)

A Seaplane Repair Section had been established at Cockatoo Island Naval Dockyard, occupying the drawing offices and electrical workshop. In SEP 1932, an order was placed for a single D.H.60G Gipsy I Moth (A7-55) built under the supervision of Lawrence Wackett, his Randwick Experimental facility having closed down. This one-off order was a trial to check alternate aircraft construction facilities and “to try the Section out”. A7-55 was completed and flew around APR 1933. Wackett had claimed a wooden Moth could be produced at £350 to £400, but the lack of any follow-on orders might suggest that the Dockyard was not as competitive as expected.<sup>48</sup> In JAN 1924, the RAAF had formed an Experimental Section in Sydney at Randwick under SQNLDR Lawrence Wackett, and his designs there provided the basis of his design and management experience. Over 1929, and while the Warrigal II design was under construction, the Salmond Report into the RAAF had recommended the closure of Randwick, however the Air Board had kept the Section operating. In DEC 1929 an option was taken to transfer a nucleus of staff to Cockatoo Island naval dockyard.<sup>49</sup>

Wackett's Designs at RAAF Experimental Section		
Design	Date	Details
1 - Warbler	1924	Wackett's first design, a parasol ultra-light monoplane named the Warbler, had been built on a part-time basis.
2- Widgeon I	1925	Experimental Section's first task was Wackett's next design, the Widgeon amphibian in 1925, which completed service trials in 1926 and was flown to Point Cook in JUN 1927 and handed over to 1FTS. Unofficially registered as 'G-AEKB'.
3 – Widgeon II	1926-27	A more advanced variant, the Widgeon II flew in FEB 1928 from Mascot, and delivered to 1FTS in APR 1928. Its performance, like that of its predecessor, was unimpressive and it fatally crashed in Port Phillip Bay in JAN 1930. <sup>50</sup>
4 – Warrigal I	1928	Warrigal I was a two-seat trainer biplane to replace the RAAF Avro 504K, and after testing at Richmond, was flown by Wackett in JAN 1929 to Point Cook for handover to 1FTS. Reportedly under-powered and overweight, the Warrigal I was written-off in SEP 1929 in a landing accident at Laverton.
5 – Warrigal II	1928-29	Warrigal II, an army cooperation design to replace the D.H.9, a was approved for 3SQN testing at Richmond in JUL 1930. It was reported as “a good general purpose machine and could be used for dual instruction, army cooperation, etc”. Flown to Point Cook in SEP 1930, trials continued over 1931, and fitted with floats for 1932 seaplane trials showed it operated from Port Phillip Bay when seas were too rough for Moths. However its performance was deficient to the Wapiti; as it was no longer economical for development, in JUL 1933 airframe went to Melbourne Tech College.
LJW.6 Codock	1933-34	Also referred to as the 'Codock Javelin' because of its 2x160hp Napier Javelin engines; LJW.6 VH-URP (c/n 1) flew in 1934. Basis of the next design, the Gannet.
LJW.7 Gannet	1935-37	Eight aircraft, production continued in 1936 by Tugan Aircraft Ltd at Mascot; Tugan was then bought by CAC Pty Ltd at Fisherman's Bend from 1937.

No evidence suggests the first five designs received Wackett's “LJW” prefix, which probably did not begin until the move to Codock.

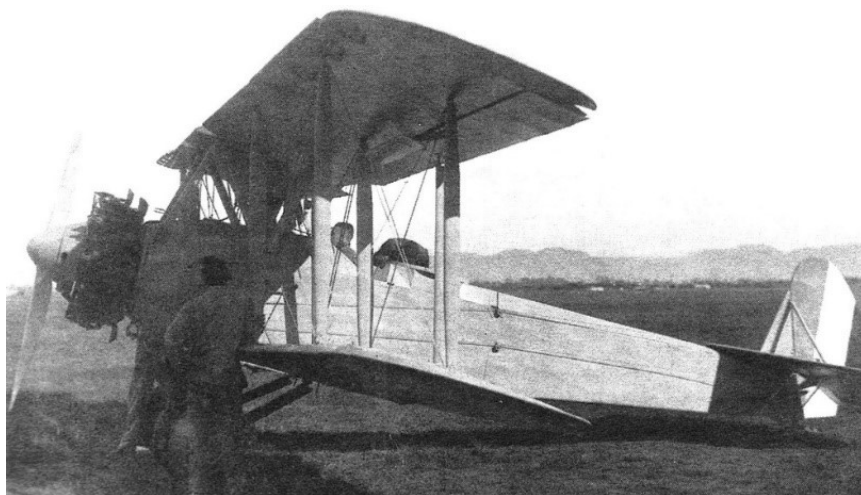


[airwaysmuseum.com]

**Wackett Widgeon I 'G-AEKB' at Point Cook 1927, with Moth A7-2**



Following tests and re-working, Widgeon I G-AEKB was transferred to the RAAF and used at 1FTS, Point Cook, for flying boat training from 1927 (above). The aircraft operated with the RAAF carrying its civil registration. G-AEKB was approved for disposal in October 1929, the airframe being broken up and engine transferred back to CAB.



[Third Brother, p.271]

#### **Wackett Warrigal II army cooperation aircraft at Richmond c JUL 1930**

When the Experimental Section closed in APR 1930, the Warrigal II was sent by road to Richmond, for service testing. Wackett transferred his operation from Randwick to Cockatoo Island (complete with a lot of RAAF equipment from Richmond) and resigned from the RAAF in MAY 1930. He continued his designing at the Dockyard, with his first task in 1932 to build a D.H.60G.

Generally, it could not be considered that Wackett's designs were successful:

- The Warrigal I as a trainer was not required, as the Moth trainers were already providing satisfactory service.
- The Warrigal II's performance, during service trials in 1932 when loaded with fuel and bombs, suffered markedly and was found to be unstable with heavy controls, generally in all aspects comparing poorly with the Wapiti.

But there was a major spin-off from the Experimental Section – designing and managing at Randwick and then at Cockatoo Dockyard Aircraft Section had placed Wackett as the leading Australian aircraft manufacturer, which would prove invaluable for aircraft production at Fisherman's Bend during World War II.

After completion of his work on the Warrigal II, Wackett's first task at **Cockatoo Dockyard & Engineering Co Ltd** was the construction over 1932-1933 of the one-off D.H.60G, **A7-55**. It was delivered to 2AD at Richmond in APR 1933, and then flew with 3SQN at Richmond and 1SQN at Laverton. Being equipped then with floats, A7-55 flew from Point Cook and departed with the RAAF Antarctic Flight in DEC 1935 aboard the Royal Research Ship *Discovery II*.

In 1933 Wackett's team at Cockatoo designed and built a twin-engined monoplane, the LJW.6 Codock, for Sir Charles Kingsford-Smith. It was a six-seat monoplane powered by two 165hp Napier Javelin engines, which was the basis of the LJW.7 Gannet with two 200hp Gipsy Six engines. The Dockyard's Aircraft Section was closed down in 1934. Gannet production was undertaken by **Tugan Aircraft Ltd** at Mascot, with Lawrence Wackett as Managing Director. By SEP 1934 the first three Gannets had been laid down to commence construction - design improvements from the Codock included the fuselage frame constructed with aircraft quality steel tubing of increased strength and less weight, window changes and more comfortable passenger seating.<sup>51</sup> Gannet maintenance would then move to the new **Commonwealth Aircraft Corporation (CAC) Pty Ltd** at Fisherman's Bend in late 1937.



[State Library of SA PRG 18/9/1/41C]

Cockatoo Island Naval Shipyard Aircraft Section (**yellow**) in 1920 looking west – little had changed for the D.H.60 work in 1932

## A7-55 – RAAF ANTARCTIC YELLOW MOTH 1935-1936

**A7-55** sailed south on RRS *Discovery II* in DEC 1935 with the RAAF Antarctic Flight to operate, flown by FLT LT Eric Douglas, in the Bay of Whales to search for the missing Antarctic explorer Lincoln Ellsworth.<sup>52</sup> A7-55 was repainted when aboard in overall *Yellow* – that included the fuselage, empennage, floats, and gravity tank at the centre of the upper wing. The serial number was not reapplied.<sup>53</sup> Ellsworth was successfully located on 15 JAN 1936.

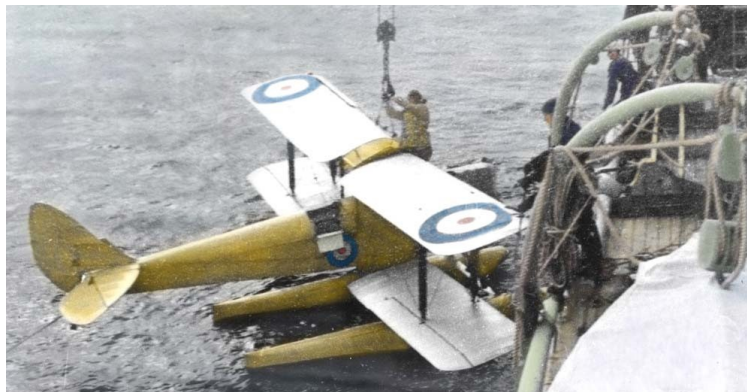


[colourised from adf-serials]

A7-55 loaded at Williamstown in DEC 1935 in overall *Aluminium* and with serial number



[colourised from Movietone News]



[colourised from RAAF image]

A7-55 fuselage painted *Yellow* aboard RRS *Discovery II*    *Yellow* A7-55, lowered over the side – no serial number but roundels



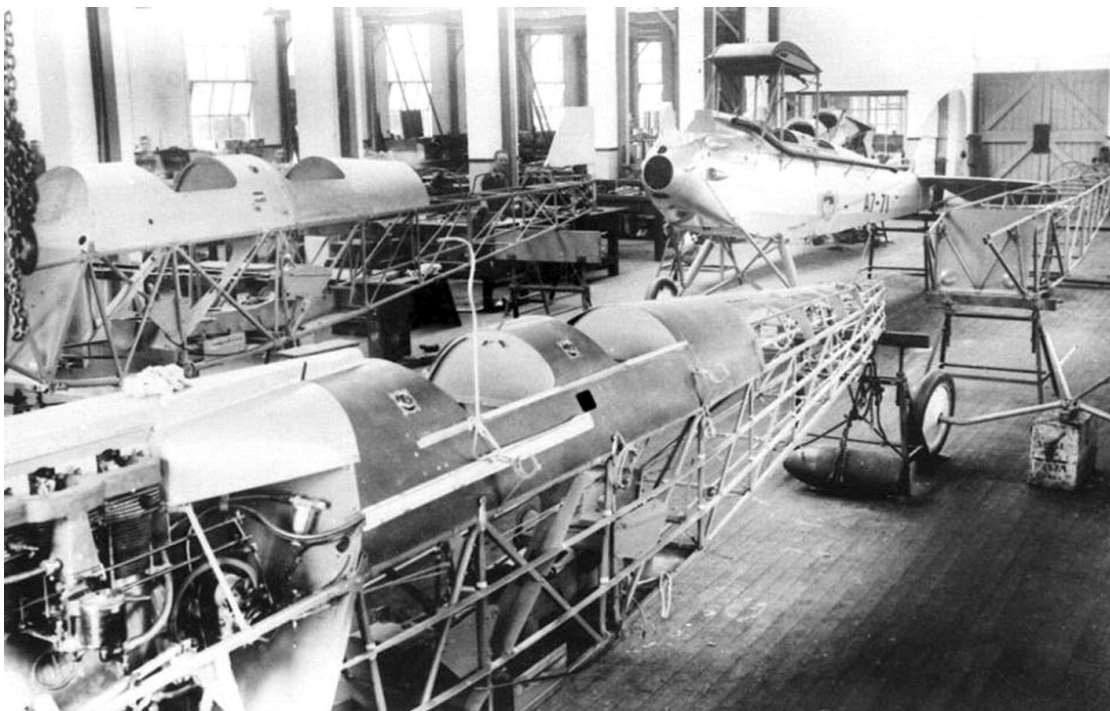
**A7-55** – the entire fuselage, empennage, floats and strut, and gravity feed tank on the upper wing were all painted *Yellow* to aid in location in case the aircraft was forced down; the wings remained *Aluminium* doped. Rudder striping was not reapplied.



## MUNITIONS SUPPLY BOARD (MSB) MARIBYRNONG

The next development in the Moth design was a strengthened aircraft using a welded steel tube fuselage, wide cockpit doors and a large locker.<sup>54</sup> Eight were ordered (**A7-61 to A7-68**) and delivered on Overseas Indent No.262, the aircraft having been built by the parent Stag Lane company (DH c/ns 1354 to 1361)<sup>55</sup> with Gipsy I engines, and completed at de Havilland's Mascot works from JAN 1930.<sup>56</sup> RAAF Aircraft Status Cards show receipt in Australia of all UK aircraft as 23 JAN 1930.<sup>57</sup> At least one aircraft, A7-62, was fitted with floats at 1FTS in 1934 as a seaplane trainer.

After the delivery of these eight imported Metal Moths, six were ordered in MAR 1934 for local production from MSB Ordnance Factory, Maribyrnong (OFM). Under Contract A.10662, the six D.H.60Ms – **A7-69 to A7-74** (c/ns 8655/1 to 8655/6) – were completed with 98hp Gipsy I engines supplied from UK, and with mainplanes sub-contracted to Tugan at Mascot.<sup>58</sup> Two of the imported Metal Moths (**A7-64** and **A7-65**)<sup>59</sup> were loaned to MSB during the Australian production. The six aircraft were assembled and accepted by the RAAF at Laverton over OCT 1935 to JUN 1936.



[adf-serials]

**1936 – D.H.60M construction at the Ordnance Factory Maribyrnong – A7-71 and the last three aircraft A7-72, A7-73, A7-74**

When these machines were completed in MAR 1936, again the competitive potential of local industry was again tested. When ordered in MAR 1934, they were contracted at a unit cost of £430. When these aircraft were completed in MAR 1936, MSB claimed a price of £729 each. The protracted haggling resulted in the Air Board agreeing to pay £586 per airframe.<sup>60</sup> This artwork below of **A7-71** has used AWM image P07175.008 as a reference.



**1940 – D.H.60M A7-71, 1EFTS Parafield, delivered from Point Cook in DEC 1939, showing the period short-lived M.1 roundel**

## The First Disposals

By the end of 1930 with the availability of Gipsy Moths and the RAAF requirement to standardise, disposal began of some of the older D.H.60X Cirrus Moths to the civilian Aero Clubs.<sup>61</sup> Soon a total of nine were transferred by the RAAF to the Civil Aviation Branch within the Dept of Defence, mainly for loan to clubs to foster flying training, but also to conduct checks and aerodrome inspections. Four of these were later impressed into wartime service in 1940. In addition, a LASCO-built example **A7-28**, sold by the RAAF after an accident in APR 1932, was rebuilt and registered.

**Civil Aviation Branch.** On 2 DEC 1920 the Air Navigation Act was passed which established the CAB as a branch with the Dept of Defence, and began to function, with the appointment of Superintendents of Aerodromes, Flying Operations and Aircraft on 28 MAR 1921. On 8 APR 1936, CAB was established as the **Civil Aviation Board** (still within Defence), becoming the **Dept of Civil Aviation** (DCA) on 14 NOV 1938.<sup>62</sup>

D.H.60X MOTH DISPOSALS – 1930-1933				
RAAF S/n	C/n	Date Reg	Civil Reg	Remarks
<b>A7-3</b>	542	23 AUG 1932	<b>VH-UAN</b>	to Civil Aviation Branch on loan to QLD Aero Club
<b>A7-4</b>	545	2 APR 1931	<b>VH-UPU</b>	to Civil Aviation Branch, on loan Bendigo Aero Club 6 MAY 1931; later Victorian Aero Club
<b>A7-9</b>	613	19 AUG 1932	<b>VH-UAO</b>	to Civil Aviation Branch on loan to Aero Club of WA; impressed 22 JUL 1940 as D.H.60G <b>A7-92</b>
<b>A7-11</b>	550	3 JUN 1931	<b>VH-UPY</b>	to Civil Aviation Branch on loan to Lismore District Aero Club; later Aero Club of NSW
<b>A7-13</b>	614	2 SEP 1932	<b>VH-UAU</b>	to Civil Aviation Branch on loan to Tas Aero Club; sold civilian owner MAR 1938; now with Powerhouse Museum Sydney, displayed as VH-UAU
<b>A7-14</b>	540	23 SEP 1932	<b>VH-UAQ</b>	to Civil Aviation Branch; sold to Royal QLD Aero Club for £210 on 16 MAR 1939; impressed 8 JUL 1940 as D.H.60G <b>A7-85</b>
<b>A7-16</b>	597	25 AUG 1931	<b>VH-UQC</b>	to Civil Aviation Branch on loan to Ballarat Aero Club; later Vic Aero Club; impressed 22 JUL 1940 as D.H.60G <b>A7-101</b>
<b>A7-17</b>	599	2 DEC 1930	<b>VH-UPK</b>	to Civil Aviation Branch on loan to Rockhampton Aero Club; later QLD Aero Club; impressed 8 JUL 1940 as <b>A7-83</b>
<b>A7-18</b>	598	8 MAY 1931	<b>VH-UPX</b>	to Civil Aviation Branch, crashed 8 JUN 1931
<b>A7-28</b>	LASCO	5 NOV 1933	<b>VH-UWB</b>	Rebuilt 1932-33 with Cirrus III engine, crashed 10 FEB 1934

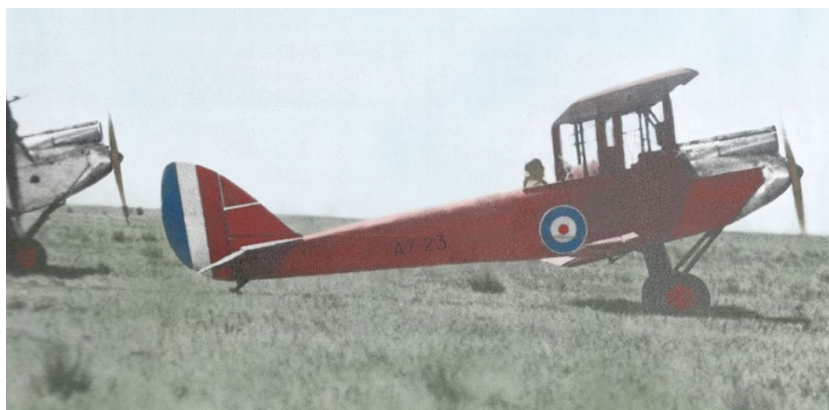


[colourised from airwaysmuseum.net]

**A7-4 became VH-UPU in APR 1931 with the CAB, here probably with RVAC at Essendon c1937**

**VH-UPU** was typical of the ex-RAAF Cirrus Moths transferred to Dept of Defence's CAB in retaining the National rudder striping. This style would be copied by the various organisations in adopting their different club colours, and remain their markings for decades. On 6 MAY 1931, the CAB loaned VH-UPU to Bendigo Aero Club, and then later to the Victorian Aero Club at Essendon. When the loan ended in APR 1936, VH-UPU returned to the club which had now become the RVAC in AUG 1937. VH-UPU crashed in a forced landing at Ballarat on 18 APR 1938, and struck off the Register.<sup>63</sup>

## A7-23 – 1FTS RED MOTH 1935



[colourised from Parnell & Lynch, p.51]



1FTS formed a dedicated three-Moth aerobatic team at Point Cook in 1935, and had specially painted Moths – the leader flew allover *Red* A7-23, and the two wingmen flew the partially *Red* Moths from A7-38, A7-48 or A7-53. The team comprised SQNLDR George Banting (RAF exchange), FLTLT M Watson and SGT Frank Cooper.<sup>64</sup> Frank Cooper was an experienced instructor, sending 'Blackjack' Walker solo in 1935, after the young trainee was having early problems.<sup>65</sup>



1FTS Red Moth A7-23 leading A7-48 and A7-38, 1935

[both colourised from RAAF images]

Above, A7-23 (the first LASCO-built D.H.60G Moth) here leading No.2 A7-48 and No.3 A7-38, the wingmen in matching partial *Red* colours. Below, A7-23 (before allover *Red*, but with *White* wheel hubs) with A7-53 (with *Red* upper mainplane) and A7-48.





## A7-64 – 1FTS TRAINING NUMBERS 1936-1940

**A7-64**, an imported D.H.-60M Metal Moth (c/n 1357) which arrived in Australia in JAN 1930 and served with both 3SQN at Richmond and then 1SQN at Laverton. In AUG 1935 it was loaned to the MSB at Maribyrnong to assist MSB with the local licensed production of D.H.60Ms. It was returned to 1FTS in MAY 1936, and served at Point Cook until the establishment of the EATS schools – being issued to 1EFTS at Parafield on 14 FEB 1940. These '64' training numbers were carried during its Point Cook service over 1936-1940.



*[colourised from RAAF image]*



1FTS training numbers were originally the 'last two' as the serial number – as **A7-64**, with '64' in squatter 14" x 10" characters to fit between fuselage stringers. These training numbers were changed over 1937-38, to be the larger properly ratioed 16" x 10" figures on the forward fuselage. These images above of A7-64 show that changeover period when both styles were temporarily carried. Below is the final definitive style.



*[colourised from RAAF image]*

**A7-64 in the final style of training numbers, c1938 outside Point Cook hangars 104 and 103.**

This image usefully shows the new modification of 'add-on' identification lights on the upper mainplane and rudder trailing edge.



## MOTH FLOATPLANES – 1928-1942

The first Moth on floats was 1FTS **D.H.60X Cirrus II Moth A7-13**. As the Cirrus Moths were retired, D.H.60G Gipsy Moths were equipped with floats for the 1FTS Seaplane Flight training role. Float equipped were **Gipsy Moths A7-24, A7-26, A7-36, A7-40, A7-54 and A7-62**. (RAAF Aircraft Status Cards, Form E/E.88, were only commenced from JUN 1938, so only aircraft in service subsequent to then have complete recorded details.) AHC#65 illustrates **A7-26** on floats in 1930, overall *Aluminium* including floats, all struts and the exhaust pipe believed to be *Black*.<sup>66</sup> No surviving images of **A7-40** have been seen. In 1935 **A7-55** was fitted with floats for the Antarctic search mission. Later in 1941 **A7-111** formed part of the Seaplane Training Flight (STF) at Rathmines, then serving with 9SQN in 1942.



**A7-24 of the 1FTS Seaplane Training FLT at Point Cook**  
Crashed in sea off Point Cook, JUN 1934 [colourised RAAF image]



**A7-36 outside the Seaplane Hangar No.101 at Point Cook c1937 with Southampton A11-2** [colourised RAAF image]

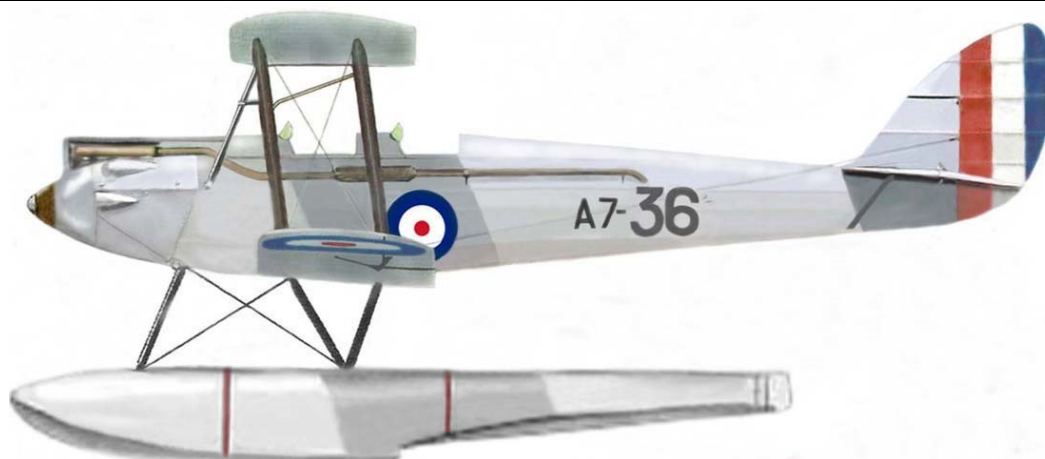


**A7-54 with training '54' as serial number** [colourised AWM 127917]



**A7-62 a D.H.60M seaplane in 1934** [colourised adf-serials]

With Australia's entry into the EATS in 1939, RAAF flying training was fundamentally changed into the preliminary EFTS and advanced SFTS system. These new schools commenced in MAY 1940 – **1FTS** was renamed **1SFTS** as part of the EATS structure, and concurrently four EFTS schools formed – 1EFTS at Parafield, 2EFTS at Archerfield, 3EFTS at Essendon and 4EFTS at Mascot. All were initially equipped with D.H.60 Moths, which necessitated the impressment of 50 of these trainers from the civil flying schools and the wider commercial and private operators. As part of a later reorganisation of EATS schools in SEP 1944, 1SFTS disbanded at Point Cook which enabled CFS to return from Parkes.<sup>67</sup>



**1937 – 1FTS D.H.60G Gipsy Moth floatplane A7-36**

1FTS standard overall *Aluminium*, carrying larger wing roundels which overlapped control surfaces, lower wing roundels same size as uppers, rudder stripes in the 1931 sequence with *Red* leading, the earlier training number style as part of the serial number. Over 1930-31, of course, the rudder striping colours were reversed – the very first of the LASCO Moths delivered over 1929-30 (including A7-36 delivered in SEP 1930) were received from Coode Island with the older style stripes, *Blue* leading against the rudder post.

## 22 SQUADRON – 1936-1939

22(Cadre)SQN formed at Richmond on 20 APR 1936 with two Hawker Demons and three Gipsy Moths, the Unit's title changing on 1 JUL 1936 to No 22 (City of Sydney) SQN. Known Moths to serve on 22SQN were **A7-30**, **A7-32**, **A7-37** and **A7-49**. In MAR 1937, Ansons were received to enable naval cooperation exercises, and at the outbreak of war, the Moths were returned to Point Cook leaving 22SQN with four Ansons and eight Demons.



[colour image from adf-serials]

**22SQN Anson A4-21 with Reserve squadron fuselage bands**



[colour image from adf-serials]

**22SQN Demon A1-17 with squadron fuselage bands**

In 1937, both the CAF 'cadre' squadrons – 21SQN at Laverton and 22SQN at Richmond – had adopted on its Demons, Ansons and Moths *light 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 early 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>68</sup> Because of the small size of the Moth sides with 20" roundels, the 22SQN Moths were marked with 4" stripes.



[colourised from RAAF image]

**Gipsy Moth A7-37, with 22SQN Blue bands, crashed at Richmond on 6 JAN 1938**

The colourful 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 ahead of the fuselage roundel on each side, 22SQN marked with 'S', 21SQN 'R').



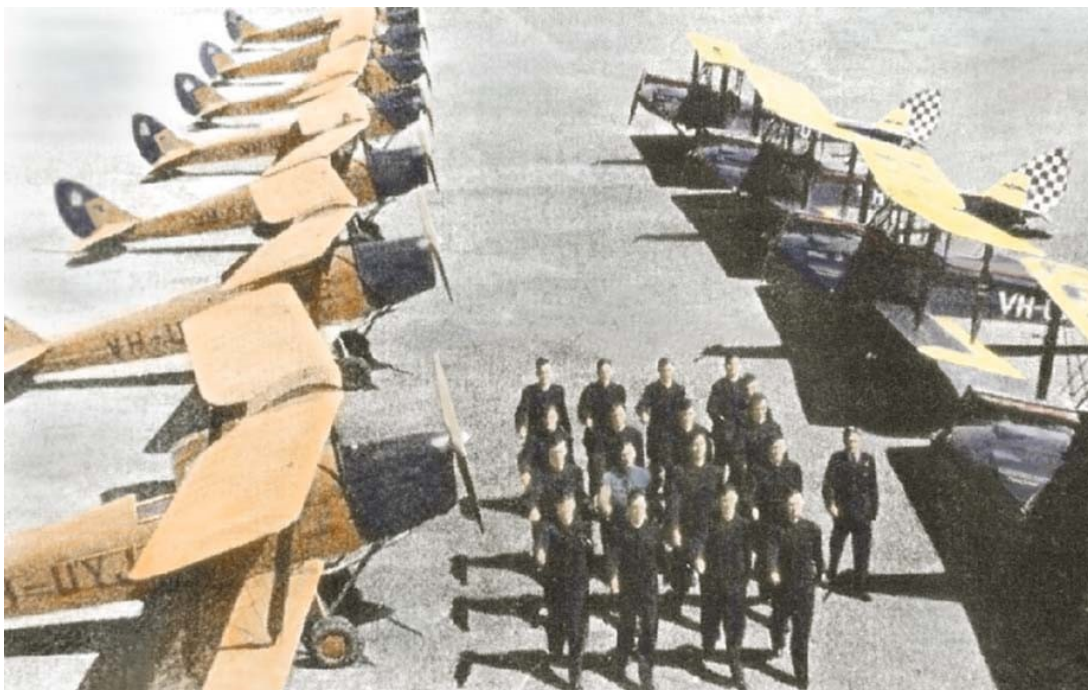
## RAAF EATS TRAINING

As related in our article on the Avro Anson,<sup>69</sup> under the EATS the Commonwealth countries undertook aircrew training, which was predominantly to supply trained aviators to the RAF. Accordingly, a variety of Schools were established around Australia for pilot, navigator/observer, air gunner and wireless operator/air gunner training, along the lines of the RAF syllabi. For pilots, after basic flying training at an Elementary Flying Training School (EFTS) on D.H.60G Gipsy Moths and D.H.82A Tiger Moths (and later CA-6 Wackett Trainers), students were passed on to the intermediate and advanced training at a Service Flying Training School (SFTS). The SFTS would grade and then specialise in either single-engined tuition (on Wirraways) for prospective fighter pilots prior to an OTU, or twin-engined (on Anson and Oxfords) for progression to the larger multi-engine aircraft.

To organise the EATS (which Canada was known as the British Commonwealth Air Training Plan, BCATP or 'The Plan'), the conference in London in NOV 1939 agreed all the various dominion training responsibilities – Australia, Canada and New Zealand – with Australia to provide 40 percent of the output from the dominions. Among those commitments for the RAAF was the establishment *inter alia* of five Initial Training Schools (ITS) for basic recruit training and aircrew groundschool and grading, twelve Elementary Flying Training Schools (EFTS) for primary pilot training, and eight advanced Service Flying Training Schools (SFTS).<sup>70</sup> In the RAAF, 1EFTS, 2EFTS, 3EFTS and 4EFTS were the only schools with the D.H.60 Moth for the EATS war effort before the complete introduction of the D.H.82A Tiger Moth.

Training Establishment	Number of Units
Initial Training School (ITS)	5
Elementary Flying Training School (EFTS)	12
Service Flying Training School (SFTS)	8

Originally the finishing date of the EATS was set at MAR 1943, but the conference in Ottawa in MAY 1942 extended this to MAR 1945.<sup>71</sup> For the Australian training commitment to the scheme, a variety of RAF training aircraft were being imported mainly for training – Ansons, Oxfords, Battles and Tiger Moths,<sup>72</sup> all of which retained their RAF serial numbers. Previous articles in this series have described the overall EATS system and throughput planned for the RAAF contribution, which for pilot training was to provide 336 pilot trainees for the EFTS, and 280 pilot trainees for the SFTS every four weeks.<sup>73</sup> In addition to the original three dominions, Southern Rhodesia also joined the scheme to establish four EFTS and four SFTS,<sup>74</sup> so that RAAF pilots could complete their flying training at an SFTS in Australia, Canada or Southern Rhodesia. For instance, the 1940 courses at 4EFTS sent trainees to 2SFTS Wagga and to Canada.



[colourised from from RACNSW 'Flying', in 'Aussie Moths' p.81]

**1939 – Pre-EFTS RAAF cadets parade at Mascot in late 1939 at the civilian flying schools, with 4EFTS forming 2 JAN 1940**<sup>75</sup>

Left are dark-blue nose/orange D.H.82 Tiger Moths and D.H.60G Gipsy Moths of the **Royal Aero Club of NSW**, which formed 4EFTS 'A' FLT. On the right are D.H.60G Gipsy Moths of **Kingsford Smith Air Services** in dark blue/yellow, that would form 4EFTS 'B' FLT.

## IMPRESSED D.H.60 MOTHS

The first four EFTS formed on 2 JAN 1940, as EATS training units with civilian D.H.60 Moths, are listed below in blue. **2EFTS** had formed at Melbourne on 6 NOV 1939, and renamed **1EFTS** 2 JAN 1940; **3EFTS** formed at Archerfield on 6 NOV 1939, renamed **2EFTS** 2 JAN 1940. It was only these first four EFTS units that instructed on D.H.60s, flying with civil VH- registrations until the majority were impressed into RAAF service with A7- serials from JUL 1940.

School	Formation	Details
<b>1EFTS</b>	Parafield SA, 2 JAN 1940	formed from 2EFTS and moved to Parafield; to Tamworth 28 MAY 1944, disbanded 12 DEC 1944
<b>2EFTS</b>	Archerfield QLD, 2 JAN 1940	formed from 3EFTS, disbanded 24 APR 1942
<b>3EFTS</b>	Essendon VIC, 2 JAN 1940	disbanded 1 MAY 1942
<b>4EFTS</b>	Mascot NSW, 2 JAN 1940	'D' FLT at Newcastle 1940-42, 4EFTS disbanded 24 APR 1942
<b>5EFTS</b>	Narromine NSW, 24 MAY 1940	largest EFTS with 114 Tiger Moths FEB 1943, disbanded 14 AUG 1944
<b>6EFTS</b>	Tamworth NSW, 22 AUG 1940	disbanded 5 MAY 1942
<b>7EFTS</b>	Western Junction TAS, 29 AUG 1940	disbanded 31 AUG 1945
<b>8EFTS</b>	Narrandera NSW, 19 SEP 1940	large EFTS with 99 Tiger Moths JUL-SEP 1942, disbanded 15 JUN 1945
<b>9EFTS</b>	Cunderdin WA, 11 DEC 1940	disbanded 17 OCT 1945
<b>10EFTS</b>	Temora NSW, 1 MAY 1941	large EFTS with 97 Tiger Moths SEP 1943, disbanded 12 MAR 1946
<b>11EFTS</b>	Benalla VIC, 26 JUN 1941	large EFTS with 96 Tiger Moths JUL 1944, disbanded 1 MAR 1946
<b>12EFTS</b>	Bundaberg QLD, 16 OCT 1941	moved to Lowood QLD 2 JAN 1942, disbanded 18 APR 1942

### RAAF Elementary Flying Training Schools <sup>76</sup>

The function of the EFTS was "to provide elementary flying training in accordance with the syllabus contained in A.P.1388", and the normal course was to be eight weeks' duration.<sup>77</sup> The history of RAAF flying training units can be found online in Volume 8, of the 1996 RAAF series *Units of the RAAF, A Concise History, Vol.8 Training Units*.<sup>78</sup> More detailed histories are of course available in the RAAF A.50 Unit Histories.

To equip these four EFTS units from the end of 1939, it was necessary to acquire civilian D.H.60 Moths, primarily for the Aero Clubs and the commercial flying training school organisation that existed in each major city. Initially when these Schools formed, civilian Moths were leased from local contractors and operated with their VH- registration, and with civilian instructors. With the major impressment requisitions from JUL 1940, the Moths received A7- numbers. It was these aircraft that constituted the early RAAF EATS training commitment. The national aero club movement as such first came into being in MAR 1926, as the Australian Aero Club Federal Council and consisted of representatives of the Victorian and NSW Clubs only. SA joined in 1927, Queensland and Tasmania in 1928, and WA in 1929, when a new association was formed and the name changed to the Associated Australian Aero Clubs. (The name was again changed to the Aero Club Federation of Australia in 1948; during 1960 the prefix "Royal" was granted by Her Majesty and the present title adopted, the Royal Federation of Aero Clubs of Australia.<sup>79</sup>)

These four EFTS units that were the main training users of the D.H.60s – primarily being D.H.60G Gipsy Moths – for service over 1939-1940, and these were then gradually replaced by the EATS Tiger Moth deliveries from UK, and then by the Australian production from de Havilland Aircraft (DHA) at Mascot from mid 1940. The D.H.60s were swapped between Schools as Tiger Moths became available, and a summary of this activity follows.

**1EFTS Parafield** – equipped with RAAF D.H.60s from 1SFTS Point Cook, re-equipped Tiger Moths in 1941;

**2EFTS Archerfield** – a 'Civil Section' and 'RAAF Section', aircraft from QLD Aero Club and Airwork were impressed JUL 1940 as **A7-82 to A7-89**, six more Moths transferred in from 4EFTS OCT/NOV, then in 1941 Tiger Moths only;

**3EFTS Essendon** – impressed Moths **A7-97 to A7-110**, then passed to 1EFTS in DEC 1940 as Tigers were received;

**4EFTS Mascot** – organised as three Flights at Mascot and one at Newcastle, impressed aircraft from Airflite and KSAS in AUG 1940 as **A7-113 to A7-120**; OCT/NOV 1940 most sent to 2EFTS, as Mascot re-equipped with Tiger Moths.

By 1941 therefore, the D.H.60 had been largely replaced as the EATS elementary trainer by the Tiger Moth. The main role then for these older Moths were as unit "hacks" until 1944, typically at an Aircraft Depot or an SFTS.

## IMPRESSED D.H.60 MOTHS

Another function at the start of RAAF wartime expansion was technical training, and many Moths became Instructional Airframes for trainees in aeroplane construction and maintenance. No.1 Engineering School (1ES) was formed, out of the Training Depot at Point Cook, in JAN 1940 at Melbourne Showgrounds at Ascot Vale. These Moths and Gipsy engines were used in the very early days for trade training, and mostly remained as training aids until 1945.



*[colourised from AWM VIC 0645]*

**1ES Ascot Vale Melbourne Showgrounds c1942 WAAAF trainees practise their skills on an 'Instructional Moth'**

A total of 50 Moths (mainly D.H.60G Gipsy Moths) were impressed into RAAF service in 1939/1940, but two were deemed as suitable for spare parts only, and so only 48 of the aircraft received RAAF serials between **A7-75 and A7-122**. One D.H.60G VH-UFV was under rebuild in AUG 1940 when impressed as **A7-112**, but this impressment was cancelled and it saw out the war conducting flying training with the Royal Aero Club of NSW at Mascot as VH-UFV.<sup>80</sup> Most Gipsy Moths were powered by the 98hp Gipsy I, some by the 130hp Gipsy Major.



*[image NLA vn 3723514]*

**A7-118 — Nancy Bird and Jack Kingsford-Smith c1933 with D.H.60M VH-UOZ (c/n 1401), impressed into 4EFTS in 1940**



## IMPRESSED D.H.60 MOTHS

Impressment of the first four Moths (**A7-75 to A7-78**) into RAAF service was in DEC 1939. While 1EFTS was established with in-service RAAF Moths, civilian Moths were required to be impressed to equip the other newly formed units, 2EFTS, 3EFTS and 4EFTS. Some early impressments went straight for ground training at the Point Cook Training Depot 'Engineering School' (which became No 1 Engineering School when it moved to Melbourne Showgrounds, Ascot Vale). Fifty Moths were impressed, although two were not airworthy or suitable for ground training, so were reduced immediately to spares, without A7- serials. Most impressed Moths were D.H.60G/Gipsy I variants; there were others.

**D.H.60M Metal Moths.** Eight impressed Moths were D.H.60M Metal Moths, more sturdy and durable than the wooden aircraft in the hands of *ab initio* trainees; others were re-engined with Gipsy Majors.

**D.H.60X Conversions.** Four had been ex-RAAF D.H.60X Cirrus Moths – **A7-83, A7-85, A7-92 and A7-101** (originally **A7-17, A7-14, A7-9 and A7-16**) which had been converted with Gipsys during their civil time and impressed as D.H.60Gs. This was the case too for ex-D.H.60s (c/n 192) VH-UAE which became **A7-88**, and VH-UAJ (241) **A7-114**.

**Gipsy Majors.** Three were taken over by the RAAF as D.H.60GIII Moth Majors. However, **A7-120** (below) had been built in Australia as a D.H.60M but had a Gipsy Major installed; **A7-112** also had a Gipsy Major, but not accepted by the RAAF; also **A7-113** was a D.H.60M impressed with a Gipsy Major – these odd ones I have listed as 'D.H.60MIII'.<sup>81</sup>



*[coloured from adf-serials]*

### **A7-120 – almost Tiger Moth lines, D.H.60MIII Moth Major VH-UOP with Kingsford Smith Flying School 1940**

Australian production was the Gipsy I powered D.H.60G and D.H.60M airframes, but other variants entered RAAF service when large numbers of Moths were impressed in 1940. Some had the more powerful Gipsy II and inverted Gipsy III engines (which became the Gipsy Major, and known as the D.H.60GIII Moth Major). **VH-UOP** was a D.H.60M built by DHA at Mascot with Gipsy I as c/n DHA.1; in AUG 1930 it had a Gipsy II installed and c/n was changed to DHA.3; in SEP 1936 it was taken over by **Kingsford Smith Air Services (KSAS)** at Mascot and re-engined with Gipsy III JUN 1940,<sup>82</sup> and then impressed in AUG 1940 as **A7-120**.

The following **Moth Summary** table lists impressments from DEC 1939, and details the major Aero Club and aviation company acquisitions (coloured) from JUL 1940: at least 14 became I/As, and six were sold and reregistered.

**QLD Aero Club: A7-82 to A7-86** on Impressment Requisition 12527<sup>83</sup>, to 2EFTS;  
**Airwork Pty Ltd (APL): A7-87 to A7-89** on Impressment Requisition 12529, to 2EFTS;  
**Newcastle Aero Club: A7-90 to A7-91** on Impressment Requisition 12533, to 4EFTS;  
**WA Aero Club: A7-92 to A7-94** on Impressment Requisition 12538, to Pearce then 4SFTS;  
**Aero Club of SA: A7-95 to A7-96** on Impressment Requisition 12547, to 1EFTS;  
**Royal Vic Aero Club: A7-97 to A7-101** on Impressment Requisition 12542, to 3EFTS;  
**Australian National Airways (ANA) Pty Ltd: A7-102 to A7-105** on Impressment Requisition 12543, to 3EFTS;  
**Victorian & Interstate Airways (VIA) Ltd: A7-106 to A7-108** on Impressment Requisition 12545, to 3EFTS;  
**C D Pratt: A7-109 to A7-110** on Impressment Requisition 12546, to 3EFTS;  
**Royal QLD Aero Club: A7-111** on Impressment Requisition 8155, to 2EFTS;  
**Royal Aero Club of NSW: A7-112** on Impressment Requisition 12539 for 4EFTS, but returned to RAC NSW;  
**Airflite Pty Ltd: A7-113 to A7-115** on Impressment Requisition 12540, to 4EFTS;  
**Kingsford Smith Air Services (KSAS) Ltd: A7-116 to A7-120** on Impressment Requisition 12541, to 4EFTS;  
**Royal QLD Aero Club: A7-121 to A7-122** on Impressment Requisition 8171, to 2EFTS.

IMPRESSED D.H.60 MOTH SUMMARY – 1939/1940						
RAAF S/n	Civil Reg	Type	C/n	Date Impressed	Impressed From	Remarks
<b>A7-75</b>	VH-ULT	D.H.60G	1060	21 DEC 1939	WA Goldfields Aero Club	Eng School JAN 40, <b>I/A.2</b> 18 JUN 40
<b>A7-76</b>	VH-UJX	D.H.60G	838	13 DEC 1939	F C Higginson	Eng School APR 40, <b>I/A.3</b> 18 JUN 40
<b>A7-77</b>	VH-UJH	D.H.60G	982	22 DEC 1939	WA Goldfields Aero Club	to <b>I/A.4</b> 18 JUN 1940
<b>A7-78</b>	VH-ULP	D.H.60M	1406	28 DEC 1939	Civil Aviation Dept	1EFTS 24 FEB 40, components JUN 44; rebuilt 1988 from parts as <b>VH-ULP</b>
<b>A7-79</b>	VH-UKV	D.H.60G	1066	8 JAN 1940	Broken Hill Aero Club	to <b>I/A.6</b> JUL 40 1ES, components 1944
<b>A7-80</b>	VH-UKJ	D.H.60G	975	10 JAN 1940	Matheson Avn Co Ltd	to <b>I/A.7</b> JUL 40, disposal and SOC 1946
<b>A7-81</b>	VH-UPV	DH.60G	1812	10 JAN 1940	E P Beresford	to <b>I/A.8</b> JUL 40, components 1945
<b>A7-82</b>	VH-URL	D.H.60GIII	5052	13 JUL 1940 <sup>84</sup>	QLD Aero Club	2EFTS, 8SFTS MAR 42, comps 1944
<b>A7-83</b>	VH-UPK	D.H.60G	599	13 JUL 1940	QLD Aero Club	ex <b>A7-17</b> ; 2EFTS, components 1941
<b>A7-84</b>	VH-UKG	D.H.60G	897	13 JUL 1940	QLD Aero Club	2EFTS, components JUL 1941
<b>A7-85</b>	VH-UAQ	D.H.60G	540	13 JUL 1940	QLD Aero Club	ex <b>A7-14</b> ; 2EFTS comps AUG 1941
<b>A7-86</b>	VH-UPF	D.H.60G	1274	13 JUL 1940	QLD Aero Club	2EFTS, components JUL 1941
<b>A7-87</b>	VH-UKU	D.H.60G	1065	20 AUG 1940	Airwork Pty Ltd	2EFTS, Surv FLT, sold MAR 45 £200 to S/L Homewood, but no CofA recorded
<b>A7-88</b>	VH-UAE	D.H.60G	192	20 AUG 1940	Airwork Pty Ltd	2EFTS, 2SFTS/5AD, sold MAR 1945 for £100 to <b>VH-UAE</b> JUL 1945
<b>A7-89</b>	VH-UFU	D.H.60G	275	20 AUG 1940	Airwork Pty Ltd	2EFTS, E/E.88 components DEC 1940; sold MAR 1946 S/L Homewood, <b>VH-UFU</b>
<b>A7-90</b>	VH-URR	D.H.60GIII	5085	22 JUL 1940	Newcastle Aero Club	4EFTS, components DEC 1940
<b>A7-91</b>	VH-URS	D.H.60GIII	5086	22 JUL 1940	Newcastle Aero Club	4EFTS, components DEC 1940
<b>A7-92</b>	VH-UA0	D.H.60G	613	22 JUL 1940	WA Aero Club	ex <b>A7-9</b> ; Pearce, 4SFTS, sold APR 45 for £100, <b>VH-UA0</b> JUL 1945
<b>A7-93</b>	VH-UKY	D.H.60G	1041	22 JUL 1940	WA Aero Club	Pearce, 4SFTS, sold MAR 45 for £210, <b>VH-UKY</b> MAY 1945
<b>A7-94</b>	VH-ULD	D.H.60G	1128	22 JUL 1940	WA Aero Club	Pearce, 4SFTS, crashed MAY 1942
<b>A7-95</b>	VH-UJU	D.H.60G	836	22 JUL 1940	Aero Club of SA	1EFTS, 4ITS, JUN 1941 to <b>I/A.13</b> , SA ATC
<b>A7-96</b>	VH-UTN	D.H.60G	1883	22 JUL 1940	Aero Club of SA	1EFTS, crashed on take-off DEC 1940
<b>A7-97</b>	VH-UMV	D.H.60G	896	22 JUL 1940	Royal Vic Aero Club	3EFTS, 1EFTS components FEB 1941
<b>A7-98</b>	VH-ULB	D.H.60G	996	22 JUL 1940	Royal Vic Aero Club	3EFTS, 1EFTS components FEB 1941
<b>A7-99</b>	VH-UHR	D.H.60G	879	22 JUL 1940	Royal Vic Aero Club	3EFTS, 1EFTS components FEB 1941
<b>A7-100</b>	VH-UHP	D.H.60G	877	22 JUL 1940	Royal Vic Aero Club	3EFTS, spun into ground AUG 1940
<b>A7-101</b>	VH-UQC	D.H.60G	597	22 JUL 1940	Royal Vic Aero Club	ex <b>A7-16</b> ; 3EFTS, 7AD, comps JUL 1944
<b>A7-102</b>	VH-UND	D.H.60M	1422	22 JUL 1940	Aust National Airways	3EFTS, 1EFTS components FEB 1941
<b>A7-103</b>	VH-UOK	D.H.60M	1494	22 JUL 1940	Aust National Airways	3EFTS, 1EFTS components FEB 1941
<b>A7-104</b>	VH-UPD	D.H.60M	1558	22 JUL 1940	Aust National Airways	3EFTS, 1EFTS components JUL 1941
<b>A7-105</b>	VH-UIA	D.H.60G	835	22 JUL 1940	Aust National Airways	3EFTS, 1AD components DEC 1940
<b>A7-106</b>	VH-UHG	D.H.60G	465	22 JUL 1940	Vic & Interstate Airways	3EFTS, 1EFTS, JUL 1941 to <b>I/A.16</b>
<b>A7-107</b>	VH-UKF	D.H.60G	974	22 JUL 1940	Vic & Interstate Airways	3EFTS, 1EFTS components FEB 1942
<b>A7-108</b>	VH-UJV	D.H.60G	846	22 JUL 1940	Vic & Interstate Airways	3EFTS, 1EFTS, JUL 1941 to <b>I/A.15</b>
<b>A7-109</b>	VH-UIB	D.H.60G	848	22 JUL 1940	C D Pratt	3EFTS, 1EFTS components FEB 1941
<b>A7-110</b>	VH-UIJ	D.H.60G	824	22 JUL 1940	C D Pratt	3EFTS, 1EFTS, 2BAGS comps JAN 1944
<b>A7-111</b>	VH-ADD	D.H.60G	920	15 JUL 1940	Royal QLD Aero Club	2EFTS, STF, 9SQN comps APR 1943
<b>A7-112</b>	VH-UFV	D.H.60GIII	878/1A	19 AUG 1940	Royal Aero Club of NSW	<b>U/S ntu</b> ; RACNSW OCT 40; rebuilt MAR 1941 reg <b>VH-UFV</b> , crashed JAN 1946.
<b>A7-113</b>	VH-UOR	D.H.60MIII	1484	19 AUG 1940	Airflite Pty Ltd	4EFTS, 2AD, to components JUN 1941
<b>A7-114</b>	VH-UAJ	D.H.60G	241	19 AUG 1940	Airflite Pty Ltd	4EFTS, 2EFTS, components DEC 1940
<b>A7-115</b>	VH-UIC	D.H.60G	849	19 AUG 1940	Airflite Pty Ltd	4EFTS, 2EFTS, 3ITS JUL 41 <b>I/A.11</b> , <b>VH-UIC</b>
<b>A7-116</b>	VH-UJN	D.H.60G	987	19 AUG 1940	KSAS Ltd	4EFTS, 2EFTS, 3ITS APR 41, JUL 41 <b>I/A.12</b>
<b>A7-117</b>	VH-UJI	D.H.60G	983	19 AUG 1940	KSAS Ltd	4EFTS, 2EFTS, 2ITS APR 41, JUL 41 <b>I/A.10</b>
<b>A7-118</b>	VH-UOZ	D.H.60M	1401	19 AUG 1940	KSAS Ltd	4EFTS, 2EFTS, SEP 1941 to <b>I/A.17</b>
<b>A7-119</b>	VH-UQT	D.H.60M	1477	19 AUG 1940	KSAS Ltd	4EFTS, 2EFTS, 2ITS APR 41, JUL 41 <b>I/A.9</b>
<b>A7-120</b>	VH-UOP	D.H.60MIII	DHA.3	19 AUG 1940	KSAS Ltd	4EFTS, 1BAGS JAN 1941, CR NOV 1941
<b>A7-121</b>	VH-ULR	D.H.60G	977	6 SEP 1940	Royal QLD Aero Club	2EFTS CR landing NOV 40, comps DEC 40
<b>A7-122</b>	VH-UIQ	D.H.60G	893	6 SEP 1940	Royal QLD Aero Club	2EFTS, 1ANS taxi acc, comps SEP 1941

Two more Moths were impressed 22 JUL 1940: **VH-UJW** (D.H.60G c/n 837) and **VH-UOQ** (D.H.60M 1483), both as spares only.<sup>85</sup>



## 1 FLYING TRAINING SCHOOL (1FTS) – 1926-1940

**1FTS** had been the RAAF's flying training unit at Point Cook since 1921, equipped with the Imperial Gift aircraft. After evaluating a pair of **D.H.60 Cirrus I Moths** over 1926-1927, 1FTS received **D.H.60X Cirrus II Moths** from 1928, and then the improved **D.H.60G Gipsy I Moths** from 1930. A student on the 1935 course was 'Blackjack' Walker: "My first flight was in an ordinary old Gipsy Moth, a D.H.60G, which was the Air Force's primary trainer in those days, and my instructor was FLTLT Norman Tamblyn... Our flying time used to alternate from week to week. We would spend half the day attending lectures in Engines, Air Force Law, or Rigging which is Airframes, and various other subjects, and then the other half would be taken up in flying. And the flying lessons were, I think, designed to give you about forty minutes in the air. After the little Gipsys we got into the huge Wapitis...It had a 450hp Bristol Jupiter for power."<sup>86</sup>



[colourised from adf-serials]

### 1938-1939 – The definitive 1FTS D.H.60G/D.H.60M Moth markings immediately prewar, with training numbers

1FTS on parade – eight Moths, 10 Cadets, 12 Wapitis. Moths here: A7-66, -74, -63, -70, -61, -71, -39 and -51. Overall *Aluminium*, standardised 16" x 10" training number on each side of forward fuselage.<sup>87</sup> Glossy *Black* struts, undercarriage, and spinner.<sup>88</sup> From 1937, all Gipsy Moths were being retrofitted with identification lights on upper mainplanes and rudders to aid night formation.



[colourised from adf-serials]

With the start of EATS in 1939, RAAF flying training was changed into preliminary EFTS and advanced SFTS schools – in MAY 1940 **1FTS** became **1SFTS**, and concurrently four EFTS schools formed: 1EFTS at Parafield, 2EFTS at Archerfield, 3EFTS Essendon and 4EFTS Mascot, all initially equipped with D.H.60 Moths. This required impressment of 50 Moths from the civil flying schools and commercial and private operators. In SEP 1944, 1SFTS disbanded at Point Cook.<sup>89</sup>



## 1EFTS PARAFIELD – 1939-1941

**2FTS** was formed at Melbourne on 6 NOV 1939 and soon moved to Parafield SA when the facilities had been completed. The main body reached Parafield on 13 DEC, and on 2 JAN 1940 the name of the unit was changed to **1EFTS**. The first course of one officer and 22 cadets commenced training on 8 JAN 1940, and over the first months 12 Moths were received from Point Cook: **A7-27, A7-30, A7-49, A7-53, A7-61, A7-63, A7-64, A7-66, A7-70, A7-71, A7-72 and A7-74**, and joined by **A7-36** in DEC 1940.<sup>90</sup>

Training was not without fatalities – on 19 MAR 1940, FLG OFF C Cox and Air Cadet R C Brown were killed in the crash of **A7-72**. By the end of 1941 most D.H.60s had left the unit, replaced by Tiger Moths, and by the end of 1942 over 1100 students had passed through 1EFTS. The unit remained at Parafield until MAR 1944, when its Tiger Moths were transferred to Tamworth, NSW, and when 1EFTS disbanded on 12 DEC 1944, approximately 2000 trainees had passed through the School.<sup>91</sup>



[State Library of SA]

**The fleet of RAC SA at Parafield, SEP 1938**

Some Moths destined for 1EFTS – from the top, VH-UAR not impressed, VH-UJU (**A7-95**), VH-UTN (**A7-96**), VH-UIB (**A7-109**), with VH-UAI, a Miles Hawk gifted in FEB 1941 to RAAF as A37-5. Rudder striping colours unknown; postwar *Blue/White* stripes.



[AWM image P07175.004]

**No 2 EATS Course at 1EFTS Parafield, FEB 1940**

With the start of the EATS in 1940, Pilot Course numbering recommenced at No 1 Course *at each EFTS*, with each running its own discrete course designators independent from the other Schools.

## 2EFTS ARCHERFIELD – 1939-1941

2EFTS was formed at Archerfield on 6 NOV 1939 as **3FTS**, renamed **2EFTS on 2 JAN 1940**. Fifteen Tiger Moths arrived from 2AD Richmond on 5 JAN 1940,<sup>92</sup> and operated from civilian hangars pending the construction of RAAF Bellman hangars. 2EFTS was divided into a 'Civil Section' and 'RAAF Section', with the flying strength of the unit complemented by leased Gipsy Moths and Tiger Moths from the civilian resources of the **Royal Queensland Aero Club** and **Airwork Pty Ltd**, who also supplied some flying instructors. In JAN 1940, No.1 EATS Course of 24 students commenced a short 8-week course, with half in the Civil Section and divided between eight at the RVAC and four at Airwork. RAAF instructors from 23SQN were soon joined by a large influx from Point Cook. As training progressed, cross-country navigation exercises were conducted to aerodromes at Dalby and Coolangatta. No.1 Course graduated on 22 FEB with 17 graduates proceeding for Intermediate Training at 1SFTS Point Cook, and the other four to 21SQN Laverton. No.2 Course, starting on 5 FEB 1940, was increased to 12 weeks to achieve 75 hours flying instruction.<sup>93</sup> Two Bellman hangars were completed in early 1940, south of the main hangar line, for use by 2EFTS and 23SQN. By APR 1940, 2EFTS 'A' FLT operated from the Aero Club, 'B' FLT from the Bellman hangars, and 'C' FLT from Airwork.

With the intensity of training, in JUL 1940 the civilian Moths were impressed into RAAF service, and there were the usual training accidents, although no fatalities – heavy landings were the most common (leading to aircraft write-offs of **A7-121** in NOV 1940, and **A7-84** in JUN 1941). By 1941, few D.H.60 Moths remained, having been replaced by Tiger Moths. 2EFTS disbanded on 24 APR 1942, and the remaining Moths were distributed as unit 'hacks' at various locations – **A7-82** to 8SFTS Bundaberg, **A7-87** to Survey FLT Lowood, and **A7-88** to 2SFTS/5AD Wagga. The Tiger Moths were transferred to 5EFTS Narromine and 7EFTS Western Junction.<sup>94</sup> By the end of MAR 1942, 806 EATS pupils had passed through 2EFTS, of which 610 successfully graduated to further SFTS training.<sup>95</sup>



[colourised from airhistory.net]

### RQAC VH-UIQ (later A7-122), Archerfield late 1930s, was overturned by a cadet trainee landing on 24 JAN 1940

The 2EFTS Unit History A.50 for JUN/JUL 1940 lists the impressment from RQAC of **A7-82** (VH-URL), **A7-83** (VH-UPK), **A7-84** (VH-UKO), **A7-85** (VH-UAQ) and **A7-86** (VH-UPF) on 13 JUL 1940, under Requisition No. 12527. **A7-82** was one of the few D.H.60G-III Moth Majors impressed, while A7-85 had originally been D.H.60X Cirrus Moth A7-14, sold in 1932 as VH-UAQ and had engine changed in MAY 1939 with a Gipsy I, to become a D.H.60G. (E/E.88 A7-86 entry is in error, recording VH-UPF as from Airwork.)

21/6/40	" Corporal (Temporary)	A. C. I. WITT, D.S. - Drill Instructor.
<u>FLYING TIMES.</u>		<u>DUAL.</u> <u>SOLO.</u> <u>GENERAL.</u>
For month of JULY	Hours Minutes	Hours Minutes Hours Minutes
	704 55	502 45 74 20
<u>GENERAL.</u>		
The following Aircraft were impressed during the month from the Royal Queensland Aero Club under Requisition No. 12527 bearing date the 13th day of JULY, 1940:-		
Tiger Moth	VH-UZV	- - - - - A17-674.
DH60 Major	VH-URL	- - - - - A7- 82.
DH609 Mk.I	VH-UPK	- - - - - A7- 83.
"	VH-UKO	- - - - - A7- 84.
"	VH-UAQ	- - - - - A7- 85.
DH609 Mk.II	VH-UPF	- - - - - A7- 86.

The 2EFTS Unit History A.50 recorded the impressment from Airwork of **A7-87** (VH-UKU), **A7-88** (which was actually VH-UAE) and **A7-89** (VH-UFU) on 20 AUG 1940, under Requisition 12529. Note E/E.88 entries give all A7-82 to A7-89 impressment dates as 8 JUL 1940 – it is assessed the local A.50 entries are more accurate than the remote, often poor, E/E.88 record keeping.<sup>96</sup>

15/8/40	<u>APPOINTMENTS AND PROMOTIONS.</u>	
	To be Chief Flying Instructor(vice Flight Lieutenant G.K.K. BUSCOMBE)Flight Lieutenant J. ARMSTRONG.	
<u>FLYING TIMES.</u>		<u>DUAL.</u> <u>SOLO.</u> <u>GENERAL.</u>
For Month of AUGUST.	Hours Minutes	Hours Minutes Hours Minutes
	799 10	716 - 54 30
<u>GENERAL.</u>		
The following Aircraft were impressed during this month from Airwork Pty.Ltd. under Requisition No. 12529 bearing date the 20th day of AUGUST, 1940.		
DH60 G	VH - UKU	- - - - - A7-87.
"	VH - UAF	- - - - - A7-88.
"	VH - UFU	- - - - - A7-89.



## FLYING TRAINING ARCHERFIELD – 1939-1940

The following images show the civilian Airwork Pty Ltd (APL) and RQAC hangars used by 2EFTS over 1939-1940.



Archerfield hangars 1940

[AWM 003648]



[annotated from [www.airwaysmuseum.com](http://www.airwaysmuseum.com)]

1965 image of the Archerfield flightline, annotated with the 1940 hangar locations for 2EFTS use

Looking north, the furthest hangar was **RQAC**, then the two **Airwork** hangars (the furthest marked 'APL' had been taken over from Airlines of Australia), closer are the two **QANTAS** hangars. Two Bellman hangars were erected for RAAF use south of this in 1940.



2EFTS Archerfield Governor-General visit 27 MAR 1940 signed by No.2 EATS Course members [colourised from AWM P11200.003]



## 3EFTS ESSENDON – 1939-1941

RAAF air cadet (pre EATS) training commenced at Essendon with civilian flying schools in OCT 1939, with **3EFTS forming on 2 JAN 1940** for EATS elementary flying training. This included a civilian element of aircraft which was approved by the Air Board but owned by commercial operators comprising: the **Royal Victorian Aero Club** (RVAC Tiger Moth VH-UYF, and D.H.60Gs VH-UHP, VH-UHR, VH-ULB, VH-UMV, and VH-UJW); **Australian National Airways** (ANA Pty Ltd D.H.60G VH-UIA, D.H.60Ms VH-VH-UND, VH-UOK, VH-UPD); **Victorian & Interstate Airways** (VIA Ltd D.H.60Gs VH-UHG, VH-UKF, VH-UJV); and the private **C D Pratt Flying School** (D.H.60Gs VH-UIB, VH-UIJ).<sup>97</sup> These Moths flew on lease to the RAAF from OCT 1939 with their civilian VH- registrations until impressment in JUL 1940.



[colourised from adf-serials]

**Mixed formation from Essendon – RVAC VH-ULB (A7-98), UHP (A7-100), UQC (A7-101); ANA VH-UIA (A7-105), UPD (A7-104)**

On 8 JAN 1940, 16 air cadets arrived for the first 8-weeks EATS training course (28 Course), which completed on 4 MAR 1940, without damaging any aircraft after 800 hours of flying training! This was probably as many of the cadets had up to 80 hours flying time before commencing training; only one started *ab initio*. The second course (29 Course) commenced on 5 FEB. On 15 MAR 1940 the School finally received its first RAAF aircraft, Gipsy Moth **A7-44** which was delivered from Point Cook. This marked the change of the civilian influence on flying training and by the end of JUL 1940 civilian involvement had largely ceased. The civil Moths that had been formerly used were impressed into RAAF service – in the batch **A7-97 to A7-110**. A segment of the training involved cross country navigation flights to Ballarat and Bacchus Marsh, and to facilitate ground training, a Link trainer was established in FEB 1941. One of the instructors at the School was FLGOFF 'Doc' Fenton, a legendary bush pilot from the Northern Territory and one of the original flying doctors, who later returned to the Top End in command of 6CF. During AUG 1941, 3EFTS commenced operating the Wackett Trainer, and was disbanded on 1 MAY 1942.<sup>98</sup>

Page 7.		OPERATIONS RECORD BOOK.		R.A.A.F. Form A50.
		of (Unit or Formation) No. 3 Elementary Flying Training School,		No. of Sheet FOUR
		ESSENDON, Victoria.		
Place.	Date.	Summary of Events.		References to Appendices.
ESSENDON	22-7-1940	<p>The Unit underwent a very marked change on this day and its evolution from partially Civil to an R.A.A.F. organization is now practically completed. All the approved Gipsy and Tiger Moths held by the four Contracting Civil Companies were impressed into the Service, along with their stocks of spare parts.</p> <p>In addition to Gipsy Moth aircraft A7-44, the following aircraft are now on the Unit's charge :-</p> <p>FROM ROYAL VICTORIAN AERO CLUB</p> <p>VH-UMV now A7-97</p> <p>VH-ULB " A7-98</p> <p>VH-UHR " A7-99</p> <p><del>VH-UJW " A7-100</del></p> <p>VH-UQC " A7-101</p> <p>FROM AUSTRALIAN NATIONAL AIRWAYS, PTY., LTD.,</p> <p>VH-UND now A7-102</p> <p>VH-UOK " A7-103</p> <p>VH-UPD " A7-104</p> <p>VH-UIA " A7-105</p> <p>FROM VICTORIAN &amp; INTERSTATE AIRWAYS, LTD.,</p> <p>VH-UHG now A7-106</p> <p>VH-UKF " A7-107</p> <p>VH-UJV " A7-108</p> <p>VH-ADO " A7-684</p> <p>FROM C.D. PRATT.</p> <p>VH-UIB now A7-109</p> <p>VH-UIJ " A7-110</p>		

The 3EFTS A.50 on 22 JUL 1940 records details of **A7-97 to A7-110**. The original **A7-100** (RVAC VH-UJW) is crossed out – it was received by the RAAF only as spares; A7-100 was re-allotted to RVAC VH-UHP.<sup>99</sup>

## Australian National Airways Aeronautical College, Essendon

Before the civilian Essendon D.H.60s were impressed into RAAF service with 3EFTS in 1940, ANA ran an Aeronautical College flight training school, which was contracted for groundschool and flying instruction of RAAF cadets from 1FTS at Point Cook. The first course was 26 Pilot's Course, which had started at 1FTS at the beginning of SEP 1939. 1FTS was already conducting its annual 'A' course in Intermediate and Advance flying training, in addition to many specialist flying courses: these were the Flying Instructors Course, refresher flying training, Nav Reconnaissance Course and Specialist Navigation Course. So with the outbreak of war and the required expansion, there was no capacity to accelerate elementary pilot training. The plan was therefore to outsource flying training to civil schools (this being pre-EATS), so 1FTS instructors visited civil flying clubs during SEP to examine and standardise the civil instructors.<sup>100</sup> '26A' Course began training at the ANA Aeronautical College in SEP 1939, 27 Course in NOV 1939. The first EATS training was 28 Course, as 3EFTS formed with the flying school Moths on 2 JAN 1940.

At this stage, the elementary training had also incorporated basic training which would soon be incorporated in the 4-week ITS course as part of the EATS syllabus. There were 16 students on each course, with four flying with ANA, six with RVAC, 4 with VIA, and two with CD Pratt. Trainees were billeted in Moonee Ponds and commuted daily to Essendon. From APR 1940, the EATS courses began numbering from No. 1 Course. When 8 weeks of elementary training was completed at the civil schools (comprising some 75 hours), trainees went on the Intermediate phase of training at 21SQN Laverton. 21SQN had restructured in DEC 1939 – 'C' and 'D' FLT's had Hawker Demons to undertake Intermediate Training of flight cadets.<sup>101</sup> The first through this abbreviated system was 26 Course, which graduated at Laverton in MAR 1940. 21SQN provided intermediate training until graduating 29 Course in JUN 1940.



[colourised from AWM P00135.004]



[AWM P00135.002]

### RAAF 26A Course trainees at Essendon, OCT 1939 (VH-UOK and VH-UND) 26A Cse trainees in their *Itala* 'motor transport'

2nd from the left: Cdt Clarrie 'Spud' Spurgeon – shot down in 8SQN Hudson A16-11 in Malaya to become a POW, later CO 1SQN Lincolns at Tengah and CO 1SQN Canberras at Amberley, OC 82WG for the 1968 F-111 pickup, Commander RAAF Vietnam 1970. 3rd from right: Air Cadet Wilbur Wackett, son of LJW, who flew P-40s and was shot down in A29-6 in the 75SQN defence of Port Moresby in 1942 and evaded, and later killed flying Beaufighter A19-208 with 31SQN from Coomalie Creek in 1944.



[colourised from AWM AC0169]



**ANA Moths c1939-1940, D.H.60G VH-LIA, and D.H.60Ms VH-UOK and VH-UND destined for 3EFTS, c 1939-40; ANA flag logo**  
These ANA aircraft became A7-105, A7-103 and A7-102 – and showing their age, by 1941 all had been converted to components.



## 4EFTS MASCOT – 1940-1941

On 2 JAN 1940, 4EFTS was raised at Kingsford Smith Airfield, Mascot NSW. The headquarters was established in the clubhouse of the RAC of NSW, and other civilian facilities were allocated for use by the School. For example, the Department of Civil Aviation casualty room was taken over as the Station Sick Quarters and a lecture room utilised the space of Airflite Pty Ltd No.2 hangar. To undertake training, civilian instructors were absorbed into the RAAF as commissioned officers to instruct on D.H.60 Gipsy Moths and D.H.82 Tiger Moths.

Without barrack accommodation, the cadets were billeted at the Brighton-Le-Sands Hotel. The EATS training commenced on 29 APR 1940, when 24 cadets from 2ITS started No.1A Course, graduating on 22 JUL for Intermediate Training at 2SFTS Wagga. Training was undertaken by a combination of service and civilian resources with four flights, under command of the RAAF CO 4EFTS: 'A' FLT (RAC NSW), 'B' Flight (KSAS Ltd), 'C' FLT (Airflite Pty Ltd), with 'D' FLT remotely located at Newcastle Aero Club.<sup>102</sup> 2A Course started 27 JUN, and 3A on 25 JUL. In AUG 1940, eight D.H.60s were impressed as A7-113 to A7-120. KSAS was sold to Airflite about SEP 1940, and Airflite maintained the RAAF servicing contract until bought by Ansett in MAR 1942.<sup>103</sup> Over OCT/NOV 1940, six Moths (A7-114 to A7-119) were exchanged with 2EFTS for Tiger Moths.<sup>104</sup> Although accidents were common, primarily forced landings, the only fatality was when an instructor fell from a Tiger Moth during a slow roll over Randwick on 18 NOV 1940. By the end of 1940, 4EFTS had finished instructing on the D.H.60, and scaled down activities to disband on 24 APR 1942.<sup>105</sup>

### OPERATIONS RECORD BOOK.

R.A.A.F. Form A.50,  
(Feb. '33)

of (Unit or Formation) **No. 4 E.F.T.S., MASCOT.**

No. of Sheet **8**

Place.	Date.	Summary of Events.	References to Appendices.
MASCOT.	19th AUG 1940	<p>Impressment of aircraft - 23 aircraft belonging to Aero Club (5) Airflite (Pty) Ltd. (4) K.S.A.S. Ltd. (3) Newcastle Aero Club (9) acquired under National Security (General) Regulations together with spare parts and materials.</p> <p>Aero Club - 5 DH82's. Airflite - 1 DH82, 1 Major DH60M, 2 DH60G. K.S.A.S. - 4 DH60G's, 1 DH60M. Newcastle - 9 DH82's, 2 still to be delivered.</p> <p>No. 1 Gov. Hangar (Aero Club) taken over and 2 Airflite Hangars impressed under hiring agreement.</p> <p>Separate contracts for flying instruction with above four organisations. Maintenance contract granted to Airflite (Pty) Ltd.</p>	

#### 4EFTS Mascot, A.50 Unit History 19 AUG 1940

4EFTS Unit History A.50, 19 AUG 1940, detailing the impressment of 23 aircraft from the four local contractors – Royal NSW Aero Club ('A' FLT), Kingsford Smith Air Services Ltd ('B' FLT), Airflite Pty Ltd ('C' FLT), and Newcastle Aero Club ('D' FLT).



[colourised and annotated from [www.airwaysmuseum.com](http://www.airwaysmuseum.com)]

**Mascot 1935** looking south – basically the same hangars as when the RAAF arrived in 1939 (now site of domestic terminals)

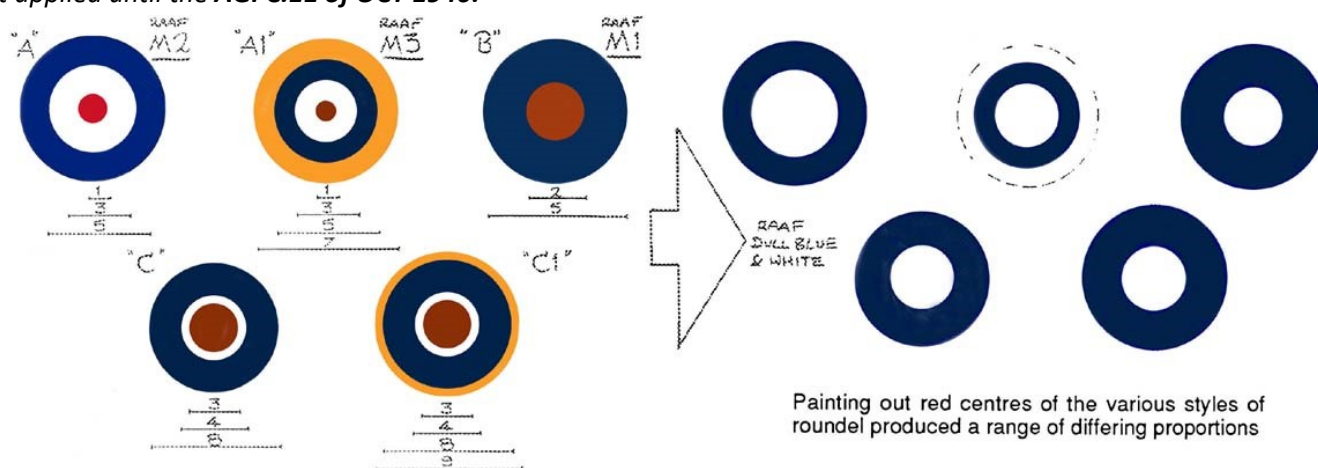
In the middle is **Airflite** hangar; **KSAS** hangar at top with (to its left) a second built by 1939; **RAC of NSW** has 'MASCOT' on roof; beside RAC NSW is a DCA 'Govt hangar', the EFTS HQ. By 1940, DHA had the hangar left of the Govt hangar with three more built left of that for Tiger Moth production; and to the left of the KSAS hangars would be the Beaufort assembly factory.<sup>106</sup>



## RAAF NATIONAL MARKINGS

The 'non-official' designators of RAF national roundels we know as 'A', 'B', 'C', etc were developed in the 1950s, purely for simplicity, from Robertson's benchmark Harleyford *Aircraft Camouflage and Markings 1907-1954*. 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 the Red/White/Blue flash 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 applied until the **AGI C.11 of OCT 1940**.



Coloured from Ian Baker's AHCB #5, Roundels, Tail Stripes & Other Markings (2)




[coloured from AWM P07175.008]


D.H.60M A7-71 marked with the M.1 roundel at 1EFTS Parafield in early 1940

The RAAF "M.1" was the RAF type-B, the "M.2" was the standard red-white-blue type-A, and the "M.3" marking was the M.2 with a Yellow ring around the outside (like converting the RAF type-A to the type-A1). The fin flash was also designated by a number – the "M.4" marking was the red-white-blue fin flash. **A7-71** shows the 20" M.1 was 2:5, the M.2 was 1:3:5. But soon into 1940, the RAAF fuselage roundel was reverted from the M.1 back to M.2 roundel.<sup>110</sup>

## EVOLUTION OF RAAF MOTH MARKINGS

In past articles in this series, individual aircraft camouflage and marking details for the RAAF from 1939 have been covered, with the changes up to 1945, often resulting from the origin of the aircraft. Below is a chronology of RAAF policy for generic, and the Moth specific markings (prewar all-over *Aluminium* Moths, and the wartime training schemes), so this can be followed in a logical timeline.

Year	Change	Policy and References
<b>Prewar</b>	The original two evaluation D.H.60 Moths were delivered in 1926 with fuselage type-A2ii roundels – that is the 1:3:5 type-A (1915-1937) with a thin <i>White</i> outline. <sup>111</sup> The subsequent batch of D.H.60X from UK in 1928 were the same. All were delivered with rudder striping, with <i>Blue</i> leading, against the rudder post. Australian production from 1930 had type-A 1:3:5 roundels (without the <i>White</i> outline) and rudder striping was altered to <i>Red</i> leading.	<b>RAAFHQ Routine Order No.248 of 24 OCT 1930.</b> This reversed the colours of rudder striping to be effective from 1 JAN 1931.
<b>1939</b>	<b>SEP 1939.</b> RAAF aircraft finishes, identification markings, and squadron code letters – training aircraft <i>Aluminium</i> . Introduction of RAF type-B fuselage roundels to all aircraft, including trainers (which became RAAF ‘M.1’).	<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> Drawn largely from <b>AMO A.154/39 of 27 APR 1939.</b> <sup>112</sup>
<b>1940</b>	<p><b>JAN 1940.</b> Introduction of <i>Yellow</i> for <b>Elementary Trainers</b>.</p> <p><b>OCT 1940.</b> Policy AGI No. C.11 Issue 3 specified trainer schemes E.1 (overall <i>Yellow</i>), interim E.2 (36” <i>Yellow</i> bands), and detailed National Markings:</p> <ul style="list-style-type: none"> <li>○ <i>Marking M.1</i> – a <i>Blue</i> ring surrounding a red centre, the diameter of the <i>Red</i> to be 2/5 of the <i>Blue</i> circle, on upper wings (i.e. type-B roundel).</li> <li>○ <i>Marking M.2</i> – a <i>Blue</i> ring surrounding a <i>White</i> ring surrounding a <i>Red</i> circle, the proportions to be 1:3:5 (type-A roundel). (From APR 1940, M.2 replaced the <i>Blue/Red</i> M.1 on fuselage.)</li> <li>○ <i>Marking M.3</i> – three colour circle (i.e. <i>M.2</i>) surrounded by a <i>Yellow</i> ring, proportions as for M.2 and the <i>Yellow</i> the same width as the <i>Blue</i> circle, i.e. 1:3:5:7 proportions (type-A1 roundel).</li> </ul> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> <li>○ <i>Marking M.4</i> – <i>Red, White</i> and <i>Blue</i> stripes on the fin (Seagull). Some Moths rudder stripes in 1940. Moth seaplane A7-111 carried M.3 roundel, no fin flash.</li> </ul> <p><b>NOV 1940.</b> The <b>RAF’s Aircraft Design Memorandum (ADM) No.332</b> specified Air Diagrams for camouflage schemes for different types of service aircraft. The <b>RAF Temperate Land Scheme (TLS)</b>, had been mandated by <b>RAF AMO A.926 in DEC 1940</b> – upper surfaces in Ministry of Aircraft Production (MAP) <i>Dark Green</i> and <i>Dark Earth</i>.</p>	<p><b>AGI No. C.11 A/L.5 of 26 JAN 1940, 150/4/658.</b></p> <p><b>RAAFHQ Aircraft General Instruction No. C.11, Issue 3, of 3 OCT 1940,</b> AFHQ file 1/501/329. Para2(i) stipulated <i>Grey</i> serial number and code letters on camouflaged aircraft.</p> <p><b>RAF ADM 332 (Issue 3) of 15 NOV 1940, External Colour Schemes of Aircraft,</b> RAAFHQ file 150/4/852 AGI C.11, <i>Standard Finishes and Markings</i>. Air Diagram <b>A.D.1169 “Camouflage Single-engined Biplanes</b> – communications aeroplanes, trainers” applied to the Moth and Tiger Moth. <b>AMO A.926/40 of 12 DEC 1940 replaced A.154/39.</b><sup>113</sup></p>
<b>1941</b>	<p><b>JAN 1941.</b> The RAF cancelled the requirement for “mirror” camouflage schemes in JAN 1941 and manufacturers then selected only one pattern as standard. Moths standardised on the ‘A’ scheme</p> <p>The RAAF adopted 1941 policy of the RAF Directorate of Technical Services (DTS) in <b>DTS 368/41</b>, which also for the first time laid out the RAAF’s standard overland</p>	<p>Merging of the ‘A’ and ‘B’ schemes occurred from 15 JAN 1941.<sup>114</sup></p> <p><b>RAAFHQ DTS directive 368/41, file 150/4/852(53A) of 23 DEC 1941,</b> letter S.A.S.9984, paras.2 and 4.</p>

	camouflage scheme; specifying <i>Foliage Green</i> (K3/177, to replace RAF <i>Dark Green</i> ), <i>Earth Brown</i> (K3/178 to replace RAF <i>Dark Earth</i> ), and <i>Sky Blue</i> (K3/195 instead of RAF <i>Sky</i> ).	RAF ADM 332 (Issue 3) of 15 NOV 1940, <i>External Colour Schemes of Aircraft</i> .
1942	<p><b>JUN 1942.</b> Deletion of <i>Yellow</i> ring from RAAF roundels.</p> <p><b>AUG 1942.</b> The <i>RAAF Technical Order, Aircraft General Instruction (AGI) No.C.11</i> changed, Issue 4 of 31 AUG 1942, for operational aircraft retaining <i>Red/White/Blue</i> National Markings, no <i>Yellow</i> – but with unintended consequences.</p> <ul style="list-style-type: none"> <li>Upper surfaces – <i>Red</i> was dropped, so the roundel was specified as <i>Matt White</i> and <i>Matt Dull Blue</i>, with the <i>White</i> diameter to be 2/5 of the <i>Blue</i> –the first directive for what we call the ‘Pacific’ Roundel. <i>Red</i> was deleted – 26 JUN 1942 attack by a USN fighter on a RAAF Catalina, confused by the <i>M.1</i> roundel <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 – <i>Dull Red</i>, <i>White</i> and <i>Dull Blue</i> stripes of the same width, with red leading.</li> </ul> <p>This <i>Issue 4</i> of the AGI, in addition to reiterating the 36” <i>Yellow</i> trainer band requirements, also directed that “Training and Communication Aircraft” were to have <i>Yellow</i> undersurfaces. This did not apply to aircraft with Reserve squadron commitments.</p> <p><b>SEP 1942.</b> On 19 SEP 1942 <i>Red</i> was dropped completely from National Markings – <i>Blue</i> and <i>White</i> roundel with <i>Blue</i> not to exceed 48”, with the <i>White</i> diameter 3/5 (3:5) of the <i>Blue</i>. Roundels were to be in the 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. The <i>Yellow</i> surround of the type-A1 fuselage roundel had been overpainted in AUG 1942 with camouflage paint.</p>	<p>RAAFHQ DTS 280/42 of 18 JUN 1942, filed on 1/501/329(63A); 1TG signal T.670 19 JUN 1942; Signal School Point Cook A.50, 29 JUN 1942.</p> <p>RAAFHQ Technical Order AGI No.C.11 (issue 4) of 31 AUG 1942.</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>RAAFHQ message T520, file 0947/19 (30A), of 19 SEP 1942.</p> <p>USAAF War Dept Circular #141, 12 MAY 1942, had removed <i>Red</i> from the US National Markings.<sup>115</sup></p>
1943	<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.</p>  <p><b>Ratio of the <i>White</i> to the <i>Blue</i>, 3:5 and 2:5</b></p> <p>Any Moths with <i>Blue-White</i> Pacific roundels in 1942-1943 would have been in the 3:5 ratios.</p>	<p>RAAFHQ AMEM DTS 1/501/329 SAS 13552, 8 JUL 1943, adopted 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>116</sup></p>
1944	<p><b>MAY 1944.</b> Revision of AGI “Camouflage Schemes and Identification Markings”: Appendix C <i>Foliage Green</i> (for CUs), and Appendix E <i>Yellow</i> for trainers. Training numbers were to be in Black forward of the fuselage roundel. For camouflaged aircraft (i.e. CUs) code letter colours changed to <i>Medium Sea Grey</i>. But by this stage, no Moths remained in service.</p>	<p>RAAFHQ T.O. AGI Pt 3(c), Instruction 1, file 150/4/5056 (1A), of 26 MAY 1944.</p> <p>Also issued as DTS Special Instr Gen/34 1 MAY 44.</p>



## RAAF TRAINER BANDS, TRAINING NUMBERS and OVERALL YELLOW

**1935-1937.** Training numbers in the RAAF started in approximately 1935 with 1FTS at Point Cook, and applied to the aircraft then on strength – D.H.60 Moths and Wapitis. On Moths and Wapitis, these larger ‘last two’ numbers were just that – they formed the last two digits as part of the serial number. Although ideally these would keep the proportions of the 8” x 5” characters of the serial number, on the rear fuselage sides of the Moth there was insufficient room, so these larger characters were truncated to 14” x 10” and were slightly squatter than the normal ratios. Soon, from 1936, Avro Cadets were in service, and these and the Moths received the more common training numbers of the ‘last two’ on the forward fuselage. For the Moth in 1937, this was in the larger, correctly proportioned 16” x 10” figures, for the Cadet these were a more *squared* training numbers of 24” x 18”.<sup>117</sup>



*[colourised from adf-serials]*

**A mixture of 1FTS Moths with training numbers, c1937**

**A7-36** and **A7-27** were LASCO D.H.60G Moths, with large ‘last-two’ serial as a training number. **A7-62** was an imported D.H.60M with similar style numbering. **A7-71** was a OFM D.H.60M, with the later large ‘**71**’ training number forward on the fuselage, which was standard at the beginning of the war. A7-27 has received the ident lights modification, apparent here on the upper mainplane and on the rudder of A7-71, which would be carried over to all in-service D.H.60Ms. Both A7-36 and A7-62 were, at one time, floatplanes. 20” diameter type-A fuselage roundels, 50” on wings.

**SEP 1939.** RAAF training aircraft policy was laid down in Aircraft General Instruction (AGI) C.11 as overall finish to be Aluminium (V.84),<sup>118</sup> but no mention was made of “training numbers”, only Grey ‘Squadron letters’ allocated to units.

**JAN 1940. Overall Yellow or Trainer Bands.** Amendment List No 5 (A/L 5) to the SEP 1939 AGI C.11 was the first Instruction on trainer aircraft to be finished in overall K3/185 *Yellow*, or as an interim expediency *Yellow* bands around the rear fuselage and mainplanes.<sup>119</sup> There is little evidence that many Moths received trainer bands as they were quickly painted overall *Yellow* – but a later image of SEP 1943 (AWM collection) shows several Engineering School Moth instructional airframes with bands, but probably applied solely for trade training. While A/L 5 specified these bands as 36” width, that was too large for the Moth’s fuselage and appear to be 2/3 that width, at 24” (see A7-111).

**MAR 1940.** Reference is made from RAAFHQ Director of Technical Services (DTS) to AMOE regarding “*Yellow* bands” to be used by AGI C.11, which were to be 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 is made that Tiger Moths being delivered from de Havilland Aircraft (DHA) at Bankstown were finished in *Yellow*.<sup>120</sup>

## YELLOW MOTH TRAINERS 1940-1942



**Overall Yellow was the scheme when Tiger Moth A17-32 was rolled out by DHA at Mascot at the end of JUN 1940**

On 21 JUL 1940, A17-32 was delivered in a batch of nine Tiger Moths (A17-32 to A17-40) from 2AD Richmond to 5EFTS at Narromine. 5EFTS was formed in MAY 1940 with only Tiger Moths – ex-RAF EATS aircraft and early deliveries from DHA at Mascot.

**OCT 1940.** Following on from the JAN 1940 C.11 Issue 1 A/L 5, release of AGI C.11 Issue No.3 reiterated the two training schemes. **Scheme E.1** was to be the permanent scheme for training aircraft, with 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>121</sup> As noted, a band of 36” was too wide for the Moth fuselage, and 24” was used.

**OCT 1940. Training Numbers.** AGI C.1 Issue 3 specified: “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”. Caveats were: one digit could be used if serial number was under 10; if more than one aircraft in the unit had the same ‘last two’, then three numbers could be used; numbers were to conform to the size of squadron code letters, i.e. under 48” in height.<sup>122</sup> By this stage, Moths had largely been replaced by Tiger Moths and withdrawn from the EFTS service.

**JAN 1942.** RAAFHQ noted *Yellow* painting was “gradually being implemented”, with recommendation from DTS to DCAS “to adopt the English scheme for training aircraft” – *Yellow* undersides with camouflage on the upper surfaces.<sup>123</sup>

**JUN 1942.** DTS noted the removal of the *Yellow* ring from the fuselage roundel for *night bombers*, “IAW instructions issued by the Allied Air Command”.<sup>124</sup>

**AUG 1942.** Release of AGI C.11 Issue No.4 formalised the earlier decisions discussed, inter alia *Foliage Green/Earth Brown* upper surfaces and *Sky Blue* lower surfaces, no *Yellow* ring to all roundels, and the 36” *Yellow* band around the fuselage and wings.<sup>125</sup> This therefore deleted the RAAF M.3 roundel (i.e type-A1), reverting to the M.2 (type-A). Roundels changed again in SEP 1942 with the deletion of *Red* altogether from National Markings. The AWM SEP 1943 image of Instructional Moths shows the then standard 3:5 *Blue/White* ‘Pacific’ roundel/fin flashes, and training bands.

The next major revision of RAAF camouflage and markings was AGI Part 3, Section (c), Instruction No.1, of MAY 1944 – by this stage the only remaining D.H.60 Moths would have been used as “hacks”, for instance at an SFTS or AD. The different roles of aircraft were detailed in the 1944 AGI appendices: Appendix “E” **Yellow** for all training aircraft, with training numbers (or letters) in *Black* to be placed forward of the roundel.<sup>126</sup>



[internet flicker image]

Impressed D.H.60G A7-75/VH-ULT had served most of its RAAF time as *Instructional Moth No.2*, rescued postwar to Camden

## YELLOW MOTH TRAINERS 1940-1942

The first overall *Yellow* Moth was of course seaplane A7-55, painted enroute to the Antarctic in DEC 1935. Subsequently the overall trainer *Yellow* scheme was directed by an AGI amendment in JAN 1940, specifying elementary trainers to be overall K3/185 Camouflage Finish *Yellow* (BALM colour S.13987).<sup>127</sup> (If the overall *Yellow* could not be painted immediately, then interim *Yellow* trainer bands were to be marked around the fuselage and mainplanes.) This overall *Yellow* colour scheme would have remained while Moths were employed as elementary trainers at EFTS units.



[colourised from RAAF image]

**LASCO-built D.H.60G A7-49 served with 1EFTS 1940-41, and then 3EFTS 1941-42**

The lighter patch on the fin suggests that a tricolour flash had been removed – the 1940 AGI C.11 Issue 3 had specified M.2 roundels (type-A 1:3:5) in all positions, but no M.4 fin flashes, or rudder stripes, were required for the *yellow* Gipsy Moth.



[Air Britain colour image]

**D.H.60G A7-75 was VH-ULT and impressed in Western Australia in JAN 1940**

A7-75 became an early Instructional Airframe (as *Instructional Moth No.2*), probably explaining its survival. Now at the Camden Air Museum, it has incorrect rudder stripes and postwar **type-D** 1:2:3 roundel – it should carry the wartime **type-A** 1:3:5 roundel.

By OCT 1940, this JAN 1940 amendment A/L 5 was formalised into RAAF HQ AGI C.11 *Issue 3* of 3 OCT 1940 para 1(a) which determined the two schemes for 'Training Aircraft' – Scheme E.1 as a permanent scheme of overall *Yellow*, and Scheme E.2, an interim scheme with *Yellow* band three feet (36") in width on the rear fuselage and mainplanes. The interim markings may have lasted longer than intended – there had been Air Board discussions in APR 1940 about the overall colour for elementary trainers, but there had been shortages of *Yellow* paint. DHA had correctly made the assumption that overall *Yellow* would be required, and the DHA Tiger Moth production line at Mascot was already turning out the aircraft in overall *Yellow*.



## A7-92 – YELLOW MOTH WITH A LONG CAREER

With the Moth as the EFTS trainer at the four larger capital cities from JAN 1940 (**A7-75 to A7-81**, and civilian aircraft), the overall *Yellow* could have been applied virtually immediately, contingent on aircraft availability. This had been directed by the AGI amendment of JAN 1940 for overall K3/185 Camouflage Finish *Yellow*.<sup>128</sup> But it was also necessary to cover the previous civilian flying club markings and VH- registrations. This would have also been the case as more Moths were impressed into RAAF service from JUL 1940 (**A7-82 to A7-122**), and here at Maylands aerodrome, Perth, where **A7-92** was impressed. However, A7-92 had already served as a RAAF elementary trainer Cirrus Moth **A7-9**, becoming one of the rare aircraft to serve with different 'A' numbers.

Cirrus Moth **A7-9** had been one of those reconditioned to join the civil Register on 19 AUG 1932 as VH-UAO, registered to the CAB and on loan to the Australian Aero Club (WA Section) at Perth/Maylands. There, it suffered the usual spate of accidents typical of the era, including a ditching in the Swan River in 1936. During its rebuild a Gipsy Mk I engine was fitted, becoming a D.H.60G. On 27 JUL 1937 the CAB sold the aircraft to the RAC of Western Australia – as the Australian Aero Club (WA Section) had by then become. The Second World War brought a desperate need for training aircraft and VH-UAO was impressed into the RAAF on 22 JUL 1940. As the aircraft had been re-engined, it was allocated a new military serial, **A7-92**.



*[coloured from Goodall image in airways museum site]*

### **Western Australian Moth – A7-92, ex VH-UAO, has just been impressed at Maylands Perth JUL 1940**

**A7-92** (VH-UAO), **A7-93** (VH-UKY) and **A7-94** (VH-ULD) when inducted into RAAF service from the RAC of WA. Only partially repainted in *Yellow* for expediency, between the E.1 (*overall Yellow*) scheme and E.2 (interim, with 36" *Yellow bands* on wings) IAW the JAN 1940 AGI amendment. *Yellow* would extend to cover the wings as time permitted, and rudder striping deleted.



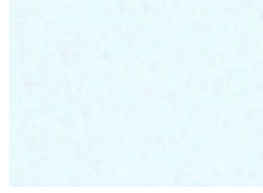
**A7-92** was impressed at Maylands from the Royal Aero Club of WA on 22 JUL 1940, used by RAAF Pearce until moving in JUN 1941 up to 4SFTS Geraldton, then storage at 9EFTS Cunderdin in FEB 1945. Sold for £100 by the Commonwealth Disposals Commission to J K Vine of Vine Motors, Perth, in APR 1945, and restored to the Civil Register as VH-UAO on 26 MAR 1946 with John Lane of Kalgoorlie, and subsequently staying in the West with a series of owners – flying again marked as **A7-9**.

## RAAF CAMOUFLAGE

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) specifying the Anson was to be in "Scheme 2", later specified as Diagram A-1733 and Z-1152<sup>129</sup> – reprints of the 1939 RAF Air Ministry Diagram A.D.1159 for 'Twin Engined Monoplanes'. The AGI also specified the use of *Red/Blue* roundels (for the fuselage and upper surfaces) and *Red/White/Blue* below the mainplanes, and also 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 determine – like the RAF had done – to re-introduce *White* to the fuselage roundel, as the RAAF did by APR 1940.

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 – the RAF used *Sky*, or "duck-egg blue" for the European haze, but *Sky Blue* was adopted here, as the richer blue was required for the Australian clearer and brighter atmosphere.

- The overland camouflage for **Ansons** received from UK in 1939 were the RAF colours *Dark Green* (DG) and *Dark Earth* (DE), however the RAAF departed from British schemes by introducing *Sky Blue* (K3/195) for undersurfaces, with *Red* and *Blue* identification colours in *dull* colours.<sup>130</sup>
- When **Oxfords** arrived from the end of 1940, they were delivered in the typical RAF training scheme of camouflage in DG/DE on uppersurfaces, and training *Yellow* on the sides and lower surfaces. This was not retained in the RAAF. The early RAF *Yellow* sides were soon eliminated in UK production, and RAAF lower surface colours were Sky Blue, which would have been applied from 1941. To continue the RAF's preference with *Yellow* for training aircraft, the RAAF implement *Yellow* trainer bands, and training numbers.

		
K3/216 RAF <i>Dark Green</i> 33B/201	K3/209 RAF <i>Dark Earth</i> 33B/198	K3/195 <i>Sky Blue</i>

### 1940 RAAF camouflage colours for RAF Temperate Land Scheme (TLS)

RAF colours were identified by the name, but for inventory had stock numbers which varied with the amount that was ordered.<sup>131</sup>



*[colourised from AWM 139774]*

### A view of camouflaged Instructional Airframes at 1 Engineering School at Ascot Vale in SEP 1943

**Camouflaged instructional airframes:** D.H.94 Moth Minor in foreground in A.D.1167 scheme with trainer stripes on wings only, no upper roundels (possibly A21-6); two D.H.60 Gipsy Moths in scheme A.D.1169 (which would be the early training aids **I/A.1 to I/A.8**), the one on left with fuselage trainer band, to the right apparently trainer bands on wings only and no upper roundels; a Hawker Demon (top left) in A.D.1162, and (at right) a D.H.82A Tiger Moth in A.D.1169 (right) with no trainer bands; and above that a Fairey Battle in A.D.1160. These markings did not necessarily represent those of previous units as they appear relatively freshly painted, probably applied by the trainee surface finishers – and also not necessarily in accordance with all extant policy.

## RAF AIR DIAGRAM CAMOUFLAGE SCHEMES

Aircraft Design Memorandum No.332 (Issue 3) of 15 NOV 1940, referenced as CD44/41,<sup>132</sup> listed the Air Diagram Numbers for camouflage schemes for the different types of aircraft. The design of camouflage or other external colours scheme must be IAW the appropriate Air Diagram.

The RAAF examples are added from RAAFHQ messages SAS.9984 (DTS 368/41) in DEC 1941 (D.C.2, Anson, Wirraway, Battles), then additionally SAS.7396 (DTS 280/42) in JUN 1942 (Hudson, B-17).<sup>133</sup> This final list was consolidated for all types by AGI C.11 (issue 4) in AUG 1942.<sup>134</sup> However, there was still a shortage of the drawings in Australia at this stage, and the AGI directed that some aircraft should use the closest drawing available.<sup>135</sup> When camouflage was added to some Cadets the appropriate A.D.1169 (Single-engined biplanes – communications aeroplanes, trainers) as per the Tiger Moth, was used.

Air Diagram No.	Types of Aircraft	RAAF Examples
A.D.1157	Twin-engined monoplanes – bombers, general reconnaissance, transports (span 75' and over)	Douglas D.C.2, D.C.3
A.D.1158	Cancelled, and included in A.D.1160	
A.D.1159	Twin-engined monoplanes – bombers, general reconnaissance, transports, army co-op aircraft (span less than 75')	Anson, Hudson, Beaufort, Beaufighter
A.D.1160	Single-engined monoplanes – army co-op aircraft, fighters	Wirraway, Battle, Hurricane <sup>136</sup>
A.D.1161	Four-engined monoplanes – bombers, general reconnaissance, transports	B-17 Fortress
A.D.1162	Single-engined biplanes – army co-op aircraft, fighters	Demon
A.D.1163	Four-engined monoplanes – general reconnaissance (flying boats)	
A.D.1164	Twin-engined monoplanes – general reconnaissance (flying boats)	Catalina
A.D.1165	Twin-engined biplanes – general reconnaissance (flying boats)	Seagull V
A.D.1166	Twin-engined biplanes (sesquiplane) – general reconnaissance (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	Single-engined biplanes – communications aeroplanes, trainers	Tiger Moth



[Warpaint 101: 'Tiger Moth']

**Tiger Moth in A.D.1169 'A' pattern**

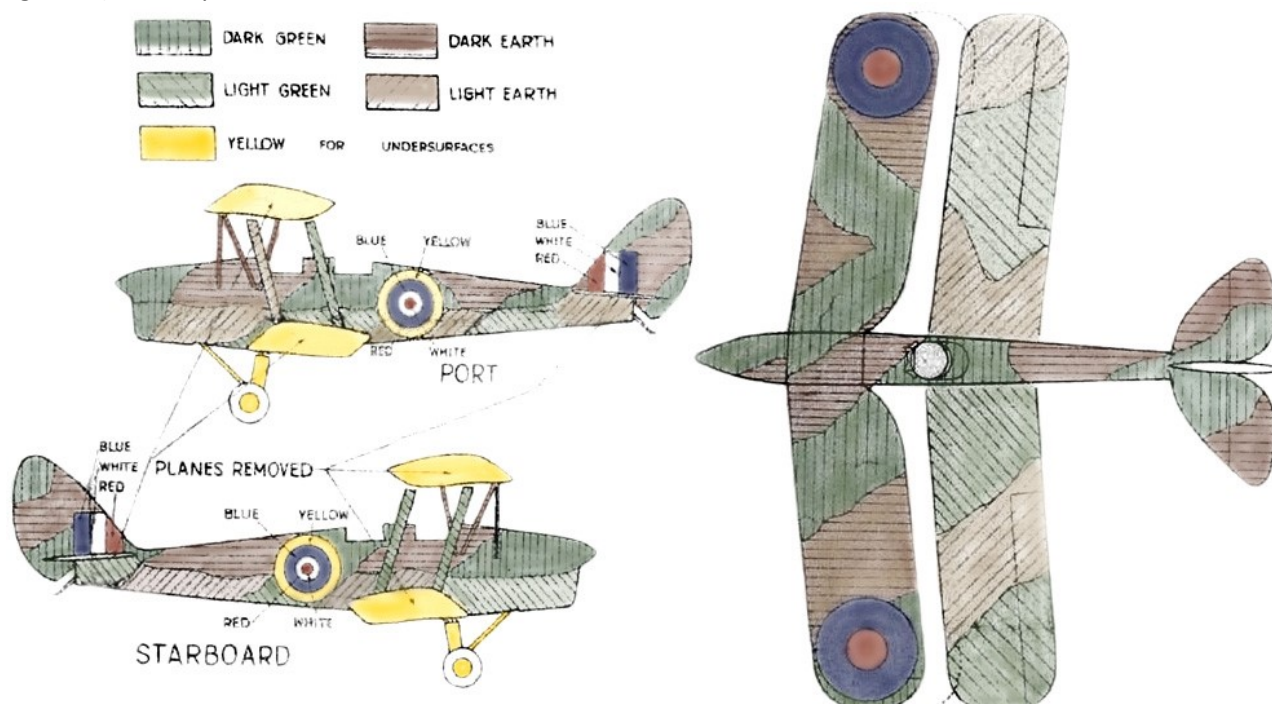
A.D.1170	Single-engined monoplanes – target towing	
A.D.1171	Single-engined biplanes – target, pilotless aeroplanes	
A.D.1172	Single-engined biplanes – Fleet Air Arm	
A.D.1173	Single-engined monoplanes – Fleet Air Arm	
A.D.1174	Single-engined biplanes – general reconnaissance, FAA	
A.D.1175	Twin-engined biplanes – communications aeroplanes, trainers	
A.D.1176	Cancelled, and included in A.D.1159	
A.D.1291	Four-engined biplanes – communications aeroplanes	D.H.86

**Mirror Images.** Where the Air Diagram shows two variations of the scheme, being mirror images of one another, the variations must be allocated to aircraft as directed in the contract instructions.



## AIR DIAGRAM A.D.1169

A.D.1169 was used for “Single Engined Biplanes (communications aeroplanes and trainers)” and is primarily associated in the RAAF with the Tiger Moth. After all D.H.60X Cirrus Moths were *Aluminium*, the prewar D.H.60G/D.H.60M Gipsy Moths were similarly coloured. With war, the surviving D.H.60 Moths, and those impressed, became overall training *Yellow*, or camouflaged if the role demanded – primarily unit “hacks” assigned to an SFTS, an Aircraft Depot or an advanced training unit. After JAN 1941 when “mirroring” ceased, the standard scheme was the A.D.1169 ‘A’ pattern. The ‘A’ camouflage colours of this scheme sloped forward (when looking from the top of the fuselage side) on the port side, and aft on the starboard side.



[‘A’ pattern colourised from A.D.1169, NAA A11083 21/4/AIR]

### A.D.1169 Air Ministry Diagram for Single Engined Biplanes<sup>137</sup> – Communications Aeroplanes and Trainers

A.D.1169 of MAY 1939 was issued like all Drawings at the time in Scheme ‘A’ and the mirror Scheme ‘B’, and also with “shadow markings, discussed in the previous Seagull article.<sup>138</sup> This comprised RAF *Dark Green* and *Light Green*, and *Dark Earth* and *Light Earth*, with the usual trainer *Yellow* undersurfaces.



[du Plessis Colour Collection]



[Phil Vabre Goodall Aviation site]

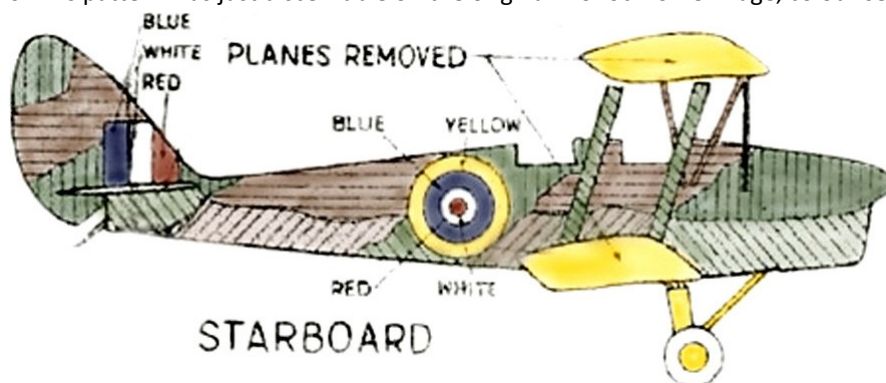
**Tiger A17-494 in A.D.1169 ‘B’ Scheme 1942 with USAAF      Restored Cadet A6-17/VH-AGH in MAR 2010, A.D.1169 ‘B’ Scheme**

While A.D.1169 was used for “Single Engined Biplanes (communications aeroplanes and trainers)”, it is primarily associated in the RAAF with the Tiger Moth. Some D.H.60 Moths were camouflaged, primarily unit “hacks”. For A.D.1169 after JAN 1941, when “mirroring” ceased, the standard pattern became the ‘A’ scheme.

## A7-88 – AUSTRALIA'S FIRST MOTH, G-AUAE

**A7-88** was impressed from on 8 JUL 1940. Nothing startling about that! But this aeroplane was the first Moth to arrive in Australia – Cirrus I Moth c/n 192 and registered as **G-AUAE** on 5 NOV 1925. After a crash into the sea off Cronulla in 1929, it was recovered to be damaged again in a forced landing in 1931. Over 1932-1933 it was totally rebuilt by Tugan Aircraft Ltd at Mascot with Tugan c/n 8, re-registered as **VH-UAE** in JUN 1934.<sup>139</sup> When impressed into the RAAF in JUL 1940 as **A7-88**, the E/E.88 records it as fitted with Gipsy engine no.2076, which was probably installed during its Tugan rebuild. Similarly, it was rebuilt with the later X-undercarriage (seen below).

This colourised image from the 1939 A.D.1169 'A' scheme shows the required starboard pattern for RAAF Moth biplanes – Gipsy Moths and Tiger Moths. This pattern was just discernable on the original monochrome image, colourised below.



[coloured from A.D.1169 'A']



[coloured from GRB collection]

### A7-88, a unit hack at Wagga in A.D.1169 'A' scheme, with USAAF B-17E cAPR 1942

USAAF B-17s arrived in Wagga during APR 1942 with the 4th Air Depot Group and the 70th Bombardment Sqn. By this stage, 2SFTS had disbanded and the resident RAAF unit was the newly-formed 5 AD – the image of the port side shows the fin flash.<sup>140</sup>

**A7-88** was transferred from 2EFTS Archerfield to 2SFTS Wagga in MAR 1942. 5AD formed at Wagga 23 MAR 1942 and when 2SFTS was disbanded in APR 1942, A7-88 was retained at 5AD Wagga as a "hack", repainted from its 2EFTS overall Yellow to *Foliage Green/Earth Brown* camouflage with A1 fuselage roundel, smaller underwing roundels, 24"x24" fin flash. The disruptive *Foliage Green* goes further forward on the upper rear fuselage than per A.D.1169.<sup>141</sup>





## A7-111 – TEMPERATE SEA SCHEME 1942

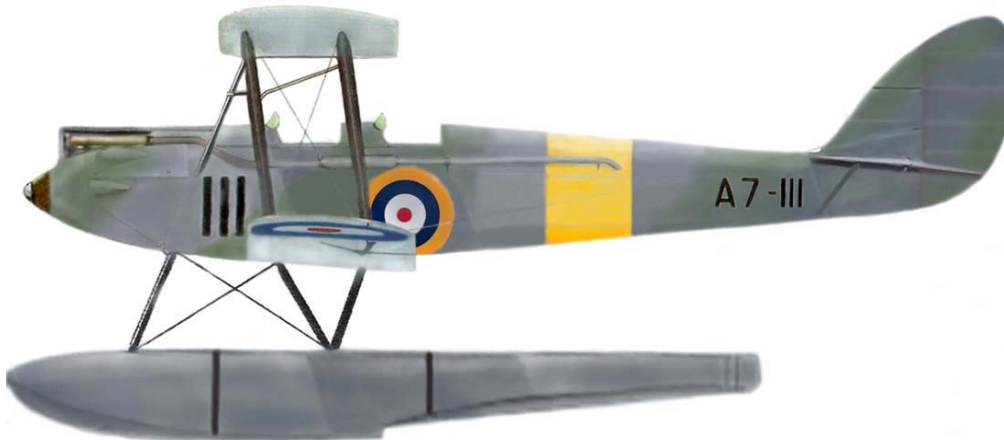
**A7-111** Moth floatplane of 9SQN 'B' FLT, Rathmines, 1942. RAF *Temperate Sea Scheme* comprised MAP colours *Dark Slate Grey* (greenish hue) and *Extra Dark Sea Grey* (EDSG),<sup>142</sup> adopted by the RAAF as *Dark Slate Grey* (K3/189) and *Extra Dark Sea Grey* (K3/187), and in 1941 *Sky Blue* (K3/195) was reiterated for undersurfaces.<sup>143</sup> The *Yellow* trainer band was only 24" wide as the Moth fuselage was too small for the AGI standard 36" band. (For comparison, see the Instructional Moths at Ascot Vale, AWM image 139774, which have 36" bands applied by trainees to the Gipsy Moth fuselage, and Moth Minor mainplane.) *Black* 16" training numbers '111' on nose, fuselage type-A1 roundel 1:3:5:7 with the standard 20" diameter *Blue* roundel, inside the 28" *Yellow* ring; it is without the required fin flash.<sup>144</sup> A7-111 was scrapped APR 1943.



**A7-111 over Lake Macquarie 1942**

[colourised from RAAF image]

**A7-111** served at Archerfield with 2EFTS JUL 1940/MAY 1941, and when floats became available was sent to STF at Rathmines. Fitted with floats at Rathmines and camouflaged in TSS, was taken on strength by 9SQN 'B' FLT in JAN 1942 until DEC 1942.



**A7-111 1941 still in Aluminium before its TSS, at Rathmines in hangar with TSS Seagull A2-5** [colourised from RAAF image]



**Temperate Sea Scheme still in the RAAF into 1944 – 9SQN Walrus HD812 YQ-J in TSS, APR 1944.** The MAY 1944 AGI introduced overall *Foliage Green* for camouflaged aircraft, but would not have been relevant to the Moths were being retired.



## MOTH INSTRUCTIONAL AIRFRAMES

Nineteen D.H.60 aircraft were converted to 'Instructional Moths' from 1936 – when **A7-32** had been assessed as unairworthy at 1AD, and issued to the Recruit Training Section at Laverton as the first Moth instructional airframe – with most converted over 1940-41. These were used initially for technical training at the Engineering School, Ascot Vale Melbourne, and later at Initial Training School (ITS) for the early recruit and groundschool training of aircrew.

Moth I/A No.	Serial	Date	Details
<b>I/A No.1</b>	A7-32	OCT 1936	1936 I/A LAV; <sup>145</sup> <b>1ES</b> I/A.1 18 JUN 1940, scrapped 2 MAY 1944
<b>I/A No.2</b>	A7-75	JUN 1940	exVH-ULT, <b>1ES</b> I/A.2 18 JUN 1940, disposal 1944; Camden Mus
<b>I/A No.3</b>	A7-76	JUN 1940	ex VH-UJX, <b>1ES</b> I/A.3 18 JUN 1940, components JAN 1945
<b>I/A No.4</b>	A7-77	JUN 1940	ex VH-UJH, <b>1ES</b> I/A.4 18 JUN 1940, components JAN 1945
<b>I/A No.5</b>	A7-54	JUN 1940	ex 1FTS, <b>1ES</b> I/A.5 14 JUN 1940, scrapped 20 JUL 1940
<b>I/A No.6</b>	A7-79	JUL 1940	ex VH-UKV 1FTS, I/A.6 JUN 1940 <b>1ES</b> , sold to <b>VH-UKV</b> MAY 1954, displayed ANAM Moorabbin "Diana"
<b>I/A No.7</b>	A7-80	JUL 1940	ex VH-UKJ 1SFTS; I/A.7 JUL 1940 <b>1ES</b> , offered CDC disposal APR 1946, DAP completed FEB 1949 presumed scrapped
<b>I/A No.8</b>	A7-81	JUL 1940	ex VH-UPV "My Little Ship" 1SFTS, <b>1ES</b> I/A.8, components 1945
<b>I/A No.9</b>	A7-119	JUL 1941	ex VH-UQT, 2ITS Lindfield NSW APR 1941, to I/A.9
<b>I/A No.10</b>	A7-117	JUL 1941	ex VH-UJI, 2ITS Lindfield NSW APR 1941, to I/A.10
<b>I/A No.11</b>	A7-115	JUL 1941	ex VH-UIC, 3ITS Sandgate QLD APR 1941, to I/A.11; sold MAY 1947 for £40 with engine; evidently re-registered <b>VH-UIC</b>
<b>I/A No.12</b>	A7-116	JUL 1941	ex VH-UJN, 3ITS Sandgate QLD APR 1941, to I/A.12
<b>I/A No.13</b>	A7-95	JUL 1941	ex VH-UJU, 4ITS Victor Harbor JUN41, I/A.13, SA ATC Renmark
<b>I/A No.14</b>	A7-36	JUL 1941	ex 1EFTS, 4ITS Victor Harbor SA JUN 1941, to I/A.14, SA Sqn ATC APR 1951, scrapped 22 JUN 1951
<b>I/A No.15</b>	A7-108	JUL 1941	ex VH-UJV, 1EFTS I/A.15, components 8 NOV 1944
<b>I/A No.16</b>	A7-106	JUL 1941	ex VH-UHG, dam heavy landing Parafield JUN 1941, 1EFTS I/A.16 JUL 1941, components 8 NOV 1944
<b>I/A No.17</b>	A7-118	SEP 1941	ex VH-UOZ, 2EFTS I/A.17 SEP 1941, components AUG 1945
<b>I/A No.18</b>	A7-63 ?	n.k.	no details known, but could possibly be <b>A7-63</b> that was held at 1AD Laverton from MAR 1942 until MAY 1944
<b>I/A No.19</b>	A7-64	JUL 1943	to ATC Coburg as I/A.19 3 JUL 1943, CDC disposal 14 AUG 1946 to Air League



[adf-serials]

### I/A No.2 – D.H.60G Gipsy Moth A7-75 at Camden Air Museum

Becoming I/A.2 from JUN 1940, after only five months' RAAF service, probably explains why A7-75/*Instructional Moth 2* survives

## DISPOSAL OF MOTHS

### 1930 – Initial Disposals

As mentioned, nine earlier Moths were retired over 1930-32 as the replacement D.H.60Gs were being received, and these were passed to the CAB for Aero Club use. These were D.H.60X Cirrus Moths: **A7-4/VH-UPU**, **A7-9/VH-UAO**, **A7-11/VH-UPY**, **A7-13/VH-UAU**, **A7-14/VH-UAQ**, **A7-16/VH-UQC**, **A7-17/VH-UPK** and **A7-18/VH-UPX**. Also Gipsy Moth **A7-28** was sold after crashing, to become VH-UWB.

### 1938 – Elementary Trainer Replacements

Before the Tiger Moth replaced D.H.60s in the EFTS units over 1940-41 (with 100 being imported from UK for EATS, and importantly 1090 wartime production by DHA Mascot),<sup>146</sup> another domestic source had been pursued, for fear of interrupted UK deliveries. This led to the prewar development of the CAC Wackett Trainer. RAAF squadrons were re-equipping with low-wing monoplanes, and some initial training needed to be carried out on monoplane trainers instead of biplanes, so RAAF Spec 3/38 was issued for a low-wing monoplane embodying all the advantages of the Miles Magister and Avro Cadet for use as a primary trainer. The new trainer was to be powered by the Gipsy Major, have tandem seating covered by a canopy, fully instrumented in each cockpit, a strong point above the fuselage in the event of overturning on the ground, be fully aerobatic, and capable of being flown from either seat. In OCT 1938 at the request of the Air Board, CAC submitted its design and immediately two prototypes were ordered at a cost of £6500 – as the CA-2, the first prototype (A3-1) was fitted with a 130hp Gipsy Major engine and delivered in OCT 1939. The second was delivered in MAR 1940, with both re-engined with 200hp Gipsy Six engines.<sup>147</sup> The 200 production aircraft had the 175hp Warner Scarab, and the Wackett Trainer served in the EFTS units beside the Tiger Moth.

### 1944 – The End for the D.H.60

The RAAF had sold D.H.60Ms **A7-61** (VH-ADO) and **A7-71** (VH-ADP) to the Spencers Gulf Aero Club in MAR 1941. By AUG 1944 with a reorganisation of RAAF flying training and the future requirements of Point Cook, it was determined that as the Moth had been replaced by the Tiger Moth as the elementary trainer, and there was no longer a requirement for the Cadet as an intermediate trainer, these would be retired in SEP 1944, with disposal through Commonwealth Disposals Commission (CDC).<sup>148</sup> The RAAF 'WINGS' magazine of 6 MAR 1945 stated that tenders closed on 20 FEB 1945, with **five** Gipsy Moths included in the first release of 87 surplus RAAF aircraft ("but CDC may consider late applications from members of the RAAF").<sup>149</sup> Selling by tender meant an aircraft was sold to the highest bidder, with no reserve. However one aircraft was withdrawn from the CDC tender process (**A7-30** at 1SFTS) and donated to the RVAC in late 1944 as VH-AFO, so that **four** serviceable Moths were sold at the prices indicated below.<sup>150</sup>

#### STATEMENT OF AIRCRAFT DISPOSED OF THROUGH THE COMMONWEALTH DISPOSALS COMMISSION.

*Con 44A*  
SHEET 1.

SERIAL NUMBER	PURCHASER	PRICE	LOCATION A/C
<u>GIPSY MOTHS:</u>			
<b>A7-93</b>	H. O. Fitzgerald	£210	4 S. P. T. S. GERALDTON
<b>A7-49</b>	J. D. Hodder	£125	6 S. P. T. S. MALLALA
<b>A7-87</b>	S/Ldr. Homewood	£200	Survey Flight, LOWOOD
<b>A7-88</b>	B. Cowan	£100	5 A. D. WAGGA

[NAA records, A705 73/21/1050, RAAF file 8/101/1073(44A) of 21 MAR 1945, p.2]

One of these was LASCO D.H.60G **A7-49** which became VH-AFR. Three had been impressed, and when sold were to revert to their original registrations: **A7-93** to VH-UKY and **A7-88** to VH-UAE; but **A7-87** (ex VH-UKU) was bought by SQNLDR Homewood, and did not receive a CofA – however he bought the remains of **A7-89** which had been converted to components in 1940, and it was rebuilt, registered VH-UFU and flew again in APR 1946 (perhaps with parts from A7-87?). After RVAC had received **A7-30** free of charge as VH-AFO, an unserviceable **A7-44** at 3AD was then issued free to RQAC, and registered in JUN 1945 as VH-AFN. The remains of an eighth, the historic **A7-92** which was in the West at 4SFTS with A7-93, was sold in APR 1945 for £100 and restored to VH-UAO. Two others were safeguarded for the duration as *Instructional Moths* – **A7-79** (I/A 6) sold and again registered VH-UKV in MAY 1954 (now displayed at the Australian National Aviation Museum Moorabbin as "Diana"), and **A7-115** (I/A 11) sold in 1947 to VH-UIC.



## SURVIVORS

While **A7-79** (*Inst Moth 6*) was rebuilt as VH-UKV in 1954 and fully restored for display at Moorabbin 1966-1967, **A7-75** (*Inst Moth 2*) had gone to the NSW Dept of Tech Education in JAN 1946, and the fuselage was rescued by Camden Air Museum in 1964, where it currently resides. Several of the original D.H.60X batch still survive (**A7-9** as D.H.60G VH-UAO, and **A7-13** VH-UAU displayed in Sydney), while **A7-44** survives with a US registration in the Netherlands. As well, **A7-78** is back on the Register as VH-ULP, as is the 'short-term' **A7-112** as VH-UFV.

One of our favourite Moths, VH-UAO is in the West. One of the imported D.H.60X Cirrus batch for the RAAF in 1928 as **A7-9**, to CAB as VH-UAO in AUG 1932; impressed as **A7-92** in JUL 1940, sold back in APR 1945 and still airworthy.



**A7-9 VH-UAO Langley Park Perth in APR 2003**

[Neville Murphy on [airliners.net](#)]

**A7-13 VH-UAU**, one of the early RAAF disposals in 1932, withdrawn from civil use 1951, displayed at Powerhouse Museum (Museum Applied Arts & Sciences), Tas AC colours



[MAAS image]

**A7-44 VH-AFN** (a LASCO build) had been registered with RQAC in JUN 1945, and sold to USA 1968 as N168G, shown residing at Schipol Netherlands in 2004



[Ad Vercrujse/[airliners.net](#)]



[Rob Alexander/[adf-serials](#)]

Registered VH-UKV 1929, impressed as A7-79, donated to Moorabbin Museum 1962, here in 2006 as VH-UKV "Diana"



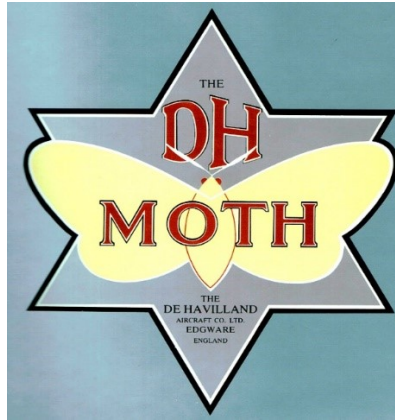
[George Canciani/[adf-serials](#)]

Australia's first Moth VH-UAE (c/n 192) reg NOV 1925, impressed 1940 A7-88, at Melton Vic MAR 2010, airworthy

Several non-RAAF Gipsys are also displayed: **VH-UNI** D.H.60M at Katherine Museum; D.H.60G **VH-ULJ** (ex SA Dept of Education) with the SAAM; and D.H.60M **VH-ULM** which had been displayed Airworld Wangaratta and since restored to airworthiness. Also currently registered is **VH-SSC**, Hermes-engined D.H.60X (ex Finnish MO-98) built for the Finnish AF, imported here in 1976.



## THE D.H.60 MOTH



*The D.H.60 Moth was historically the most successful light aeroplane ever – being so popular that by 1932, more than half of the aircraft on the Australian Civil Register were D.H.60 Moths.<sup>151</sup> In Australia the first Moth was registered as G-AUAE in 1925, and the following year the RAAF began evaluation of the D.H.60 for Service use. By 1928 it was adopted – against the advice of the RAF – as the new RAAF trainer.*

*Public interest in the Moth's many racing successes and long distance flights was aroused to the point where the man-in-the-street called every small aircraft a 'Moth'.<sup>152</sup>*

*When war started in 1939, the first four Elementary Flying Training Schools were formed in Adelaide, Brisbane, Melbourne and Sydney, operating primarily D.H.60 Moths from the commercial flying schools, and in 1940 a further 50 were impressed from civil operators. Subsequently its son – the Gipsy Major-powered D.H.82A Tiger Moth – became the mainstay of Australia's considerable wartime pilot training effort, and the postwar workhorse of the aero clubs and aerial work operators.<sup>153</sup>*

*But the D.H.60 was first. It was the D.H.60 Moth that had taught Australia to fly.*

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# From ABERNATION to ZIMMERMAN

## An Introduction to Code Names, Code Words and Code Letters (and Prowords and Prosings and Callsigns and Phonetic Alphabets and ...)

Garry Shepherdson

Generally speaking a Code Name was a word assigned for the purpose of describing a geographical area or place. Typically, the word should not have a natural association with its new assignment. For example, the code name for Goodenough Island was “Ginger”.<sup>154</sup> A Code Word was a word assigned for the purpose of describing a thing. For example, the code word for the occupation of Woodlark and Kiriwina Islands was “Chronicle”.<sup>155</sup> A Code Letter, just like a code word, was a letter assigned for the purpose of describing a thing. For example, the code letter for a B-25 was “R” (spoken as “Roger”, being the pronunciation of the letter “R” using the phonetic alphabet of the time).<sup>156</sup>

This is a small quantity of code names from a list dated 29<sup>th</sup> September, 1945.<sup>157</sup>

Code Name	Location
Abernation	Alexishafen
Adobe	Brisbane
Alder	Townsville
Apparition	Nadzab
Augusta	Merauke
Bandoleer	Kornasorem (Noemfoor)
Benevolent	Milne Bay
Breakfast	Arafura Sea
Byproduct	Kiriwina Island
Callous	Townsville
Caramel	Port Moresby
Erosion	Exmouth Gulf
Fall River	Milne Bay
Featherweight	Merauke
Flatcatcher	Tarakan
Gunsmith	Torres Strait
Hospitable	Melbourne [ha!]
Interlude	Morotai Island
Lardydardy	Cairns
Leatherback	Woodlark
Marshmellow	Mokmer Aerodrome
Pepper	Kiriwina
Potshot	Exmouth Gulf
Pygmy	Goodenough Island
Salt	Woodlark
Spoilsport	Kamiri Aerodrome
Straightleft	Momote (Los Negros)
Tabletennis	Noemfoor
Zimmerman	Cape Dampier

It wasn't uncommon for a location to have more than one code name. Sometimes they were in force for a limited time, to then be replaced with a different name. And, a reminder, the list as replicated above is just a portion of what the original list contained.

This is a small portion of the code words in a list from 1<sup>st</sup> October, 1945:<sup>158</sup>

Code Word	Operation or Plan
Anchorage	Occupation of the Admiralties – Operation F.
Blacklist	Occupational Forces for Japan.
Cartwheel	Campaign 1, Operations 1, 2, 3, A, B, C.
Chronicle	Occupation of Woodlark and Kiriwina – Operation 1.
Dexterity	Occupation of western New Britain – Operation 3.
Fishnet	Bismarck, Admiralty and New Guinea Operations.
Galvanic	Gilbert Island Operations.
Gulliver	Construction of aerodromes at Buna and on Goodenough.
Hotfoot	Projected carrier strike on Japan.
Iceberg	Operations against Okinawa and surrounding islands.
Landgrabber	Operations Hansa Bay, Madang and Alexishaven – Operation D.
Lilliput	Supplies for Buna – Gona area.
Olympic	Invasion of Japan
Onerous	Operations Kavieng, Rabaul – Operation E.
Postern	Operations Lae to Madan – Operation 2
Providence	Construction of aerodromes at Buna.
Reckless	Operations Hollandia.
Toenails	New Georgia Operation – Operation A.

A code name, code word or code letter shouldn't be confused with a proword or prosign or, indeed, a call sign. Whilst the naming conventions can be the same, their meaning is different. A proword is a word assigned to either describe or initiate a certain activity. To make one up as an example, if you wanted to make a frequency change to a predetermined frequency or channel, the proword "Undies" might be assigned. So, rather than broadcasting, "all right you lot, change to x frequency (or x channel) now" the transmission can be shortened and the meaning veiled by simply transmitting the proword, "Undies". Those who know what it means can accomplish the activity and those that might have heard the transmission but don't know its meaning will not know what is going on. A different and very common type of proword is "over". In various forms of communications, it signifies an invitation for another station to transmit; in effect, it means "I have finished my transmission and am expecting a reply". The prosign for "over" is "K". Another proword, of course, is "out" which means, "I have finished my transmission and I am not expecting any reply"; the prosign for which is "AR". Knowing now that the words "over" and "out" (for example) are prowords with specific meanings and what those meanings actually are, will automatically tell you that "over and out" is meaningless idiocy!

The purpose of these alternative words and letters, whether they be code name, code word, code letter, proword, or prosign, was and still is to identify places or things or activities and to communicate those specific meanings with others in a way that either a) an outsider would not be able to easily understand and/or b) which reduces and simplifies communications. If the operation to breach various dams in the Ruhr Valley in 1943 had been called "Breach Ruhr Valley Dams", it would have not only been a bit of a mouth full, but would have made it very easy to understand that an effort was being made towards that end and what the specific purpose of that effort was. Even if it had been given a name from which the intent could be determined such as, "Flood" or "Cascade", the value in having a code word would have been significantly diminished because the intent or objective could be determined. Much better that the powers that be had chosen "Chastise". No one, other than those with a need to know, would know what meaning the word was being used for.

As an aside, the NATO phonetic alphabet, which most of us probably know or, at least, have heard some of it spoken at some point, is a standardised way of pronouncing letters so they can be easily understood, particularly over radio circuits. To say emm and enn ("m" and "n") might cause those letters to be misunderstood, but to say "Mike" or "November" vastly reduces the likelihood of confusion. But, like all things, the phonetic alphabet has evolved over time. The current pronunciation of letters has been around since (I think) the 1950's, but the pronunciation of certain



letters used to be different – indeed the standardisation of phonetic alphabets was limited not only to (say) nations but sometimes to specific services or users within a nation.

Former COMMSOP's amongst us will remember "Eight-E's Ack-R". "E E E E E E E" was (is) the sign for "erase" and "AR" is the prosign for "out" so, "E E E E E E E AR" in effect means, "disregard this transmission, out". But why "Ack-R"?

### Examples of Phonetic Alphabets

Letter	WW2 (Early) <sup>159</sup>	WW2 (From late 1942) <sup>160</sup>	Modern NATO <sup>161</sup>
A	Ack	Able	Alpha
B	Beer	Baker	Bravo
C	Charlie	Charlie	Charlie
D	Don	Dog	Delta
E	Edward	Easy	Echo
F	Freddie	Fox	Foxtrot
G	George	George	Golf
H	Harry	How	Hotel
I	Ink	Item	India
J	Johnnie	Jig	Juliet
K	King	King	Kilo
L	London	Love	Lima
M	Monkey	Mike	Mike
N	Nuts	Nan	November
O	Orange	Oboe	Oscar
P	Pip	Peter	Papa
Q	Queen	Queen	Quebec
R	Robert	Roger	Romeo
S	Sugar	Sugar	Sierra
T	Toc	Tare	Tango
U	Uncle	Uncle	Uniform
V	Vic	Victor	Victor
W	William	William	Whiskey
X	X-ray	X-ray	X-ray
Y	Yorker	Yoke	Yankee
Z	Zebra	Zebra	Zulu

The (very) early WW2 phonetic alphabet (many letters of which were actually carried over from the Great War) explains the usage of some, otherwise incorrect, phonetics being in general use during, and even after, the Second World War. For example, a Dispatch Rider was commonly called "Don-R" ("DR"), or Anti-Aircraft fire as "Ack-Ack" (A-A) and why, for a period, Search Area N and Search Area P (driven by North Eastern Area) were frequently referred to as "Nuts" and "Pip" rather than "Nan" and "Peter". But, the use of obsolete phonetics continues to this day. Not only the use of "Ack-R" as mentioned above but, "Roger" as a form of acknowledgment or understanding. The prosign "R" used to be used in written communications logs to signify the receipt of a message, which, when spoken was naturally, "Roger". Despite the phonetic pronunciation of "R" being (and has been for decades) "Romeo", the word "Roger" is still used.

Anyway, this jolly side-track down alphabet lane was not only to provide background to the use of "Ack-R", but to lead in to the use of certain types of code letters alluded to early on – such as B-25's having the code letter "R".

The signification of these code letters was to be found in Identification Letters for Aeroplanes. This is a late 1943 list:<sup>162</sup>

### Identification Letters for Aeroplanes

Letter	Phonetic Letter	Aircraft
<b>A</b>	Able	Hudson
<b>B</b>	Baker	Anson
<b>C</b>	Charlie	Wirraway
<b>D</b>	Dog	Seagull/Walrus
<b>E</b>	Easy	Catalina
<b>F</b>	Fox	Mosquito
<b>G</b>	George	Beaufort
<b>H</b>	How	Ventura
<b>I</b>	Item	-
<b>J</b>	Jig	Vought-Sikorsky
<b>K</b>	King	Vengeance
<b>L</b>	Love	B-17
<b>M</b>	Mike	B-24
<b>N</b>	Nan	B-26
<b>O</b>	Oboe	Boomerang
<b>P</b>	Peter	P-40
<b>Q</b>	Queen	-
<b>R</b>	Roger	B-25
<b>S</b>	Sugar	Boston
<b>T</b>	Tare	P-39
<b>U</b>	Uncle	P-38
<b>V</b>	Victor	-
<b>W</b>	William	Beaufighter
<b>X</b>	X-ray	Spitfire
<b>Y</b>	Yoke	Mariner
<b>Z</b>	Zebra	Sunderland



Look – A Zebra! Sunderland III, A26-2. [via Mike Mirkovic, [adf-gallery.com.au](http://adf-gallery.com.au)].

Here is a later list:<sup>163</sup>

Letter	Phonetic Letter	Aircraft
A	Able	Hudson/Ventura
B	Baker	F4U Corsair
C	Charlie	Wirraway
D	Dog	C46 Commando
E	Easy	Catalina
F	Fox	F6F Hellcat
G	George	Beaufort
H	How	P61 Black Widow
I	Item	Mariner
J	Jig	C47
K	King	Vengeance
L	Love	B17
M	Mike	B24
N	Nan	B26
O	Oboe	Boomerang
P	Peter	P40
Q	Queen	A24 Dauntless
R	Roger	B25
S	Sugar	A20 Boston
T	Tare	C54 Skymaster
U	Uncle	P38 / F5 Lightning
V	Victor	P47 Thunderbolt
W	William	Beaufighter
X	X-ray	Spitfire
Y	Yoke	L4 / L5 Cub
Z	Zebra	P51 / F6 Mustang

May I direct you to, “How to Read RAAF Historical Records, Coloured Signal Forms” [ADF-Serials Telegraph Vol 10, Iss 4] for examples of the practical application of some of these identification letters.

I shouldn’t overlook the fact that operations sometimes received a letter designation instead of a name or word. In the South West Pacific (SWPA) there were, as examples, operations lettered: B1, I1, K1, L3, M1, M3, M6 and M7, amongst others. Perhaps the best known were the “O” series of operations relating to activities directed against various locations around Borneo and Brunei. These are better remembered by their phonetic name, “Oboe”.

Operational Signals, or Opsigs, have been around for a long time. Civilian “Q” codes have been around for more than a century and, along with military “Z” codes, are still in current use. During the Second World War, there was also a series of “X” codes (I’ve seen documents that refer to them but, have never seen any) and also “R” codes (which I’ve never seen referred to but, have seen a large list of).<sup>164</sup> These trigrams were developed initially for the concise and efficient transmission of more complicated phrases or concepts by morse code, which, of course was also the purpose of prosigns. Anyone involved in aviation will have heard of “QNH” for example (barometric value to be set on an altimeters subscale which setting would, if on the ground, give the current aerodrome elevation). The use of prosigns with opsigs is common. For example, “INT QRE” means “what is your ETA?” (INT is short for “interrogative” which therefore means either a question or question mark). The COMM-CEN that I worked at was 24 hours, but only during the week. We used to close late on Friday evening and reopen on Monday morning. To close down, we’d send, “INT ZKJ ZID x IMI x”, which meant, “May I close down? Last number received was x I say again, x.” The response (hopefully) was “ZWG ZKJ1”, which meant, “Numbers correct, you may close down.” Naturally, I don’t need to tell you that “Q” and “Z” codes are to be found in ACP131 because, well, everyone knows that.



This next table gives a variety of voice call signs and commercial call signs. The voice call signs are either of the “code word” type wherein the word used to signify an entity has no relationship with that entity, for example, “Setter” being “Momote Tower”; and of the “self evident” type whereby the call signs clearly identifies the entity, for example the HF D/F (Huff-Duff) R/T call sign for Momote being “Momote”. All the information in this table comes from the one source, unless otherwise referenced:<sup>165</sup>

Location	Airfield	Tower R/T	Homer	HF D/F R/T	HF D/F W/T	VHF D/F
Admiralties	Momote	Setter	XZ	Momote	VNQS	Telling Homer
	Mokerang	Fanfare				
	Pityilu	Pityilu				
	Ponam	Ponam				
	Seaplane Base	Merit Badge				
Aitape	Tadji	Wheezy	AT			Welcome Crystal <sup>166</sup>
Biak	Mokmer	Lordship	PT		WZPT	Linger Crystal <sup>167</sup>
	Owi	Bayleaf				
	Sorido	Toughy				
Darwin	Darwin	Darwin	DN	Darwin	VNDL	
Dobodura	Horanda	Rocket	XG			
Emirau	North	North Field	WB			
	South	South Field				
Fenton	Fenton	Fenton	TN			
	Long	Long				
Finschafen		Harvest	XT			
Green Is.	Bomber	Ocean	TQ		WUQP	
Guam	Orote	Falcon	KG		NPN5	
	Angana	Dove				
	Depot	Carnation				
		Ranger				
Hollandia	Hollandia	Tumbler	XW		WXXW	
	Sentani	Bolster				
Lae		Ripple	XQ			
Lingayen	Goatee	Goatee	KY			Ashlun Crystal
	Honey	Honey				
Leyte	Tanisan	Velvet	KR	Poker	WXKR	Austere Crystal
	Bayug	Dixie				
	Tacloban	Cheeky				
	Dulag	Clipper				
Manilla	Quozon	Weaver				
Madang		Madang	MG			
Mapia Is.			KU			
Merauke		Merauke	MR	Merauke	VNQM	
Milne Bay	Gurney	Gurney	XF		VNQB	Olfast Homer
Mindoro	Hill	Freeboot	KX			August Crystal
	San Jose	Hammer			WXXX	
	Camin	Vista				
Moresby	Jackson	Rooster	KD	Moresby	VNPY	Orange Homer Madam Crystal <sup>168</sup>

Location	Airfield	Tower R/T	Homer	HF D/F R/T	HF D/F W/T	VHF D/F
Morotai	Wama	Applaud	PS	Yardstick	VNPG	Gypsy Crystal
	Pitoe	Bloomer				
Munda		Munda	EH		WYVR	
Nadzab	No. 1	Scorcher	XP			
	No. 2	Sandwich <sup>169</sup>				
	No. 3	Topline				
	No. 4	Esquire <sup>170</sup>				
Noemfoor	Kornasoren	Spotter		Stepchild	VNNH	
	Kamiri	Drawbridge				Atabrine Crystal <sup>171</sup>
Palau	Anguar Is.	Eifel	LK			
	Peleliu Is.	Jungle				
Samar Is.	Guinuan	Zambo	QE			
San Marcelino		Eyelid	QE			
Saipan	East	Violet	MM			
	Isley	Bluegrass				
	Koblör	Gardenia				
Sansapor	Mar	Dextro	PR			Jackpot Crystal
	Amsterdam Is.	Blockade				
Tadji		Wheezy <sup>172</sup>				Welcome Crystal <sup>173</sup>
Torokina	Piva North	Piva North	CD		WYVE	
Tinian	West	Palm				
	North	Lotus				
Treasury		Sterling	HH			
Wakde		Camel	PQ		(WZPQ)	
Ulithi Is.		Alpha	BZ			

Although they're not relevant for this article, I covered commercial call signs in 2016 (Volume 6 Issue 6). But, since some appear in the above table, here is an extract so as to refresh your memory:

International call signs were (and still are) allocated in blocks and assigned to different countries by what is now known as the International Telecommunications Union (ITU).<sup>174</sup>

[...]

This call sign system was originally specified in Article 14 of the General Regulations annexed to the International Radiotelegraph Convention in Washington, 1927. Within Section 1 of Article 14 appeared the "Table of Distribution of Call Signs" which comprised a list of all countries and the call sign blocks allocated to them. The allocations made to the then Commonwealth of Australia was VHA – VMZ.<sup>175</sup> This meant that the entire VH, VI, VJ, VK, VL and VM blocks (that is VHA to VHZ, VIA to VIZ, etc.) were available for use by Australia from that time.

Section 2 of Article 14 of the General Regulations described the form that call signs for certain purposes were to take.

- (a) three letters in the case of fixed and land stations;
- (b) four letters in the case of ship stations;
- (c) five letters in the case of aircraft stations[.]<sup>176</sup>

So, the allocation of the entire blocks in the VH to VM series meant that any combination of three, four or five-letter call signs could be used within those blocks.

Further expansion to Australia's block allocations were made at the 1938 convention in Cairo. Australia's block allocations were expanded to read "... Commonwealth of Australia ... VHA – VNZ ..." and "... VZA – VZZ ..." <sup>177</sup>

As a matter of interest, at the Atlantic City conference of 1947, a further block (AXA – AXZ) was allocated to Australia. <sup>178</sup> These allocations from 1927, 1938 and 1947 (AXA – AXZ, VHA – VNZ and VZA – VZZ) are still in force in 2016.

During the Second World War, it was common practice in Australia to allot 4-character ship station type call signs to fixed land stations. Ship stations still received 4-character call signs as well.

So, there you have it. A very brief run down on what a code name ~~are~~ is ...

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# THE TWO A72-38s – AN UPDATE

David Vincent

In these pages three years ago, Gordon Birkett explained how it was that the RAAF received two Liberators with the same serial number and what happened to them.

This update looks at what is known about the service of A72-38A, perhaps the only RAAF wartime aircraft to be operated under two different serial numbers and one of the first to be modified for ‘special duties’ operations, whilst in No. 24 Squadron’s hands July-August 1944.

June 1944 - No. 3 Aircraft Depot at Amberley, Queensland, began allotting the first of 12 new Liberators to No. 24 Squadron RAAF, then in the process of re-forming, based at Manbulloo, Northern Territory.

6 July 1944 – A72-38A was delivered Amberley-Manbulloo by Flt Lt John Napier.<sup>179</sup>

14 July 1944 – Flt Lt Dick Overheu DFC flew A72-38A Manbulloo-Fenton-Manbulloo to collect the Eriksen and McCombe crews on their posting from 380<sup>th</sup> BG USAAF to No. 24 Squadron RAAF.<sup>180</sup>

27 July 1944 – listed in No. 24 Squadron ORB as a would-be participant in the squadron’s first Liberator operation that was to take place on this date. This was to be a joint mission with the 380<sup>th</sup> Bomb Group USAAF but did not take place because the Americans somewhat oddly declared all of the essentially new RAAF “Libs” unserviceable due to “mechanical defects”.<sup>181</sup>

29 July 1944 – No. 4 RSU ORB states, with obvious pride, that on this date:

Pell Strip had the appearance of being a large airport, besides the various types of aircraft dotted about the inserts, three B24s (Liberators) led by F/Lt Overhue [sic; Overheu] DFC arrived for certain modifications to be carried out by this Unit.<sup>182</sup>

The August 1944 CO’s Report (then Sqn Ldr Bill Symons) provides further details of the work carried out at Pell:

These fine aircraft arrived for a modification to be fitted to take part in a secret operation and it is to the credit of the personnel concerned that the job was completed a day and a half before the target date. No. 5993 Sgt Sedgley E. E. (who played a large part in the original design of the modification) with his team of willing workers, never let up until the job was completed. Credit is also extended to those crew members of 24 Squadron, who co-operated so well with personnel of No. 4 RSU.<sup>183</sup>

The “Libs” are identified in 4 RSU’s records as A72-38A, A72-39 and A72-43.<sup>184</sup>

It seems that the crews that delivered the “Libs” to Pell (according to Lin McDonald’s log book) may have stayed the night there and returned to Manbulloo the following day after being collected from Batchelor next morning by Flt Lt Napier in A72-42.

2 August 1944 – with the work by No. 4 RSU – a slide fitted to each aircraft where the ball turret had been – completed, the three “Lib” crews were flown back to Pell in A72-37 by Flt Lt T. S. “Erik” Eriksen and the three modified aircraft flown to RAAF Darwin.

4 August 1944 – two test flights carried out from Darwin by Overheu in A72-38A dropping parachute supplies (reference log book of Lin McDonald, Dick Overheu’s flight engineer, which is also the source of information on all subsequent flights unless otherwise stated).

6 August 1944 – two more test flights from Darwin by Overheu in A72-38A, this time dropping “paratroops”.

9 August 1944 – operational travel flight by Overheu in A72-38A Darwin–Hollandia (6 hrs 45 mins).

10 August 1944 – travel flight by Overheu Hollandia–Wakde–Hollandia.

12 August 1944 – insertion of an intelligence gathering team of Indonesians ('Radish' party) into the Vogelkop Peninsula by Overheu (6 hrs 55 mins). The other two Libs, A72-39 and A72-43, also flew to Hollandia on 9 August, according to the squadron Operations Record Book "to carry out a special mission on 12<sup>th</sup> and 13<sup>th</sup> August 1944, as detailed in RAAF Command Operation Instruction 87/1944. The mission was successfully completed." [Flt Lt C. E. R. "Boz" Parsons flew the 13<sup>th</sup> August 1944 mission in A72-39 carrying 'Perch' party; A72-43 was, presumably, a back-up aircraft].

13 August 1944 – Overheu in A72-38A flew Hollandia–Wakde–Hollandia; the stopover, Lin McDonald told me, was to collect "much needed spare parts from scrapped USAF aircraft" at Wakde.

15 August 1944 – A72-38A returned to Manbulloo, stopping first at Darwin.

17 August 1944 – test flight local area.

18 August 1944 – travel flight Manbulloo–Darwin and operational travel flight Darwin-Hollandia (6 hrs 5 mins).

23 August 1944 – Hollandia-Darwin carrying out a reconnaissance of the Babo area, Dutch New Guinea, en route (flying time 9 hrs) [of this operation the squadron Operations Record Book states "Three Liberators from this Squadron [again the three were A72-38A, A72-39 and A72-43] took off from Darwin for Hollandia on 17<sup>th</sup> (Lin McDonald's log book definitely records 18<sup>th</sup>) August 1944, to carry out a special mission on 22<sup>nd</sup> August, as detailed in RAAF Command Operation Instruction 100/1944. The mission was completed successfully."].

25 August 1944 – last known operation involving A72-38A, a reconnaissance flight over Timor, the squadron Operations Record Book adding that it was "as defined by SRD [Services Reconnaissance Department] representative".

26 August 1944 – training flight dropping "paratroops" in the local area (Darwin?).

27 August 1944 – travel flight Darwin–Manbulloo, bombing practice also being mentioned in Lin McDonald's log book.



**Two of the three No. 24 Squadron "Libs" A72-38A, A72-39 and A72-43 at Pell, Northern Territory, late-July 1944.** *[Photo originally from the collection of former No. 4 RSU CO Bill Symons but reproduced here from Walter Venn's Restore to Service (Loftus, 1999)].*

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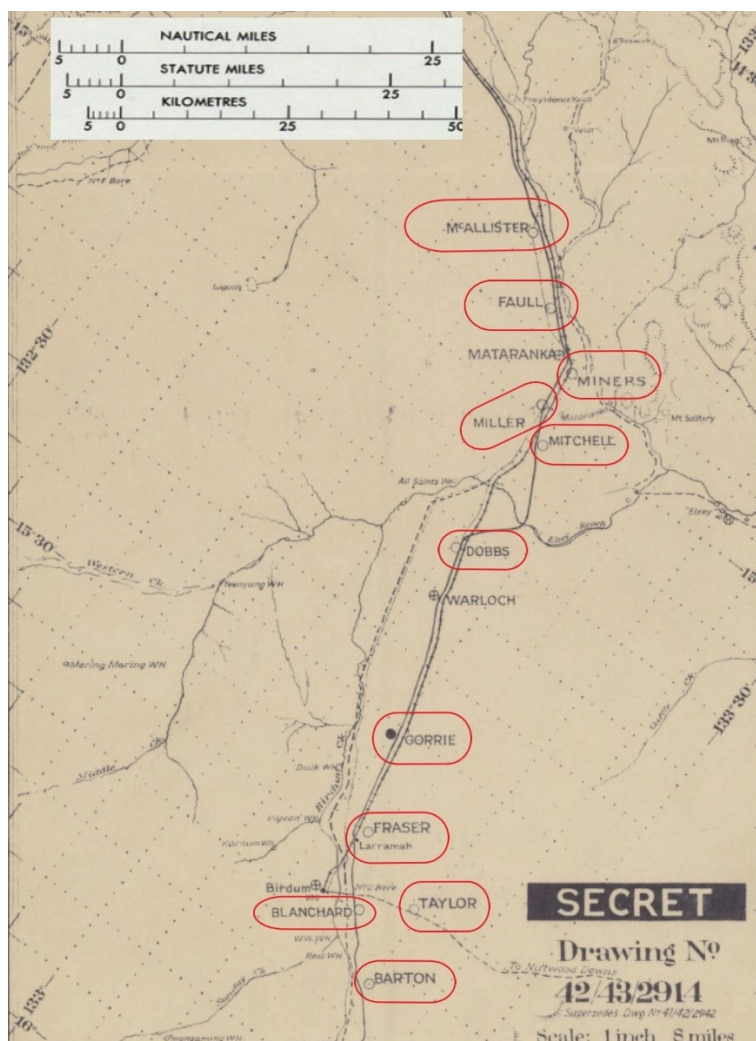


# Former RAAF Aerodromes along or near the Stuart Highway

## Part 5, Mataranka / Larrimah Region

Garry Shepherdson

Of all of the airfields listed in this instalment, only one was completed and put into use.



Portion of Drawing No. 42/43/2914, here showing the airfields covered by this instalment. [NLA obj-233091255].

District	Name	Location	Position
Mataranka	McAllister [sic]	10 ½ miles N Mataranka	14°50'S 132°55'E
	Faull (AKA Dale)	4 miles NW Mataranka	14°53'S 133°00'E
	Miners (Knox)	1 mile S Mataranka	14°56'S 133°04'E
	Miller	4 miles S Mataranka	14°59'S 133°04'E
	Mitchell	8 miles S Mataranka	15°02'S 133°05'E
	Dobbs (Towers)	18 miles S Mataranka	15°12'S 133°06'E
Larrimah	Gorrie (319-Mile)	7 ½ miles N Larrimah	15°28'S 133°10'E
	Fraser (Vaughan / 321-Mile)	5 miles N Larrimah	15°33'S 133°13'E
	Taylor	4 ½ miles E Birdum	15°36'S 133°20'E
	Blanchard	3 ½ miles S Birdum	15°38'S 133°16'E
	Barton (339-Mile)	9 ½ miles S Birdum	15°42'S 133°20'E

MACALISTER  
14°50'S 132°55'E

Named after Flight Lieutenant Jack Lyle Macalister [often incorrectly spelt, “McAllister”], Number 2 Squadron, RAAF, missing – failed to return from an operation to Koepang, 23<sup>rd</sup> April, 1942 [sic].<sup>185</sup> Jack Macalister and his crew were flying a 13SQN Hudson, A16-109, on a Reconnaissance of the Koepang area on 23<sup>rd</sup> March, 1942. After departing from Drysdale River Mission, the aircraft wasn't seen or heard from again.<sup>186</sup>

According to a witness statement, Macalister's aircraft crashed near the village of Oepoela after he was able to bail out. The other three members of the crew were all killed. Macalister was taken prisoner by the Japanese and was eventually sent to Changi. He was repatriated in September, 1945.<sup>187</sup>

On the 25<sup>th</sup> of June, 1946, the award of the Distinguished Flying Cross (DFC) to Jack Macalister was Gazetted and that was followed, in 1947, by the award of the OBE.<sup>188</sup>

For his DFC:<sup>189</sup>

Flying Officer (temporary Flight Lieutenant) MacAlister, No. 390, on 23<sup>rd</sup> March 1942, carried out a photographic reconnaissance of Koepang aerodrome in a Hudson Aircraft. There was no cloud cover and enemy fighters were known to be based close to the target. Flight Lieutenant MacAlister carried out a bombing run, through anti-aircraft opposition, wrecking a flying boat and damaging another. He continued on course, taking photographs and making visual observations, while 15 Japanese aircraft were seen taking off to intercept him.

He took evasive action by flying low but was unsuccessful and was engaged by the enemy fighters at a low altitude. The gun turret out of action and repeatedly hit, the Hudson caught fire. He gave the order to abandon the aircraft, which was carried out by the wireless operator and second pilot, the gunner apparently killed in the turret. At this period a Japanese fighter was close in and Flight Lieutenant MacAlister engaged and shot it down, then abandoned his burning aircraft.

After escaping machine gun fire directed at him from the Japanese fighters Flight Lieutenant MacAlister was captured by the Japanese due to his betrayal by treacherous natives.

The conspicuous bravery and devotion to duty displayed by Flight Lieutenant MacAlister in this series of gallant actions, is an inspiration to all.

The citation for his OBE read:<sup>190</sup>

After an abortive but nearly successful attempt to capture an enemy aircraft in Timor whilst a prisoner of war, Flight Lieutenant MacALISTER was associated with Major Wyett of the A.I.F. in a similar plan which resulted in his being placed in the hands of the Japanese Military Police by whom he was subjected to the most rigorous torture.

This officer was afterwards kept for nine months in solitary confinement under the most degrading conditions, finally being removed to hospital more dead than alive.

During the period from 4<sup>th</sup> January, 1943, to 6<sup>th</sup> July, 1943, Flight Lieutenant MacALISTER had maintained a firm refusal to give any information to the Japanese, while his exemplary behaviour and spirit during the period of his rigorous imprisonment were an example to all. No praise can be too high for his fortitude and courage.



**The area of the proposed site, as it appears now.** [Google Earth Image at 27MAY20].

A proposed aerodrome, not proceeded with.<sup>191</sup> Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



FAULL  
[Dale]  
14°53'S 133°00'E

Named after Pilot Officer Stanely Winter Faull, Observer, Number 2 Squadron, RAAF, missing – failed to return from operations, 21<sup>st</sup> August, 1942.<sup>192</sup> He was a member of Flying Officer Wadey's crew, flying in Hudson, A16-209.<sup>193</sup> In order to provide relief to a platoon from Sparrow Force who were in contact with Japanese forces near Moabisse, six Hudson's were tasked to strike Moabisse village and then perform an armed reconnaissance of the area.<sup>194</sup> During the course of the mission, A16-209 was attacked by and hit by gunfire from a Japanese fighter aircraft, causing the Hudson to erupt into flames. Only Flying Officer Wadey was able to bail out before the aircraft crashed.<sup>195</sup>

F/O Wadey, captain of our aircraft which was shot down by Zeros during an attack by six of our Hudsons on Moabesse [sic] on August 21<sup>st</sup>, and baled out, returned to Darwin by boat, was picked up there ... and flown down to our camp at Batchelor. He was in very high spirits but very weak from dysentry [sic] and the extensive burns sustained when auxiliary tank of his aircraft exploded. After landing on Timor by parachute he hid for some hours, was eventually found by natives and carried 150 miles in a chair to our A.I.F. Sparrow force.<sup>196</sup>

See also, Gould (Wadey's Wireless Operator Air Gunner in A16-209 on this mission).



**The area of the proposed site, as it appears now.** [Google Earth Image at 27MAY20].

A proposed aerodrome. No other details known.<sup>197</sup> Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



MINERS  
[Knox]  
14°56'S 133°04'E

Named after Pilot Officer L. Miners, Wireless Operator Air Gunner of Number 2 Squadron, RAAF, missing – failed to return from air operations, 30<sup>th</sup> July, 1942.<sup>198</sup> Lloyd Miners was a member of Pilot Officer Robert Carl Muecke's crew, who, whilst conducting a Diverging Search to seaward for surface vessels and aircraft carriers in Hudson A16-234, with two other Hudson's, failed to return having not been seen or heard from after departure.<sup>199</sup>

On August 9<sup>th</sup>, 1942, a Spanish language broadcast on Tokyo radio claimed that a Hudson aircraft had collided with a Japanese float plane in the vicinity of the Kai Islands and that the Hudson had lost a wing and crashed into the sea. With no word nor mention of any of the crew of four, it was considered that the report may have had some substance as the planned search area of Miners Hudson would have had the aircraft close to approximately 90 nautical miles to the south west of the Kai Islands and eventually, on November, 19<sup>th</sup>, 1946, the crew were officially presumed to have lost their lives on July 30<sup>th</sup>, 1942.<sup>200</sup>



**The area of the proposed site, as it appears now. It is doubtful that the runway in this image owes anything to the wartime proposal. [Google Earth Image at 27MAY20].**

A proposed aerodrome. No other details known.<sup>201</sup> Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



MILLER  
14°59'S 133°04'E

Named after Second Lieutenant Edward McC. Miller, pilot 8<sup>th</sup> Pursuit Squadron, 49<sup>th</sup> Pursuit Group, killed in aircraft accident near Darwin, 5<sup>th</sup> June, 1942.<sup>202</sup>



**The area of the proposed site, as it appears now.** [Google Earth Image at 27MAY20].

A proposed aerodrome. No other details known.<sup>203</sup> Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



MITCHELL  
15°02'S 133°05'E

Named after Flying Officer G. C. Mitchell, Area Combined Headquarters, North Western Area, killed at Koepang on an operational flight, 14<sup>th</sup> February, 1942.<sup>204</sup>

Mitchell was the captain of A16-61 which had departed Koepang for a Parallel Track Search to Darwin. Shortly after take-off an engine failed and, in attempting to return to Koepang, the aircraft flew into a heavy rain storm and then, in conditions of very poor visibility, struck rising terrain. All on board lost their lives.<sup>205</sup>



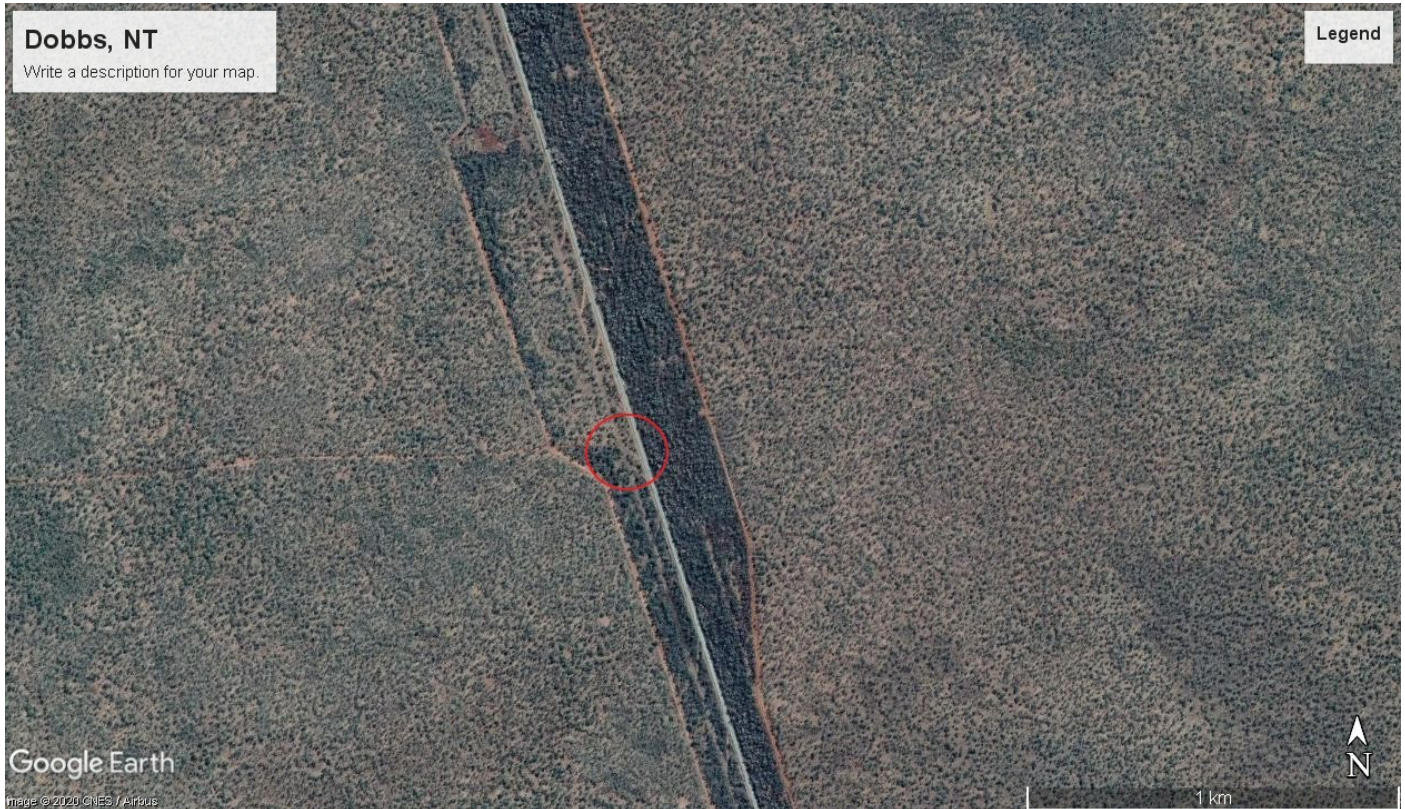
**The general area of the proposed site. The intersection at the top of the image, circled in red, is at 15°01'50"S 133°05'08"E. [Google Earth Image at 23SEP20].**

A proposed aerodrome. No other details known.<sup>206</sup> Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



DOBBS  
15°12'S 133°06'E

A proposed airfield<sup>207</sup> named after Sergeant Stanley Gilbert Dobbs, Wireless Operator Air Gunner, Number 2 Squadron, RAAF, missing – failed to return from operations, 15<sup>th</sup> September, 1942.<sup>208</sup> He and his crew were lost in Hudson A16-172 during a diving attack on a ship at Saumlaka (08°00'S 131°18'E) and were believed to have been hit by anti-aircraft fire from shore. The aircraft crashed into the sea in flames.<sup>209</sup>



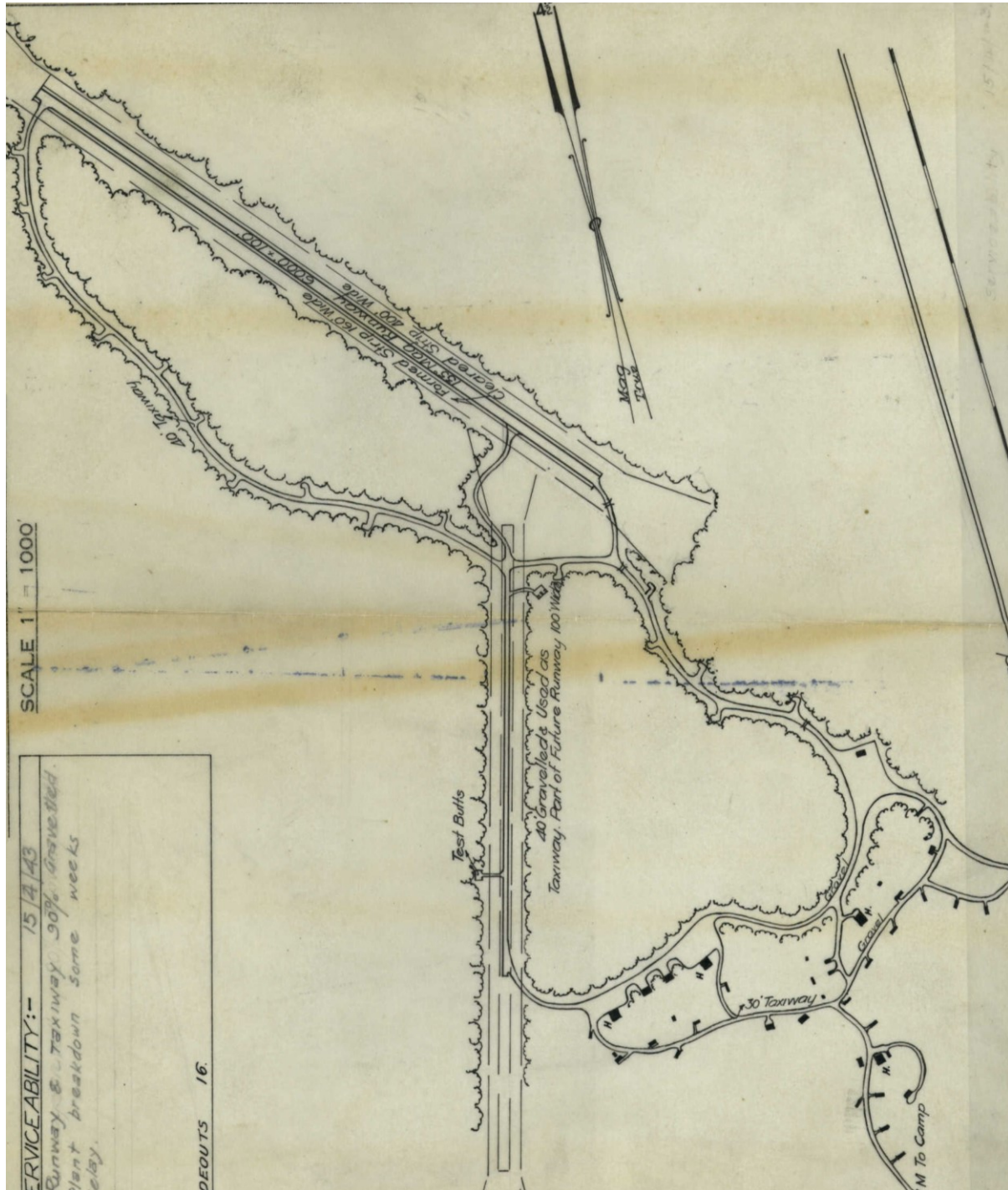
Another largely featureless image. The red circle marks the position 15°12'S 133°06'08"E. According to the strip map, a portion of which was reproduced at the start of this article, Dobbs was supposed to have been sited on the western – that is, left-hand side – of the Stuart Highway. [Google Earth Image at 23SEP20].

Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



GORRIE  
[319-Mile]  
15°28'S 133°10'E

Named after Flying Officer P. Gorrie, Number 2 Squadron, RAAF, killed in action near Manado, 12<sup>th</sup> January, 1942.<sup>210</sup> Gorrie, Barton, Hodge and Sattler and their crews all failed to return from this operation whilst flying A16-12, A16-67, A16-46 and A16-7 respectively.<sup>211</sup>



RAAF Landing Ground Gorrie, Drawing No. 42/43/1426B. [NAA: A9716, 528].

Gorrie was constructed by the Allied Works Council as an Operational Base suitable for Heavy Bombers in all weather conditions. Based on a field inspection dated January 26<sup>th</sup>, 1944, it consisted of a single 6,300 feet long sealed gravel runway bearing 125°M which had the potential to be extended another 2,000 feet to the south east. The taxiway system consisted of five miles of taxiway with a mile or so of it running down the centre of what was otherwise a 7,200









**The runway and dispersal taxiways.** Interestingly, the nominated latitude and longitude for this airfield is a position quite some distance off beyond the top left of this image. [Google Earth Image at 23SEP20].



**The emergency strip and hangar area.** [Google Earth Image at 23SEP20].

Unfortunately, and like many other former World War Two airfields in the region, Gorrie now seems to have been closed off to public access.



FRASER  
[VAUGHN/321-Mile]  
15°33'S 133°13'E

Named after Squadron Leader Simon John Fraser, Number 2 Squadron, RAAF, killed in a motor vehicle accident on 10<sup>th</sup> October, 1942.<sup>214</sup>

A proposed aerodrome. No other details known.<sup>215</sup>



It isn't known if this station airstrip owes anything to the old wartime proposal. The circled threshold is at 15°33'09"S 133°13'05"E. [Google Earth Image at 23SEP20].

Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



TAYLOR  
15°36'S 133°20'E

Named after Pilot Officer P. G. Taylor, Number 13 Squadron, RAAF, missing – failed to return from a dawn attack on aircraft at Penfoei airfield, 14<sup>th</sup> April, 1942.<sup>216</sup> Taylor and his crew were flying Hudson A16-137<sup>217</sup> and it was thought, although the reasoning wasn't recorded, that the aircraft had ditched in the Timor Sea after the attack which, according to the two other participating crews, was characterised by very intense Anti-Aircraft fire from all around the airfield.<sup>218</sup>

A proposed aerodrome for Heavy Bombers, it was to have had three runways: two of 5,000 feet length (bearing 0°M and bearing 045°M) and one of 7,000 feet (bearing 135°M).<sup>219</sup>

Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.



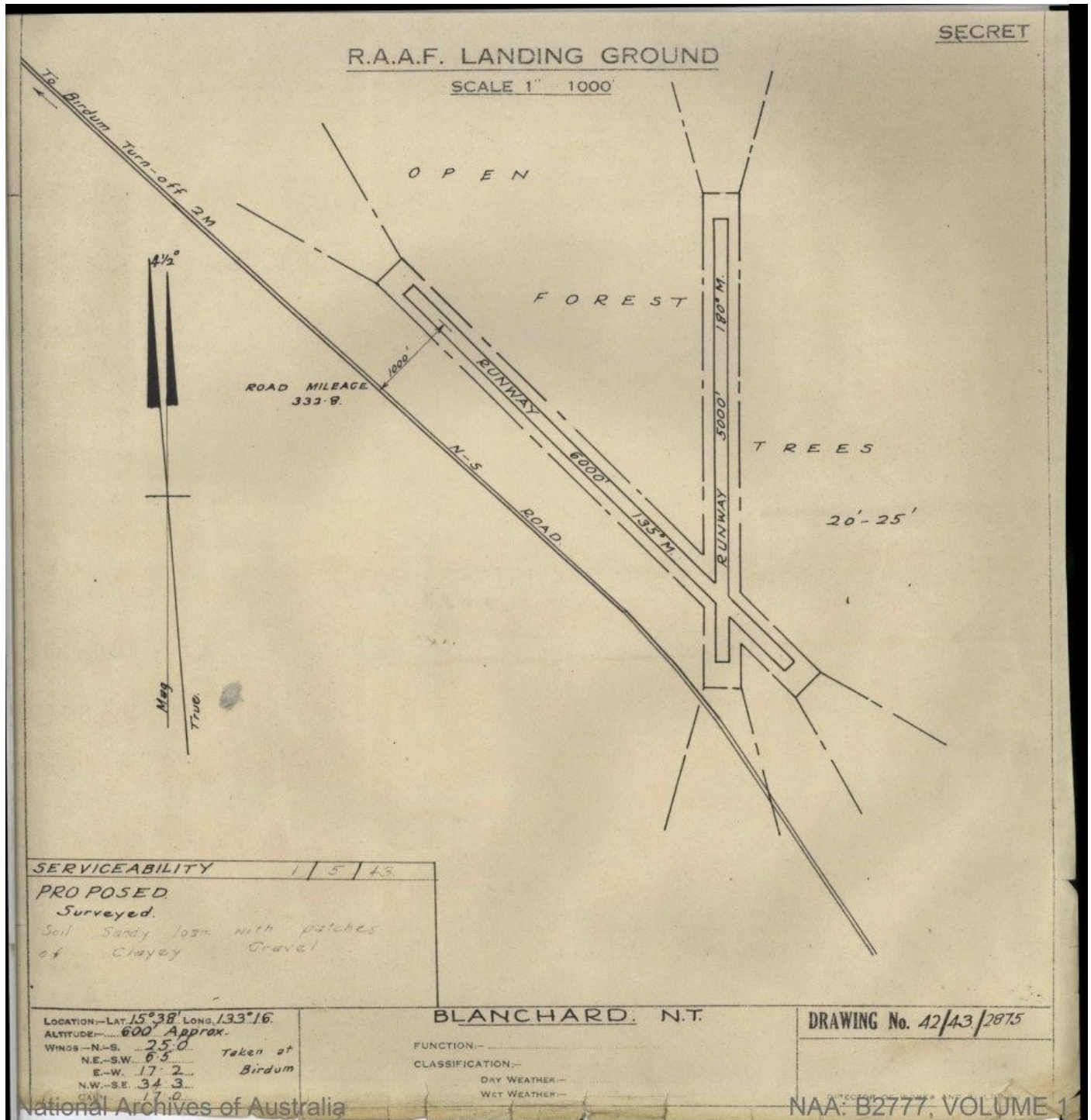
Aside from the track meandering across the image, there is nothing of interest to point out. The red circle encapsulates the position 15°36'22"S 133°20'18"E which is pretty close to the nominated aerodrome reference point for the proposed airfield of Taylor. [Google Earth Image at 23SEP20].



BLANCHARD  
15°38'S 133°16'E

Blanchard was a proposed Heavy Bomber base with an elevation of 600 feet with two runways, one bearing 180°M of 5,000 feet length and one bearing 135°M of 6,000 feet.<sup>220</sup>

Named after Flying Officer Roger Joseph Blanchard, Number 13 Squadron, RAAF, missing – failed to return from a reconnaissance over Koepang, 23<sup>rd</sup> April, 1942,<sup>221</sup> whilst flying Hudson A16-182.<sup>222</sup> Blanchard and his crew had been tasked to perform a late afternoon reconnaissance of the Koepang, Penfoei and Mina River areas with an ETA back at Darwin of 10 pm local time.<sup>223</sup> By 4 am the next morning, they were officially reported as having failed to return.<sup>224</sup>



Basic runway alignment for the proposed Blanchard aerodrome. The design and layout of the dispersal taxiways and aircraft hideouts hasn't been located. [NAA: B2777, VOLUME 1].





The bend, circled in red, is located at 15°39'48"S 133°17'24"E and is about 2 nautical miles away from the nominated latitude and longitude. It does however match up with the bend on the old Stuart Highway drawn on the location diagram, reproduced above. [Google Earth Image at 23SEP20].



BARTON  
[339-Mile]  
15°42'S 133°20'E

Barton, also known as, "339-Mile" was a proposed airfield to be located 9 ½ miles south of Birdum at 15°42'S 133°20'E.<sup>225</sup>

It was named after Flight Lieutenant Arthur Robert Barton, Number 13 Squadron, RAAF, missing believed killed in action against Manado, 12<sup>th</sup> January, 1942,<sup>226</sup> who, along with his crew, was flying Hudson A16-67. Gorrie, Hodge and Sattler and their crews also failed to return from this operation whilst flying A16-12, A16-46 and A16-7 respectively.<sup>227</sup>



The dirt road intersection, circled in red, is located at 15°42'15"S 133°19'20"E; perhaps suggesting that the airfield would have been sited immediately to the north of the dirt road which extends across the image to the right. [Google Earth Image at 23SEP20].

Unfortunately, if an aerodrome layout diagram had been prepared, a copy hasn't yet been located.

## Bibliography

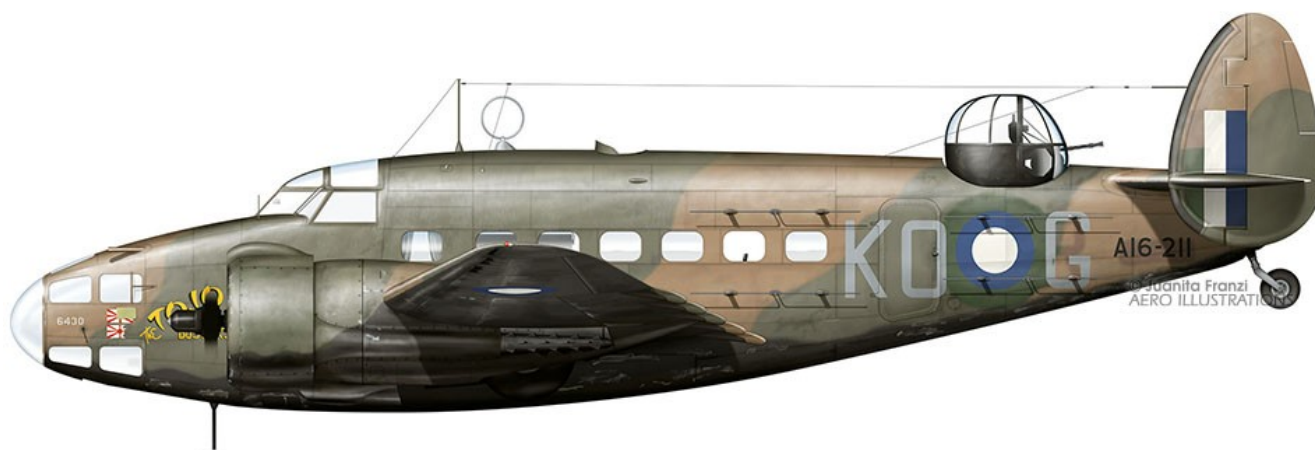
- Casualty Repatriation File, Dobbs Gilbert Stanley, 414292. NAA: A705, 163/103/245.
- Casualty Repatriation File, Macalister Jack Lyle, 390, A16-109. NAA: A705, 166/26/658.
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# Notes Regarding No.2 and No.13 Squadron Hudson's

Garry Shepherdson

To follow on from the 13SQN Hudson instalment in the previous issue. The assignment of individual identification letters to 2SQN Hudson's between November, 1942 and April, 1944, in order of allocation, looked like this:

Letter	Pre AFCO A3/43 Allocations		Post AFCO A3/43 Allocations		
	Nov-Dec 1942	Jan-Apr 1943	Apr 43 KO-	May-Dec 43 KO-	1944 KO-
A	197	197	197 / 241	244	-
B	161	161	161	178	-
C	-	169 / 186	186	-	-
D	160	160	160	181 / 203	203
E	-	233	233	244	-
F	241	195	195	199	199
G	-	238	156	211/244/226	226
H	178	178	178	213 / 215	215
I	-	235	-	-	-
J	242	242	202	186 / 154	154
K	-	199	-	240	-
L	181	181	217	177	-
M	183	183	183	219	219
N	-	247 / 204	204	233	-
O	217	217	227	195	-
P	207	207	-	227	-
Q	210	240	-	156	-
R	232	241	211	171 / 189	-
S	-	213	213	204	-
T	221	221	171	207	207
U	237	237	192	192	-
V	-	236	236	230	230
W	-	219	219	235	-
X	-	-	230	160	160
Y	-	-	-	236	-
Z	-	177	177	185	-



A16-211/KO-G, "The TOJO BUSTER'S". After service with 6SQN, A16-211 joined 2SQN on April 3<sup>rd</sup>, 1943, and was coded "KO-R". It was re-coded "KO-G" during the first few days of May and then suffered a landing accident at Millingimbi on May 7<sup>th</sup>, 1943. [Juanita Franzi, Aero Illustrations, LHUD3101].

Here is a tabular analysis of the accuracy of the identification letter to serial number associations for each of 2SQN's and 13SQN's Hudson's in NWA for which an identification has been made during my research.

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 (%)
A16-118	-	0	0	0	0	1	0
	SF-K	1	0	1	0	0	100
A16-134	L	6	0	5	1	2	62.5
A16-154	KO-J	61	11	50	0	1	98.0
A16-156	F	20	1	17	2	0	89.4
	SF-Q	14	1	11	2	3	68.7
	KO-G	3	0	2	0	0	100
	KO-Q	43	0	43	0	1	97.7
A16-160	D	23	2	18	3	1	81.8
	KO-D	6	1	5	0	0	100
	KO-X	46	2	43	1	1	97.7
A16-161	B	37	0	33	4	3	82.5
	KO-B	1	0	0	1	0	0
A16-166	J	12	1	11	0	3	78.5
A16-169	C	13	0	12	1	3	75.0
A16-171	KO-T	2	0	2	0	0	100
	KO-R	4	0	4	0	0	100
A16-177	Z	2	0	1	1	0	50.0
	KO-Z	4	0	4	0	0	100
	KO-L	35	3	29	3	1	87.8
A16-178	H	27	1	26	0	3	89.6
	KO-H	1	0	1	0	0	100
	KO-B	34	2	30	2	2	88.2
A16-181	L	18	0	16	2	2	80.0
	KO-D	31	2	29	0	0	100
A16-183	M	29	0	27	2	2	87.0
	KO-M	3	0	3	0	0	100
A16-185	KO-Z	13	0	12	1	3	75.0
A16-186	E	10	0	10	0	1	90.9
	SF-R	9	0	9	0	0	100
	C	4	0	4	0	0	100
	KO-C	1	0	1	0	1	50.0
	KO-J	3	0	2	1	0	66.6
A16-189	KO-R	20	1	19	0	0	100
A16-192	G	3	0	3	0	1	75.0
	SF-U	9	0	8	1	0	88.8
	KO-U	25	1	23	1	1	92.0



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 (%)
A16-195	F	16	1	15	0	0	100
	KO-F	6	2	3	0	0	100
	KO-O	12	1	11	0	1	91.6
A16-197	A	24	1	21	0	1	95.4
	SF-L	11	1	10	0	0	100
	A	2	0	1	1	0	50.0
	KO-A	1	0	1	0	1	50.0
A16-199	D	31	4	24	3	5	75.0
	SF-V	11	1	9	1	0	90.0
	K	2	0	2	0	0	100
	KO-F	100	6	92	2	2	95.8
A16-202	M	12	0	12	0	1	92.3
	SF-P	17	0	16	1	1	88.8
	KO-J	3	0	2	0	2	50.0
A16-203	KO-D	41/43	5	34/36	1	4/2	87.1/92.3
A16-204	A	19	1	17	1	1	89.4
	P	1	0	1	0	2	33.3
	SF-S	14	1	11	2	1	78.5
	N	1	0	1	0	0	100
	KO-N	6	1	5	0	0	100
	KO-S	55	2	52	1	2	94.5
A16-207	P	23	0	21	2	1	87.5
	KO-T	87	5	80	2	0	97.5
A16-210	Q	14	0	14	0	1	93.3
A16-211	KO-R	9	1	7	1	1	77.7
	KO-G	2	0	2	0	0	100
A16-212	C	17	0	17	0	0	100
A16-213	S	3	0	3	0	0	100
	KO-S	4	0	3	0	1	75.0
	KO-H	46	2	43	3	4	86.0
A16-215	KO-H	30	2	28	0	2	93.3
A16-217	O	31	2	26	3	2	83.8
	KO-L	4	0	4	0	1	80.0
A16-219	V	30	3	27	0	2	93.1
	SF-M	14	0	12	2	0	85.7
	W	4	1	2	1	1	50.0
	KO-W	5	0	4	1	0	80.0
	KO-M	70	8	61	1	0	98.3
A16-221	T	27	1	24	2	2	85.7
A16-224	E	2	0	2	0	0	100
A16-225	K	8	1	5	2	0	71.4
A16-226	B	15	1	13	1	2	81.2
	A	3	0	1	2	0	33.3
	SF-T	3	0	3	0	0	100
	KO-G	66	10	56	0	1	98.2
A16-227	X	16	1	12	3	2	70.5
	SF-O	15	1	14	0	2	87.5
	KO-O	4	0	4	0	0	100
	KO-P	25	0	24	1	1	92.3

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 (%)
A16-230	KO-X	4	1	3	0	0	100
	KO-V	82	6	75	1	2	96.1
A16-232	R	8	0	6	2	0	75.0
A16-233	R	19	2	16	1	1	88.8
	SF-N	6	0	6	0	1	85.7
	E	4	1	3	0	0	100
	KO-E	4	0	4	0	0	100
	KO-N	27	0	26	1	1	92.8
A16-235	H	3	0	1	2	0	33.3
	S	31	1	28	3	1	87.5
	SF-W	13	0	11	2	1	78.5
	I	4	0	4	0	0	100
	KO-W	50	0	47	3	1	92.1
A16-236	Q	32	2	24	2	1	88.8
	SF-Y	5	0	5	0	0	100
	V	3	0	3	0	0	100
	KO-V	4	0	3	1	0	75.0
	KO-Y	30	1	29	1	1	93.5
A16-237	U	29	1	24	4	2	80.0
A16-238	G	25	1	21	3	2	80.7
A16-240	Q	20	2	14	4	1	73.6
	KO-K	40	1	38	1	0	97.4
A16-241	F	2	0	2	0	1	66.6
	R	12	1	11	0	3	78.5
	KO-A	2	0	2	0	0	100
A16-242	J	30	0	30	0	3	90.9
A16-243	G	1	0	1	0	0	100
A16-244	KO-G	2	0	2	0	0	100
	KO-E	1	0	1	0	0	100
	KO-A	50	3	45	2	0	95.7
A16-245	T	19	6	10	3	0	76.9
A16-247	U	19	0	19	0	1	95.0
	SF-Z	7	1	6	0	1	85.7
	N	3	1	2	0	0	100

From 120 entries, the highest accuracy figure recorded was 100% on 35 occasions. The lowest accuracy figure recorded was 0% (twice) followed by 33.3% on three occasions and then 50% accuracy on six occasions. The remaining entries (74) returned an accuracy figure greater than 60%. Surely irrefutable evidence that these associations were fact and not chance.

Three points should be remembered. Firstly, that the mission tables I had prepared during this research and therefore this accuracy table have been derived from surviving and available records – there may well have been contemporaneous documents that have since either been lost, destroyed or not yet re-discovered, that may have provided further proof of an aircraft having been replaced (or formally replacing another) on a flight. Secondly, that the accuracy of an aircraft's individual identification to serial number association will be adversely affected if that aircraft was used as a replacement on any occasion – that is it is being “penalised” for being serviceable and available. Thirdly, my research and therefore this accuracy table deliberately ignores photographic evidence. At least three images exist which verify the association of a particular letter to a certain serial number which my table gives an accuracy figure of less than 100%. They are, A16-160/KO-X, A16-192/KO-U and A16-213/KO-H.

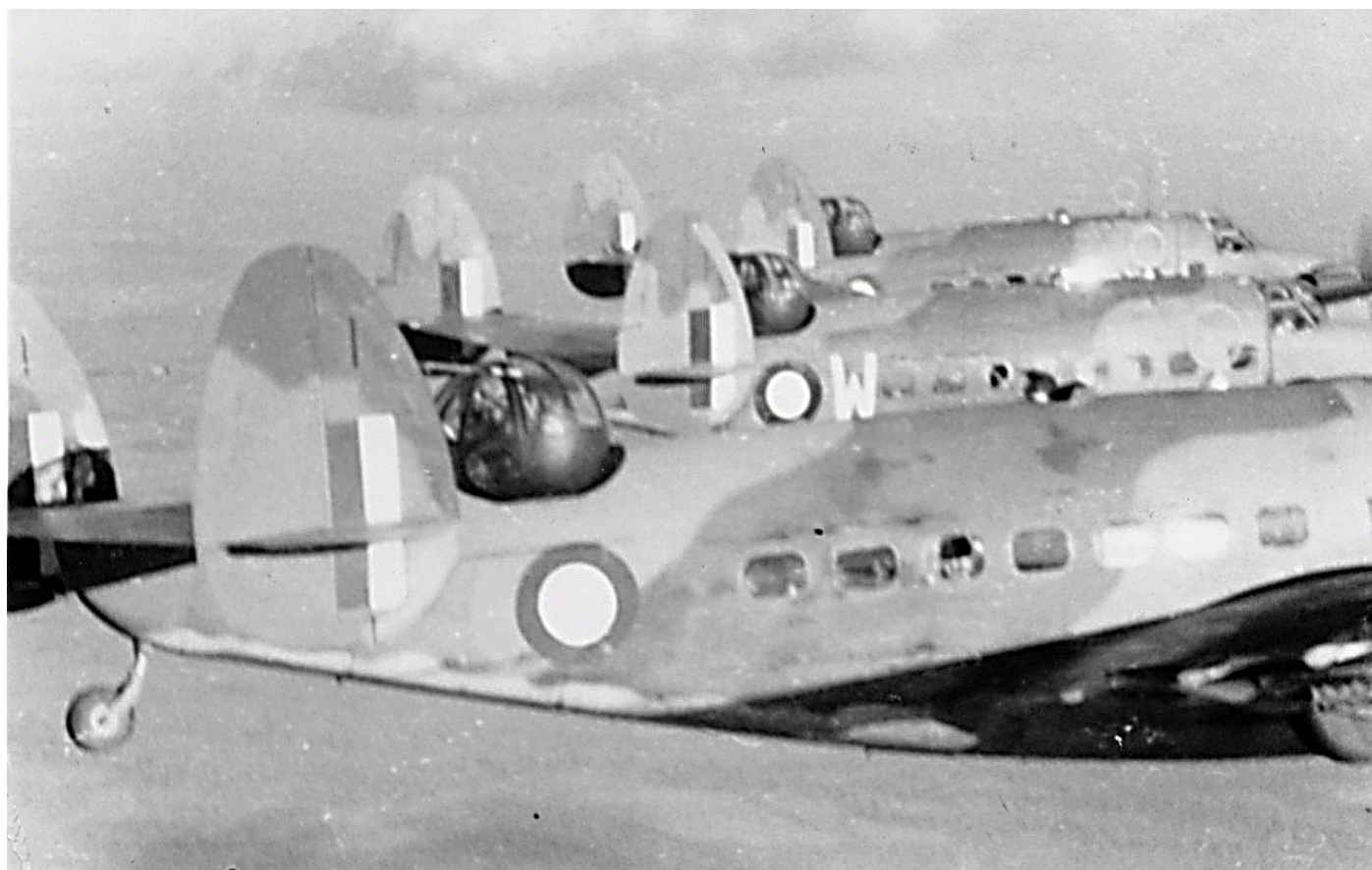
Aside from individual identification letter assignments, other items of interest regarding RAAF Hudson's and which are not necessarily specific to 2SQN or 13SQN, include:

### ***Astrodome***

On the fuselage roof-top, nearly half-way between the cockpit and the upper turret (directly above the fourth cabin window back from the cockpit on the port side), was an aperture. This was often occupied either by a transparent astrodome, a flush hatch cover – the Removable Hatch Cover, or by an open cupola with a fixed wind deflector.

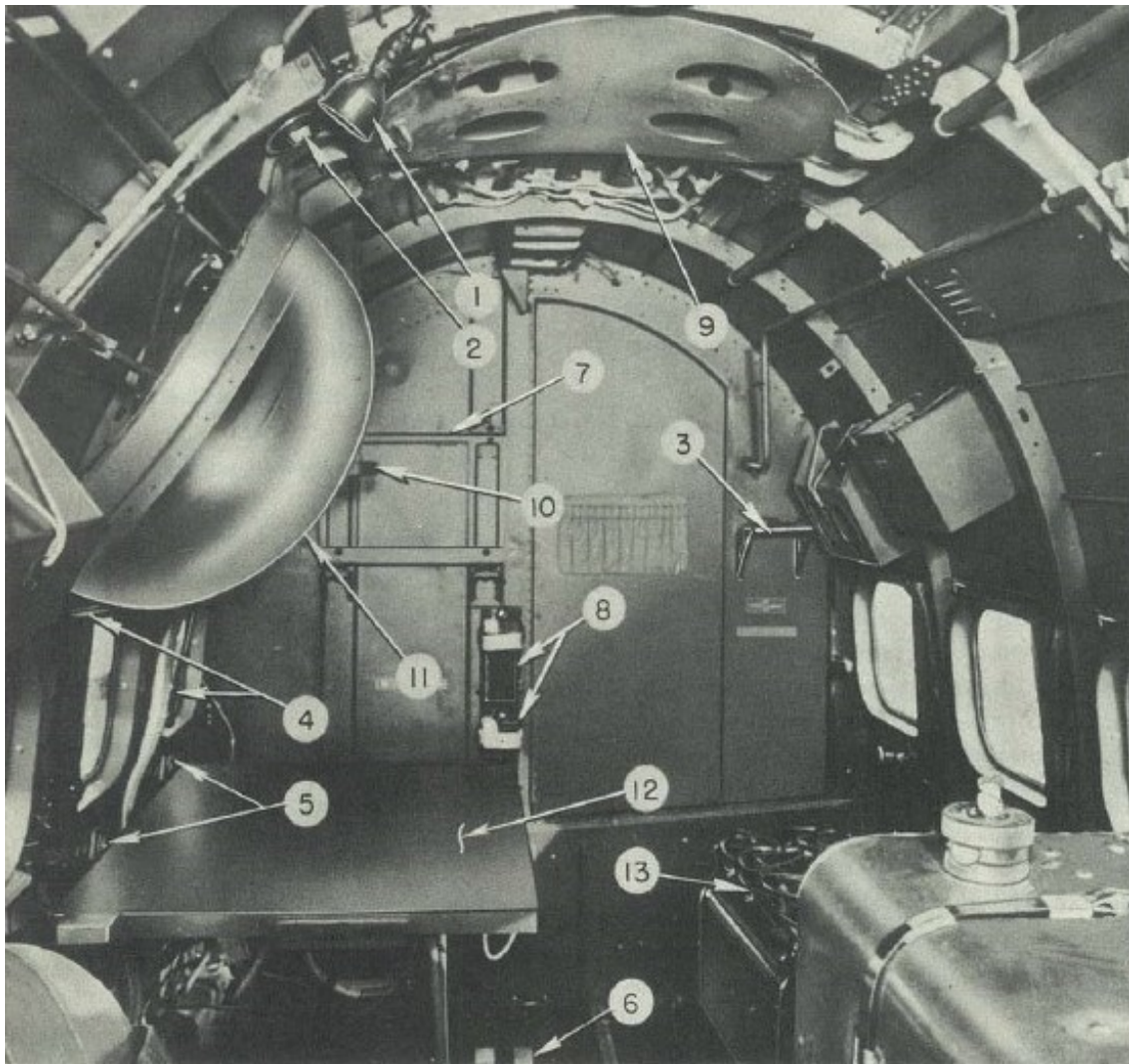
Each of those fittings was interchangeable. The standard arrangement was for two of the fittings – typically the flush Removable Hatch Cover and the astrodome – to be mounted on hinges either side of the aperture (that is: to the left and right of it); with the starboard side fitting being the flush hatch and the port side fitting being either the astrodome or the open cupola with wind deflector.

So, the flush hatch would have its hinges on the starboard side, its operating latch on the port side and, if it was deployed, would be up against the ceiling of the cabin closing off the aperture. If it was thus in use but no longer required, the latch on its port side would be operated and the hatch allowed to swing down into the cabin and away to the starboard side to be secured, by its operating latch against the starboard side wall, above the window line. The astrodome (or open cupola with wind deflector), similarly, would have had its hinges on the port side of the aperture and would have been secured by its operating latch to the port side of the fuselage, again, above the window line. To now bring it into operation, its latch would be operated, the astrodome would then be free to be swung up into the aperture left by the hatch and then secured in place by its latch (on the starboard side of the aperture).

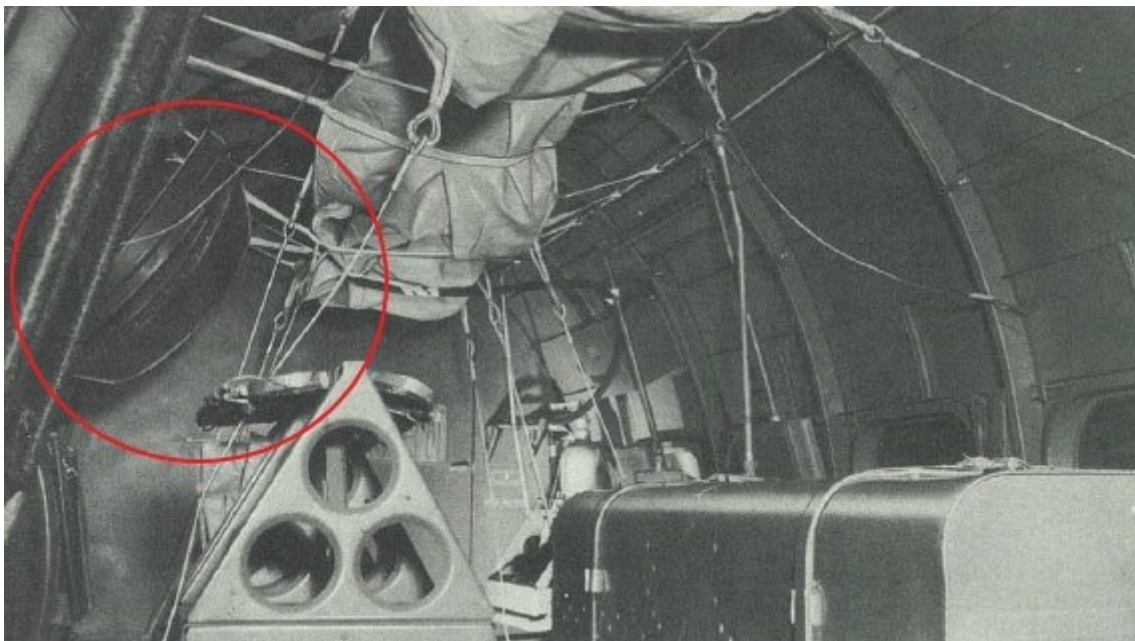


**The lead aircraft and No.2 (A16-235/W) both have the normal astrodome in place. However, the closest aircraft, A16-202, is pictured here with the open cupola with wind deflector in place. [Aviation Heritage Museum of WA image P015828 via Mike Mirkovic].**





Interior of an American Hudson, looking forward. The astrodome, is seen here in its stowed position against the port-side wall and indicated as item "11" with the Removable Hatch Cover, indicated here as item "9" in place. [TO 01-75AB-2, Sec V, Par 3, Equipment, p376].



A rather more cluttered interior. Again looking forward, the open cupola with wind-deflector is seen here (circled in red) stowed on the port side wall instead of the astrodome. [TO 01-75AB-2, Sec IV, Par 7 g, Furnishings, p348].

Hudson Order No.72 – Installation of Special Radio Equipment (i.e. ASV – Aircraft to Surface Vessel equipment, later known as Radar) – was issued on November 27<sup>th</sup>, 1942.<sup>228</sup> But by that time a slowly increasing number of RAAF Hudson aircraft had already been equipped with this system. Four RAAF Hudson's had been equipped with (English) ASV in August, 1940,<sup>229</sup> and from March, 1942, Catalina, Hudson and Beaufort aircraft started to receive Australian ASV Mk II systems.<sup>230</sup> However, the promulgation of Hudson Order No.72 did not mean that ASV was then instantly fitted to all of the remaining un-modified aircraft. It took a considerable amount of time before the system was in even semi-regular use in so far as Hudson's were concerned, indeed, by the start of 1943, only 100 aircraft were equipped with ASV – and that number was spread across the entire Catalina, Hudson and Beaufort fleets, that number though, had increased to around 600 by the end of the year.<sup>231</sup> The difficulty with the fitment of ASV to Hudson aircraft is that there appears to be no surviving documentary record indicating exactly when ASV was installed on any particular aircraft. The only reliable method seems to be consulting the relatively few available photographs of Hudson's and looking for the presence of the collinear search array on the fuselage sides and/or the small transmitting and receiving aerials that constitute the homing array on the sides of the nose and forward fuselage. One then has to bear in mind the problem of accurately dating the photograph – captions and official dates may not be accurate.

The Australian ASV Mark II was described at the time as being a UHF-band<sup>232</sup> radar which utilised the AT300 transmitter<sup>233</sup> and AR301 receiver.<sup>234</sup> It was capable of transmitting a pulse of 2.5 to 3 microseconds duration at a Pulse Repetition Frequency of between 300 and 400 Pulses Per Second<sup>235</sup> at a peak power of 8 Kw<sup>236</sup> transmitted on a 176 MHz carrier wave (today we'd call that VHF).<sup>237</sup> Four range settings were available, 4 ½, 9, 36 and 90 nautical miles.<sup>238</sup>

In very simple terms, radars work by transmitting a pulse of electromagnetic energy of a certain power and a certain duration on a certain carrier wave frequency, then listening for an "echo" to return. So, here we have the concepts of "Peak Power" – the pulse of radar energy of a certain power; "Pulse Width" – pulse of energy of a certain power and a certain duration; "Frequency" – the carrier wave frequency and "Dwell Time" – listening for the echo. That is then repeated at a certain rate which is called the "Pulse Repetition Frequency" and all of that together is called a "Pulse Train".

The pulse of energy, being electromagnetic energy, travels at the speed of light – 162,000 nautical miles per second – which is constant. The time taken for the pulse of energy to travel to a contact and then back to the receiver is measured. So, time is range.

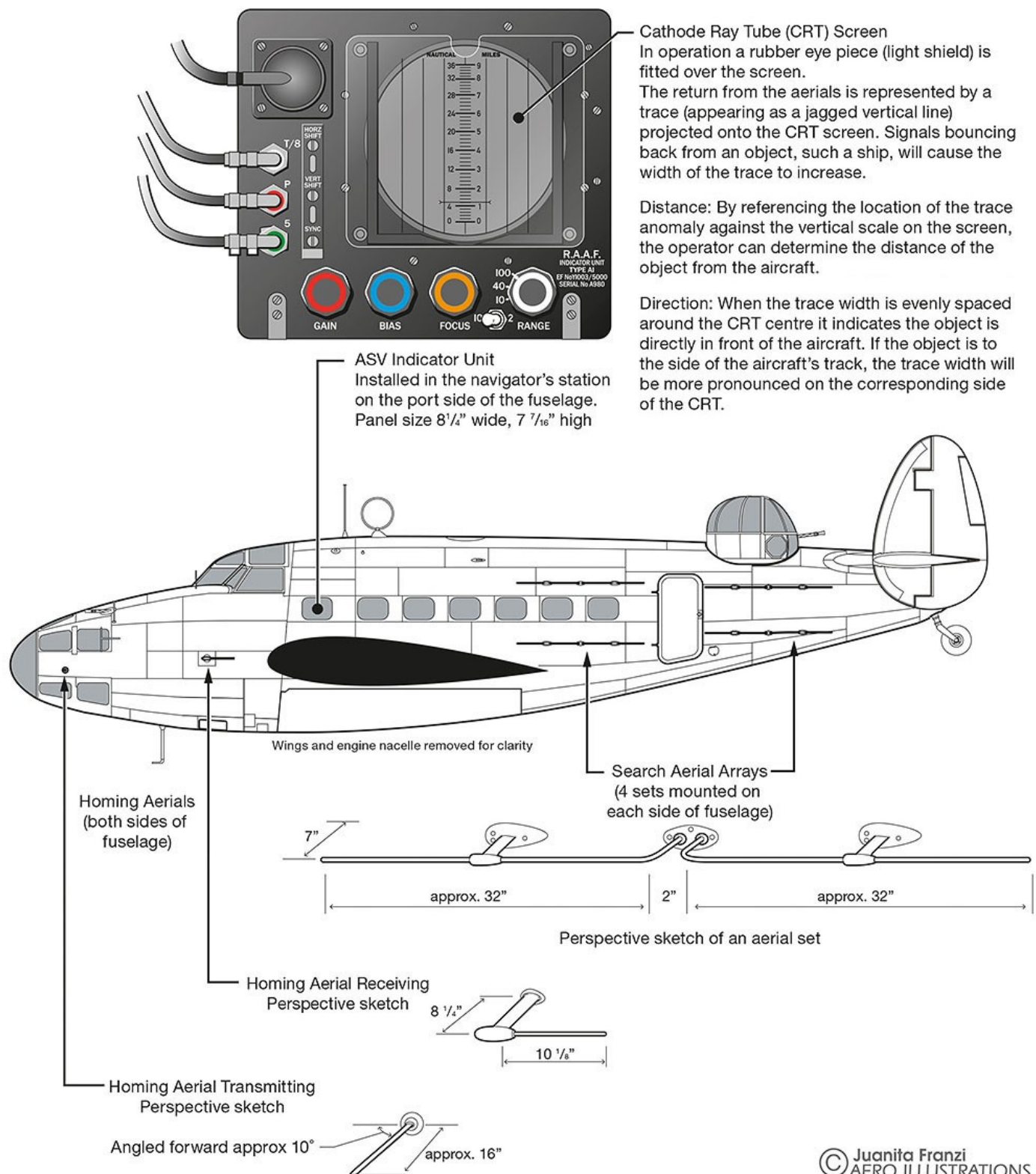
Pulse Width (PW), measured in microseconds (µsec), is the duration of the transmitted pulse and determines minimum range (Rmin). The longer the transmitted pulse, the larger the area covered by the pulse, which means that if an object is within the length of the pulse, it can't be heard by the receiver which can only listen during the dwell time. Therefore, the shorter the pulse, the greater the resolution.

The formula used to determine a radar's minimum range (Rmin) in nautical miles (nm) is  $R_{min} = PW \times 1 \text{ divided by } 12.35$ . Where "PW" = Pulse Width and "12.35" is 1 radar mile in microseconds (i.e. the time it takes radar energy to travel one nautical mile). So, the Australian ASV Mk II would have had a minimum range of  $2.5 \times 1 / 12.35 = 0.2$  nautical miles. Very high resolution.

Pulse Repetition Frequency (PRF), measured in pulses per second (pps), is (obviously) the number of transmitted pulses per second and determines maximum range. The higher the PRF, the shorter the range, because the dwell time is short. So, if the unit was set to 4 ½ nautical mile range, it would be transmitting its 2.5 to 3 microsecond pulses at a rate of 400 pulses per second, but if it was set to 90 nautical mile range, it would do so at 300 pulses per second because to listen for returns from further away requires a longer dwell time.

The formula used to determine a radar's maximum range (Rmax) in nautical miles (nm) is  $R_{max} = C \text{ divided by } 2 \times PRF$ . Where "C" is the speed of light (162,000 nm/sec) and PRF is, as you know, the Pulse Repetition Frequency. The theoretical Rmax for the Australian ASV Mk II would have therefore been  $162,000 / (2 \times 300) = 270$  nautical miles.

Peak Power, measured in kilowatts, is the power output of the pulse of radar energy.



**Location and arrangement of both the Search Array and the Homing Array on RAAF Hudson aircraft.** [Juanita Franzi, Aero Illustrations].

Average Power, measured in watts, is the average power of the radar over time and is the overall value of the pulse train. A variation in PRF will result in a variation of Average Power.

One other factor which might help in having an elementary understanding of airborne radar and is therefore worth a mention here is the Radar Horizon. The radar system is installed in an aeroplane which is flying at a certain altitude over a sphere (the earth). A straight line, being the path of the transmitted energy, from the aircraft to a point on the horizon where it makes a tangent with the surface of the earth is called the Radar Horizon. There is a little formula which is used to determine the Radar Horizon which says the Radar Horizon, in nautical miles, equals 1.23 times the



square root of the aircraft's altitude, in feet. Therefore at 500 feet, the Radar Horizon would be 27.5 nautical miles; at 1,500 feet, 47.63 nautical miles and at 5,000 feet, 86.97 nautical miles.

Three factors will affect the maximum range of a radar. PRF, because the higher the PRF the shorter the range. The height of the radar antenna (radar horizon) – so, in the case of aircraft, the altitude of the aircraft and attenuation.

The energy was radiated using two separate aerial arrays, a Search array and a Homing array.

The Search array used 16 multi-element directional antennas on the side of the fuselage, 8 per side, with the same antennas being used to both transmit and receive by rapidly switching between the two functions.<sup>239</sup> The Search array would transmit and receive at approximately right angles to the line of flight on both sides in a narrow beam, with the maximum intensity of the radiation being at a relative bearing of 100°.<sup>240</sup>

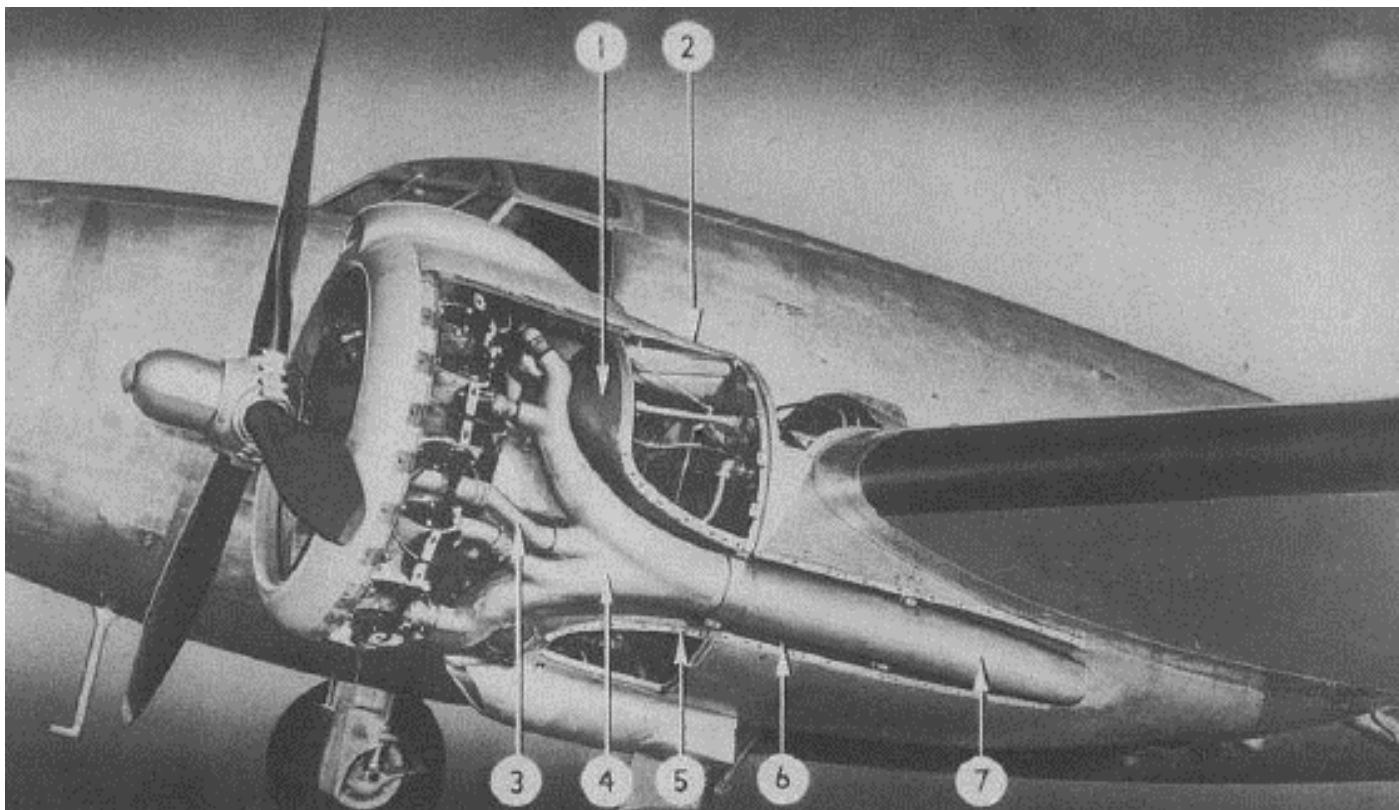
The Homing array used separate transmitting and receiving aerials and covered an area about 22 ½° either side of the nose. There were two transmitting aerials, one “whisker” on either side of the nose, mounted well forward and two receiving aerials, one “dog-leg” (which was parallel to the fuselage) on either side of the forward fuselage.<sup>241</sup>

### ***Exhaust Flame Dampers***

Hudson Order No.56 – Installation of Exhaust Dampers – was issued on April 10<sup>th</sup>, 1942. It said, in part, that the dampers would normally be fitted for night flying operations only and should then be removed when it was known that the aircraft would be used solely for daylight operations.<sup>242</sup> Whilst the majority of 2SQN and 13SQN's operations during the late '42 to early-mid '44 period were daylight operations, night operations were still undertaken from time to time. Accordingly, it is reasonable to assume that these flame dampers were not removed during an individual aircraft's tenure with 2SQN or 13SQN during this period.

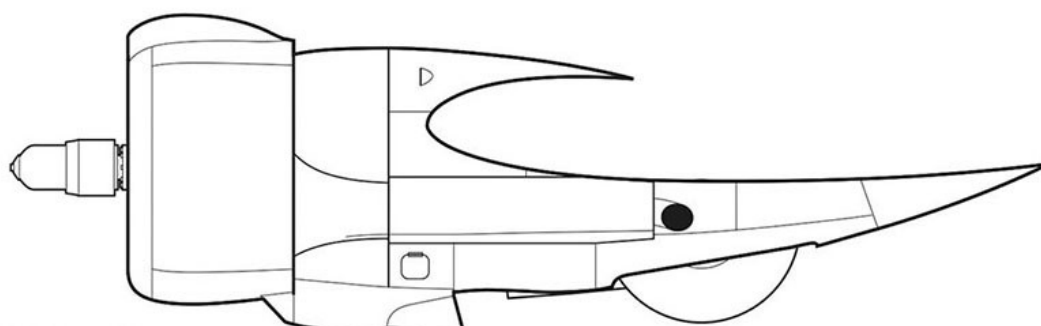


2SQN's A16-242 about to move out of its revetment. The flame damping exhaust fitted to the aircraft's number 2 engine is evident. As a side note, it is interesting to see that, whilst the aircraft has had ASV fitted (search array fitted to the fuselage), the transmitting and receiving aerials for the homing array on the starboard side are missing; the mounts are there but the aerials have been removed – they haven't been censored out, they're simply not there. [AWM image 027618].

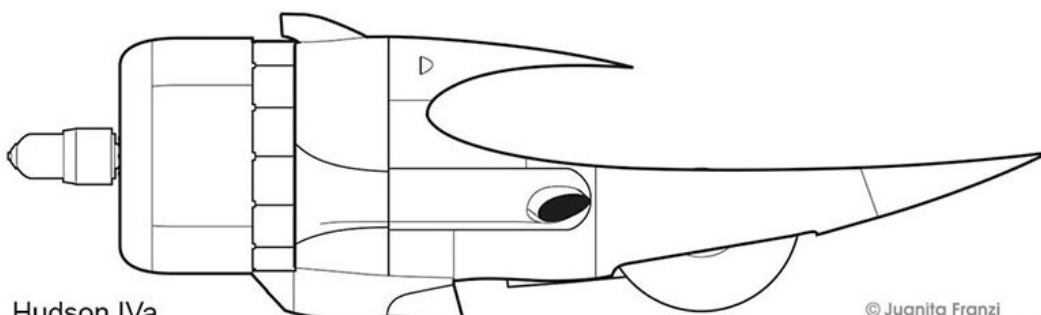


The Wright Cyclone R-1820 installation on an American Hudson. Item "7" is the Exhaust Tail Pipe. This obviously being the open type without the flame damper fitted. [TO 01-75AB-02, Sec IV, Par 5 a, Nacelle Group, p89].

### Hudson engine cowl variation



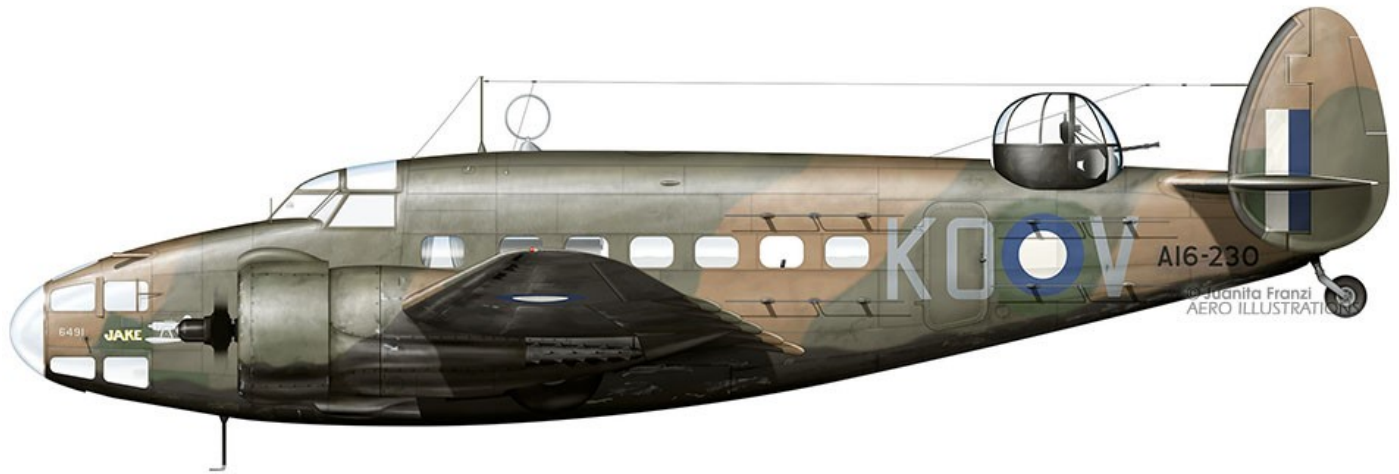
Hudson IIIa



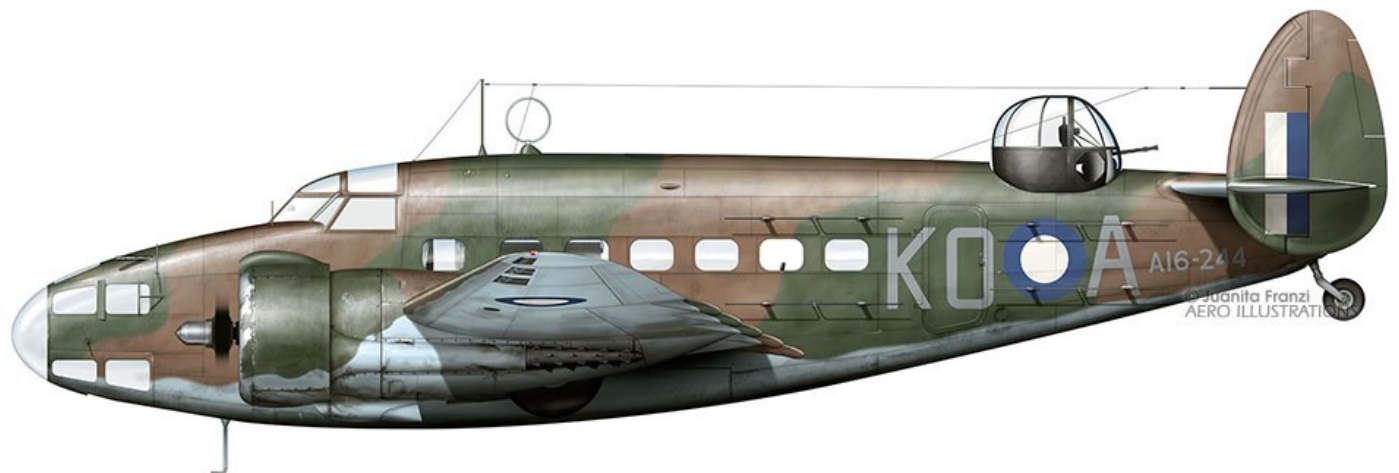
Hudson IVa

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AERO ILLUSTRATIONS

An illustration showing the obvious difference between the engine cowling enclosing the single row, 9 cylinder, Wright R-1820 Cyclone radial of the Hudson Mk IIIa (upper) and the twin-row, 14 cylinder, Pratt and Whitney R-1830 Twin Wasp radial of, not only the Hudson Mk IVa but also Hudson Mk I's. Note that the original, open bore, exhaust is illustrated, not the flame damper type. [Juanita Franzi, Aero Illustrations, 3160 Cowl Graphic].

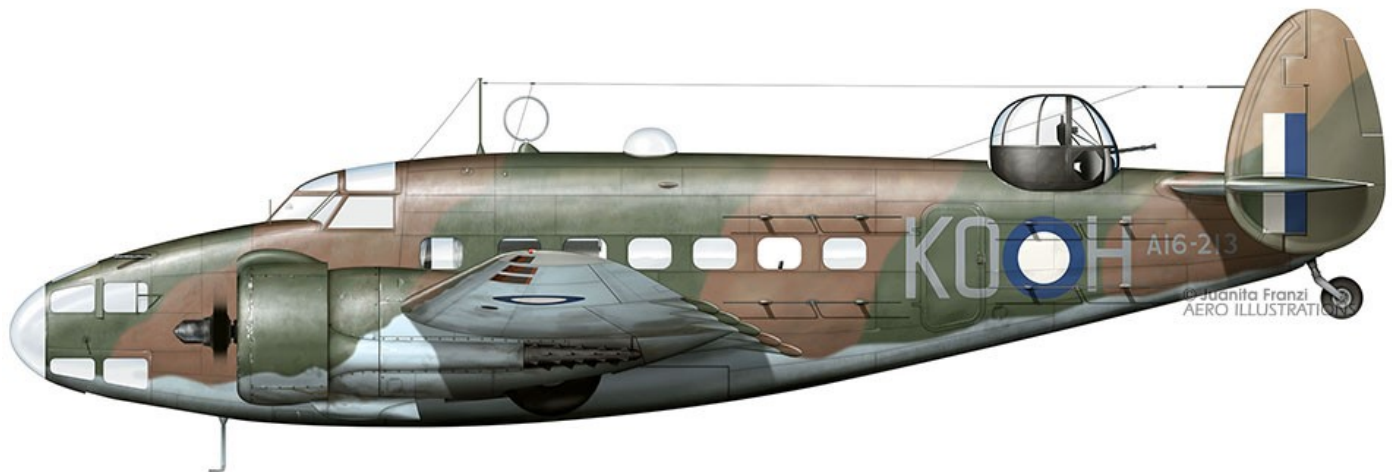


2SQN's A16-230/KO-V with a representation of a Japanese "Jake" on the nose. After service with 6SQN, A16-230 joined 2SQN on April 12<sup>th</sup>, 1943, and was coded "KO-X". During early May, it was re-coded "KO-V" and shot down a Japanese Aichi E13A floatplane on July 2<sup>nd</sup>. It continued to serve 2SQN until it failed to return from operations on March 27<sup>th</sup>, 1944. The aircraft had been forced down into the sea. The crew of five survived the ditching and deployed their dingy, made landfall and were protected by brave locals until being betrayed by a Japanese sympathiser some two months later. The five now prisoners were later embarked on a Japanese barge for transport between islands when the barge was attacked by an 18(NEI)SQN B-25. One of the five waved at the attackers and was promptly shot dead by a Japanese guard and his body thrown overboard. The remaining four eventually arrived at Ambon and, after a period of incarceration, were executed by decapitation by the Japanese around mid-August, 1944. Pilot Officer Donald Cosmo Beddoe, WAG, was the member shot dead by a guard at sea; Squadron Leader John Leonard Scott, pilot, Flight Sergeant Robert Ian Maxwell King, Navigator, Flight Sergeant Bruce Eskdale Wallace, WAG and Flight Sergeant Keith Charles Wright, AG, were executed at Ambon. [Juanita Franzi, *Aero Illustrations*, LHUD3121].

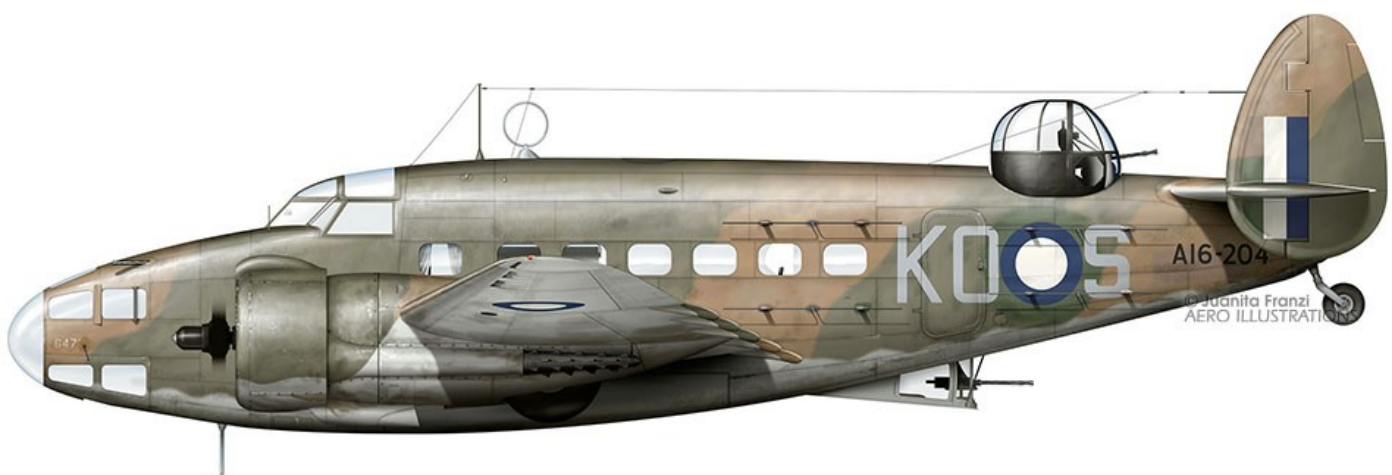


A16-244 had seen operational service with 6SQN and then 32SQN prior to being delivered to 2SQN on May 19<sup>th</sup>, 1943. It was initially coded "KO-G" (after that letter was vacated by A16-211 on May 7<sup>th</sup>). An engine change fell due and after returning to 2SQN on June 8<sup>th</sup>, A16-244 was re-coded "KO-E". However, that allocation was short-lived, because the machine was sent back to 4RSU after a few weeks service for another engine change and when it returned to 2SQN at the end of June, was re-coded "KO-A". A16-244 was reduced to spare parts at 14ARD after suffering a landing accident at Drysdale River Mission on November 4<sup>th</sup>, 1943. [Juanita Franzi, *Aero Illustrations*, LHUD3131].

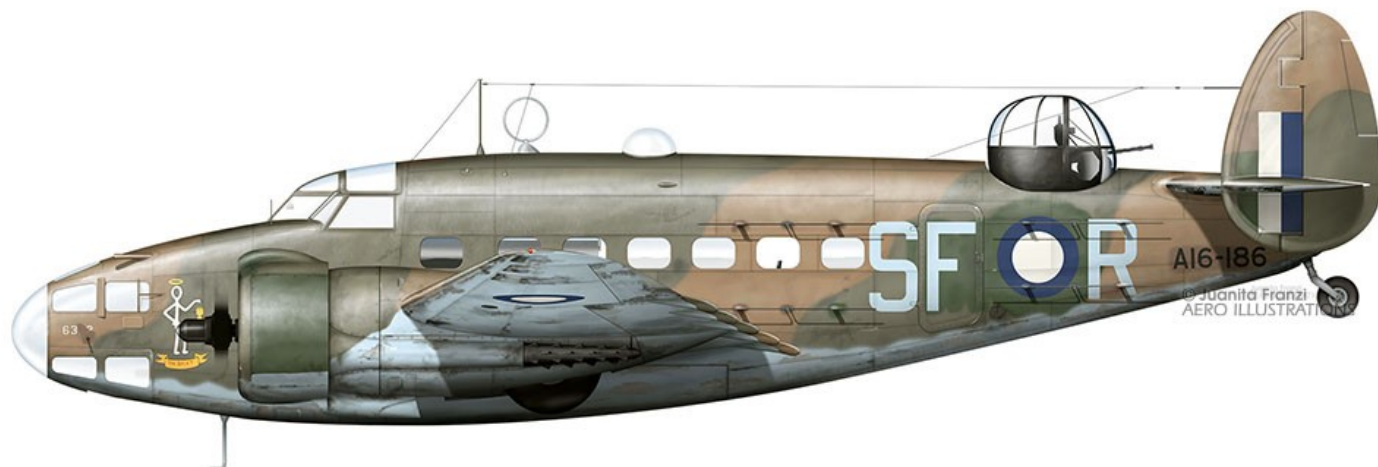




Yet another ex-6SQN veteran, A16-213 joined 2SQN on March 27<sup>th</sup>, 1943, and was allocated the individual identification letter "S"; this became "KO-S" around mid-April. On May 4<sup>th</sup>, this aircraft was sent to 4RSU for a double engine change and when it returned to 2SQN towards the end of May, was re-coded "KO-H". During a night bombing attack on Langgoer, in company with other 2SQN aircraft and following close behind a similar raid by 18(NEI)SQN B-25's, A16-213 was bracketed and then hit by heavy calibre A/A fire. The left rear fuel tank was hit, controls shot away and radio equipment destroyed. The crew were close to bailing out when it was discovered that a small amount of control was still available so the decision was made to attempt a return to base. Moments away from executing a successful wheels up emergency landing at Hughes, the aircraft started to yaw uncontrollably to the right, with the inevitable result that the aircraft skidded off the runway into small scrub within the flight strip. The crew were unhurt but the aircraft was removed to 14ARD at Gorrie and reduced to spare parts. [Juanita Franzi, *Aero Illustrations*, LHUD3141].



No. 13SQN received A16-204 as a new aircraft on August 2<sup>nd</sup>, 1942. By October 2<sup>nd</sup>, the aircraft had been allocated the individual identification letter "A". This was changed to "P" during mid-January, 1943. Between January 27<sup>th</sup> and January 30<sup>th</sup>, the aircraft was re-coded "SF-S" and kept that identity until being handed over to 2SQN on April 10<sup>th</sup>, 1943. With 2SQN it was initially identified as "N" and then, from either April 15<sup>th</sup> or 16<sup>th</sup>, as "KO-N". It was re-coded "KO-S" on or about May 1<sup>st</sup>, 1943. It continued to serve with 2SQN as "KO-S" until being received by 5AD at Wagga Wagga on September 28<sup>th</sup>, 1943. [Juanita Franzi, *Aero Illustrations*, LHUD30911].



A16-186 had served with 32SQN before being received by 13SQN on December 28<sup>th</sup>, 1942. By early January, 1943, it had received the individual identification letter "E" and was re-coded "SF-R" during the last few days of January. On April 4<sup>th</sup>, 1943, it became a 2SQN machine and was allocated the letter "C" which became "KO-C" on April 15<sup>th</sup>. Some time between mid-April and early June, it was re-coded "KO-J". Sadly, on June 12<sup>th</sup>, 1943, whilst attempting a forced landing at Hughes, the aircraft crashed and exploded, killing all 7 people on board (crew of 5 and 2 passengers). [Juanita Franzi, Aero Illustrations, LHUD3051].

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

## Bibliography

ACD 2005(2), *Manual of ASV Mk.II (Aust)* (1944); NAA: AA1966/5, 377.

Hudson Order No. 56, Hudson III Installation of Exhaust Flame Dampers. NAA: A705, 150/4/1868.

Hudson Order No. 72, Installation of Special Radio Equipment. NAA: A705, 150/4/2479.

TO 01-75AB-02, *Handbook of Service Instructions for the Model A-29 (Hudson III) Airplane Manufactured by Lockheed Aircraft Corp Burbank, California* (1942).

Wing Commander A.G. Pither, *An Account of the Development and Use of Radar in the Royal Australian Air Force* (1946) via the RAAF Radar Association [www.raafradar.org.au/pdf/Pither\\_RAAF\\_Radar\\_Part1](http://www.raafradar.org.au/pdf/Pither_RAAF_Radar_Part1).

# End Notes

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## Curtiss Corner

<sup>1</sup> Dutch P-40N contracts and requisitions provided by Peter Boer by email Sunday, August 23, 2020 1:26 AM. Extrapolated on my data sheets

## RAAF WWII in Colour No.8 – RAAF D.H.60 Moths

<sup>2</sup> J Bennett, *The Imperial Gift*, Banner Books, Maryborough, 1996, p.29.

<sup>3</sup> Air Board Agenda No. 1368 of 29 JAN 1930, approved by the Minister for Defence on 4 FEB 1930.

<sup>4</sup> Coulthard-Clark, p.173.

<sup>5</sup> AM Sir Richard Williams, *These Are Facts*, AWM, Canberra, 1977, p.175.

<sup>6</sup> Williams, p.176.

<sup>7</sup> A J Jackson, *De Havilland Aircraft since 1909*, Putnam, London, 1987, p.224.

<sup>8</sup> Williams, p.184.

<sup>9</sup> B A Winley, *Aussie Moths, De Havilland D.H.60 Moths in Australia*, self-published, Kiama NSW, 1997.

<sup>10</sup> <http://www.adf-serials.com.au/2a7.htm>

<sup>11</sup> D.H.60X c/ns from Winley, pp191-192.

<sup>12</sup> Several sources claim that serials **A7-56** to **A7-60** were allocated to five rebuilt wrecked airframes by de Havilland at Mascot: Coulthard-Clark p.273; Winley p.194. K R Meggs, *Australian-Built Aircraft and the Industry Vol 1*, Finger Four Publishing, Seymour VIC, 2009, p.591, claims these as D.H.60M "5 metal fuselages ordered in SEP 1929", which could indicate replacement fuselage frames for earlier aircraft. But these serials are out of sequence, as **A7-55** had not been allocated until 1932-33 to the Codock-built aircraft, and there is no RAAF documentation to support that aircraft flew with these five serial numbers.

<sup>13</sup> These MSB c/ns from adf-serials are queried by Winley: "D.H.60M VH-ADP (**A7-71**) carried the markings 'MSB 8655' as a c/n, which apparently was a confusion of the works job No. MSB 5655", Winley, p.195. Meggs, p.375, points out that while MSB8655 had been claimed as a c/n for **A7-71**, this may be the Contract number for the whole batch.

<sup>14</sup> Jackson, pp.216-217.

<sup>15</sup> Jackson, p.220.

<sup>16</sup> Cookson VH-UAN.

<sup>17</sup> Jackson, p.224.

<sup>18</sup> Jackson, p.230.

<sup>19</sup> Winley, p.40.

<sup>20</sup> The Gipsy was rated at 135hp, derated for the Moth to 98hp at 1900rpm, or 100hp at 2100rpm; Jackson, p.230.

<sup>21</sup> Winley, p.43.

<sup>22</sup> Jackson, p.231.

<sup>23</sup> Jackson, p.231.

<sup>24</sup> Winley, p.258.

<sup>25</sup> Winley, p.31; Jackson, p.247.

<sup>26</sup> Jackson, p.242.

<sup>27</sup> <https://www.baesystems.com/en-uk/heritage/dh60-cirrus-moth>

<sup>28</sup> *Historical Civil Aircraft Register G-AUAA to VH-UZZ* lists three impressed D.H.60G-III's – VH-URL (c/n 5052) to **A7-82**; VH-URR (c/n 5085) to **A7-90**; VH-URS (c/n 5086) to **A7-91**. But a fourth aircraft, VH-UOP, was impressed as **A7-120** – this was built by DH at Mascot (c/n DHA.1), and was re-engined with a Gipsy II (c/n changed to DHA.3), but imagery of VH-UOP shows it with a 130hp Gipsy Major.

<sup>29</sup> C H Barnes, *Shorts Aircraft since 1900*, Putnam, London, 1989, p.187.

<sup>30</sup> Jackson, p.227.

<sup>31</sup> Winley, p.191.

<sup>32</sup> B Robertson, *Aircraft Camouflage & Markings 1907-1954*, Harleyford, Marlow, 1956, p.102: In the Bruce Robertson designations of RAF roundels, the type-A2 roundel was a 1:3:5 type-A with a thin *White* outline which could vary in size, which was refined as the **type-A2(ii)**. From measurements on various Museum aircraft, this *White* outline was only ½" wide (small aircraft like the S.E.5a and D.H.60 had *Blue* 20" roundels with the ½" ring; larger aircraft like the D.H.9/9A and 504K had 30" *Blue* roundels with a wider 1" *White* ring) : Bennett, p.196.

<sup>33</sup> The colours of rudder striping were not reversed from *Blue* leading to *Red* leading until 1 JAN 1931. RAAFHQ Routine Orders 1930 Serial No. 248, of 24 OCT 1930: "**PART III – TECHNICAL EQUIPMENT, COLOURS MARKINGS ON RUDDERS OF AIRCRAFT:** That part of the rudder which lies behind the rudder post is to be divided into three vertical strips of equal width which are to be coloured *red*, *white*, and *blue*, respectively; the *red* strip being next to the rudder post, the *blue* at the trailing edge, and the *white* between. This is a reversal of the present sequence of colours. Unit are to carry out the conversion as opportunity offers, but all aircraft must bear the reversed colour markings by 1st JANUARY, 1931." [My bolding.] RAAFHQ file 9/1/109 *Colour Markings on Rudders of Aircraft*.

<sup>34</sup> Winley, p.191.

<sup>35</sup> Coulthard-Clark, p.272, gives the assembly at Essendon. Meggs, p.591, gives the assembly of these 20 imported Moths at Whiteman St, South Melbourne.

<sup>36</sup> NAA A705 121/8/853 RAAFHQ DDAI Minute to D of S, of 26 JUN 1928.

<sup>37</sup> NAA A705 121/8/853 CAS Minute AS.121/8/353 to D of S of 22 FEB 1929, and reply by D of S, of 26 FEB 1929.

<sup>38</sup> Bureau of Aircraft Accidents Archives, VH-UPX: <https://www.baaa-acro.com/>

<sup>39</sup> Coulthard-Clark, p.273.

<sup>40</sup> NAA A705 121/8/853 file, ongoing correspondence over JUN 1928 to MAR 1929.

<sup>41</sup> *Flight* magazine, London, 19 DEC 1930, p.1469.

<sup>42</sup> <http://www.saam.org.au/wp-content/uploads/2018/07/SAAM-Profiles-LARKIN-BROTHERS.pdf>

<sup>43</sup> **A7-44**/VH-AFN later registered as N168 at Glendale CA, and retaining this registration currently in the Netherlands, has the claimed **c/n as 27**: [www.airhistory.org.uk/dh/pAus00.html](http://www.airhistory.org.uk/dh/pAus00.html); and also the Ed Coates collection: [www.edcoatescollection.com](http://www.edcoatescollection.com)

<sup>44</sup> NAA A705 121/8/853 RAAFHQ DAI Minute of 24 SEP 1930, hand-written addition of 25 SEP 1930.

<sup>45</sup> Meggs, p.224.

<sup>46</sup> NAA A705 121/8/853 RAAF Specification A.C.43, 9 OCT 1928, p.4 – which interestingly still referred to the 'D.H.60X'.

<sup>47</sup> NAA A705 121/8/853, RAAFHQ file 121/8/502 letter AS.10832, of 16 AUG 1929.

<sup>48</sup> Coulthard-Clark, p.273.

<sup>49</sup> Coulthard-Clark, pp.258-272.

<sup>50</sup> Meggs, pp.289-291.



- <sup>51</sup> <https://www.goodall.com.au/australian-aviation/tugan-gannet/tugan-gannet.htm>
- <sup>52</sup> Jackson, p.236.
- <sup>53</sup> I K Baker, *Aviation History Colouring Book 54, Question & Answers*, Queenscliff Vic, 2004, p.13.
- <sup>54</sup> Jackson, p.242.
- <sup>55</sup> Jackson, p.247.
- <sup>56</sup> Coulthard-Clark, p.273.
- <sup>57</sup> RAAF E/E.88s for aircraft A7-61 to A7-68. Cards for all aircraft show "date received" as 23/1/1930, but with varying acceptance dates over JAN and FEB 1930.
- <sup>58</sup> Meggs, p.374.
- <sup>59</sup> RAAF E/E.88 Aircraft Status Cards.
- <sup>60</sup> Coulthard-Clark, p.273.
- <sup>61</sup> B Cookson, *Historical Civil Aircraft Register G-AUAA to VH-UZZ*, AustAirData, QLD, 1996; Parnell & Boughton, p.57; Winley, p.68.
- <sup>62</sup> <http://www.airwaysmuseum.com/>
- <sup>63</sup> Cookson, VH-UPU.
- <sup>64</sup> N M Parnell & C A Lynch, *Australian Air Force since 1911*, Reed, Sydney, 1976, p.51.
- <sup>65</sup> Walker, p. 10.
- <sup>66</sup> I K Baker, *Aviation History Colouring Book 65, RAAF Colour Schemes & Markings Part 1*, Queenscliff Vic, 2008, p.17.
- <sup>67</sup> No.1 Training Group HQ, A.50 Unit History, SEP 1944.
- <sup>68</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>69</sup> <http://www.adf-gallery.com.au/newsletter/ADF%20Telegraph%20Vol%2010%20Issue%203%20Winter%202020.pdf>
- <sup>70</sup> AM Sir Richard Williams, *These Are Facts*, AWM, Canberra, 1977, pp.269-270.
- <sup>71</sup> J Herington, *Air War Against Germany & Italy 1939-1943*, AWM, Canberra, 1962, pp.530-1; Williams, pp.300-1. This Ottawa Conference also recast the original EATS, greatly empowering Canada's size and influence within the scheme, which probably accounts why they prefer reference to 'The Plan', and not to EATS.
- <sup>72</sup> Australian-produced Wacketts, Wirraways and Tiger Moths also served on EATS and SFTS units.
- <sup>73</sup> Parnell & Lynch, p.54. From initial training, Australia would hand over 194 trainees per month for further training in Canada.
- <sup>74</sup> J Forsyth, *The D.H.82A Tiger Moth in Australia*, Skyline, Melbourne, 1995, p.xxiii.
- <sup>75</sup> **Aero Club Colours/Rudder Striping.** RAC NSW: RAC NSW had *orange/dark blue* (as per Tiger Moth VH-AZQ in 1947 in the Ed Coates collection, referred to as *orange/black*), but also prewar: "The Club's colour scheme had changed to *orange and blue*", Winley p.66. This continued on to Chipmunks at Bankstown in the 1960s as Club colours. KSAS: At one stage VH-ULM was restored at the Airworld Museum in a scheme apparently copied from KSAS, i.e. *dark blue* fuselage and *silver* fuselage detailing, *yellow* wings and fin, *black/white* checkered rudder. RQAC: Prewar RQAC aircraft had diagonally striped rudders, such as D.H.60G VH-UIQ (later A7-122 when impressed into 2EFTS in SEP 1940) assessed to be stripes of *orangish-red/dark blue* (referenced from RQAC painting at Archerfield of Tiger Moth VH-AZF in the early 1950s, and comment by Sec RQAC to author on 2 OCT 2020 "We have no reason to believe that what is depicted in the painting would not have been the colours as painted on the aircraft.") RVAC: The Essendon colours at 3EFTS appear more straightforward, maintaining the standard *red/white/blue* striping until impressment but with the Club logo on the white stripe, then postwar two *dark blue* stripes separated by an inner *light blue* stripe (as seen on Chipmunk VH-RVS). ANA Aeronautical College: Prewar had the *red* flag ANA logo on the rudder. RACSA: These rudder stripes are more problematic (as seen on the early image of the Parafield line-up of VH-UAR, UJU, UTN, UIB and UAI) comprising *three different* vertical colours, and the centre one is not white. Geoff Goodall email to author on 30 SEP 2020, says he remembers 1960s Aero Club rudder colours as *blue/white*, so that is obviously different from the prewar colours. Tasmanian Aero Club: D.H.60X Moth VH-UAU (ex A7-13) has been restored at the Powerhouse Museum in Sydney in its prewar 1937-38 Tasmanian Aero Club markings of a *green* rudder with *yellow/red* stripes (also, the current restoration of D.H.60M VH-ULM is the same, and 1962 image of Tas Chipmunk VH-BSR looks similar). Overall, a subject perhaps worthy of more scrutiny if someone wants to run with it?
- <sup>76</sup> Parnell & Lynch, p.207; Forsyth pp.259-270. Some slight discrepancies occur in "formation" dates of units. For instance, although the first 12 Tiger Moths arrived on 9 DEC 1940, as did the CFI, CGI and some flying instructors, the A.50 then does record that 9EFTS Cunderdin formed on 11 DEC 1940, which was when the CO and "nucleus party" arrived.
- <sup>77</sup> 11EFTS Unit History A.50, on formation at Benalla on 26 JUN 1941, promulgated by Air Board Order N.591, RAAFHQ file 151/2/120 of 29 MAY 1941.
- <sup>78</sup> *Units of the RAAF, A Concise History, Vol.8 Training Units*, AGPS, Canberra, 1995.
- <sup>79</sup> [www.rfaca.com.au](http://www.rfaca.com.au)
- <sup>80</sup> Winley, p.45.
- <sup>81</sup> These additional Gypsy Major-engined Moths are annotated on the E/E.88 Aircraft Status Cards.
- <sup>82</sup> Cookson VH-UOP; Winley, p.256.
- <sup>83</sup> The A7-86 E/E.88 confusingly is annotated as Impressment 12529 from Airwork, but also as from "ACQ" Aero Club QLD. However, civil records show VH-UPF as an Aero Club of QLD Moth, and the 2EFTS A.50 also lists VH-UPF/A7-86 as QLD Aero Club. There are discrepancies too with the dates of impressment which the E/E.88s list all as 8 JUL 1940: the 2EFTS A.50 which would be more accurate as it was maintained on-site at Archerfield on a daily basis for submission each month (whereas E/E.88s were maintained remotely at RAAFHQ Melbourne), and lists **A7-82 to A7-86** as impressed 13 JUL 1940, **A7-87 to A7-89** as 20 AUG 1940.
- <sup>84</sup> See endnote above.
- <sup>85</sup> <http://www.adf-serials.com.au/2a7.htm>
- <sup>86</sup> B R Walker, *Black Jack*, Banner Books, Canberra, 1994, pp. 8-11.
- <sup>87</sup> I K Baker, *Aviation History Colouring Book 66, RAAF Colour Schemes & Markings Part 2*, Queenscliff Vic, 2009, p.11.
- <sup>88</sup> G Pentland, *RAAF Camouflage & Markings 1939-45 Vol 1*, Kookaburra, Melbourne, 1980, p.12.
- <sup>89</sup> No.1 Training Group HQ, A.50 Unit History, SEP 1944.
- <sup>90</sup> E/E.88 A7 Aircraft Status Cards.
- <sup>91</sup> *Vol.8 Training*, pp.15-16
- <sup>92</sup> These first 15 Tiger Moths received on 2EFTS were: A17-1, -3, -4, -5, -8, -9, and -12 to -20; Forsyth, pp.2-9.
- <sup>93</sup> 2EFTS Unit History A.50, JAN-APR 1940.
- <sup>94</sup> Forsyth, p.260.
- <sup>95</sup> *Vol.8 Training Units*, p.17.
- <sup>96</sup> Meggs, p.562, makes the following observation: "However, the standard of writing and orderliness on many of the cards, plus the now-known misinformation also presented, brings into question the ability of what might well have been relatively poorly-educated junior clerks. They had to handle and to interpret a great mass of material sent on a daily basis to the centre responsible for keeping the records up-to-date, in a period of massive RAAF expansion, activity, and even confusion."
- <sup>97</sup> 3EFTS Unit History A.50.
- <sup>98</sup> *Vol.8 Training Units*, pp.18-19.
- <sup>99</sup> Cookson lists VH-UHP (c/n 877) as a D.H.60X, but this relatively late c/n is listed by Jackson p.240 as -UHP D.H.60G.
- <sup>100</sup> 1FTS A.50 Unit History SEP 1939-JUN 1940.
- <sup>101</sup> 21SQN A.50 Unit History DEC 1939-JUN 1940.
- <sup>102</sup> 4EFTS Unit History A.50.
- <sup>103</sup> N Parnell & T Boughton, *Flypast*, AGPS, Canberra, 1988, p.180.

<sup>104</sup> E/E.88s give these six Moths as: **A7-114 to A7-119**.

<sup>105</sup> *Vol.8 Training Units*, pp.20-21.

<sup>106</sup> Meggs, p.II-413.

<sup>107</sup> Lucas, p.13.

<sup>108</sup> The *Yellow* was introduced to the RAF roundel on 1 MAY 1940; P Lucas, *Camouflage & Markings No.2*, Scale Aircraft Monographs, Guideline Pubs, Luton, 2000, 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> 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>111</sup> Robertson, p.102.

<sup>112</sup> Cited in Tanner, p.1.

<sup>113</sup> Cited in Tanner, p.9.

<sup>114</sup> The Hurricane 'B' scheme was abandoned in JAN 1941 and future Hurricanes were produced in the 'A' scheme only. *Goulding & Jones, Camouflage & Markings 1936-1945*, Doubleday, New York, 1971, 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: for Moths this was the 'A' pattern, e.g. for Oxfords the 'B' scheme became standard.

<sup>115</sup> Cited in Archer, p.70.

<sup>116</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>117</sup> **Mensuration:** These different training numbers are determined by mensuration – the sizes of some aircraft markings are often provided here from mensuration (as there are no surviving technical documents to provide this). **The Moth training numbers on the forward fuselage (and the smaller Cadet training numbers) are measured at 16" high x 10" in 2" strokes** (i.e. doubled from the standard serial number characters 8" x 5" in 1" stroke), which provided a good standard. The fuselage roundels are measured at 20" diameter. Digital imagery, with large monitors, now makes it easier to accurately measure markings. For calibration, known dimensions are used and extrapolated – for instance, aircraft serial numbers at 8" high and 5" wide (Imperial measures used, as that was the standard of the day), and some Tech Orders provide roundel and fin flash dimensions. Generally, squadron code letters vary, applied by the unit, and no laid down standards survive. Such mensuration is accurate if the camera lens is directly perpendicular and horizontal to a flat subject. But perspective is further affected by fuselage curvature, or other shaped panels, and there can be camera lens imperfections. So while an imperfect art, in general sizes of aircraft markings can be provided inside a 2" (50mm) margin of error.

<sup>118</sup> RAAFHQ AGI No. C.11, para. 1(a), of 22 SEP 1939.

<sup>119</sup> RAAFHQ AGI C.11 A/L.5, RAAF file 150/4/658 of 26 JAN 1940.

<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 3, para. 4(b) Training Aircraft, of 3 OCT 1940. This Instruction also left to the discretion of the Station CO to allot different coloured numbers for identification to different units operating at the base.

<sup>123</sup> RAAFHQ file 1/501/329 Minute Sheet, M.2 DTS to DCAS of 6 JAN 1942; M.3 DCAS agreement same date.

<sup>124</sup> RAAFHQ Letter S.A.S.7396 DTS.280/42, filed as 1/501/329(63A), from DTS for AMEM to all Area HQs, of 18 JUN 1942.

<sup>125</sup> RAAFHQ AGI No. C.11, Issue 4, of 31 AUG 1942, files as 150/4/852(1A). This AGI lists all the A.D. numbers (in Appendix I) for the various types.

<sup>126</sup> RAAFHQ T.O. AGI Pt 3(c), Instruction 1, file 150/4/5056 (1A), of 26 MAY 1944.

<sup>127</sup> RAAFHQ AGI C.11 A/L.5, RAAF file 150/4/658 of 26 JAN 1940.

<sup>128</sup> RAAFHQ AGI C.11 A/L.5, RAAF file 150/4/658 of 26 JAN 1940.

<sup>129</sup> RAAFHQ AGI C No.11 of 22 SEP 1939, filed as 9/1/396(13), and which referred to the RAF AMO A.154.

<sup>130</sup> RAAFHQ S.A.S. 2699 1/501/329(55A), undated but c JUL 1940.

<sup>131</sup> P Lucas, *Camouflage & Markings No.2*, Scale Aircraft Monographs, Guideline, Luton, Beds, 2000, 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>132</sup> RAF ADM.332 (Issue 3) filed as RAAFHQ 150/4/852(12).

<sup>133</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>134</sup> RAAFHQ Aircraft General Instruction No.C.11 (Issue 4), Appendix I, of 31 AUG 1942.

<sup>135</sup> Appendix I of the AGI noted that: A.D.1164 (twin-engined flying boats) be used for Sunderland and Empire, as no separate scheme for 4-engined flying boats was available (this was A.D.1163); A.D.1165 (twin-engined biplane flying boats) be used for Seagull V (Walrus), as no separate scheme for single-engined flying boats was available; A.D.1291 (4-engined biplanes) be used for Gannet, D.H.84 and D.H.89 as no diagram for these types was available (for the biplanes this was A.D.1175).

<sup>136</sup> Neither the Kittyhawk nor Vengeance were listed.

<sup>137</sup> NAA A11083 21/4/AIR, *NEA HQ Camouflage of Aircraft*, pp.73-74.

<sup>138</sup> <http://www.adf-serials.com.au/newsletter/ADF%20Telegraph%20Vol%2010%20Pre-supplement%20Winter%20Edition.pdf>

<sup>139</sup> Cookson, VH-UAE.

<sup>140</sup> SAD Unit History A.50, MAR-APR 1942. Below, not an ideal image, is also from GRB's collection showing the other side of the USAAF B-17E at Wagga cAPR 1942. The Moth is A7-88 serving as a unit 'hack' at Wagga – not a dedicated trainer, so no trainer bands, as most D.H.60s had by this stage been retired from EFTS units; obviously rudder striping has been replaced by a fin flash.



- <sup>141</sup> A 1945 image of the new owner Bruce Cowan with A7-88 (about to become VH-UAE), in Winley p.61, shows a disruptive pattern on the fuselage and rudder and not in the *overall 1944 AGI Foliage Green*. The contrast also suggests the disruptive *Foliage Green* came further forward on the upper rear fuselage than as shown in the A.D.1169 diagram – this is not surprising as it would be inevitable that variations would occur in the pattern painted over the years.
- <sup>142</sup> <http://adf-serials.com.au/newsletter/ADF%20Telegraph%20Vol%2010%20Issue%201%20Autumn%202020%20Final.pdf>
- <sup>143</sup> RAAFHQ S.A.S. 9984 1/501/329(53A), DTS 368/41, 23 DEC 1941.
- <sup>144</sup> I K Baker, *Aviation History Colouring Book 72, RAAF Colour Schemes & Markings Part 6a*, Queenscliff Vic, 2011, p.11, observes that “someone forgot to add the required fin stripes”. Fin stripes were required by the extant 1940 policy as: “Scheme M.4: vertical stripes of red, white and blue of same width painted on the fin”, RAAF HQ AGI No C.11 Issue 3, 3 OCT 1940 – however it appears that the 1940 ‘M’ designators for Markings were soon discarded in 1941 and 1942.
- <sup>145</sup> A7-32 had been assessed as unairworthy at 1AD, and Air Board Agenda 1946/1936 of 6 OCT 1936 approved issue to Recruit Training Section at Laverton as the first Moth instructional airframe, NAA A14487 11/AB/1946.
- <sup>146</sup> Forsyth, pp.344-355.
- <sup>147</sup> Parnell & Boughton, p.175.
- <sup>148</sup> NAA file A705 73/21/1050, RAAF file 1/501/398(8A) App D, of 20 NOV 1944.
- <sup>149</sup> ‘WINGS’ magazine, RAAF, Melbourne, 6 MAR 1945, p.10. This article “The Commonwealth Disposals Commission has 87 for sale”, mentions 20 Moth Minors, 5 Gipsy Moths, 23 Ryans, and the odd Dolphin, Waco and Gannets being available.
- <sup>150</sup> Sale prices from E/E.88 cards where marked or NAA file A705 73/21/1050, RAAF file 8/101/1073(44A), 21 MAR 1945 Sheet 1.
- <sup>151</sup> Winley, p.81; of the 192 aircraft then on the Register, 100 were D.H.60 Moths, Winley p.44.
- <sup>152</sup> Jackson, p.224.
- <sup>153</sup> Forsyth, p.xvii.

## From Abernethy to Zimmerman

- <sup>154</sup> AFCC B283/43; Air Force Confidential Orders – Series A and B – and Index, 1943; NAA A7674, 3.
- <sup>155</sup> Code Names, Operations and Plans, SWPA, edited by Pilot Officer I.C. Pratt, 1 October, 1945. NAA: A9695, 1132.
- <sup>156</sup> ASD 205/1 RAAF System of Operational Control. Chapter II Conduct of Operations, p15, Identification Letters for Aeroplanes (paragraph 28) in RAAF Command RAAF System of Control; NAA: AA1966/5, 360.
- <sup>157</sup> Code Names, SWPA, edited by Pilot Officer I.C. Pratt, 29 September, 1945. NAA: A9695, 1132.
- <sup>158</sup> Code Names, Operations and Plans, SWPA, edited by Pilot Officer I.C. Pratt, 1 October, 1945, *ibid*.
- <sup>159</sup> Appendix A, The Interservice Phonetic Alphabet, RAAF Publication 206, R/T Procedure for Fighter Pilots and Operators (1942) in R/T Procedure for Fighter Pilots, Controllers & R/T Operators; NAA: A1196, 53/501/184.
- <sup>160</sup> Basic Signal Operations Instructions Southwest Pacific Area, December 1, 1942, Signal Communications Part B, Phonetic Alphabet and Numeral Pronunciation, Effective: December 15, 1942 in General Headquarters Southwest Pacific Area Basic Signals Operation Instructions; NAA: A1196, 40/505/42.
- <sup>161</sup> Paragraph 303 b), ACP125 (F), Communication Instructions Radiotelephone Procedures.
- <sup>162</sup> ASD 205/1 RAAF System of Operational Control. Chapter II Conduct of Operations, p15, Identification Letters for Aeroplanes (paragraph 28) in RAAF Command RAAF System of Control; NAA: AA1966/5, 360.
- <sup>163</sup> RAAF Command Operation Instruction 107/1945, revised to 1<sup>st</sup> June, 1945, Appendix A, Aeroplane Identification Letters in Headquarters, RAAF Command Operations Instructions Nos 1-123 1945; NAA: AA1966/5, 252.
- <sup>164</sup> RAAF Command Operation Instruction 107/1945, revised to 1<sup>st</sup> June, 1945, Schedule 2 to Appendix A, “R” Signal Operational Code, *ibid*.
- <sup>165</sup> Guide to Air-Ground-Air Communications and Radio Aids in SWPA Nth of 12°S (Revised 22 Feb 45) in 1<sup>st</sup> TAF RAAF Guide to Air-Ground-Air Communications and Radio Aids in SWPA Nth of 12°S; NAA: A11225, 29.
- <sup>166</sup> Special Communication Instructions, No. 81 Fighter Wing Movement Order No. 4/44 of 20<sup>th</sup> December, 1944 in First Tactical Air Force – 81 Fighter Wing – Operation Orders and Instructions; NAA: A11225, 2/8/2.
- <sup>167</sup> *Ibid*.
- <sup>168</sup> *Ibid*.
- <sup>169</sup> *Ibid*.
- <sup>170</sup> *Ibid*.
- <sup>171</sup> *Ibid*.
- <sup>172</sup> *Ibid*.
- <sup>173</sup> *Ibid*.
- <sup>174</sup> International Radiotelegraph Convention in Washington, *General Regulations, Article 14, Section 1*, (1927) 69.
- <sup>175</sup> *Ibid*, p70, Table of Distribution of Call Signs.
- <sup>176</sup> *Ibid*, *Section 2*, p71.
- <sup>177</sup> International Telecommunication Convention Madrid, *General Radiocommunication Regulations, Article 14, Call signs*, (1932) Revision of Cairo (1938) [291] 50, Call Sign Allocation Table.
- <sup>178</sup> International Telecommunication Convention in Atlantic City, *Radio Regulations, Ch VII, Article 19, Section II*, (1947) [419] 92-E.

## A72-38A – A RAAF Wartime Airframe Serial Number Anomaly

- <sup>179</sup> L. Fitzgerald’s log book quoted in “B24 – Liberator Squadrons of Australia Newsletter” #59.
- <sup>180</sup> Comments from Overheu in “B24 – Liberator Squadrons of Australia Newsletter” #56.
- <sup>181</sup> RAAF Form A51, Unit History Sheet, Detail of Operations by 24 Squadron, RAAF, entry for Fen49 in RAAF Unit History Sheets Number 24 Squadron Jun 40 – Dec 60; NAA: A9186, 51.
- <sup>182</sup> RAAF Form A50, Operations Record Book of No. 4 Repair and Salvage Unit, entry of 29/7/44 “B24s Arrival at Pell Strip” in RAAF Unit History Sheets - No 1 RSU [Repair and salvage unit] Higgins Field NT, Mt Druitt and Labuan, 1942-1945 - No 2 RSU Mt Druitt, 1942-1945 - No 3 RSU Aitkenvale, 1944 - No 4 RSU Laverton and Pell Field NT, 1942-1945; NAA:A9186, 372.
- <sup>183</sup> RAAF Form A50, Appendix ‘C’ for August, 1944, *ibid*.
- <sup>184</sup> RAAF Form A50, Appendix ‘B’ for August, 1944, *ibid*.

## Former RAAF Aerodromes Stuart Hwy Pt5

- <sup>185</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>186</sup> Darwin signal A193 of 1607Z, 23MAR42.
- <sup>187</sup> Casualty Repatriation File, Macalister Jack Lyle 390, A16-109; NAA: A705, 166/26/658.
- <sup>188</sup> RAAF Form P/P.24, Personal Record of Service – Officers for Jack Lyle Macalister, 390 in Personal File Macalister Jack Lyle, 390. NAA: A9300, MACALISTER J L.
- <sup>189</sup> Typed document titled, “Flight Lieutenant Jack Lyle MacAlister, No. 390, Distinguished Flying Cross”, n.d., in Personal File Macalister Jack Lyle, 390. NAA: A9300, MACALISTER J L.



- <sup>190</sup> Royal Australian Air Force Honours and Awards, Member of the Order of the British Empire, Flight Lieutenant Jack Lyle MacAlister (390) in Personal File Macalister Jack Lyle, 390. NAA: A9300, MACALISTER J L.
- <sup>191</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>192</sup> North Western Area Aerodromes Finished, Started and Proposed. NAA: A9695, 17.
- <sup>193</sup> RAAF Form A.51, Operations Record Book, Detail of the Work Carried Out by No. 2 Squadron, sheet three, entry for BAT 11/21, Attack MAOBESSI in RAAF Unit History Sheets, Number 2 Squadron May 37 – May 46. NAA: A9186, 5.
- <sup>194</sup> DA/G3/20 Aug (1942).
- <sup>195</sup> Air Reconnaissance Report No.83, No. 2 Squadron, Batchelor NT, dated 22/8/42.
- <sup>196</sup> RAAF Form A.50, Operations Record Book of No. 2 Squadron, entry for Batchelor or 27/9/42 in RAAF Unit History Sheets Number 2 Squadron May 37 – May 46. NAA: A9186, 5.
- <sup>197</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>198</sup> North Western Area Aerodromes Finished, Started and Proposed. NAA: A9695, 17.
- <sup>199</sup> RAAF Form A.50, Operations Record Book of No. 2 Squadron, entry for 30/7/42, Dar.46. in RAAF Unit History Sheets Number 2 Squadron May 37 – May 46. NAA: A9186, 5.
- <sup>200</sup> Presumption of Death of Crew of Hudson Aircraft A16-234, enclosure 264A in Presumption of Death – Casualties in Royal Australian Air Force Units – Minutes. NAA: A705, 166/1/319 PART 3.
- <sup>201</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>202</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>203</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>204</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>205</sup> RAAF Form A50, Operations Record Book of No. 2 G.R. Squadron, entry for Koe pang of Feb. 1 – 16 (1942) in RAAF Unit History Sheets Number 2 Squadron May 37 to May 46. NAA: A9186, 5.
- <sup>206</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>207</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>208</sup> North Western Area Aerodromes Finished, Started and Proposed. NAA: A9695, 17.
- <sup>209</sup> No. 2 B.P.S.O. signal M395 of 15/9 [1942] to Air Board in 414292 Sergeant Dobbs Gilbert Stanley Casualty Repatriation. NAA: A705, 163/103/245.
- <sup>210</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>211</sup> RAAF Form A.51 Unit History Sheet Detail of Operations by No. 13 Squadron, entry for Laha of 12.1.42 in RAAF Unit History Sheets Number 13 Squadron Jun 40 – Dec 45. NAA: A9186, 35.
- <sup>212</sup> RAAF Directorate of Works and Buildings, Engineer Intelligence Section; Airfield Data. NAA: A9716, 7.
- <sup>213</sup> RAAF Directorate of Works and Buildings, Engineer Intelligence Section; Airfield Data. NAA: A9716, 7.
- <sup>214</sup> North Western Area Aerodromes Finished, Started and Proposed. NAA: A9695, 17.
- <sup>215</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>216</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>217</sup> RAAF Form A.51, Unit History Sheet Detail of Operations by No. 13 Squadron, entry for Darwin of 14.4.42 in RAAF Unit History Sheets Number 13 Squadron Jun 40 – Dec 45. NAA: A9186, 35.
- <sup>218</sup> DAR/B1/14 Apr (1942).
- <sup>219</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>220</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>221</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>222</sup> RAAF Form A.51, Unit History Sheet Detail of Operations by No. 13 Squadron, entry for Darwin of 23.4.42 in RAAF Unit History Sheets Number 13 Squadron Jun 40 – Dec 45. NAA: A9186, 35.
- <sup>223</sup> DAR/M2/23 Apr (1942).
- <sup>224</sup> DAR/M1/24 Apr (1942).
- <sup>225</sup> RAAF and Civil Official Lists of Aerodromes, Emergency Landing Grounds and Flying Boat Bases Australia and Territories. NAA: A9716, 1555.
- <sup>226</sup> North Western Area Aerodromes and Landing Strips (Existing and Projected) Named After RAAF and USAAC Pilots Killed or Missing During This War. NAA: A9695, 18.
- <sup>227</sup> RAAF Form A.51 Unit History Sheet Detail of Operations by No. 13 Squadron, entry for Laha of 12.1.42 in RAAF Unit History Sheets Number 13 Squadron Jun 40 – Dec 45. NAA: A9186, 35.

## Notes Regarding No.2 and No.13 Squadron Hudsons

- <sup>228</sup> Hudson Order No.72, Hudson Mk I, III and IV – Installation of Special Radio Equipment in Directorate of Technical Services – Publication of Technical Order – Hudson Order No. 72 – Installation of Special Radio Equipment; NAA: A705, 150/4/2479.
- <sup>229</sup> Wing Commander A.G. Pither, *An Account of the Development and Use of Radar in the Royal Australian Air Force* (1946) 3 via the RAAF Radar Association [www.raafradar.org.au/pdf/Pither\\_RAAF\\_Radar\\_Part1](http://www.raafradar.org.au/pdf/Pither_RAAF_Radar_Part1).
- <sup>230</sup> Ibid p12.
- <sup>231</sup> Ibid p29.
- <sup>232</sup> Directorate of Radio Services (Radar), RAAF Headquarters Melbourne, *ACD 2005(2) Manual of ASV Mk.II (Aust)* (1944) Introduction 7 [3]; NAA: AA1966/5, 377.
- <sup>233</sup> Ibid ch 1 1.
- <sup>234</sup> Ibid ch 4 1.
- <sup>235</sup> Ibid ch 1 1 [2].
- <sup>236</sup> Ibid ch 1 1 [5].
- <sup>237</sup> Ibid ch 1 6 [17].
- <sup>238</sup> Ibid Introduction 7 [7].
- <sup>239</sup> Ibid ch 6 1 [2].
- <sup>240</sup> Ibid ch 6 7 [18].
- <sup>241</sup> Ibid ch 6 1 [3].
- <sup>242</sup> Introduction, Hudson Order No.56, Hudson III – Installation of Exhaust Flame Dampers in HQ Technical Section Technical Order – Publication – Hudson Order No.56, Hudson III – Installation of Exhaust Flame Dampers; NAA: A705, 150/4/1868.