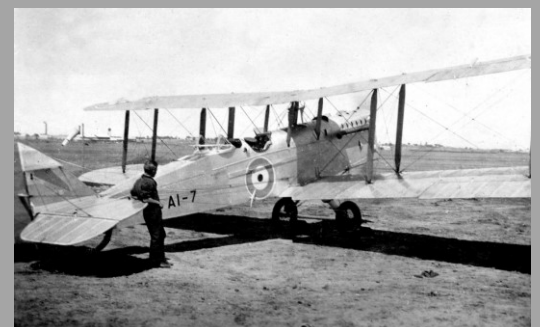




# ADF-Serials Telegraph



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Articles for those interested in Australian Military Aircraft History and Serials

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

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

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## In This Issue:

Page#	Title
4	Douglas DB-7/A-20 in RAAF Service, Part 1: DB-7B/Boston III by Mark Harbour
29	RAAF WWII in Colour, No.10 – RAAF Wackett Trainers by John Bennett
71	Notes Regarding No.18(NEI)SQN B-25s by Garry Shepherdson
102	Curtiss Corner: P-40D/E/E-1, Happy 80 <sup>th</sup> Birthday by Gordon Birkett
107	End Notes

**We put a little tribute message for the RAAF Centenary in last issue, but here, to mark the actual date, let us say, “Happy 100<sup>th</sup> Birthday, RAAF!”**

**Special Thanks:**  
Juanita Franzi, Aero Illustrations

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

# Douglas DB-7/A-20 in RAAF Service.

## Part 1: DB-7B/Boston III.

Mark Harbour

The Douglas DB-7 series of Light Attack/Bombers, first designed in 1935, was one of the foremost Light/Attack Bombers used by the Allies in WW2. The DB-7 series was the only Light/Attack bomber used by the Allies in front line use thru the whole of WW2.

The DB-7 was first designed and build for the French from the Douglas Model 7B, and also ordered by the Belgians. The original DB-7 had 1200 HP P&W R1830 Twin Wasp engines, while having good performance the French wanted more: improving the airframe, fitting a larger fin and fitting 1600 HP Wright R2600 Twin Cyclone engines this became the DB-7A, the USAAC showed interest in this version and was further improved with a new nose and, with other airframe improvements, became the A-20.

With the fall of France, large numbers of DB-7s escaped to the UK and were taken over by the RAF. The British gave it the name of Boston I and the 100 new improved DB-7A which never made it to France before it fell but delivered to the UK, the Boston II. The British liked the DB-7 but wanted more improvements and various British mods, radios etc. The version designed for the British was based on the new USAAC A-20 and called the DB-7B Boston III, the British ordered two batches of 150 Boston IIIs (W8252 to W8401 and Z2155 to Z2304 serial series) and converted an outstanding French order taken over by the RAF for 480 DB-7s to the DB-7B version (due to Douglas reaching full capacity building aircraft, the order was split between Boeing (serials AL263 to AL502) and Douglas (serials AL668 to AL907), building 240 aircraft each) while these aircraft were the same as the original order of 300 DB-7Bs they were referred to as DB-7-3 as they were the converted French order the RAF took over, this batch of 480 DB-7B Boston IIIs was to contain 22 Boston IIIs operated by Number 22 Squadron, RAAF (22SQN).

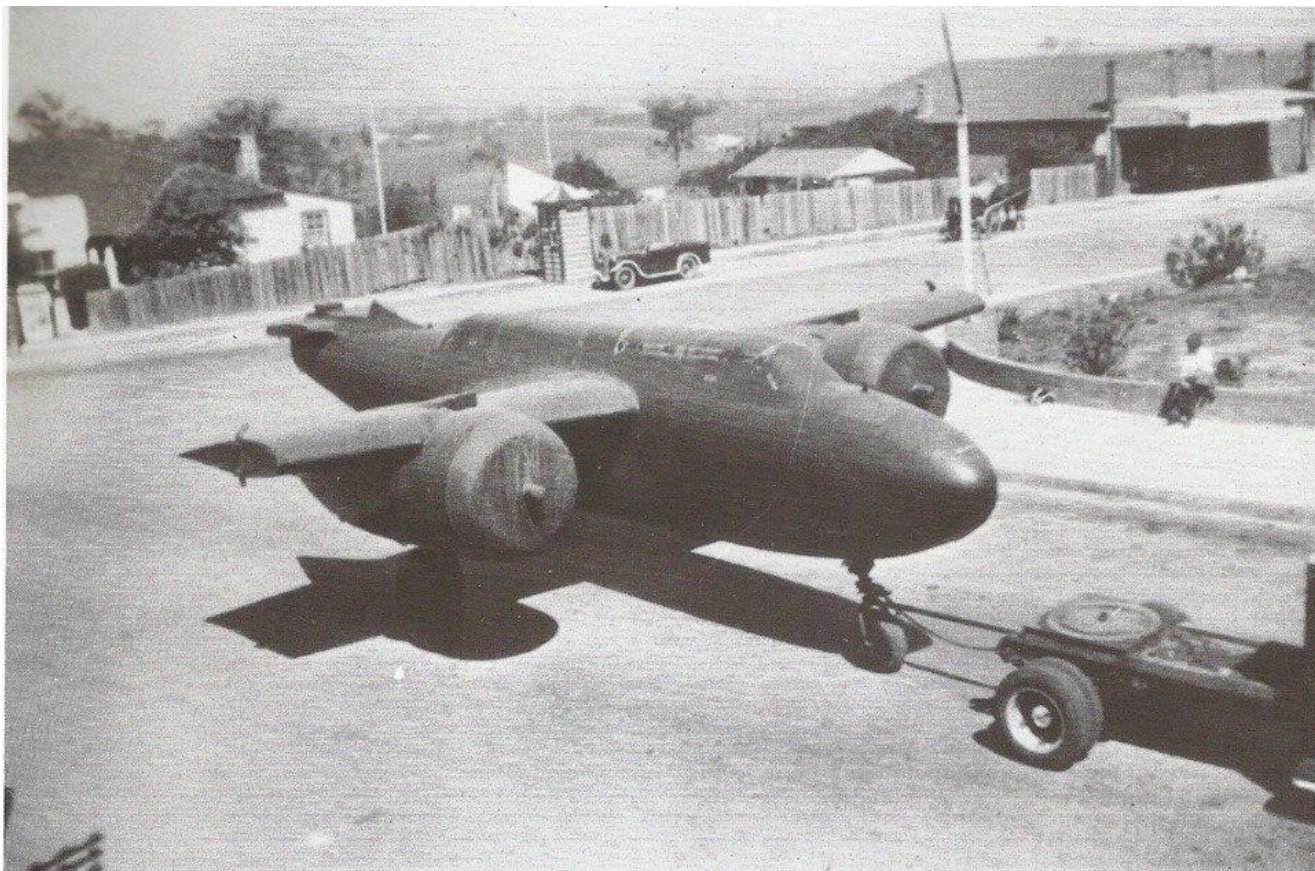
Australia's association with the Boston was initiated by events in the Dutch East Indies. The Dutch Navy had ordered 80 DB-7 Boston from the US in a frantic attempt to modernise the MLD before the war with Japan. Of this order, 32 were DB-7Bs diverted from a British order and 48 were DB-7Cs build to a Dutch spec with interchangeable solid 4 x 20mm cannon noses and bomb aimer noses with automatic deploying life rafts and equipped to carry torpedoes. These 48 DB-7Cs were not completed before the fall of the Dutch East Indies and were completed to DB-7B specs and delivered to the USSR.

Of the 32 DB-7Bs dispatched from the US only six were to make it to Java before the Dutch capitulation and only one was made flyable. The Japanese subsequently captured these six and got 2 and possibly 3 of them flying, two with the IJAAF test unit and one with the IJNAF test unit. This last aircraft (AL904) was recovered at Atsugi Naval Air Base in Japan after the war. Of the remaining 26, four still on freighters in the Pacific when the Dutch East Indies fell returned to the US and these aircraft were taken on as training aircraft with the USAAC. The remaining 22 on five refugee ships landed in Australia after the fall of Java, 9 arriving in Melbourne and transported to 1AD Laverton for assembly on 29MAR42, 5 arriving in Sydney and towed to 2AD Richmond on 06APR42 and the remaining 8 also into Sydney and towed to 2AD Richmond 13APR42. These 22 DB-7B Boston IIIs were issued to 22SQN in April 1942, and were the first of 69 Boston to be operated by the RAAF.

The introduction of the Boston presented numerous problems: no manuals, no organised training and no tooling. This was exacerbated by the complete lack of understanding or interest in the capability of the aircraft by RAAF HQ. The first problem was tooling. When 2AD and 22SQN said they needed tools for the Boston, RAAF HQ responded with, "you already have tools from Anson and other aircraft [they maintained], use those".<sup>1</sup> RAAF HQ had no understanding of the difference in hardware and hand tools between UK and US built equipment. The UK used British Standard Whitworth (BSW) tools and hardware while the US used Society of Automotive Engineers (SAE) tooling and hardware, the two are not interchangeable.

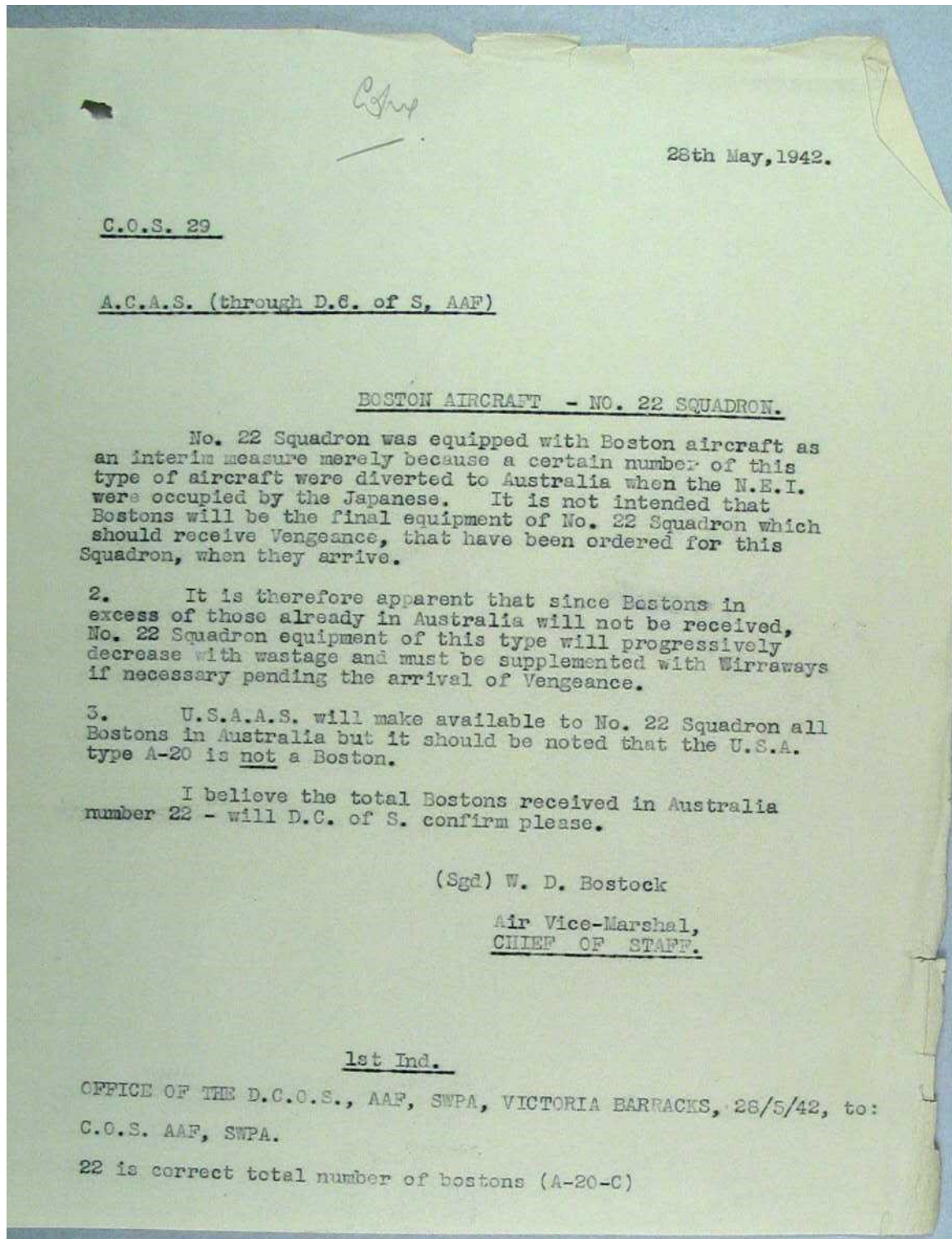
Pilot training was another issue, none of the RAAF Pilots at Richmond at this time had flown a high-performance tricycle undercarriage aircraft. This lack of training and experience led to the loss of A28-2 in May, when, only a month

after issue to 22SQN, it crashed whilst attempting to take off. The cause was attributed to be the lack of experience of the pilot in taking-off in a tricycle undercarriage aircraft. A28-19 was also lost when, during engine runs post assembly, it had an engine fire which wrote off the aircraft. The Sqn hadn't even converted to the Boston and they had already written off two aircraft (although these two aircraft then became the primary source of spares for the remaining Boston).



**DB-7B being towed thru Windsor, NSW, from Sydney docks to RAAF Base Richmond for assembly April, 1942. [22 Squadron Association].**

These aircraft were unwanted and unexpected by the RAAF and were only put into service in desperation, in fact they were only considered an interim aircraft until previously ordered Vultee Vengeance Dive Bombers arrived in Australia. These Boston were brand new built advanced aircraft, faster and more advanced than anything currently in RAAF service, these were also the first aircraft in the RAAF with tricycle undercarriage and were to be the RAAF's premium strike/attack aircraft for almost the next two years until large numbers of Beaufighters became available.



Document on use of Boston and eventual replacement. [NAA: A11093, 452/A28].

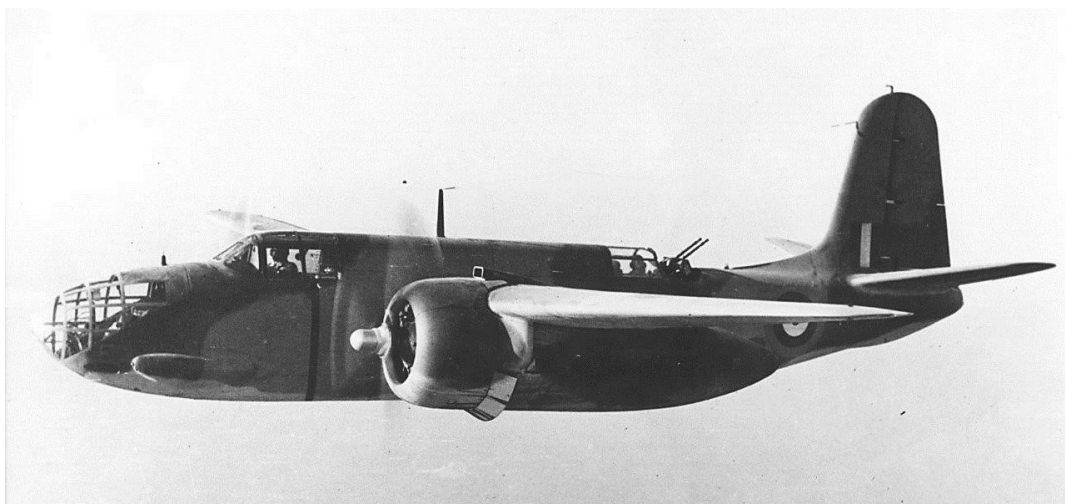
After assembly for a short time 10 were issued on paper to the newly formed Number 18 (Netherlands East Indies) Squadron, RAAF, (18(NEI)SQN), as the aircraft actually belonged to the NEI Government; 8 x A-20As were also issued to 18(NEI)SQN from newly assembled aircraft with the USAAF 3<sup>rd</sup> BG in Melbourne in exchange for B-25s earmarked for the Dutch but taken by the US 3<sup>rd</sup> BG. But the Dutch no longer wanted the Boston as their range was too short for

operations over the NEI from Australia and opted for B-25s instead, also 18(NEI)SQN had no pilots checked out in the DB-7/A-20. The Dutch relinquished ownership of the Boston to the RAAF. Accordingly, these 10 DB-7Bs had their transfer cancelled and returned to 22SQN and the A-20As similarly returned to the 89<sup>th</sup> BS. The US A-20's which made it to Canberra were actually flown back to Melbourne by 22SQN crews.

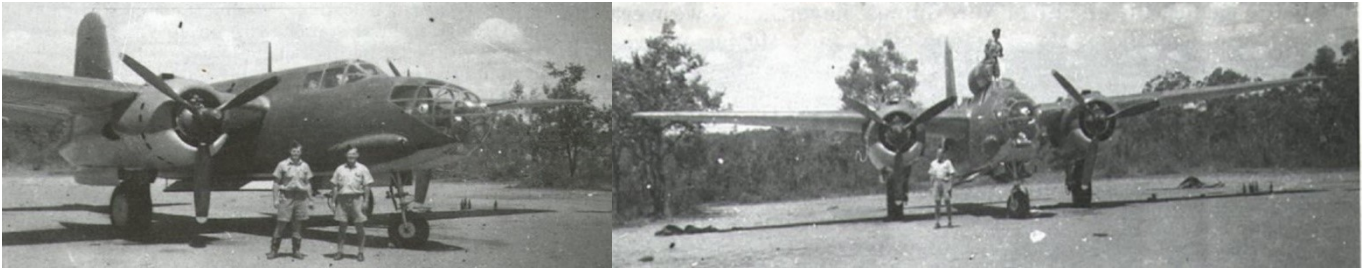
22SQN carried out anti-submarine patrols along the NSW coast between May and Sep, 42, as the Squadron became operational on the Boston and prepared for deployment for operations in New Guinea.



Newly assembled DB-7B Boston III at 2AD Richmond, new Wright Cyclone Engines removed for modification to be refitted to Bostons. [Daniel Cox collection].

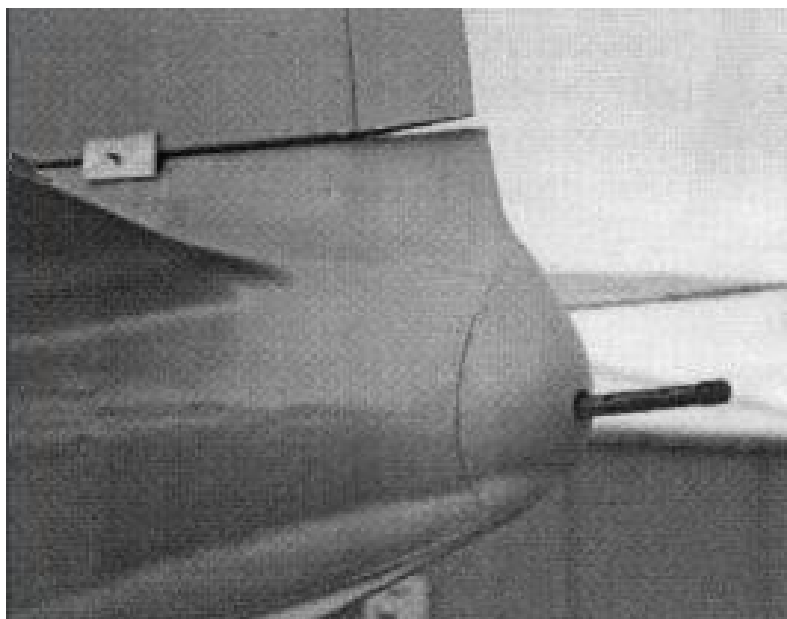


Newly assembled DB-7B Boston III flying over Richmond. [22 Squadron Association].

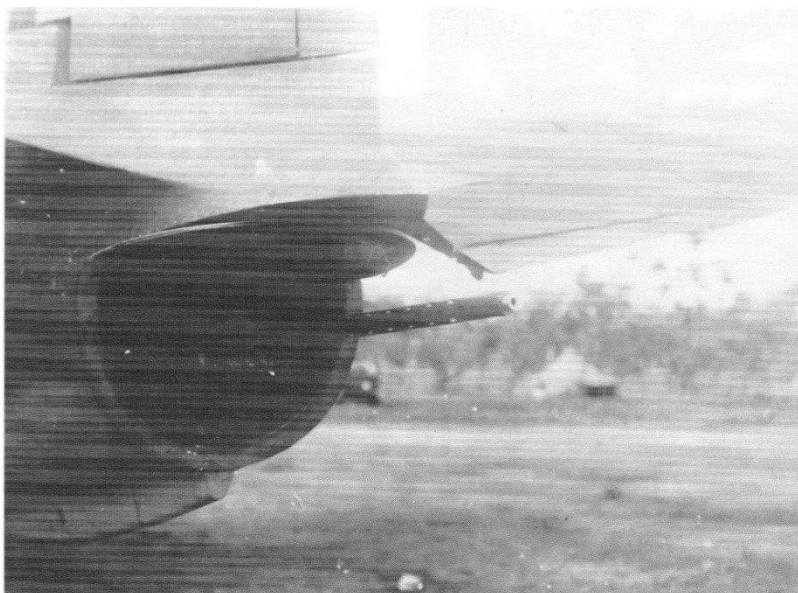


**DB-7Bs in Charters Towers pre modification to Strafer, note .303 Browning added to nose. [22 Squadron Association].**

The Squadron forward deployed to Charters Towers in September, 1942, in preparation for the onwards move to New Guinea. It was at this time that .303 Brownings were added to a ball mount in the nose and fixed in the tails of most Boston. As the Boston was originally to be operated in the light bombardment role, bombing in formation from medium altitude, experience in the Middle East had shown that the Boston were found to have a blind spot directly behind the aircraft which made them susceptible to attack directly behind by enemy fighters. At least 10 Boston had tail guns fitted and A28-14 "P" had a .50 Browning fitted. These tail guns were removed from all the Boston by mid-1943, as they proved to be of no use in the low level attack role and the 100 plus pounds of the installation was better removed.



**A28-8 "J" with single .303 fitted. [Gary Byk collection].**



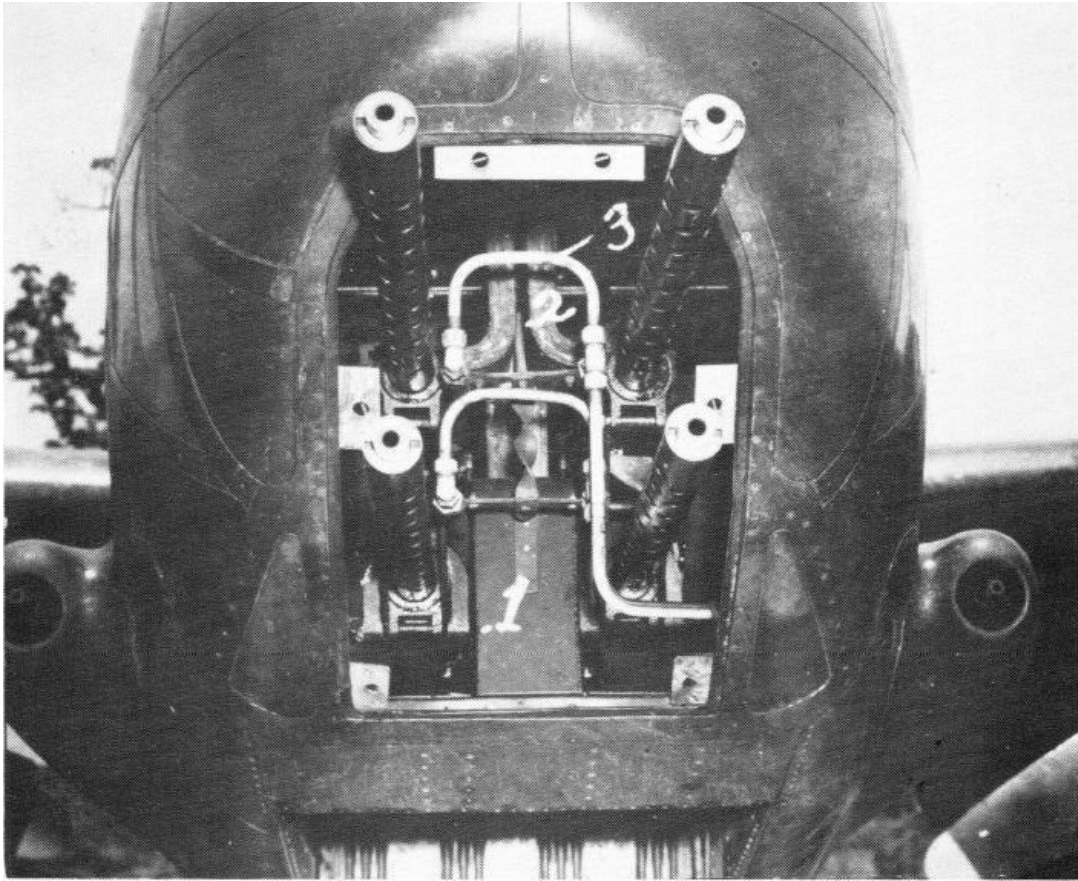
**A28-14 "P" with experimental .50 fitted. [22 Squadron Association].**



When the innovative Captain “Pappy” Gunn of the USAAF developed strafers kits for B-25 and A-20, it transformed these Medium and Light level bombers into highly efficient low level attack aircraft. The modification consisted of removing the Navigator/Bomb Aimer from the nose and in his place installing a battery of 4 x .50 MGs and ammunition. This took the nose armament in the Boston to 4 x .303 in the cheek positions and 4 x .50 thru where the bomb aimer glass was. The CO at the time, Squadron Leader R .E. Bell, an experienced pilot with considerable combat experience with 8SQN flying Hudson aircraft in the desperate fighting thru Malaya, Singapore and Java, realised that the role of light bomber in New Guinea was not ideal for the Boston as most combat was low-level precision attack not medium altitude straight and level bombing. He, together with Group Captain Garrison, RAAF Commander in Port Moresby, decided to get 22SQN’s Boston onto the end of the USAAF modification program, at that time being carried out to 3<sup>rd</sup> BG A-20s at Townsville and Amberley with kits made up at Amberley. Thru October, 1942, Boston were flown in batches to Amberley to be modified to strafers. As Navigators were longer needed, they were posted out. This modification caused the deployment to NG to be delayed a month, RAAF HQ in Melbourne found out about this delay and the subsequent unauthorised modification program, and carried out an investigation. Subsequently, SQNLDR Bell was found to have acted beyond his responsibilities and was issued with a letter of reprimand on his file and subsequently removed as CO. This letter may have slowed his career, but he eventually became CO of 24SQN flying B-24 Liberators and commanded the Governor-Generals Flight after the war and was awarded the DFC and AFC; he retired a Group Captain in 1961.



**DB-7B Boston after modification to a straffer, 4 x .50 MGs thru nose and 4 x .303 MG cheek guns. [22 Squadron Association].**



A-20A/DB-7B .50 installation. [22 Squadron Association].



The same mounts and installation were used in A-20A/DB-7B and B-25C/D for Pappy Gunn's 4 x .50 installation. This is a B-25C/D .50 installation. [22 Squadron Association].

MEMORANDUM A.O.C.re 22 SQUADRON

Spoke to D. Arm. (W/C Hannah). He understood the re-armament had been arranged by North Eastern Area themselves. On his recent visit to Townsville Area, Armament Officer (W/C Garrison) had mentioned the matter; he took the view that people on the spot consider it a good thing to do but was content to agree. The modification could be installed under Squadron arrangements if the Squadron was provided with the guns and gun mountings. The modification washes out the bomb aimer's position in the nose of the machine, and makes it unsuitable for high level bombing, but in view of the role allotted to the American counterpart of 22 Squadron, it seemed that A.20's would be used for low level attack.

2. Subsequently spoke to W/C Garrison, who said the proposed originated with Squadron Commander, who put it up to S.A.S.O., and was told to go ahead. Intention had been to instal the necessary modification during the period this Squadron was waiting at Townsville. He estimated that Amberley could make the necessary installations at the rate of one machine a day. I told him there was urgent need for this Squadron at Maple; he said he would contact Amberley forthwith, and let me know early this afternoon what was the earliest day by which the 7 now at Amberley and the 5 en route could be available at Maple.

3. The damage appears to have been done. Apparently the re-armament was inspired by the example of the Americans, and no doubt it had the blessing of A.O.C. North Eastern Area. Suggest that either S.A.S.O. takes up the matter with S.A.S.O., N.E.A. or you may care to discuss with A.O.C. yourself. The main point appears to be that, excellent as the modification may be, it entailed delay in making the Squadron operationally available to 5th Air Force. The principle is clear, i.e. that R.A.A.F. Command should be advised of any circumstances which make it impracticable for a Squadron to comply with its operation orders.

4. W/C Garrison subsequently telephoned to say that 22 Squadron could not be expected at Maple until 3/11; this was the reason for sending 5 aircraft down to Amberley to re-arm. The position now was that 3 aircraft were at Maple, 7 more now at Amberley should reach Maple by 1/11, and 5 more should be ready a few days after. He understood the balance of the aircraft (2 at Richmond, 1 at Wagga) would not be fitted with the modification.

(Sgd) C.A.B. S/Idr.  
S.O.A.

30.10.42.

*Information Copy.*

*Action Copy and 400 51. —*

*Modifications - Aircraft*

This Strafer conversion for the 4 x .50's and mounts when fitted added approx. 250-lb to the aircraft and 200 rounds per gun added approximately 600-lb's, this aircraft weight increase decreased the bomb load from 2000-lb down to 1500-lb; the usual bomb load being 2 x 250-lb Semi Armour Piercing or Medium Capacity bombs and 2 x 500-lb Medium Capacity bombs. The Semi Armour Piercing bombs were used in the anti-shipping role.

Four aircraft were lost before operations started. A28-2 to a fire, -17 crashed at Richmond, -19 crashed in south east Queensland and A28-12 was blown up by its own 20-lb bombs during a training flight. Two more were lost soon after operations commenced when, in separate incidents, 20-lb Anti-Personnel bombs blew up shortly after release destroying both A28-20 and -22 and killing their crews. Rumours spread that the problem with the 20-lb bombs had happened overseas and was known about but this was denied by RAAF HQ, 20-lb bombs had blown up under Blenheim aircraft but had not been dropped before by Boston.

R.A.A.F. Form A. 14.  
(R.A.F. Form 683)  
(Revised October, 1941.)

**CYPHER MESSAGE**

986

Serial No. \_\_\_\_\_

This Message must not be referred to in any but Cypher Messages.

<b>TO</b> 9 OPERATIONAL GROUP REPEAT RAAF COMMAND HQ N/E AREA 22 SQUADRON	<b>T.O.O.</b> 0450/Z/5  <b>Time of</b> <b>TRANS.</b> 1322/Z/5 <b>                  </b> <b>DEPART.</b> 1557/Z/5
<b>FROM</b> RAAF HQ MELBOURNE	<b>System</b>

R 657 5TH DEC.

130

IN REPLY R 650 1 DEC. BOSTON AIRCRAFT REFERENCE FIRST SENTENCE MY MESSAGE QUOTE ABOVE (.) REGRET THIS STATEMENT INDICATED THAT ACCIDENT OF SIMILAR NATURE RECURRED WITH BOSTONS OVERSEAS (.) THIS IS NOT REPEAT NOT SO (.) INFORMATION HELD HERE INDICATED THAT ACCIDENTS HAVE OCCURRED OVERSEAS IN WHICH IT IS SUSPECTED THAT BOMBS JOSTLING AND STRIKING EACH OTHER ON RELEASE FROM SMALL BOMB CONTAINER MAY HAVE CAUSED ACCIDENT (.) NO REPEAT NO REFERENCE HOWEVER MADE TO BOSTONS IN THIS INFORMATION (.) FOR INFORMATION AIR MINISTRY HAVE BEEN REQUESTED FOR FULL DETAILS OF ANY SIMILAR ACCIDENTS (.) YOU WILL BE ADVISED ON RECEIPT OF THIS INFORMATION .

**ACTION** SASO

**20 lb Bombs Incidents, Cypher Message.** [NAA: A11093, 452/A28].

22SQN started 1943 already down to a total of 14 Boston in Port Moresby and 2 in Australia. The Squadron was to operate at a hectic rate right through 1943, including participating in the Battle of the Bismarck Sea and multiple raids on Lae and Salamaua, culminating in the award of the V.C. to Flt Lt W.E (Bill) Newton for two destructive raids on Salamaua, on 16MAR43 in A28-7/H and the mission he was shot down on: 18MAR43 in A28-3/C. The Squadron moved from Port Moresby to Vivigani Strip on Goodenough Island in July, 1943, when operations to New Britain became the priority. The Squadron moved again to Kiriwina Strip, Trobriand Islands during mid-November, 1943, and to Kamiri Strip, Noemfoor Island, Dutch NG in mid-July, 1944 and finally to Morotai in mid-November, 1944. After the losses of

mid-September by October 1943 the Sqn was in a desperate situation with aircraft and down to six operational Boston and 2 undergoing major repairs in Australia, this was rectified by a transfer of A-20A's from the 89<sup>th</sup>BS, 3<sup>rd</sup> BG and used A-20Cs from the US. The A-20Cs became the primary aircraft with the DB-7Bs, still filling an important part of the Squadron. By mid-1944, with the arrival on new A-20Gs, the DB-7Bs had dropped into a training role until the Squadron was almost wiped out by the Japanese raid on Morotai on 22NOV44. The remaining surplus DB-7Bs were then converted to components in February, 1945. Thus ending the RAAF association with the A-20/ DB-7B Boston.

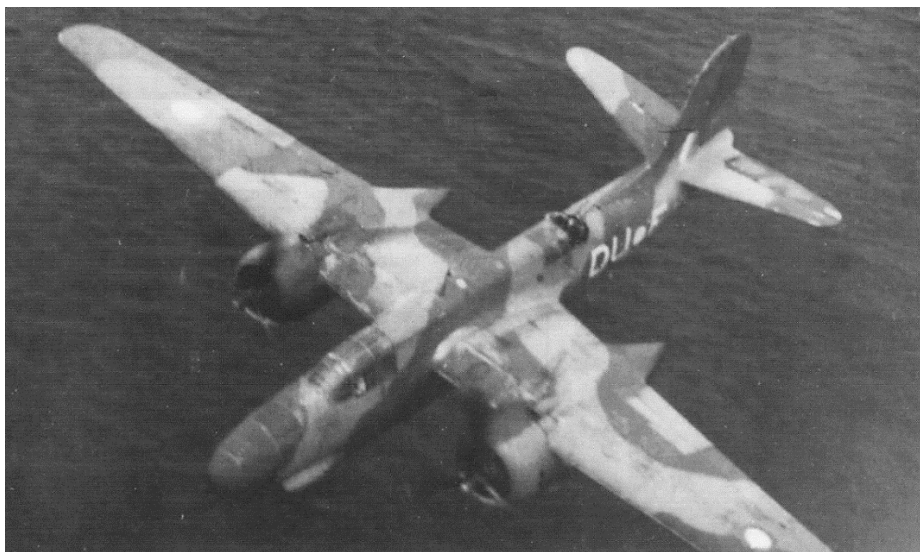
## Camouflage and Markings

When they arrived in Australia, the DB-7Bs were new aircraft diverted for the Dutch East Indies Navy from the tail end of an RAF order. They were in standard RAF scheme of Dark Green/Dark Earth over Sky (Type S). The RAF markings were over painted with Dutch orange triangles applied to fuselage sides and lower wings. RAF markings which were the standard for the RAAF at the time were reapplied over the Dutch markings. No roundels were applied under wing initially, and RAAF "A28" serial numbers were applied over the RAF "AL" serial numbers. The yellow surround to the fuselage roundels were soon removed and, before deployment to New Guinea, all red was removed from the national markings and under wing roundels applied. In January, 1943, roundel size was reduced with 48" upper wing roundels being reduced to 24" with the white staying the same size. Serials were in black and squadron codes (36") in white or RAAF Sky Blue (still some conjecture as to which, but the RAAF Sky Blue fades to near white very quickly in the tropics). In mid-1943, two letter squadron codes were applied (DU) these were 24" high and also in white or RAAF Sky Blue. Roundels were standardised at 24", 5:3 ratio. The DB-7Bs stayed in the standard scheme of DG/DE over Sky their whole lives until June, 1944, when a new RAAF scheme of all over Foliage Green came into effect. Roundels were changed to 48", 5:2 ratio.

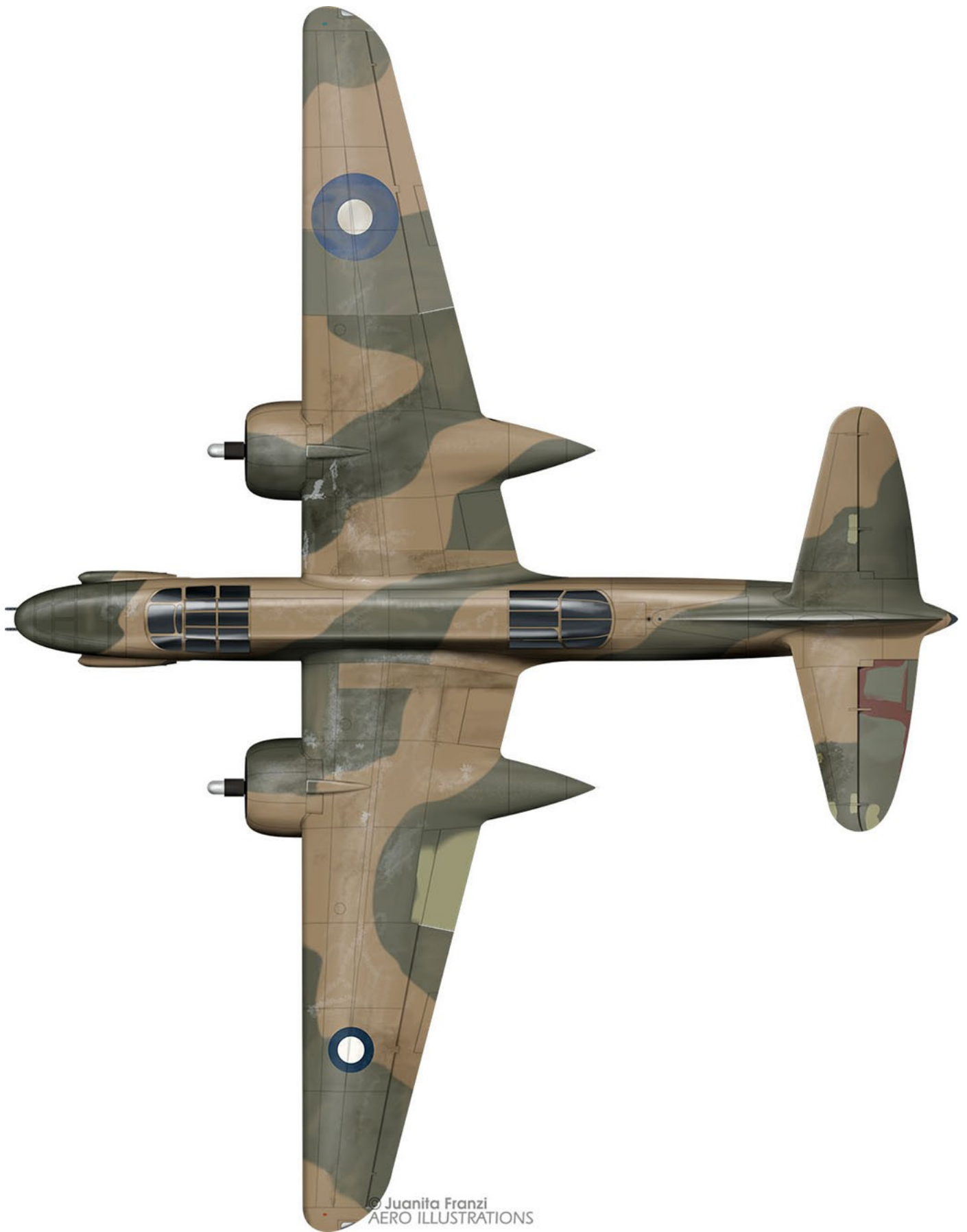
## Variations

As DB-7Bs crash landed on a regular basis (some aircraft 3-4 times in their careers), the Sky (Type S) on lower surfaces was repainted with RAAF Sky Blue. The Dark Green and Dark Earth was only repainted when absolutely necessary with the aircraft getting very faded and rough looking before the reapplication of Foliage Green in July, 1944. Foliage Green was generally not used on the DB-7Bs for touch-ups, but Dark Green. The freshly applied patches of Dark Green looking much darker in B&W photo's than the original faded paint giving the impression of the use of Foliage Green being applied.

See image below of A28-5/DU-F, which had its right wing replaced in September, 1943, with the wing of A28-4/E, which crashed in JAN43 and converted to components. Note the excessive fading of the right hand wing, and the pre-JAN43 roundel size on the right wing.



**A28-5/DU-F repaired after AA damage 03SEP43, R/H outer wing replaced, L/H Flap replaced and repairs to tail assembly. [Peter Malone collection].**



Artwork of the above photo showing the heavily faded outer R/H wing and damage repairs to the L/H flap and L/H horizontal stab and elevator. [Copyright Juanita Franzi, Aero Illustrations].



Wing Commander Keith Hampshire with crew Sgt A.C.Taylor and FSgt J.G.Barden beside A28-15 "Spirit Of Sport", the aircraft usually associated with Bill Newton. WGCDR Hampshire flew A28-15 on 10DEC42, several days before it crash-landed at Port Moresby and was out of action for repairs till early MAR43. [AWM].



Artwork on opposite side of nose A28-15. [22 Squadron Association].

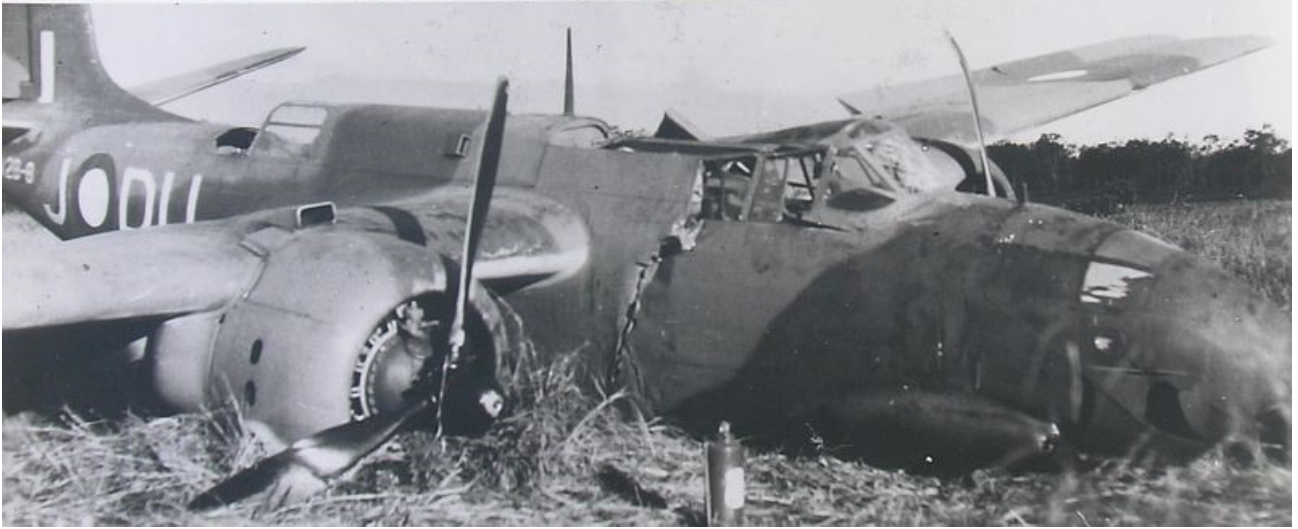


A28-8 "J", A28-16 "R", A28-15 "Q" and A28-5 "F" flying together early April, 1943. Note "Hedge Hog" exhaust fitted for night operations, in early 1943, 22SQN did operations taking off at night and arriving over the target at daybreak, these were instigated by WGCDR Hampshire but were not popular with the crews as the Boston had no navigator or navigation capability. Many of the crews voiced their displeasure to WGCDR Hampshire as they felt those jobs more in line with the night capability of the Beaufort. [22 Squadron Association].

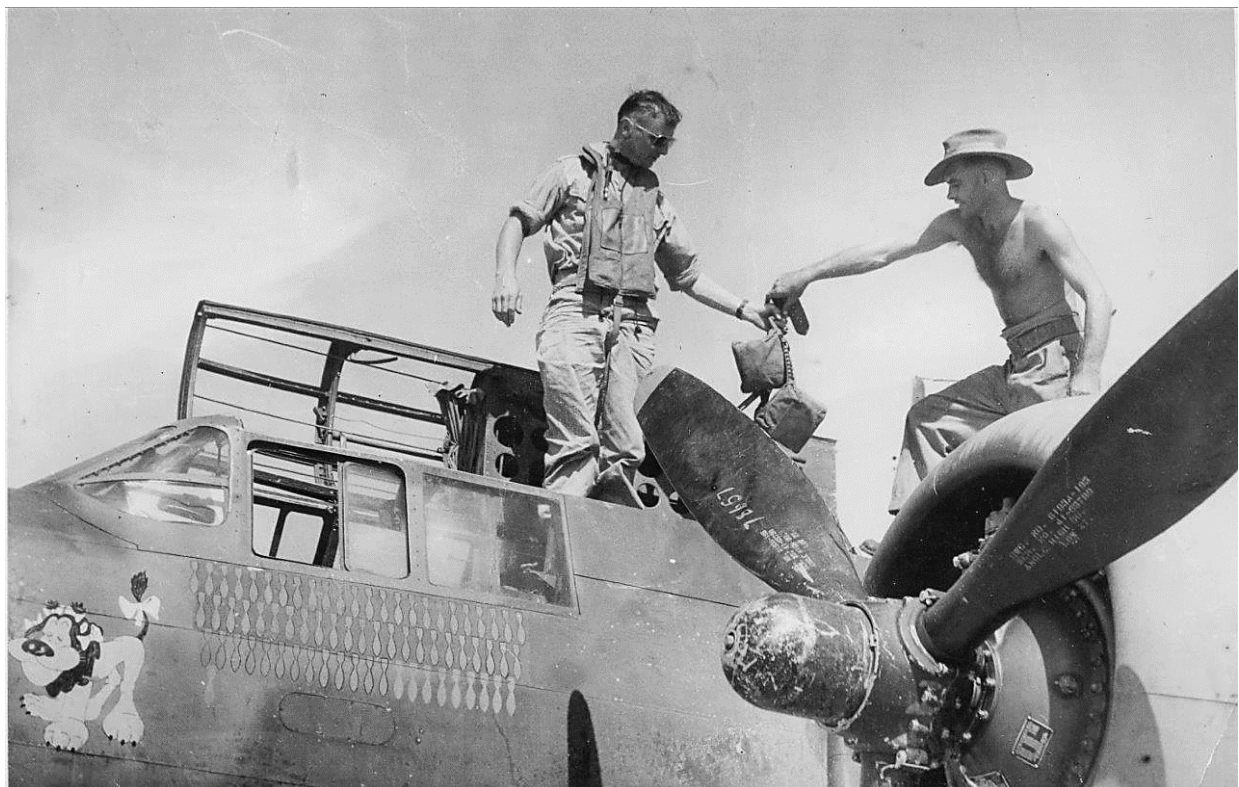


A28-8/DU-J after crash landing Goodenough Island, 12SEP43. FLGOFF Harry Rowell, pilot in cockpit, and CO WGCDR Charles Learmonth, beside aircraft. [22 Squadron Association].





More views of the crash that wrote off A28-8/22-9, Goodenough Island. A28-8 had its hydraulics shot out over Gasmata, New Britain. [22 Squadron Association].



Commanding Officer Wing Commander J.G.Emerton on returning from a strike mission in A28-8 "She's Apples", Kiriwina Dec, 1943. [AWM].



Multiple aircraft strike on Gogosi, Kiava and Bialla Plantations, New Britain, 24MAR44, with A28-18/DU-Y, A28-9/DU-K, A28-5/DU-F and A28-30/DU-W visible. Other participating aircraft were A28-10/DU-L, A28-7/DU-H, A28-25/DU-N and A28-28/DU-U. [22 Squadron Association].

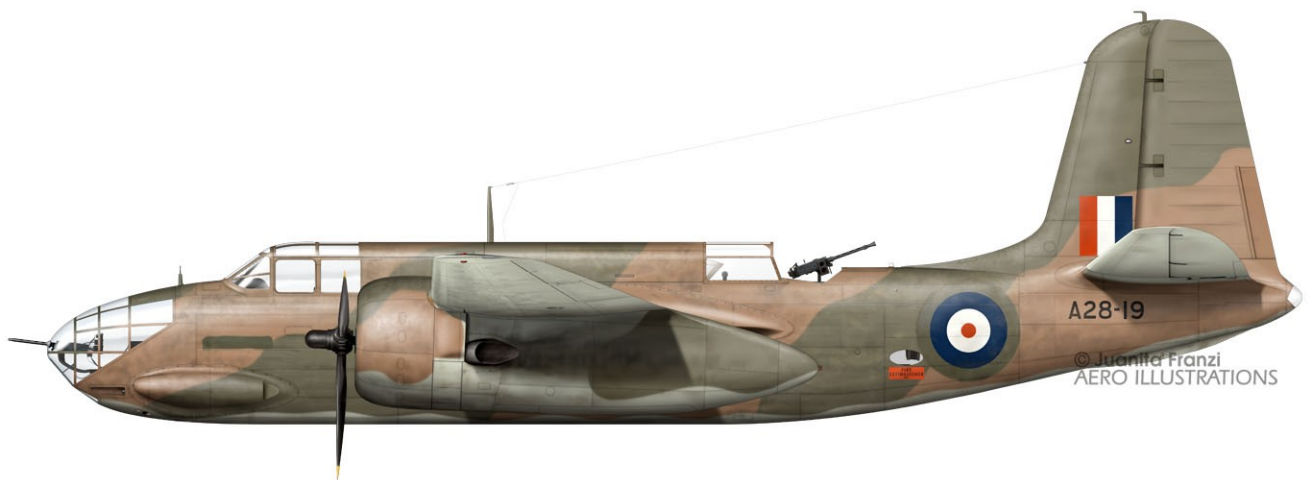
In JUL 1944, the remaining DB-7Bs were crudely repainted in the all over Foliage Green scheme.



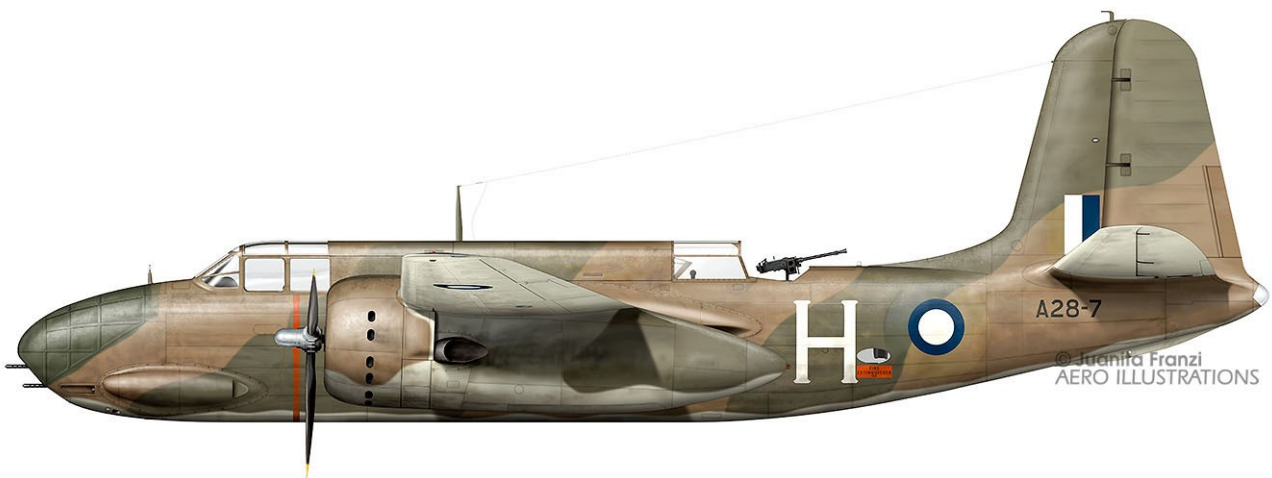
Newly applied Foliage Green to one of the high time DB-7Bs (A28-5,6 or 9), Note: Dark Earth from previous scheme breaking thru thinly applied Foliage Green. Noemfoor July 1944. [AWM].



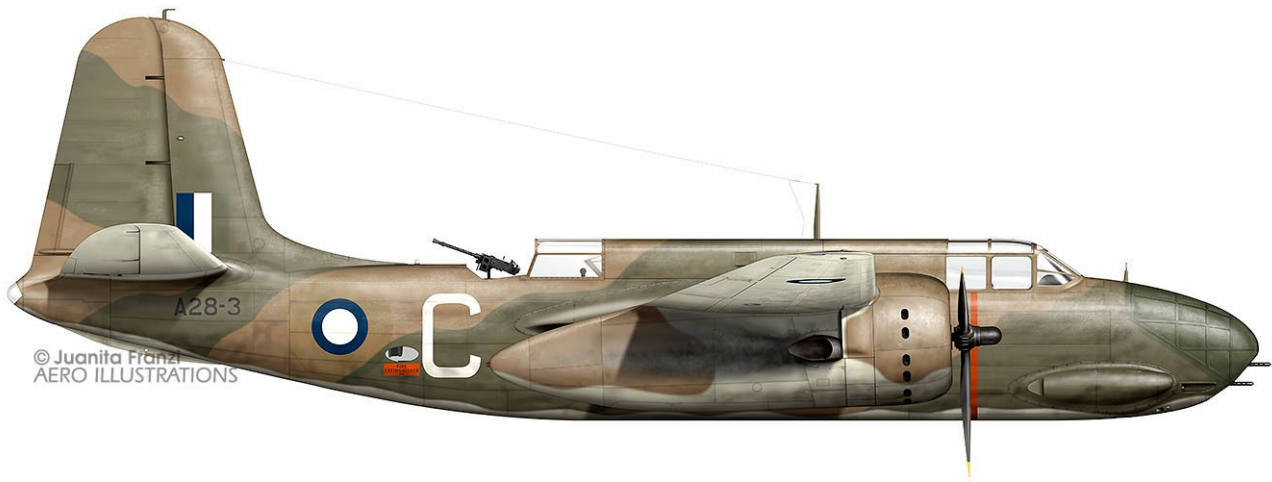
The three remaining DB-7Bs (A28-5, -9 and -10) in all over Foliage Green scheme after the Japanese raid on Morotai 22NOV44. [Craig Busby collection].



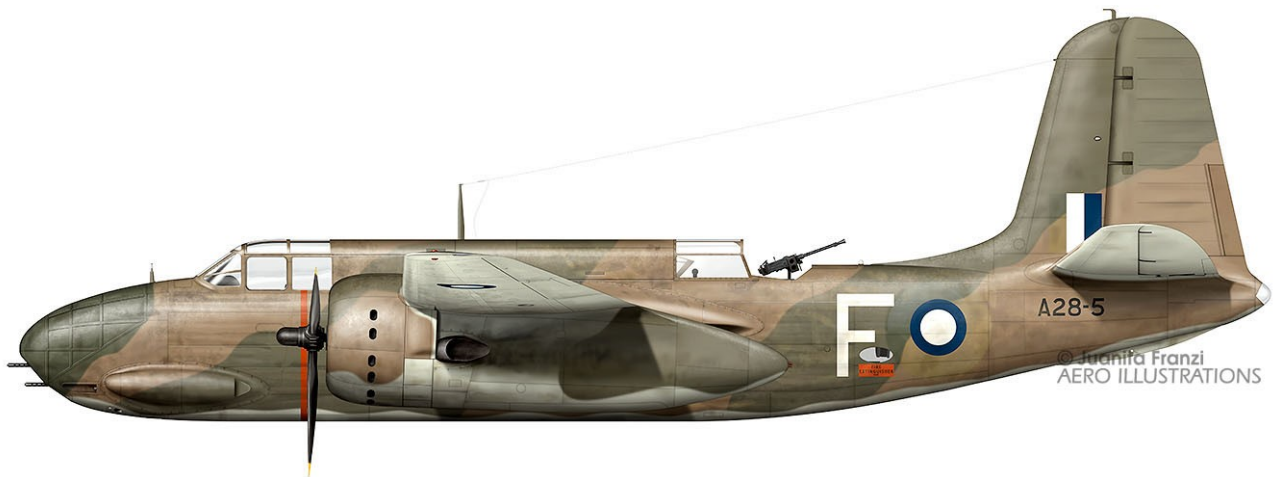
A28-19, September, 1942, before Gunship conversions carried out. This aircraft was based at Amberley in the training role hence still having red in the national markings (including tops of wing), although the yellow had been painted out on the fuselage roundels. The cooling vents are still fitted to the engine cowls and had the extra nose gun fitted but not the tail gun mod. This aircraft belly landed at Woodford near Caboolture, QLD, on 12OCT42, and was damaged beyond repair. It was then used as a spares supply for the Boston fleet. Standard scheme as delivered Dark Green/Dark Earth over Sky. [Copyright Juanita Franzi, Aero Illustrations].



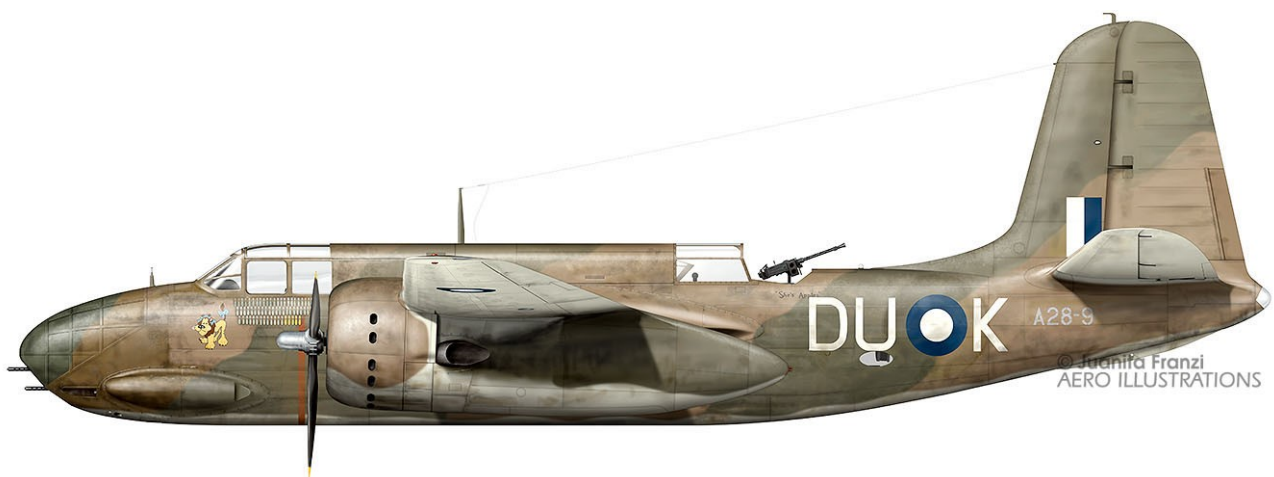
A28-7/H, the aircraft flown by Bill Newton on his 16MAR43 mission to Salamaua. This aircraft was extensively damaged during the attack with one engine shot out, tyres punctured and the main wing spar shot thru. Newton flew the aircraft back to Port Moresby on one engine and landed it without further damage. It required a new wing, engine and undercarriage and was out of action for more than 3 months. [Copyright Juanita Franzi, Aero Illustrations].



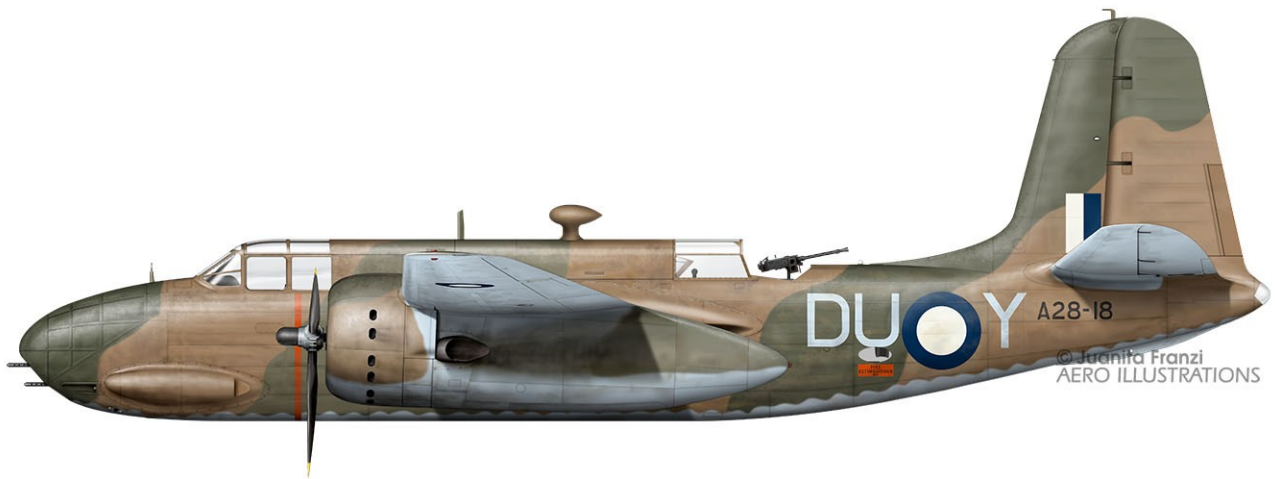
**A28-3/C**, the aircraft flown by Bill Newton on his 18MAR43 Mission to Salamaua when he was shot down. Unlike the mission on the 16<sup>th</sup>, the bomb load in this aircraft had the wrong fuses fitted. The 16MAR mission had delayed action fuses fitted to the bombs allowing a low level attack. On the 18MAR mission, instantaneous fuses had been fitted requiring a high level diving attack which put him right in the middle of the Japanese 75mm Anti Aircraft Artillery at ideal range. The aircraft was hit badly, losing an engine, but Newton pressed on dropping his bombs on target before ditching several miles from Salamaua. [Copyright Juanita Franzi, Aero Illustrations].



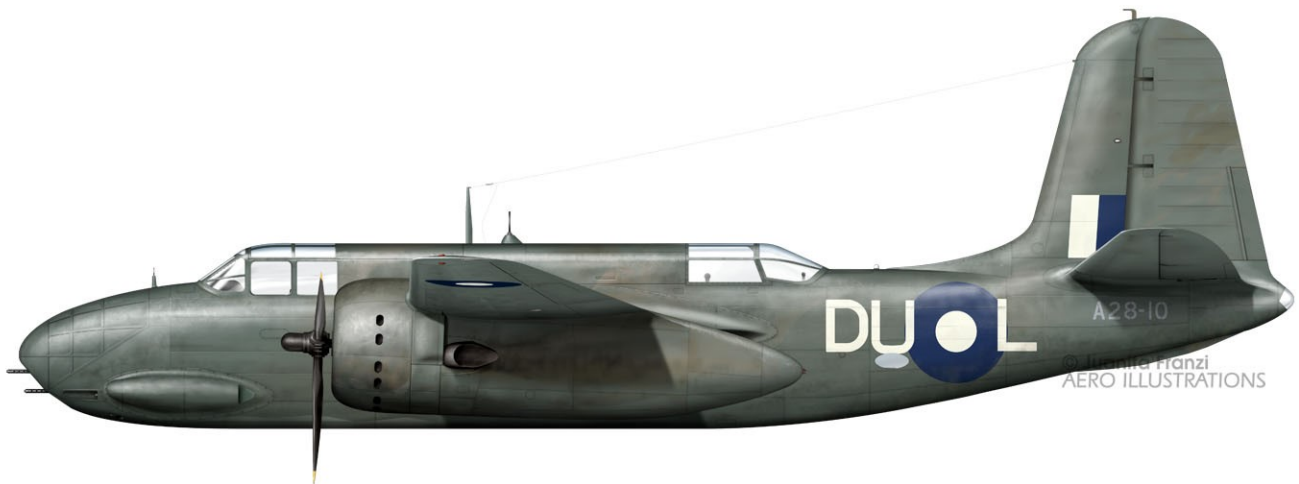
**A28-5/F**, the usual aircraft of Bob Wines. He was also on both Salamaua raids with Bill Newton. Bill Wines gunners dropped lifejackets to Bill Newton and John Lyon in the water as they swam ashore after ditching. [Juanita Franzi, Aero Illustrations].



**A28-9/DU-K**, "*SHE'S APPLES*", the usual aircraft of Wing Commander Learmonth. This aircraft flew a total of 77 missions in its operational life, with Learmonth flying 50 of them, before it was scrapped on Morotai in early 1945. It received the name "*SHE'S APPLES*" because it was so reliable. When ground crew asked Learmonth after a mission how the aircraft was, his usual reply was "she's apples". With 60 missions marked on the aircraft, gives an approx. date of Aug 43 when based on Goodenough Island. The "DU" codes were added to 225SQN Boston about the time of the move from Port Moresby to Goodenough Island, the RAAF roundel sizes also changed then and serials went from Black to Sky Blue. [Copyright Juanita Franzi, Aero Illustrations].



**A28-18/DU-Y.** This aircraft belly landed at Rockhampton on the way to join 22SQN on 18SEP43 as an attrition replacement. It had previously been used as a training aircraft at Amberley and was shipped back to 3AD Amberley for rebuild. During the rebuild, the lower surfaces were repainted in RAAF Sky Blue and the markings changed to suit the style as per current regulations plus an ADF antenna was added. This aircraft eventually joined 22SQN during January 1944, when all repairs had been carried out. [Copyright Juanita Franzi, Aero Illustrations].



**A28-10/DU-L,** in the post June, '44, scheme wearing markings appropriate for RAAF Strike/Bomber aircraft. The remaining six DB-7Bs were retired from operations in July 44 when new A-20Gs arrived at the Squadron. The remaining DB-7Bs were repainted crudely in the new all over Foliage Green scheme and were being prepared to be sent back to Australia to form a Boston OCU at Amberley. The new markings for "Bombers" required 48-inch 5:2 ratio roundels however the 48-inch roundels were too big for the Boston fuselage side necessitating the squadron codes to overlap onto the roundel. Most of the A-20Gs had 32-inch "Fighter" roundels applied which suited the size of the Boston better. ADF antennas had been fitted to all models of the Boston at the end of 1943. [Copyright Juanita Franzi, Aero Illustrations].

## No. 22 Squadron DB-7B Aircraft Histories

RAAF Serial	Aircraft Type	RAF Serial	Const. #	SQN Code	Mission Tally	Aircraft History / Name
A28-1	DB-7B Boston III	AL890	Douglas 3822	DU-A	Nil	Received from USA on ship diverted from NEI. Delivered 29/3/42 to 1AD. Awaiting erection 30/3/42. To 1AD 14/4/42. To 22SQN 27/4/42. To 5AD for engine change 12/10/42. To 3AD for strafer conversion 19/10/42. To 22SQN 20/11/42. Crashed whilst taking off on night operation, crew escaped injury 30/11/42. To 3AD for repairs 03/12/42. Retained at Amberley as training aircraft. To 22SQN 22/4/44. Crash landed 23/4/44. To 13ARD for repairs 09/6/44. To 22SQN 17/4/44. Crashed Kiriwina 04/7/44. To 10RSU for conversion to components 06/7/44.
A28-2	DB-7B Boston III	AL347	Boeing 2728	Nil	Nil	Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. Awaiting erection 30/03/42. Erected at Geelong. To 22 Sqn 27/04/42. 17/05/42, Anti Sub Patrol 2hrs. Crew: Flt Lt Bell and Flt Sgt Clifford Grove. Crashed while taking off from Richmond NSW 19/5/42. Pilot was P/O R Fethers who was uninjured as was his crew. To 2AD 27/05/42. Converted to components 10/42. A primary source of spares for the rest of the Boston fleet.
A28-3	DB-7B Boston III	AL887	Douglas 3819	*C	18	Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. Awaiting erection 30/03/42. Erected at Geelong. To 22 Sqn 27/04/42. To 1AD 16/06/42 for fitting of long range tanks. To 22 Sqn 14/07/42. To 3AD 10/11/42. For Strafer conversion. To 22 Sqn 07/12/42. Shot Down 18/03/43 at Salamaua. After an attack the burning aircraft was ditched in the sea about 1000yards out from shore. Sgt Basil Gilbert Eastwood (13056) being killed. F/Lt William Ellis Newton (748) was executed by the Japanese on 29/03/43, the only WW2 RAAF Pacific VC recipient, see A28-7. F/Sgt John Lyon (401706) was executed by the Japanese at Salamaua.

RAAF Serial	Aircraft Type	RAF Serial	Const. #	SQN Code	Mission Tally	Aircraft History / Name
A28-4	DB-7B Boston III	AL893	Douglas 3825	*E	6	Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. Awaiting erection 30/03/42. Erected at Geelong. To 22 Sqn 27/04/42. To Wards Strip (Port Moresby) arriving 22/10/42. To 3AD 10/11/42. For Strafer conversion. To 22 Sqn 07/12/42. Bombing and Strafing Kumsi River 14/12/42. Crew: F/O Wines and Flt Sgt Clifford Grove. Bombing and Strafing Amboga River 22/12/42. Crew: F/O Wines and Flt Sgt Clifford Grove. Bomb Test Flight 27/12/42, could be related to crashes caused by 20 lb bombs mentioned below. Damaged by enemy ack-ack while on a mission to attack Lae. Crashed landed at Jackson Aerodrome Pt Moresby 07/01/43. The pilot F/O Wines and crew were ok. To 15RSU. To 3AD 14/01/43. Converted to components. Fuselage to 2AD for salvage 12/03/43. A major spares source for the Boston fleet, R/H wing later fitted to A28-5.
A28-5	DB-7B Boston III	AL895	Douglas 3827	DU-F	76	Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. Ex MLD # D-70. Accident 13/04/42 at Laverton when nose wheel tyre blew on landing. Pilot: F/Lt Y W Morgan (550) not injured. On a mission 22/1/44 with pilot F/Sgt Gifford and gunner F/Sgt Gronow the a/c was hit in the front machine gun magazine which was full of incendiary ammunition. It didn't explode and the a/c returned to base. Served till mid 44 and replaced by A-20Gs. Converted to components Feb 45. This a/c was one initially allotted to 18 NEI Sqn.
A28-6	DB-7B Boston III	AL897	Douglas 3829	DU-G	80	Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. In Service with 22 Sqn 16/05/42. Badly damaged 25/1/44 during attacks on guns at Kabu River and crash landed at Kiriwina. Later repaired. Pilot was F/O Sugden and gunner F/Sgt H Hughes was wounded in both arms. Eventually damaged at Morotai 22/11/44 and written off.  <i>"JAPANESE GHOST PRODUCER"</i>
A28-7	DB-7B Boston III	AL899	Douglas 3831	DU-H	62	Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. In service with 22 Sqn. F/L Bill Newton received the VC in this a/c for pressing home an attack after his a/c was substantially damaged in one engine at Salamaua on 16/3/43. The a/c struggled to return to Pt Moresby 180 miles away. The VC was awarded posthumously on 20/10/43. The a/c was repaired and returned to service until written off after a crash at Gurney strip, Milne Bay 6/44.

RAAF Serial	Aircraft Type	RAF Serial	Const. #	SQN Code	Mission Tally	Aircraft History / Name
A28-8	DB-7B Boston III	AL907	Douglas 3839	DU-J	56	<p>Received from the USA on ship diverted from NEI. Delivered 29/03/42 to 1AD. In service with 22SQN 16/05/42. Crash landed at Goodenough Is on 12/9/43 after bombing Gasmata. Its pilot was F/O Harry Rowell who flew it on approx 20 of its 56 missions. It was also flown on 2 missions by VC winner Fl Lt Bill Newton. It was stripped of useable equipment and left until 1987 when it was salvaged and moved to Amberley. This a/c was one initially allotted to 18 NEI Sqn. On display at RAAF Museum Point Cook VIC.</p> <p><i>"J for Jessica"</i></p>
A28-9	DB-7B Boston III	AL891	Douglas 3823	DU-K	77	<p>Received from the USA on ship diverted from NEI. Delivered 04/42 to 1AD. Rec Ex MLD #D-66. Accident 12/04/42 when landing at Laverton 12/04/42. Pilot: F/Lt W J Meehan (865) of 1AD not injured. In service with 22SQN 29/05/42. To 3AD for strafer conversion 30/10/42. Bombing and strafing Membari River 14/12/42. Crew: F/O Wines and Flt Sgt Clifford Grove. This was one of two Bostons modified in the field to be fitted with twin 0.303in in the tail. This was normally F/L (later W/C) Charles Learmonth DFC. Aircraft and was titled 'She's Apples' with a Lion motif. He flew it on approx. 40 missions. It was originally known as 'Pegasus', with Pegasus Horse on fuselage side and 'Kon Marine' below. This a/c was one initially allotted to 18 NEI Sqn. Served till mid 44 and replaced with A-20Gs</p> <p><i>"She's Apples"</i></p>
A28-10	DB-7B Boston III	AL358	Boeing 2739	DU-L	27	<p>Received from the USA. Delivered 04/42 to 2AD, Richmond. Kept in Australia as training and test aircraft. Tested ADF fit in Sep 43 before fitment to Boston fleet, strafer conversion 10/43. Issued 22SQN 16/12/43. On a mission 22/1/44 with pilot F/O Sudgen and gunner F/Sgt H Hughes this a/c was hit in both elevators and the bomb bay and returned to base. Eventually damaged at Morotai 22/11/44 and written off.</p>
A28-11	DB-7B Boston III	AL364	Boeing 2745	DU-M	43	<p>Received from the USA. Delivered 04/42 to 2AD. Issued 22SQN 05/42 To 3AD, Amberley 30/10/42 for strafer conversion. Served till replaced by A-20Gs in mid 44. Converted to components in 2/45. This a/c was one initially allotted to 18 NEI Sqn</p> <p><i>"Chubby Bobby"</i></p>
A28-12	DB-7B Boston III	AL365	Boeing 2746	Nil	Nil	<p>Delivered 04/42. In service 22SQN. Sank Japanese submarine 6/6/42 off Botany Bay, Sydney. further investigation post-war cast doubt on claim. Blew up in mid-air 10/11/42 while practice bombing off Pt Moresby. Probable cause is the light fragmentation bombs being flicked back onto the fuselage when they hit the slipstream (see A28-20). Killed were F/L Vernon William Morgan, F/O John Harold Borland and Sgt Ronald Thomas Power. This a/c was one initially allotted to 18 NEI Sqn</p>



RAAF Serial	Aircraft Type	RAF Serial	Const. #	SQN Code	Mission Tally	Aircraft History / Name
A28-13	DB-7B Boston III	AL367	Boeing 2748	*O	44	Delivered 04/42. In service 22SQN. Crashed 01/06/43, off the New Guinea coast near Hood Point. Killed: Flight Sergeant Austin James Collins.  <i>"ROCKY'S GAL"</i>
A28-14	DB-7B Boston III	AL892	Douglas 3824	*P	24	Delivered 04/42. In service 22SQN 04/07/42. Anti Sub Patrol 15/07/42, Crew; P/O Hunt and WO/AG Flt Sgt Clifford Grove 3 hrs 10 mins. Lost in bad weather on the return flight from attacking Malahang 9/2/43. The crew were F/O Lesland Arthur Kenway, F/Sgt Francis Colin Gordon and Sgt Horace William "Bill" Hall, all missing. Fitted with experimental .50 tail MG.  <i>"HOOLEY F. DOOLEY"</i>
A28-15	DB-7B Boston III	AL361	Boeing 2742	DU-Q	56	Delivered 04/42. Crash landed 13/12/42 Port Moresby, repaired. Crash landed in the sea 35 miles south of Gasmata on 12/9/43 after an attack on Gasmata Is. The crew F/L Harry Blinman Dawkins, F/Sgt Douglas George Semple and F/Sgt Gordon Ronald Thomas got into their dingy and that was the last time they were seen by their Squadron mates. The crew was captured by the Japanese and eventually executed at Rabaul. On the LHS under the cockpit the artwork was of a Japanese head with a boomerang hitting him and on the RHS there was a shield with "Spirit of Sport" across the middle with each quarter of the shield having a lady, cards, a beer mug and smoking items (a pipe, a cigar and a filter tip and cigarette). This a/c was one initially allotted to 18 NEI Sqn. This aircraft was nominally Fl Lt Bill Newtons aircraft though he only flew it on two missions, it was taken over by Fl Lt R.A Wines who flew it on more than 30 of its 56 missions  <i>"Spirit of Sport"</i>
A28-16	DB-7B Boston III	AL362	Boeing 2743	DU-R	52	Delivered 04/42. In service 22SQN. On the 12/9/43 this a/c crewed by F/Sgt Eric George Turton Riley and F/Sgt Lindsay Kenneth Wilson bombed the Gasmata area and was seen leaving the target but never returned to the base. This a/c was named "Indoor Sport" which was written below the front windscreen with some naked ladies and a beer bottle top around the wording. This a/c initially served with 18 NEI Sqn.  <i>"INDOOR SPORT"</i>
A28-17	DB-7B Boston III	AL363	Boeing 2744	Nil	Nil	Delivered 04/42. In service 22SQN. An engine fire while being run up at Richmond on 18/5/42 damaged this a/c beyond repair. Converted to components and used as spares source for remaining Boston.

RAAF Serial	Aircraft Type	RAF Serial	Const. #	SQN Code	Mission Tally	Aircraft History / Name
A28-18	DB-7B Boston III	AL366	Boeing 2747	DU-Y	16	Delivered 04/42. In service 22SQN. Claimed to have damaged a submarine in 8/42 off Tuggerah, NSW. This claim was dismissed after the war after further investigation. This a/c was one initially allotted to 18 NEI Sqn. Belly landed 17/10/42 Amberley Sent 3AD for repair, used as training aircraft. Belly Landed 18/09/43 at Rockhampton QLD on way to join 22SQN returned 3AD for repair and finally issued to 22SQN 11/01/44. Damaged Kiriwina strip 17/11/44 and converted to components.
A28-19	DB-7B Boston III	AL368	Boeing 2749	Nil	Nil	Delivered 04/42. In service with 22SQN 05/07/42. Two Anti Sub Patrol's from Moruya NSW 11/08/42. 3hrs 50mins and 3hrs 40mins. Crew; P/O Wines and Flt Sgt Clifford Grove. Crashed near Woodford, Qld on the 9/10/42. Became a spares source for remaining Boston.
A28-20	DB-7B Boston III	AL369	Boeing 2750	*W	6	Delivered 04/42. In service 22SQN. Blew up while attacking Gona Mission 29/11/42. Probable cause is the light fragmentation bombs being flicked back onto the fuselage when they hit the slipstream. Following the loss of this a/c the fragmentation bombs were dispensed with and the losses due to this cause ceased. Killed were F/L Herbert James Bullmore, Sgt John William McKay and Sgt Ian Cameron Stoddart.
A28-21	DB-7B Boston III	AL894	Douglas 3826	*X	24	Delivered 04/42. In service 22SQN. Shot down and crashed into the sea just south of Salamaua, 6/2/43. Killed were P/O George Trevelyan Smith, Sgt Roderick Thomas Kerr and Sgt Lance Dawes.  <i>"The Leprechaun"</i>
A28-22	DB-7B Boston III	AL898	Douglas 3830	*Y	1	Delivered 04/42. Blew up while attacking Buna strip 26/11/42. Probable cause is the light fragmentation bombs being flicked back onto the fuselage when they hit the slipstream (see A28-20). Killed were S/L Kenneth Roy McDonald, F/O Thomas Edward O'Neill and Sgt Charles Ronald Napier. Aircraft was titled "Retribution" and under that it had a white eagle dropping a white bomb. This motif was located under the cockpit. This a/c was one initially allotted to 18 NEI Sqn  <i>"RETRIBUTION"</i>

\*indicates aircraft loss before "DU" squadron code applied.

## Chronological DB-7B Boston III Losses

DATE 1942	Serial No.	Code Letter	Reason for Loss	Location	Notes
18 MAY	A28-17		ENGINE FIRE	RICHMOND	Extensive damage starboard engine, wing and fuselage- aircraft written off. CTC 03/06/43
19 MAY	A28-2		TAKE OFF ACCIDENT	RICHMOND	Aircraft failed to take off and crashed through fence. Nose and undercarriage extensively damaged- aircraft written off. CTC 03/07/42
12 OCT	A28-19		CRASH LANDING	WOODFORD	Crashed during training flight at Woodford QLD. Operating out of Amberley. Fuselage, wings extensively damaged. Aircraft written off. CTC 31/10/42
10 NOV	A28-12	N	CRASHED/ BLEW UP 20lb BOMBS	PORT MORESBY, NG	Blew up and crashed on bombing training, with 20lb bombs, 8 miles South of Moresby. Written off. Attempted salvage of parts 03/12/42. CTC 31/12/42
26 NOV	A28-22	Y	BLEW UP 20lb BOMBS	BUNA, NG	Engaged in bombing and strafing over Buna, when 20lb bombs blew up prematurely. Written off 08/12/42.
29 NOV	A28-20	W	BLEW UP 20lb BOMBS	BUNA, NG	Engaged in bombing and strafing over Buna, when 20lb bombs blew up prematurely. Written off 08/12/42.

DATE 1943	Serial No.	Code Letter	Reason for Loss	Location	Notes
07 JAN	A28-4	E	HIT BY ENEMY AA FIRE AND FIGHTER ATTACK OVER LAE	PORT MORESBY, NG	Hyd. shot out, crash landed Port Moresby, extensive damage- written off. CTC 26/01/43
07 FEB	A28-21	X	HIT BY AA FIRE OVER SALAMAUA	SALAMAUA	Shot down in flames over sea, 2miles South/East Salamaua. Written off 15/02.43
10 FEB	A28-14	P	SHOT DOWN LAE, NG	LAE, NG	Missing after bombing and strafing Lae. Witten off 17/02/43
18 MAR	A28-3	C	SHOT DOWN SALAMAUA	SALAMAUA, NG	Hit by AA Fire attacking Salalmaua, and ditched several miles South/East Salamaua. Written off.
01 JUN	A28-13	O	FLEW INTO SEA	PORT MORESBY, NG	Out on training mission post maintenance. Didn't pull out of strafing run on ship target. Written off 11/06/43.
12 SEPT	A28-8	DU-J	HIT BY AA FIRE, CRASH LANDED GOODENOUGH ISLAND	GOODENOUGH ISLAND, NG	Hit by AA fire on raid to Gasmata, New Britain. Hyd shot out, crash landed Goodenough Island. Extensive damage, written off. CTC 11/10/43
12 SEPT	A28-15	DU-Q	DITCHED IN SEA, HIT BY AA FIRE	GASMATA. NG	Hit by AA fire in raid to Gasmata, ditched 35 Miles South of Gasmata. Written off 18/09/43.
12 SEPT	A28-16	DU-R	MISSING	GASMATA, NG	Last seen bombing and strafing Gasmata. Written off 18/09/43.

DATE 1944	Serial No.	Code Letter	Reason for Loss	Location	Notes
17 JUN	A28-7	DU-H	CRASHED ON TAKEOFF	GUENEY FIELD, MILNE BAY, NG	Crashed on takeoff Gueney Field, Milne Bay. Extensive damage, written off. CTC 26/06/44
4 JUL	A28-1	DU-A	CRASH LANDED	KIRIWINA, NG	Crash landed Kiriwina strip, extensively damaged, and written off. CTC 21/08/44
16 NOV	A28-18	DU-Y	RAN OFF STRIP	KAMIRI STRIP, NOEMFOOR, DUTCH NG	Ran off strip, extensively damaged. Written off. CTC 28/11/44
22 NOV	A28-6	DU-G	DAMAMGED ENEMY AIR RAID	MORTAI, DUTCH NG	Enemy air raid, extensively damaged. Written off. CTC 06/12/44
22 NOV	A28-10	DU-L	DAMAGED ENEMY AIR RRAID	MORTAI, DUTCH NG	Enemy air raid. Damaged. Written off. CTC 29/12/44

DATE 1945	Serial No.	Code Letter	Reason for Loss	Location	Notes
FEB	A28-5	DU-F	NO LONGER REQUIRED	MORTAI, DUTCH NG	Retired air craft CTC 02/45
FEB	A28-9	DU-K	NO LONGER REQUIRED	MORTAI, DUTCH NG	Retired air craft CTC 02/45
FEB	A28-11	DU-M	NO LONGER REQUIRED	MORTAI, DUTCH NG	Retired air craft CTC 02/45



## Sources

### Primary Sources

RAAF Command Headquarters – Boston Aircraft – A28. NAA: A11093, 452/A28.

### Secondary Sources

Bert Rice, *A History of No. 22 (City of Sydney) Squadron, 1936 – 1946* (2018).

	<h2 style="margin: 0;">RAAF WWII IN COLOUR</h2>	
	<p><b>A series of RAAF aircraft in WWII – in Australia, New Guinea and the islands. Later, Europe and the Middle East will be included.</b></p>	

### No.10 – RAAF Wackett Trainers

by John Bennett 2021

The Wackett Trainer was one an initial product of the newly formed Commonwealth Aircraft Corporation (CAC) Pty Ltd at Fisherman’s Bend. Formed with local industrial support and with Lawrence Wackett as the General Manager, CAC had been supported by North American in the selection of the Wirraway as an indigenous Australian trainer for the RAAF, which ultimately would equip the Service Flying Training Schools (SFTS) of the forthcoming Empire Air Training Scheme (EATS). The embryonic Australian aircraft industry provided the backbone of the RAAF’s considerable participation in the EATS, with locally built Tiger Moths, Wirraways, and – to a lesser extent – Wackett Trainers. As we have seen, the multi-crew training schools were supplied with imported RAF Ansons, Oxfords and Battles.



[Colourised from AWM 005589]

**First production CA-6 Wackett Trainer A3-1 at the CAC Fisherman’s Bend factory – the AWM dates this as 7 FEB 1941**

The Australian-designed Wackett Trainer was intended for *ab initio* instruction – not as a step between the Tiger Moth and Wirraway – and when plans for the EATS structure were developed, in Australia it was considered that the Wackett would fulfil this role in the Elementary Flying Training Schools (EFTS). Consideration then was given to increasing its syllabus as an intermediate trainer, which could reduce the flying time required on the advanced SFTS Wirraways. Accordingly, the initial allocation was of three Wackett Trainers each to 1EFTS at Parafield and 3EFTS at Essendon. As training requirements matured over 1940, two elementary schools would be totally equipped – 3EFTS at Essendon and 11EFTS at Benalla – while a major role that then emerged in early 1941 was as a wireless trainer for the RAAF’s planned Wireless Air Gunnery Schools (WAGS). These would form as 1WAGS Ballarat VIC, 2WAGS Parkes NSW, and 3WAGS Maryborough QLD. In addition to those fulfilling the EFTS *ab initio* trainer role, 25 would also equip Central Flying School at Camden from late 1941 for instructor training. Development of the Wackett Trainer was not straightforward as the availability of engines proved problematic. The two CA-2 prototypes (**A3-1** and **A3-2**) were powered by Gipsy Major series II and Gipsy VI series I engines respectively, and first flown in SEP 1939. By DEC 1939 both had the Gipsy VI, but in another change, were soon fitted with the production-standard 175hp Warner Super Scarab radial and renumbered **A3-1001** and **A3-1002** – allowing the CA-6 production versions to be serialised **A3-1** to **A3-200**.<sup>2</sup>

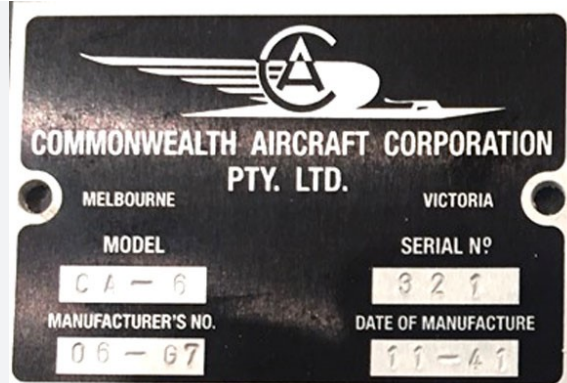
CAC Designation	C/n	Delivery	RAAF Serials	Details
CA-2	101	OCT 1939 to 1FTS	<b>A3-1</b>	140hp DH Gipsy Major II, f/f 11 SEP 1939, re-engined Gipsy VI DEC 1939 as CA-2A
CA-2A	101, 102	DEC 1939 to Comm Flt	<b>A3-1, A3-2</b>	200hp Gipsy VI, f/f 10 NOV 1939, re-engined Scarab
CA-2B	101, 102	JUL 1940	<b>A3-1001, A3-1002</b>	Prototype tests of 175hp Warner Super Scarab 165D
CA-6	235-434	MAR 1941 – APR 1942	<b>A3-1 to A3-200</b>	Production 175hp Warner Super Scarab 165D

## RAAF Wackett Trainer Production Summary

CAC produced its aircraft in production batches, for instance the first block of 40 CA-1 Wirraways (serialled A20-3 to A20-42) were built in five batches – numbered up to F10.<sup>3</sup> This process was followed for CA-6 Wackett Trainer production. CA-6 production ramped up from small batches of five, to stabilise in nine batches of twenty airframes. The first CA-6 batch was numbered A1 to A5 (serials A3-1 to A3-5), then B1 to B5 (A3-6 to A3-10), C1 to C10 (A3-11 to A3-20) and D1 to D20 (A3-21 to A3-40). Batch production of 20 aircraft continued up to A3-200, batch “M” (there was no “I” batch), and the assessment below is based on data points for individual airframes from the NAA MP113/1 series files – given for instance for A3-13 as 06/C3/247 (i.e. CA-6 batch no. 06-C3, c/n 247).<sup>4</sup> The batch numbers are also confirmed by Derek Buckmaster from the CAC ledger (held at ANAM Moorabbin).<sup>5</sup>

Type	RAAF Serial	CAC c/n and Production Batch	RAAF Delivery Details
CA-2 prototypes [2]	A3-1	c/n 101. First prototype.	First flight 11 SEP 1939 Gipsy Major II
	A3-2	c/n 102. Second prototype.	First flight 10 NOV 1939 Gipsy VI
	A3-1001 A3-1002	Same configuration, new serial numbers	Re-engined with production Super Scarab as the CA-2B reserialled JUN 1940, and A3-1001 to CFS JUL 1940.
CA-6 Trainer Production batches [200]	A3-1 to A3-5	c/n 235 to 239. First production batch <b>A1 to A5</b> .	5/41 – 6/41; A3-1 to 1AD 3/41 and returned to CAC 5/41; to 1EFTS 6/41 with A3-5 and A3-10.
	A3-6 to A3-10	c/n 240 to 244. Production batch <b>B1 to B5</b> .	6/41 – 6/41
	A3-11 to A3-20	c/n 245 to 254. Production batch <b>C1 to C10</b> .	6/41 – 7/41
	A3-21 to A3-40	c/n 255 to 274. Production batch <b>D1 to D20</b> .	8/41 – 9/41
	A3-41 to A3-60	c/n 275 to 294. Production batch <b>E1 to E20</b> .	8/41 – 10/41; delayed by propeller supplies
	A3-61 to A3-80	c/n 295 to 314. Production batch <b>F1 to F20</b> .	10/41 – 11/41; A3-61 to A3-72 first dozen aircraft modified by CAC as W/T trainers <sup>6</sup>
	A3-81 to A3-100	c/n 315 to 334. Production batch <b>G1 to G20</b> .	11/41 – 1/42
	A3-101 to A3-120	c/n 335 to 353. Prodn batch <b>H1 to H20</b> .	1/42 – 2/42; A3-101 to A3-112 second dozen aircraft modified by CAC as W/T trainers <sup>7</sup>
	A3-121 to A3-140	c/n 354 to 374. Production batch <b>J1 to J20</b> .	2/42 – 2/42; A3-131 to A3-142 third dozen aircraft modified by CAC as W/T trainers <sup>8</sup>
	A3-141 to A3-160	c/n 375 to 394. Production batch <b>K1 to K20</b> .	2/42 – 3/42
A3-161 to A3-180	c/n 395 to 414. Production batch <b>L1 to L20</b> .	3/42 – 3/42	
<b>Total 202</b>	A3-181 to A3-200	c/n 415 to 434. Production batch <b>M1 to M20</b> .	3/42 – 4/42

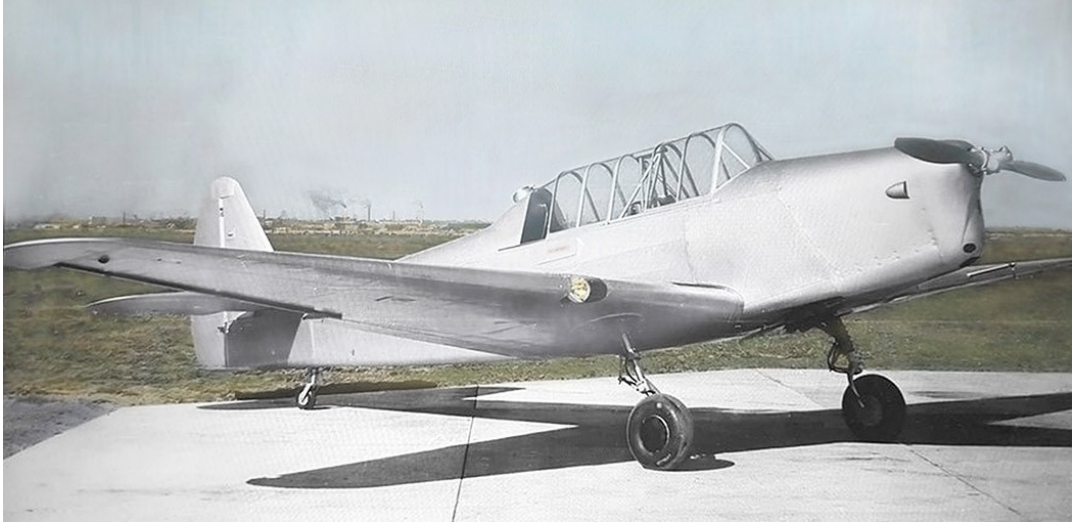
CAC production runs (for Wackett, Wirraway and Boomerang) divided production into batches, typically starting at 5 or 10 aircraft per batch, and building up to batches of 20 – each batch would run consecutively for each aircraft type from A1, A2, A3, etc, B1, B2, B3, etc, C1, C2... and so on. Shown below is an **original plate 319/06-G5**. Also a **reproduction 321/06-G7** for restored A3-87.



[Maryborough Military Avn Museum]

## CA-2 PROTOTYPE A3-1 1939

The first CA-2 prototype (**A3-1** seen below without serial) was initially fitted with the 140hp 4-cylinder Gipsy Major series II and metal DH variable pitch propeller – the only one built so configured, and the only one built without wing leading edge slots.<sup>9</sup> This unserialised prototype first flew in SEP 1939 (later becoming **A3-1**), and the second CA-2 prototype (**A3-2**) flew in NOV 1939 and was fitted from the outset with a 6-cylinder 200hp Gipsy VI srs I and wooden propeller (removed from a CAC-owned Tugan Gannet). By MAR 1940, A3-1 too was fitted with the Gipsy VI.<sup>10</sup>



*[Colourised from adf-serials]*



*[Colourised from SA State Library PRG 247/143/29, via adf-serials]*

### CA-2 prototype A3-1 with Gipsy Major engine before the application of its serial number

Below is **A3-1**, now with RAAF markings, serial number and the CAC fin logo, with modified undercarriage oleos. In JUN 1940, **A3-1** was re-serialised **A3-1001**, allowing the CA-6 production run to commence at A3-1 in FEB 1941; RAAF fin flashes were not applied to the Wackett Trainers until the aircraft were camouflaged from early 1942.



## Wackett's Designs

After the closure of his RAAF Randwick Experimental facility, Lawrence Wackett took over the Seaplane Repair Section at Sydney's Cockatoo Island Naval Dockyard. In SEP 1932, an RAAF order was placed for a single D.H.60G Gipsy Moth (A7-55) as a trial to check the viability of alternate aircraft construction locations and "to try the Section out".<sup>11</sup> Moth A7-55 was completed and flew around APR 1933. Wackett followed on from his Widgeon seaplane and Warrigal designs from Randwick, at his new Cockatoo Dockyard & Engineering and produced the **LJW.6 Codock** twin-engined high wing monoplane, which was developed into the **LJW.7 Gannet**. Eight Gannets were produced, initially by Tugan Aircraft Ltd at Mascot with Wackett as Managing Director, and by SEP 1934 the first three Gannets had been laid down to commence construction.

For the Gannet, design improvements from the Codock had included the fuselage frame constructed with aircraft quality steel tubing of increased strength and less weight, window changes and more comfortable passenger seating.<sup>12</sup> Wackett's experience in designing and managing at Randwick, Cockatoo Island and with Tugan had placed him as the leading Australian aircraft producer, and this would prove invaluable for the establishment of the Commonwealth Aircraft Corporation at Fisherman's Bend. CAC was formed in Melbourne in OCT 1936 with Wackett as General Manager. Work on the CAC site at Fisherman's Bend commenced in FEB 1937.<sup>13</sup>

In NOV 1937, the Tugan factory at Mascot was closed down and remaining Gannets were completed by CAC at the new Fisherman's Bend factory.<sup>14</sup> But more significantly, Wackett and the CAC leadership toured the US and UK inspecting appropriate designs, factories and manufacturing techniques for the establishment of aircraft and engine mass production in Australia. This would result in the importation of the North American NA-16/NA-33 pattern aircraft for the 'general purpose' Wirraway from the US in 1937, followed by the completion of the first **CA-1 Wirraway** (serialled A20-3) in MAR 1939, and then the first **CA-2 Wackett Trainer** (A3-1) in SEP 1939.

## Preproduction Challenges

During the 'thirties, the RAAF required a monoplane trainer for local manufacture, and by MAY 1937 had narrowed its choice to the Percival Vega Gull and the Miles Hawk. The Hawk when fitted with the Gipsy Major II became known as the Magister. The Gull was reported as not being cleared for aerobatics, and accordingly was of no further interest to the RAAF.<sup>15</sup>

**1937.** Over 1937, the Air Board considered an initial order for six trainers with subsequent local production, and CAC's Lawrence Wackett visited England recommending the Magister and the Gipsy Major for Australian manufacture. One Magister was ordered by the RAAF on O.I.584, arriving at 1AD in JAN 1938 as **A15-1** for RAAF evaluation.<sup>16</sup> Although some features were considered unsuitable, the major stumbling block in JUL 1938 was the UK manufacturer's refusal to permit manufacture by CAC, because of the local commitment to building American aircraft.<sup>17</sup> There was significant British opposition at the time to CAC favouring American aircraft designs over those from Britain, driven by CAC's adoption of the North American NA-16 and NA-33 designs as the basis of the Wirraway.<sup>18</sup> Significantly, Wackett was critical of UK production methods and the British prejudice to our domestic production, so it was no wonder he was perceived as anti-British.<sup>19</sup> His manufacturing success was truly in the forging of a strong alliance with North American, which began an aviation industry through the Wirraway, and later fundamental to Mustang and Sabre production.

**JUN 1938.** RAAF **Specification 3/38** as set out by Air Member for Supply (AIRCDRE W Anderson), issued in JUN 1938, was for a low-wing monoplane, with fixed undercarriage, as an *ab initio* trainer which embodied the advantages of the Miles Magister (the low-wing monoplane under evaluation) and Avro Cadet (the high-performance intermediate trainer) for RAAF use as a primary trainer. This specified tandem seating under a canopy, a full range of flight instruments in each cockpit, a strongpoint above the fuselage in the event of overturning on the ground, and dictated that it was to be powered by a Gipsy Major engine.<sup>20</sup> Further, the new trainer was to be capable of full aerobatics including good recovery from spins, and be able of being flown from either seat without the aid of ballast.

**OCT 1938.** In response to *Specification 3/38*, CAC submitted its plans on 10 OCT 1938 for the new trainer. The proposal was immediately accepted on 28 OCT, approving the purchase of two prototypes at a cost of £6,500, allowing construction to commence. The fuselage was of steel tube and fabric design, with wings and tail made of wood with ply covering. But despite the simplicity of the design, construction of these first of two CA-2 prototypes that began in OCT 1938 was not completed until SEP 1939. This was partly because CAC was still building its factory over this period.



**SEP 1939.** The first prototype flew on 11 SEP 1939 powered by a 140hp Gipsy Major series II engine, fitted with a metal DH variable pitch propeller. Although the first flight date is often quoted as 19 SEP 1939, according to Keith Meggs' comprehensive CAC history the maiden flight is identified as 11 SEP 1939.<sup>21</sup>



[Colourised from RAAF image]

**Both CA-2A prototypes A3-1 and A3-2 at CAC Fisherman's Bend with Gipsy VI engines c MAR 1940**

Both the CA-2A prototypes, with A3-1 now in its later Gipsy VI / wooden propeller configuration which replaced the Gipsy Major.

**OCT 1939.** After the declaration of war with Germany, the RAAF ordered 350 Tiger Moths for elementary pilot training. This caused some consternation within CAC, as the Air Board was reticent to recommend production for the indigenous trainer, and did not want to interfere with the urgent Tiger Moth requirement. Wackett had already contacted the US regarding supply and local production of the Warner Super Scarab engine, which could be made using personnel and techniques already available for the Wirraway's P&W Wasp. WGCDR Frederick Scherger (already involved with Wirraway development flying) supported acquisition of a second trainer type, as they would be used in separate schools and, significantly, that "*a pilot trained on the CAC trainer would be a better product than one produced from biplane training*".<sup>22</sup> Certainly, this was a ringing endorsement of the advances and the advantages being incorporated in the CAC aircraft.

### Prototype Engine Changes

As Specification 3/38 had dictated that the new trainer was to be powered by a DH Gipsy Major (for which CAC manufacturing rights had been obtained in NOV 1937<sup>23</sup>), both the two CAC prototypes had been designed with the 97kW (140hp) Gipsy Major four-cylinder engine. The prototypes were assigned the CAC designation CA-2 with RAAF serials **A3-1** and **A3-2**. But the powerplant specified was an ongoing issue, and as early as the end of 1939 the Warner Super Scarab radial was being considered.

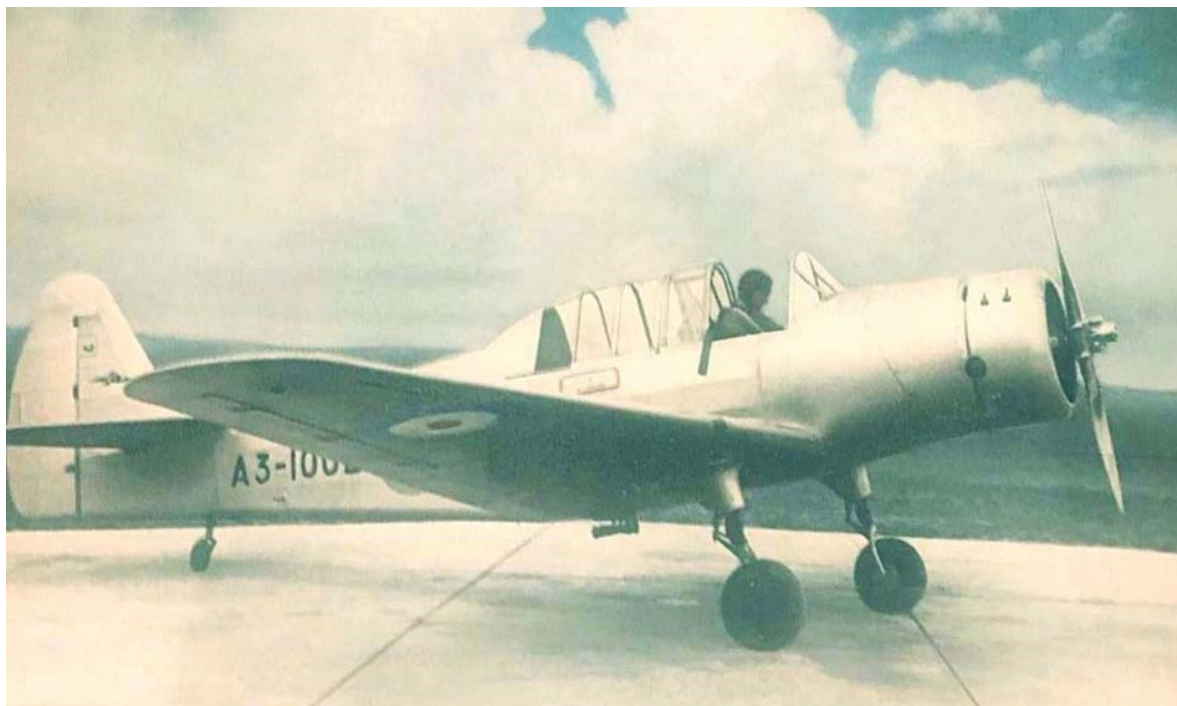
**Gipsy Major series II.** The first CA-2 prototype **A3-1** was completed and flew for the first time at Fisherman's Bend on 11 SEP 1939 with the second scheduled to fly the following month.<sup>24</sup> Despite Wackett himself recording that the A3-1 performed satisfactorily in the air, he noted takeoff performance and continuous power output issues that he believed warranted *a change to a more powerful engine type*.

**Gipsy VI.** Therefore, the second prototype, CA-2A **A3-2**, was re-engined and flew with the more powerful 149kW (200hp) six-cylinder Gipsy VI engine, which had been fitted to a Wackett Gannet held at the factory. A3-2's maiden flight was delayed by the change of engine until 10 NOV 1939. By MAR 1940 both prototypes were equipped with the Gipsy VI,<sup>25</sup> but the additional weight of the engine was found to cancel out its performance benefits. Problems were also reported with the availability of sufficient Gipsy VI engines to satisfy the requirements for a 200 aircraft production run order, although it is evidently debatable whether this was the case.

**Warner Super Scarab.** Early in the process, CAC had proposed on 23 OCT 1939 that the Government place an order for 200 Wackett Trainers, at £3,000 (\$6,000) each, recommending use of Warner Super Scarab radial engines in lieu of the Gipsy Major.<sup>26</sup> The 130kW (175hp) Warner Super Scarab 165D seven-cylinder radial engine did not match the performance of the Gipsy VI engine, but was 36kg (80lb) lighter. As CAC was assured, supply of the Super Scarab

engine (designated the R-500 by the US military<sup>27</sup>) could be guaranteed, and this was selected for the production aircraft – now with the CAC designation CA-6. Because of the opposite rotation of British and American engines, it was necessary to compensate for the change in torque by reversing the fin-offset when the Scarab was fitted. In addition, all production aircraft had the letter-box leading-edge slots fitted to improve the handling at the stall.<sup>28</sup> Satisfactory flight testing of the Scarab in the CA-2B progressed from JUN 1940,<sup>29</sup> and production CA-6 deliveries began on 21 MAR 1941 with the ‘new’ **A3-1** formally handed over to the RAAF. To deconflict serials, the two prototypes had been re-numbered **A3-1001** and **A3-1002** from mid-JUN 1940 to enable the CA-6 production aircraft from **A3-1**.

This system of “-1000” individual numbers became a useful RAAF method of designating prototype aircraft, and was soon in use also with the Beaufort (A9) and Wackett Bomber (A23) serial blocks. It is a shame it hadn’t retrospectively been applied to the A20 block for the imported NA-16/-33 pattern aircraft, which would have allowed production Wirraways to be numbered from A20-1, instead of commencing at A20-3.



*[Aircraft magazine, JUL 1942]*

**A3-1002 (ex A3-2) prototype, now a CA-2B with production-standard Super Scarab engine, probably c JUL 1940**

## Production

The Air Board met on 30 MAY 1940 with the Aircraft Production Commission, and the role of the Wackett Trainer was considered with the EATS requirements – recently disrupted by a restriction of British aircraft exports – and the necessity for local aircraft production. Accordingly, the Air Board meeting of 1 JUN 1940 approved the production by CAC of 200 Wackett Trainers, with 50 spare engines and associated spares at a total cost of £815,000 (\$1,630,000).<sup>30</sup>

Small batch production started at CAC Fisherman’s Bend during the second half of 1940 with the first CA-6, **A3-1**, delivered to 1AD at Laverton in MAR 1941. There were only five aircraft in the first batch as A1 to A5 (**A3-1 to A3-5**), followed by a further five as B1 to B5 (**A3-6 to A3-10**) which were delivered in JUN 1941. Supplies of Hamilton Standard 2B20 propellers (locally manufactured by de Havilland Aircraft /DHA Pty Ltd in Sydney) and the Scarab engines, were erratic during the first half of 1941. The CAC Engine Factory provided the propeller hub and DHA supplied the blades.<sup>31</sup> The propeller supply problem was not fully resolved until OCT 1941 with many unflyable production aircraft accumulating at the CAC factory at Fisherman’s Bend.

From early 1941 block production had increased to a ten aircraft batch as C1 to C10 (**A3-11 to A3-20**), and then CAC swung into what would become the standard twenty batch production for both Wackett and Wirraway. This batch production continued up to the two hundredth and last CA-6 – **A3-200**, as batch number M20, delivered to the RAAF on 22 APR 1942.

## Into Service – Elementary Dual Trainer

Basically, the RAAF service of the Wackett can be split into two streams – as a ‘dual’ elementary trainer until FEB 1943 at which stage all the EFTS dual trainers were being despatched to 7 Aircraft Depot (7AD) at Tocumwal and then permanently grounded for an aborted overhaul program, or as ‘a single-stick’ wireless transmission (W/T) trainer after a radio installation by CAC and destined for WAGS training over 1941-1944.

For its intended role as an elementary trainer, from JUN 1941 the Wackett was entering service with 1EFTS at Parafield, and 3EFTS at Essendon. The plan by the RAAFHQ director of Training (ACDRE George Jones) was for the Wackett to provide advanced training at 1EFTS and 3EFTS for trainees before graduating to 2SFTS at Wagga. The use of the Wackett in this role would “reduce the hours to solo on Wirraway aircraft”.<sup>32</sup>



[Colourised from AWM 007293]

**MAY 1941 – CA-6 Wackett A3-2 (c/n 236 production block number ‘A2’), at the CAC Factory, delivered to 1AD 30 MAY 1941**



[Colourised from RAAF image]

**JAN 1942 – A3-100 (c/n 334 production batch number ‘G20’), at CAC Fisherman’s Bend with A20-502 in JAN 1942**

**A3-100** was last dual trainer delivered in allover *Yellow*. Seen here at CAC Fisherman’s Bend with Wirraway A20-502, both aircraft being delivered in JAN 1942. The standard Wackett training scheme was changed at the factory from this time, from allover *Yellow* to camouflage with central fuselage demarcation. (Note that the training number has moved forward to the *nose*, and not the contemporary EFTS side position.) The next production CA-6, A3-101 (the first from batch ‘H’), was delivered in FEB 1942 in the new camouflage/*Yellow* scheme, and those dozen aircraft **A3-101 to A3-112** were delivered with the W/T mod to 2WAGS at Parkes NSW.

In early DEC 1941, the RAAF Resident Technical Officer at CAC provided the disposition of Wacketts as: 25 at CFS Camden, 35 at 3EFTS Essendon, 12 at 1WAGS Ballarat, with a further eight at depot or in overhaul.<sup>33</sup> CFS was equipped with Wacketts from OCT 1941, then generally passing most aircraft to the WAGS units over late 1942 to early 1943.

### Into Service – CAC W/T Trainer Modification

By early 1941 a single-engined aircraft was required for the airborne Wireless Transmitter (W/T) training of WAGS students. While the Tiger Moth had been under consideration and trialled at 1WAGS and 2WAGS, it was soon determined this type was unsuitable, and the Wackett emerged as a better option – probably because of its enclosed cockpit. In FEB 1941, the RAAF Director of Training, GPCAPT George Jones, proposed that aircraft from the current production run of Wacketts meant that many would be “surplus to requirements of intermediate training squadrons in SFTSs”, and would be suitable as W/T trainers. Jones’ proposal addressed the configuration of this modification, and a planned dispersal of the aircraft:<sup>34</sup>

“An examination of the Wackett Trainer reveals that there is sufficient space for the fitting of a GP set in the rear cockpit, either in front to the existing seat which would necessitate the removal of the control column and instrument panel, or at the rear of the seat which would necessitate the reversal of the seat.

It is requested that the possibility of fitting a GP set with fixed and trailing aerials in this aircraft be investigated, and if practicable, that CAC be instructed to make the necessary modifications.

The number of aircraft to be fitted would be:

No.1 WAGS	..	12
No.2 WAGS	..	12
No.3 WAGS	..	12
No.4 WAGS	..	<u>12</u>
		<u>48</u>

The requirements of Wireless Air Gunners’ Schools should for the present receive priority over the priority for Service Flying Training Schools.”

It is interesting that the Director of Training was referring to Wackett use in the SFTS schools, when he really meant the EFTS units as – although the Wackett was often termed an “intermediate trainer” – it was never planned to equip an SFTS. The modification of installing a GP radio set in the rear cockpit comprised a R1082 receiver and a T1083 transmitter, with a radio mast ahead of the cockpit and a trailing antenna. The removal of rear-seat controls necessitated differentiating the modified aircraft – those not modified were the standard “**dual**” variant, and those with this mod were “**W/T**” – and their E/E.88 Aircraft Status Cards were annotated accordingly.

By APR 1941, CAC was building a W/T “mock up installation” while Tiger Moth R4837 (previously fitted with W/T by CAC) was sent to the factory to use the radio and fittings as Government Furnished Equipment (GFE), where a Wackett could be “fitted with all the W/T equipment required”.<sup>35</sup> The plan was for 1WAGS to relinquish its Tiger Moths to 2WAGS, as Wacketts would progressively equip all WAGS units. (R4837, the Tiger Moth W/T prototype, was returned to 1WAGS and ultimately passed to 2WAGS and then 3WAGS.<sup>36</sup>) In MAY 1941, a dozen Tiger Moths each equipped 1WAGS and 2WAGS and, to ensure continuity of training, by mid-1941 a rather complex redistribution of W/T trainers was underway:<sup>37</sup>

Wackett Trainers are being supplied to re-equip No.3 EFTS Essendon up to their establishment of 16 IE and nine IR aircraft. The Tiger Moths released by the provision of Wackett Trainers are being allotted to No.11 EFTS, Benalla. As soon as this allotment is completed, the Tiger Moths now at No.1 WAGS Ballarat will be re-allotted to No.2 WAGS Parkes, and the aircraft taken from Ballarat will be replaced by Wackett Trainers. The policy is that No.2 WAGS use Tiger Moths for the present, and at a later date these will be replaced by Wackett Trainers.

Also by JUL 1941, the plans for forming 4WAGS had been cancelled and, in lieu, 1WAGS would be doubled to “full school” or “double school” status into 1942. From SEP 1941, CAC undertook the W/T modification program converting new production aircraft and ex-EFTS trainers into W/T trainers for the WAGS, with the first twelve installations carried out on **A3-61 to A3-72**.<sup>38</sup> This modification typically took a week, before delivery to 1AD initially, where the permanent radio sets were fitted. This batch of W/T trainers was delivered to 1WAGS over OCT-NOV 1941. It also was necessary, of course, to make modifications in the rear cockpit to prevent the WAG trainee inadvertently interfering with any flight or engine controls.<sup>39</sup> The equipping of 1WAGS during late 1941 saw the first W/T Wackett Trainers delivered and operated in overall *Yellow* (as seen below), but from the beginning of 1942, Wacketts were

being delivered from CAC in camouflage which became the WAGS standard training scheme – although with ongoing variations.



*[Colourised from State Library of VIC, via 'Aircraft of the RAAF']*

### **NOV 1941 – First Wackett W/T trainers, at 1WAGS Ballarat in 1941 with A3-71 in the background**

The CAC W/T Trainer modification program was externally visible by the radio mast ahead of the cockpit for the R1082/T1083 GP radio set installed in the rear cockpit, and the trailing wire antenna visible above and behind this trainee. A3-71 was in the first W/T production batch in SEP 1941 and delivered to 1WAGS in NOV 1941. Around this stage too, the **training numbers** were moved forward, from against the fuselage roundel to below the front cockpit – probably with A3-75 or A3-76, dual trainers for 3EFTS.

By OCT 1941, the next dozen Wacketts for W/T modification were selected, **A3-101 to A3-112**, with the first to be delivered to 1AD in mid-OCT and the others at a rate of five aircraft per week.<sup>40</sup> By JAN 1942, the program had quickly progressed with the next batch, comprising **A3-131 to A3-142**, to be delivered from CAC by late FEB 1942.<sup>41</sup> By mid 1942 the following list of 79 Wackett trainer modifications was documented:<sup>42</sup>

- A3-61 to A3-72**
- A3-101 to A3-112**
- A3-131 to A3-142**
- A3-154 to A3-165**
- A3-167 to A3-177**
- A3-181 to A3-200.**

Many earlier aircraft retrospectively received the W/T trainer modification (e.g. A3-5, A3-8, and in fact two dozen aircraft prior to A3-61 would be modified from the second half of 1942). The gaps in the higher serial range (i.e. above A3-150) were due to attrition, and the requirement to retain a few “dual” trainers.

The ambitious Wackett production schedule of building up to 30 aircraft per month was in fact achieved (shown on the next page), in parallel with the ongoing deliveries of 350 Wirraways over the period.<sup>43</sup>



**CAC aircraft, including CA-6 A3-22, gathered at Fisherman's Bend for CAC's 40th Anniversary in 1977** *[CAC photo]*

26/8/41.

COMMONWEALTH AIRCRAFT CORPORATION PTY. LTD.  
ESTIMATED PRODUCTION SCHEDULES OF WIRRAWAY AIRCRAFT AND  
WACKETT TRAINERS, to 30TH JUNE, 1942.

1. WIRRAWAY AIRCRAFT:

(In connection with request from British Government, through A.P.C.)

Position at August 31st, 1941.

Wirraways delivered = 330

Position at December 31st, 1941.

Wirraways estimated to be delivered = 500 (September 43  
 {October 43  
 {November 43  
 {December 41

Position at June 30th, 1942.

Wirraways estimated to be delivered = 680 (30 per month)

Hence - Total number of Wirraways between September 1st, 1941, and June 30th, 1942. = 350

2. WACKETT TRAINERS:

Position at August 31st, 1941.

Trainers delivered = 35

Position at March 31st, 1942.

Trainers estimated to be delivered = 200 (September 20  
 {October 20  
 {November 20  
 {December 20  
 {January 25  
 {February 30  
 {March 30

Hence - Total number of Trainers between September 1st, 1941, and June 30th, 1942. = 165

By AUG 1942 the Wackett W/T production program had matured into an establishment of 32 Wacketts at each of the three WAGS – the fourth WAGS was never formed – with the decision in OCT 1942 that all Wackett Trainers, apart from those already written-off at an EFTS, were *for exclusive use as WAGS trainers*.<sup>44</sup>

**Wackett WAGS Disposition – SEP 1942**<sup>45</sup>

Unit	Aircraft Establishment	Aircraft Strength
1WAGS Ballarat	32	29
2WAGS Parkes	32	31
3WAGS Maryborough	32	20

In FEB 1944, as 2WAGS at Parkes disbanded, a total of 88 Wackett W/T trainers remained in service, of which 76 were unit equipment (U/E) at 1WAGS and 3WAGS.<sup>46</sup>

## Technical Problems

Meanwhile in its EFTS role, structural problems had appeared with the aircraft. In NOV 1941, a fatigue problem emerged after heavy landings, when a ¾" (195mm diameter) fuselage cross bracing strut was found to be bowing, and seven aircraft were defective.<sup>47</sup> This restricted all Wacketts to straight and level flight – not ideal for pilot training.<sup>48</sup> CAC urgently produced a rectification – *Wackett Trainer Instruction No.17*.<sup>49</sup> Over this stage too, there had been a series of minor faults – undercarriage magnesium castings cracking, lower wing plywood skins splitting, and blocking of fuel tank vents from mud thrown up by the wheels – but all were relatively easily cured.<sup>50</sup> By mid-1942, 7 Aircraft Depot (7AD) at Tocumwal were heavily involved in the major servicing of the Wackett, with 61 under repair over JUL 1942.<sup>51</sup>

But the aircraft's Warner Super Scarab engine was to prove a major source of trouble. The main problem by 1942 was the use of a constant-speed propeller without a manifold pressure gauge in the cockpit to properly balance power output.<sup>52</sup> The lack of this gauge causing ongoing piston problems was the reason for all EFTS Wacketts being transferred to 7AD from early 1943 for its fitment as mandatory, specified by the Wackett Trainer Order No.61 modification.<sup>53</sup>

Engine problems resulted in a high unserviceability rate of the type at the training units. After withdrawal from the EFTS role, at the WAGS units Super Scarab piston cracking continued as the main issue. The engines also tended to display high engine oil temperatures, particularly in summer months when aircraft were often flown with engine cowlings removed – which is apparent in imagery from 3WAGS at Maryborough, QLD. Other lesser problems contributing to the unserviceability rates included cracking of brake shoes, fuel tanks and welded fuselage joints.<sup>54</sup>

### 7AD Tocumwal Wackett Overhaul Program – 1943

In NOV 1942, the grounding of all Wackett elementary trainers, which were now concentrated in 11EFTS at Benalla, saw them being replaced there by Tiger Moths.<sup>55</sup> While the Wacketts briefly returned to service, major repair and overhaul program was scheduled for 7AD at Tocumwal over FEB-MAY 1943. In MAR 1943, a 1WAGS flight rigger recorded:<sup>56</sup> "We have had a Wackett make a forced landing nearly every day this week, mostly with engine trouble. One was nearly 60 miles away and was flown back after a new engine had been taken out and installed. They all seem to be worn out and use a lot of oil."



[Colourised from RAAF image]

#### **MAR 1943 – A3-90, ex-11EFTS, stored at 7AD Tocumwal from MAR 1943, and scrapped by 7CRD in 1945**

In 11EFTS standard 1943 training colours – *Foliage Green/Earth Brown* camouflage to the fuselage bottom, *Yellow* undersides and trainer band with probable *Black* serial, *Medium Sea Grey* nose training number, *Blue/White* 3:5 roundels standard from SEP 1942.

The first group of 20 Wacketts for the overhaul program arrived at Tocumwal from 11EFTS Benalla on 22 FEB 1943, followed by a further 20 two days later, and a further 20 on 15 MAR.<sup>57</sup> The program was conducted by 7AD Aircraft Repair SQN, with Engine Repair SQN completely overhauling the Scarab engines. However, later in 1943 the long term viability of maintaining the Wackett in service as an elementary trainer was now under review, and repair work soon ceased as the aircraft were "held pending advice on recovery" – as stated on their E/E.88 Status Cards.

With this ongoing grounding and uncertainty on whether to progress repairs, the overhaul program remained in limbo, and this continued throughout 1944 – by SEP 1944 there were 53 unserviceable Wacketts held by 7AD.<sup>58</sup>

Basically, the aircraft withdrawn from 11EFTS were held at Tocumwal, which had effectively ended the Wackett's life as an elementary trainer from FEB 1943. However, those aircraft that had undergone the CAC W/T modification were continued to be flown by the WAGS units, presumably because of their more benign operating demands.

In early 1945, the Tocumwal aircraft were selected either for long-term storage at 8EFTS/CMU Narrandera pending CDC disposal, or for breaking down at 7AD's co-located 7 Central Recovery Depot (7CRD) into components and scrap. Several of these grounded aircraft were recovered to fly as elementary trainers with the NEI Air Force (ML-KNIL) from 1946, and some flew privately or with aero clubs on the Australian civil register.

The Wackett's relatively short career as an RAAF elementary trainer, at 3EFTS Essendon from JUN 1941 to withdrawal at 11EFTS Benalla in FEB 1943, was only a brief period for its designed purpose as an elementary trainer. So could the Wackett be considered a suitable elementary trainer? Basically it was plagued with technical problems from an inexperienced production line – this (in parallel with the demands of the Wirraway) really was CAC's first original design and introductory attempt at long production runs in the embryonic Australian industry. Its problems saw various groundings of the aircraft, resulting in the extensive 7AD overhaul program at 7AD Tocumwal, which was then left uncompleted. However, it must be remembered that Wacketts equipped the three RAAF EATS WAG schools where they served economically as part of the huge EATS aircrew training program – the type was certainly more efficient than the earlier DC-2 and D.H.89 radio trainers. Presumably it was the Wackett's enclosed cockpit which was suitable for wireless operator students to successfully conduct their airborne training. And it was probably the docile straight-and-level flying in W/T training which enabled the Wackett to continue in this role.

From an aerodynamic perspective, the Wackett handled well including for aerobatics, had a low stalling speed, and had no noticeable vices. It had quite a satisfactory cockpit layout. But its major problems were with the powerplant: "The Warner Scarabs were reliable in the main, but some were suspect on a very hot days, and, after an hour or so of flight, they overheated and lost power, necessitating a prudent search for suitable landing areas."<sup>59</sup>



[Colourised from RAAF image]

**The last production Wackett, CA-6 A3-200 (c/n 434) on a farewell test flight from CAC Fisherman's Bend on 22 APR 1942**  
A3-200 flown by CAC test pilot Jim Carter, for a public relations shoot over Melbourne by photographer John Harrison from Wirraway A20-584 flown by Ken Frewin. This is an RAAF image, and the AWM has a series of images giving details of this flight.<sup>60</sup>



## RAF AIR DIAGRAM CAMOUFLAGE SCHEMES

*Aircraft Design Memorandum No.332 (Issue 3)* of 15 NOV 1940, referenced by the RAAF as CD44/41,<sup>61</sup> listed the Air Diagram Numbers for camouflage schemes for the different types of aircraft. The design of camouflage or other external colours scheme was to be in accordance with the appropriate Air Diagram.

These listed 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>62</sup> This final list was consolidated for all types by AGI C.11 (issue 4) in AUG 1942.<sup>63</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>64</sup>

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>65</sup>



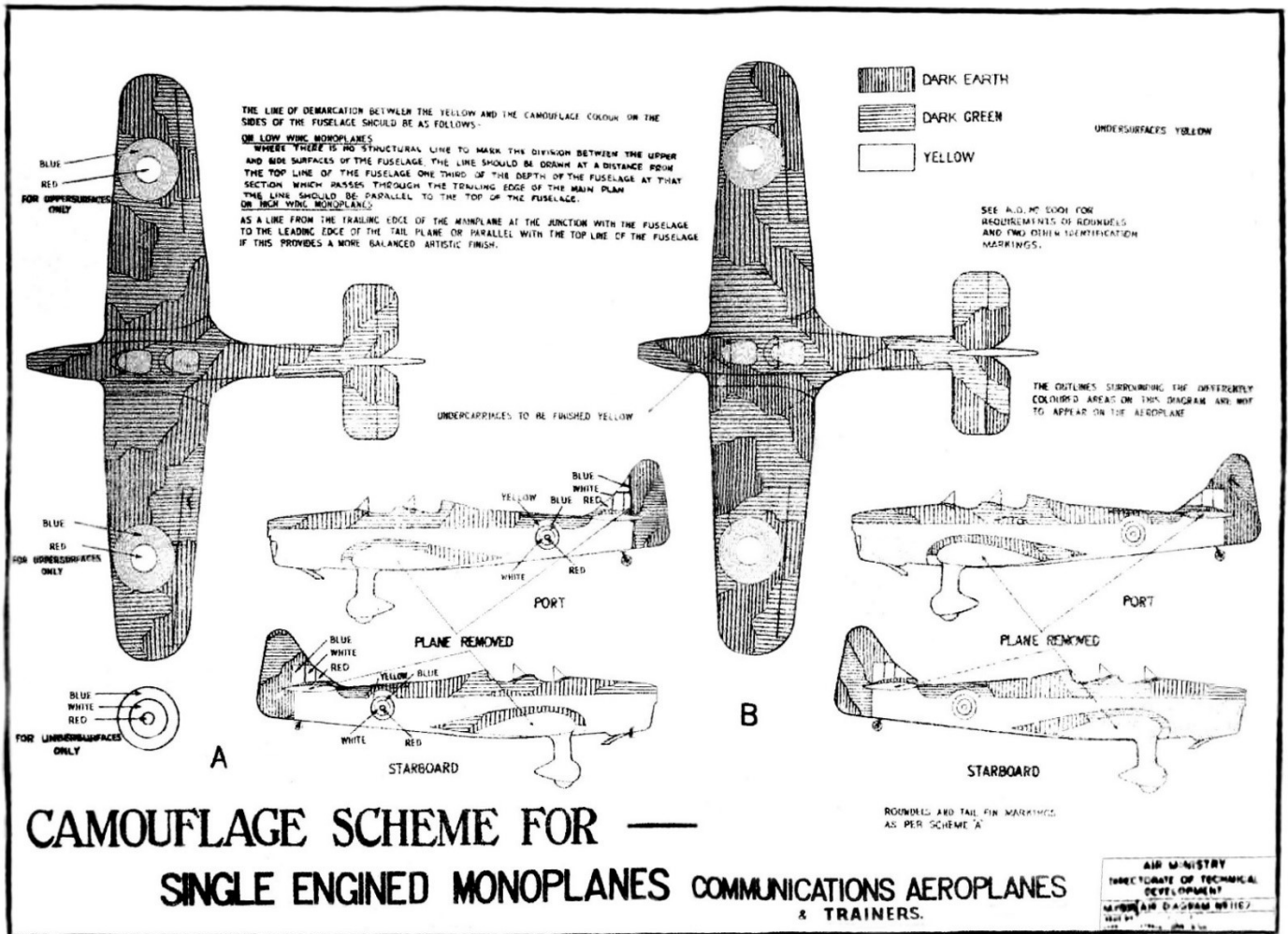
[adf-serials]

**A.D.1160 was modified in OCT 1939 for the Wirraway, here on restored A20-10 of Moorabbin Air Museum, at Laverton 1971**  
A.D.1160 was modified in 1939 as CAC dwg 01-01002, and a similar scheme, **A.D.1167**, was applied from JAN 1942 to the Wackett.

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 href="#">A.D.1167</a>	<a href="#">Single-engined monoplanes – communications aeroplanes, trainers</a>	<a href="#">Wackett</a>
A.D.1168	Twin-engined monoplanes – communications aeroplanes, trainers	Oxford
A.D.1169	Single-engined biplanes – communications aeroplanes, trainers	Tiger Moth
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, 'B' being mirror image of the another 'A', the variations were allocated to aircraft as directed by the contract. Merging of the 'A' and 'B' schemes occurred from 15 JAN 1941.

AIR DIAGRAM A.D.1167



[NAA A11083 21/4/AIR]

A.D.1167 Air Ministry Diagram Single Engined Monoplanes<sup>66</sup> – Communications Aeroplanes and Trainers

A.D.1167 of c 1938 was issued like all Drawings at the time in Scheme 'A' with the mirror Scheme 'B', and the early high-sided RAF Yellow undersurfaces. This carried over to the RAAF with Wacketts and Tiger Moths, until late 1942 when the camouflage was extended to the bottom of the fuselage sides.

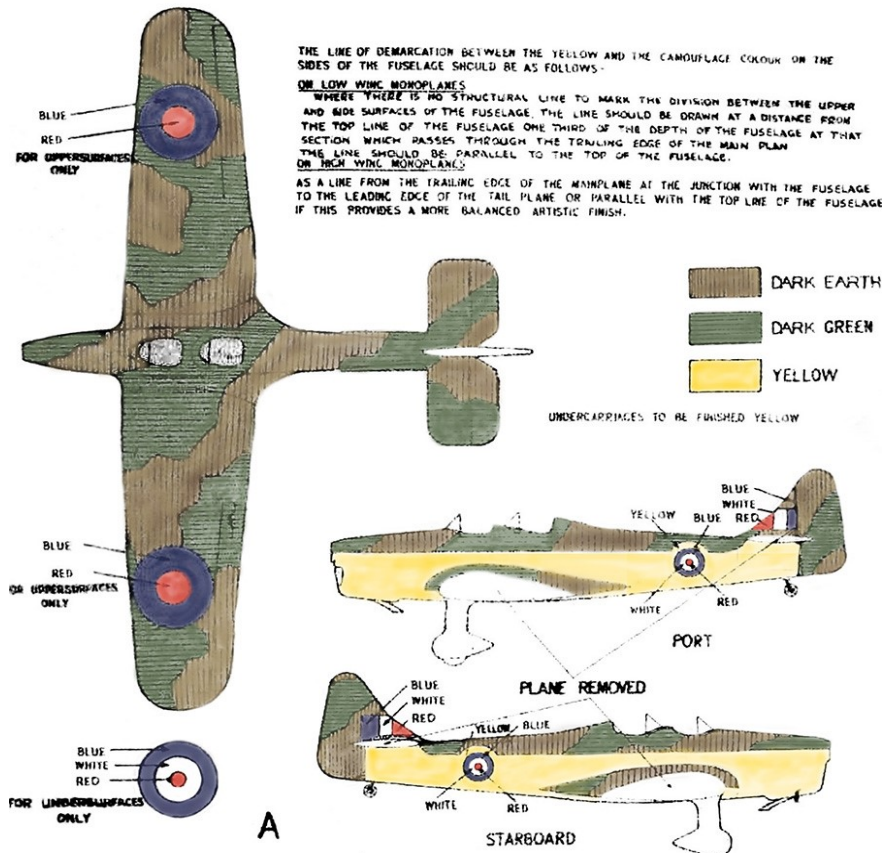


[du Plessis colour collection]

Magister T8826 in AUG 1941 – the later variation of A.D.1167 'A' Scheme which extended lower down fuselage sides

## AIR DIAGRAM A.D.1167 SCHEME 'A'

A.D.1167 was the "Single Engined Monoplanes" scheme, introduced by the RAF c1938. When the RAAF scheme changed for the Wackett Trainer from all over *Yellow* in JAN 1942, it was the A.D.1167 'A' camouflage pattern adopted for the Wackett – colours of this scheme sloped forward on the port side (when looking from the top of the fuselage side) as seen below on **A3-14**, and sloped aft on the starboard side as shown below by **A3-22**. The lower surface *Yellow* began at the centreline, and the standard 36" *Yellow* trainer bands were on the Wackett fuselage and mainplanes.



*[Colourised from A.D.1167 'A']*

### Wackett Trainer camouflage A.D.1167 'A'



**A3-14** after repaint in new camouflage by 1AD, probably in JAN 1942 *[Colourised from Pentland vol.1, p.50]*



**A3-22** restored to this scheme in 1977.


*[Pentland vol.1, p.72]*

## EVOLUTION OF RAAF WACKETT MARKINGS

### National Markings

The designation of RAF national roundels we know as 'A', 'B', 'C', etc were developed in the 1950s, purely for simplicity. These British 'non-official' designators are attributed to author Bruce Robertson, used from his early benchmark *Harleyford Aircraft Camouflage and Markings 1907-1954*. The official terminology was both cumbersome and ambiguous, so Robertson's invention has simplified this. 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>67</sup> The RAF formalised this on **27 APR 1939** as **AMO A.154/39 – Identification Markings on Aircraft of Operational Units**, which also included a Yellow surround for roundels on camouflaged aircraft and introduced Red/White/Blue stripes on the fin.<sup>68</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>69</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 referenced until the **AGI C.11 of OCT 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 (i.e. like converting the RAF type-A to the type-A1). The M.1 was in a 2:5 ratio,<sup>70</sup> the M.2 1:3:5. The fin flash was also designated by a number – the "M.4" marking was the red-white-blue fin flash. But soon into 1940, the RAAF fuselage roundel was reverted from M.1 roundels back to M.2 roundels.<sup>71</sup> However, these designators did not last long as there is no reference to them in the 1942 Issue 4 of the AGI. Below is a chronology of the applicable generic RAAF policy, and for Wackett specific markings – which basically was Aluminium for the prototypes in 1939/40, all-over trainer Yellow in 1941, training camouflage/Yellow from early 1942 until the general withdrawal from service in 1944, and a reversion to all-over Yellow for the few trainers remaining with CFS in 1944/45.

Year	Change	Policy and References
<b>1939</b>	<p>Introduction of the 2:5 type-B to RAAF aircraft fuselages and uppersurfaces – this became the M.1 roundel in 1940.</p> <p>RAAF aircraft finishes, identification markings, and squadron code letters – training aircraft <i>Aluminium</i> (this only applied to the prototype CA-2 Wacketts). Initially, Wacketts had six position roundels (RAAF 'M.2', or type-A), and no fin flash.</p> <div style="text-align: center;">  </div>	<p><b>RAAFHQ DTS 9/1/442 of 12 SEP 1939.</b></p> <p><b>RAAFHQ Aircraft General Instruction No. C.11, of 22 SEP 1939, 9/1/396(13A).</b></p> <p>RAAF 1939 Policy was drawn largely from <b>AMO A.154/39 of 27 APR 1939.</b><sup>72</sup></p>
<b>1940</b>	<p>RAAF camouflage colours were <i>Camouflage Green</i> and <i>Camouflage Brown</i>, copies of the RAF dark green and earth colours.</p> <p><b>OCT 1940.</b> Policy AGI No. C.11 <i>Issue 3</i> specified trainer schemes E.1 (overall <i>Yellow</i>) E.2 (36" <i>Yellow</i> bands) – the E.1 scheme applying to the production CA-6s, from A3-1, delivered from mid-1941. This AGI also detailed RAAF National Markings as M.1, M.2, M.3 and M.4.</p> <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>, and undersides MAP <i>Sky</i> (the last not being adopted by the RAAF), with variations of schemes for different aircraft, including RAF (and ultimately RAAF) trainers.</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 grey 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 A.D.1167 "Single-engined monoplanes – communications aeroplanes, trainers" would apply to the Wackett.</p> <p><b>AMO A.926/40 of 12 DEC 1940 replaced A.154/39.</b><sup>73</sup></p>

<p><b>1941</b></p>	<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.</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 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>).</p> <p><b>DEC 1941.</b></p> <p>From APR 1941, production CA-6s were coming from CAC production in the specified all-over <i>Yellow</i> ‘E.1’ scheme of AGI <i>Issue 3</i>. Serial numbers were marked on the undersurfaces of the mainplanes, stbd forward facing, port aft facing.</p>	<p>Merging of the ‘A’ and ‘B’ schemes occurred from 15 JAN 1941.<sup>74</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> <p><b>RAAFHQ Aircraft General Instruction No. C.11, Issue 3, of 3 OCT 1940.</b></p>
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[Both coloured from adf-serials]

**First production CA-6 A3-1 at CAC Fisherman’s Bend in APR 1941 in overall ‘E.1’ Yellow**

In the background are production camouflaged CA-8 Wirraways in the A20-260/-270 serial range (A-fuselage roundels, B-upper wing roundels), and an *Aluminium*-finished prototype CA-2B Wackett with the Super Scarab engine fitted. Up to the delivery of A3-100 (delivered in JAN 1942) all Wackett Trainers were in overall *Yellow* with A-roundels in all six positions, and no fin flashes.

<p><b>1942</b></p>	<p>From JAN 1942, production Wacketts were delivered by CAC in the camouflage and <i>Yellow</i> undersides. This was basically the AGI <i>Issue 3</i> ‘E.2’ <i>Interim Finish for Training Aircraft</i>, that had never been intended for the Wackett but had been necessitated by Japan’s entry into the war.</p> <p>This was formalised by <i>Issue 4</i> of the AGI in AUG 1942.</p>	<p><b>RAAFHQ Technical Order AGI No.C.11, Issue 3, of 3 OCT 1940.</b></p> <p><b>RAAFHQ Technical Order AGI No.C.11, Issue 4, of 31 AUG 1942.</b></p>
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[Coloured from Pentland vol.1, p.50]

**JAN 1942 – A3-14, after repaint in new camouflage by 1AD Laverton probably in JAN 1942, served its RAAF career in testing**

A3-14 was with 1AD Test Section through 1941-1943 for performance testing, and probably this image is at beginning of 1942 for markings calibration when the standard Wackett scheme was changed from all-over *Yellow* to camouflage/lower *Yellow* (with fuselage centreline demarcation). A3-100 (the last from the ‘G’ production batch) was delivered in overall *Yellow*, and A3-101 (the first from batch ‘H’) was delivered in JAN 1942 in this new scheme, which introduced the tricolour **fin flash** to the Wackett. A3-14 subsequently went to 1APU in DEC 1943 (as that unit was formed out of 1AD) until to storage at 8OTU Narromine in OCT 1944.

<p><b>1942</b></p>	<p><b>JUN 1942.</b> Deletion of <i>Yellow</i> from RAAF roundels. This made the type-A1 roundel (in 1:3:5:7 ratios) into a type-A (1:3:5).</p> <p><b>AUG 1942.</b> The RAAF Technical Order, AGI No.C.11 was changed by <i>Issue 4</i> for those operational aircraft retaining <i>Red/White/Blue</i> National Markings, to drop the <i>Yellow</i> outer ring, but there were still 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 because of the JUN 1942 USN fighter attack on a RAAF Catalina.</li> <li>○ Fuselage sides – <i>Dull Red, White, and Dull Blue</i> (type-A) roundels in the 1:3:5 proportions.</li> <li>○ Undersurfaces – the same <i>Dull Red, White, and Dull Blue</i> roundels but only for day fighters and trainers, but not for bombers or seaplanes.</li> <li>○ Fin markings – all aircraft marked with <i>Dull Red, White and Dull Blue</i> stripes of the same width, with <i>Red</i> 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.</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 A1 fuselage roundel had been overpainted in AUG 1942 with camouflage paint.</p>	<p><b>RAAFHQ DTS 280/42 of 18 JUN 1942</b>, filed on 1/501/329(63A); 1TG signal T.670 19 JUN 1942; Signal School Point Cook A.50, 29 JUN 1942.</p> <p><b>RAAFHQ Technical Order AGI No.C.11 Issue 4 of 31 AUG 1942.</b> Appendix I of the AGI’s <i>Issue 4</i> lists A.D. 1167 for the Wackett.</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><b>RAAFHQ message T520, file 0947/19 (30A), of 19 SEP 1942.</b></p>
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[Colourised from RAAF image]

**A3-132 of 1WAGS cSEP 1942 with no upper *Yellow* training markings**

Still with three-coloured fuselage National Markings with type-A roundel (the *Yellow* outer ring being removed in AUG 1942) and three-coloured fin flash, but the type-B roundels on the upper mainplane have had *Red* overpainted with *White* (as one of the first examples of the RAAF Pacific roundel). This is on the verge of all *Red* being removed from National Markings. Delivered as a camouflaged W/T trainer, its scheme had been changed by lowering the *Foliage Green/Earth Brown* colours down the fuselage from the original fuselage centreline demarcation. No *Yellow* training markings; serial and training number in *Medium Sea Grey*. Although unseen in this image, undersurfaces at 1WAGS were probably still *Yellow*. **A3-132** was delivered from CAC as a W/T trainer to 1WAGS in FEB 1942, serving in this role at Ballarat for its whole RAAF career, until going into storage in OCT 1944. It was always a camouflaged aircraft, typical of these tranches of post-A3-101 W/T trainers, and this scheme is of interest.

<p><b>1943</b></p>	<p><b>JAN 1943.</b> RAAF squadron code letters – three letter codes introduced in <i>Sky Blue</i> K3/195, two letters signifying the squadron/unit, the third as an individual aircraft identifier.</p> <p><b>JUL/AUG 1943.</b> Cease re-camouflaging US aircraft arriving in OD/NG – the standard RAAF camouflage colours up to 1943 were uppersurfaces <i>Earth Brown</i> and <i>Foliage Green</i>, undersides <i>Sky Blue</i>; in DEC 1943 in line with 1940 US colours Spec 24114 (Air Corps Bulletin 41, 22 OCT 1940) this was changed to uppersurfaces <i>Green</i>, undersides <i>Grey</i>. ('Green' in this context refers to <i>Foliage Green</i> for Australian refurbishment, <i>Olive Drab</i> from US factories.)</p> <p><b>JUL 1943.</b> Already some roundels were 1:2 ratio, from converting RAF 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>, i.e. the 2:5 roundel.</p> <div data-bbox="339 629 839 853" data-label="Image"> </div> <p style="text-align: center;"><b>Ratio of the <i>White</i> to the <i>Blue</i>, 3:5 and 2:5</b></p>	<p><b>Air Force Confidential Order (AFCO) A.3/43, Code Letters for Operational and Reserve Squadrons, of 4 JAN 1943, 62/1/271.</b></p> <p>Request from HQ 5MG 300/3/1 of 20 JUL 1943, 1/501/329 (89A), to cease re-camouflage.</p> <p><b>RAAFHQ DTS Special Instr Gen/8 (SIG/8) 26 AUG 1943:</b> Aircraft finished in American camouflage scheme are to be accepted and not to be re-camouflaged in RAAF scheme during erection. Aircraft will be finished in RAAF camouflage when repainting required or during major overhaul.</p> <p><b>RAAFHQ AMEM DTS 1/501/329 SAS 13552, 8 JUL 1943,</b> 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>75</sup></p>
<p><b>1944</b></p>	<p><b>MAY 1944.</b> Revision of AGI "Camouflage Schemes and Identification Markings": for the Wackett the applicable orders were Appendix E <i>Yellow</i> for trainers. Training numbers were to be in <i>Black</i> forward of the fuselage roundel. Training numbers on Wacketts had been moved forward below the cockpit, then to the nose in late 1941 and this did not change.</p>	<p><b>RAAFHQ T.O. AGI Pt 3(c), Instruction 1, file 150/4/5056 (1A), of 26 MAY 1944.</b></p> <p>Also issued as <b>DTS Special Instr Gen/34 1 MAY 44.</b></p>
<p><i>[Colourised from AWM AC0250]</i></p> <p><b>1944 Back to Yellow – the MAY 1944 AGI re-introduced overall Yellow for trainer aircraft</b></p> <p>Overall <i>Yellow</i> re-adopted by very few Wacketts as most were being withdrawn from service when the MAY 1944 AGI was released. One with <i>Yellow</i> applied over camouflage was <b>A3-180</b>, here with CFS at Point Cook in 1945, with 2:5 ratio roundels.</p>		
<p><b>1945</b></p>	<p><b>NOV 1945.</b> Review of aircraft camouflage policy for post-war aircraft: AGI should be amended to revert to pre-war practice of aircraft being uncamouflaged.</p>	<p>From 4 (Maint) Gp to RAAFHQ <b>4MG file 301/15/1 (61A) of 10 OCT 1945, filed as RAAFHQ 1/501/329 Pt.2 (30A).</b></p> <p><b>AMEM 1/501/329 Pt.2 (31A) 18 OCT 1945.</b></p>

## A3-22 – INITIAL CA-6 PRODUCTION SCHEME 1941

All-over *Yellow* was the initial production scheme for the CA-6 (up to A3-100 in JAN 1942) and then changed to camouflage, coinciding with Japan's entry into the war and the policy for toning down bright *Yellow* training aircraft.



*[Colour image from adf-serials]*

### A3-7, with early CA-6 Wacketts (A3-21, A3-22, A3-23) in production at CAC factory Fisherman's Bend, AUG 1941

A3-7 had been returned to the CAC factory from 3EFTS Essendon for modification, prior to issue to CFS at Camden in OCT 1941. Beside the CA-8 Wirraway production, at this stage CA-6 Wackett 'D' Batch production has reached A3-21, A3-22 and A3-23.

A3-22 was delivered to 3EFTS Essendon in AUG 1941, and then later over OCT/NOV 1941 with many others was transferred to CFS at Camden. After a brief storage in APR 1943 it was sent to 1WAGS as a dual (not a W/T) trainer and returned to CFS in OCT 1944. With the CFS move to Point Cook A3-22 was attached to the Beam Approach FLT (BAF) and offered for CDC disposal in NOV 1945 from Point Cook, being sold in DEC 1945 for £68.

<b>Overall Trainer Yellow K3/185</b>		<b>Serial Number A3-22</b>	8" x 5" (1" stroke)
<b>Fuselage Roundel Type-A</b>	25"B – 15" W – 5" R	<b>Side Training Number 22</b>	24" x 15" (3" stroke)
<b>Wing Roundel Type-A</b>	45"B – 27" W – 9" R	<b>Underwing Serial</b>	40" x 25" (5" stroke)



**A3-22** was bought postwar with many other Wacketts by a consortium representing Kingsford Smith Air Services, and this became a monopoly for Wackett spares, selling 50 to the NEI Air Force and converting others into agricultural sprayers as the KS.3 Cropmaster, and subsequently the Yeoman YA-1. A3-22 was one of a few that went to individual civil buyers as **VH-ALV**, and was eventually recovered for **restoration as A3-22** at Moorabbin.



## A3-158 – LATER CA-6 PRODUCTION SCHEME 1942-1943

From JAN 1942, the all-over *Yellow* scheme gave over to camouflage. This was a specific trainer camouflage, retaining *Yellow* undersides which extended to about halfway up the fuselage sides. This pattern was introduced apparently with **A3-101**, the first aircraft of Wackett production 'H' batch – while at the same time the 1AD performance test aircraft A3-14 was camouflaged in this scheme at Laverton (as previously shown beside a calibration post).

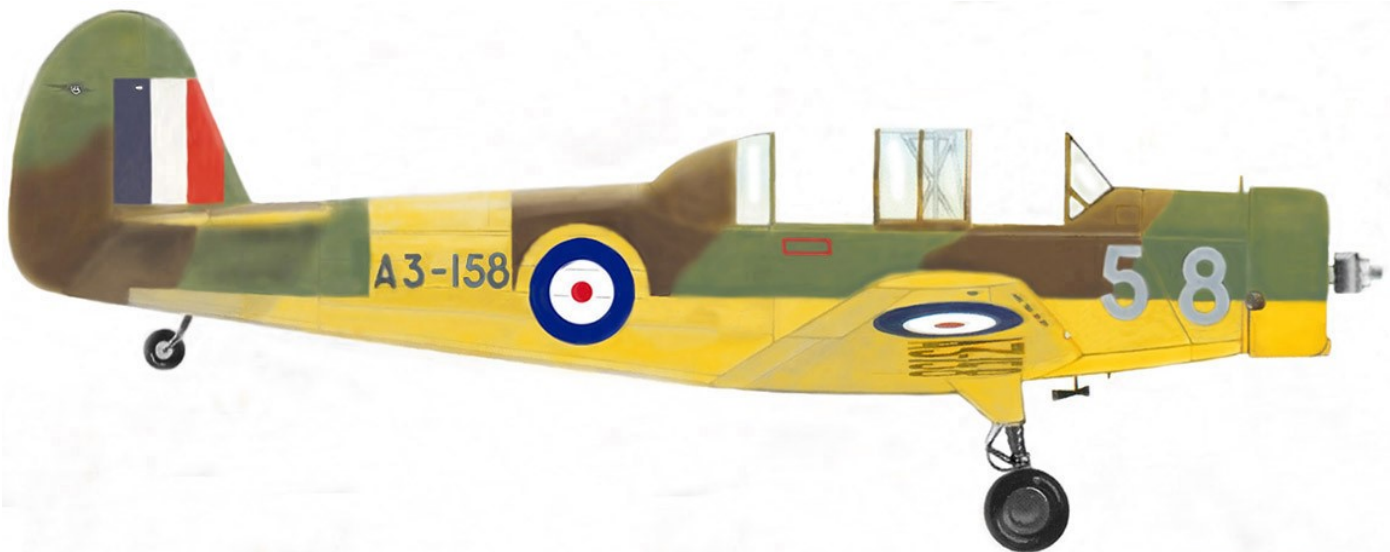
**A3-158** was delivered to 1WAGS in MAR 1942 from CAC fitted with W/T equipment for the WAGS training role. In MAY 1942 it moved to 2WAGS, and in JAN 1944 to 3WAGS – so serving on all the three WAGS units. On 15 FEB 1944 it suffered an engine failure and crashed, being converted to components.



[Colourised from RAAF image]

### A3-158 at CAC factory Fisherman's Bend MAR 1942 before fitment of W/T equipment

The scheme for **A3-158** was the same as the last production machine in MAY 1942, **A3-200** – *Foliage Green* and *Earth Brown* camouflage with *Yellow* undersides and trainer band, with *Black* underwing serials. AHCB assesses that in a departure from policy, *Grey* was used for the serial number and the nose training numbers, which was logical to cover both camouflage and *Yellow*.<sup>76</sup> National Marking with the *Yellow* surround on the fuselage made this the 35" type-A1 roundel, but remained as the three-colour type-A roundels on undersides, 24" x 24" tricolour fin flash, but on the camouflaged upper mainplane the type-B 2:5 roundel was used – remembering that *Red* would be deleted from National Markings over AUG/SEP 1942.



A3-158 in A.D.1167 'A' camouflage pattern

## A3-154 – LATER CA-6 IN-SERVICE SCHEME 1943-1944


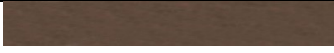

**A3-154** was fitted in APR 1942 with the CAC W/T modification for the WAGS training role. In MAY 1942 it was received by 2WAGS at Parkes, and then in JAN 1944 passed to 3WAGS Maryborough. *Red* was removed from RAAF National Markings over AUG/SEP 1942, so this AWM colour image is after that time – but probably not into 1943, as the lighter undersurface is still reaches halfway up the fuselage, a practice that was discontinued around later 1942. The aircraft immediately behind appears to have *Yellow* undersides and the lower demarcation with the upper camouflage.

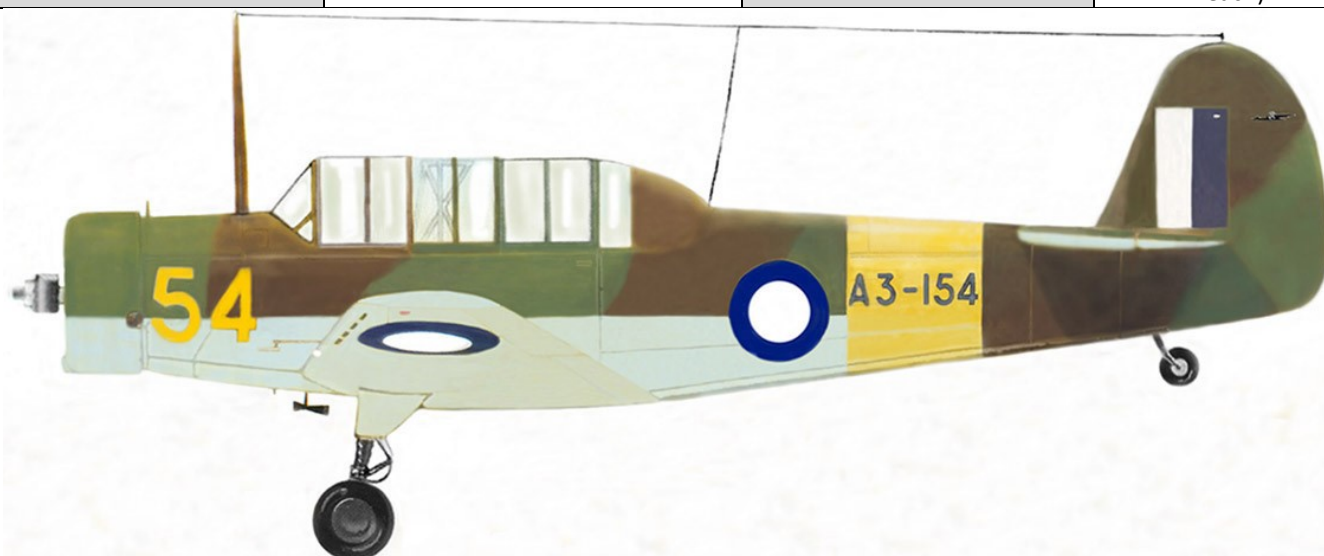


[Colour image AWM F03642]

### A3-154 at 2WAGS Parkes late 1942

The scheme for **A3-154** had been the same as the last production machine, A3-200 – *Foliage Green* and *Earth Brown* camouflage with *Yellow* undersides and trainer band, with *Black* underwing serials. But at 2WAGS the lower colours were changed, perhaps when *Red* was removed from National Markings, and as being further north it might have been considered that *Sky Blue* undersurfaces were more appropriate than the *Yellow* undersides of southern schools. This *Blue/White* fin flash is taller than the normal 24". While *Sky Blue* was adopted for the undersides, *Yellow* trainer bands around the fuselage and mainplanes were retained, *Yellow* nose training numbers were used. This *Sky Blue* scheme may have been adopted too by 3WAGS at Maryborough at a similar time, although this School eliminated training *Yellow* completely during 1943 and used *White* serials and training numbers.

Upper <i>Foliage Green</i> K3/177		Fuselage Roundel 3:5	15" W – 25" B
Upper <i>Earth Brown</i> K3/178		Nose <i>Yellow</i> Training Number	24" x 15" (3" stroke)
Lower <i>Sky Blue</i> K3/195		Fin Flash	30"H x 20"W (10" each)



A3-154 in A.D.1167 camouflage 'A' pattern 2WAGS late 1942 – with *Yellow* undersides repainted by *Sky Blue*

## A3-180 – FINAL CA-6 IN-SERVICE SCHEME 1944-1945

**A3-180** was delivered as a **dual trainer** amongst the final production batches of W/T trainers. Serving at 1WAGS as a dual for pilot checks from 1942 to 1944, A3-180 was received by CFS in OCT 1944, and moved with the unit to Point Cook, where it served until storage in SEP 1945.



*[Colourised from AWM AC0252]*

### A3-180 with CFS at Point Cook 1945, with undercarriage spats

The MAY 1944 AGI Part 3, Section (c), Instruction No.1 specified the sole scheme for the Wackett was the 'Appendix E' overall **Yellow** training finish. With the AGI was RAAF Diagram A.5524 sheets 1 to 4, which specified the dimensions of **National Markings** and special markings, such as underwing serials and fuselage training numbers. Sheet 1 referred to the roundel as '*National Marking 1*', in 2:5 proportions. By this stage over 1944/45, the **fuselage roundels** were *larger than normal* on this Wackett at 35" diameter. **Fuselage serial number** was maintained as the standard 8" x 5" size, and the **underwing serials** were in the same 5/8 proportions with height specified as half chord at third span from the centreline – for the Wackett this approximated 24" x 15" in 3" strokes. The RAAF practice of using underwing serials for trainers was continued postwar into the 1950s on Wirraways (also with the early Winjeels, and even the first deliveries of the UK Canberra pattern aircraft). CAC rudder logo overpainted by this stage.

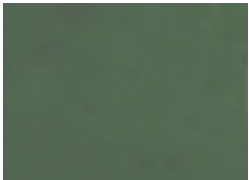

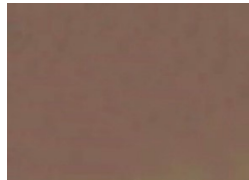
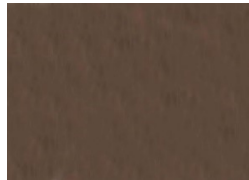

<b>Allover Trainer Yellow K3/185</b>		<b>Underwing Roundel 2:5</b>	Approx 35" diameter
<b>Fuselage Roundel 2:5</b>	14" W – 35" B	<b>Black Underwing Serial</b>	H ½ chord at ½ span, W 5/8
<b>Nose Black Training Number</b>	24" x 15" (3" stroke)	<b>Fin Flash</b>	24"H x 16"W (8" each)



## RAAF CAMOUFLAGE AND TRAINER MARKINGS

**National Markings.** As war arrived, colours changed virtually overnight for the RAAF's 'service' aircraft. First, roundels were toned-down to *Red/Blue* at the end of 1939, and camouflage replaced the *Aluminium* – introduced by the **AGI No. C.11 of 22 SEP 1939** (the first RAAF policy on markings) and specified the use of *Red/Blue* roundels. 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.

**Camouflage Colours.** Across the whole RAAF, by **JUL 1940** camouflage had been applied and was being confirmed by the units to RAAFHQ. But where the RAAF did depart from RAF policy was with undersurface colours on operational aircraft – the RAF used *Sky*, or greenish “duck-egg blue” for the European haze, but *Sky Blue* (K3/195) was adopted here, as the richer blue was required for the Australian clearer and brighter atmosphere. On imported aircraft from the UK, the overland *Temperate Land Scheme* camouflage in 1939 were the RAF colours *Dark Green* (DG) and *Dark Earth* (DE), with *Red* and *Blue* identification colours in *dull* colours.<sup>77</sup> From 1941, the darker RAAF camouflage colours were replacing the lighter RAF colours – *Foliage Green* (K3/177) with a blueish hue, and *Earth Brown* (K3/178) with a more “chocolatey” shade of brown. The RAAF continued the RAF schemes of *Yellow* (K3/185) undersides on trainer aircraft, but from late 1942 *Sky Blue* replaced *Yellow* undersides on some Wacketts at WAGS units.

				
<b>K3/216 RAF Dark Green</b>	<b>K3/177 Foliage Green</b>	<b>K3/209 RAF Dark Earth</b>	<b>K3/178 Earth Brown</b>	<b>K3/195 Sky Blue</b>

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



*[David Eyre colour image from Goodall website]*

**A3-134 in 1943 markings, retired at Bankstown in APR 1960**

A3-134 had served with 1WAGS Ballarat from FEB 1942 until storage at Narromine in OCT 1944. Sold with the others in 1945, it still had the 1943-44 camouflage markings while stored for KSAS at Bankstown in 1960 – *Blue/White* National Markings, *White* serial and codes, and *Yellow* trainer bands on the mainplanes.

**Camouflage Patterns.** The RAAF adopted the RAF Air Diagram patterns for aircraft, these having been introduced as 'A' and 'B' “mirror” schemes in 1937 as a guide to disruptive camouflage.<sup>78</sup> The RAF cancelled the requirement for mirror schemes in JAN 1941, and manufacturers then selected only one pattern as standard, with most manufacturers selecting the 'A' pattern.<sup>79</sup> For the Wackett, A.D.1157 'A' pattern was adopted at the beginning of 1942, and disruptive patterns would remain until changed by new policy in 1944. The AGI C.11 *Issue 4* in AUG 1942 specified that 'second line aircraft' were to have *Sky Blue* (K3/195) undersurfaces, and trainers *Yellow* (K3/185) undersurfaces – from this stage the Wacketts at WAGS units appeared to have both.

**Trainer Bands.** In MAR 1940, reference is made from RAAFHQ Director of Technical Services (DTS) to AMOE regarding **“Yellow bands”** which were to be painted on training aircraft around the fuselage and wings. This was a carryover from the RAF by using *Yellow* markings on trainers – and bands around the fuselage and mainplanes had been used at 1FTS Point Cook on Avro Cadets introduced by Amendment List No.5 (A/L 5) to this AGI in JAN 1940 as an interim marking.<sup>80</sup> It was noted that this had not been done to date as supplies of *Yellow* paint had not been obtained.<sup>81</sup> The OCT 1940 AGI C.11 *Issue 3* had stipulated two training schemes: **Scheme E.1** was to be the permanent scheme for training aircraft, with the entire airframe to be finished in *Yellow*; and **Scheme E.2** as an interim finish comprising **“a Yellow band three feet in width”** around the fuselage and around the mainplanes.<sup>82</sup> On some aircraft which were classified as “service” types, these 36” E.2 trainer bands were preferable to overall *Yellow*, so as aircraft could be rotated through operational units requiring reversion to a camouflage finish. The AGI C.11 *Issue 4* of AUG 1942 formalised some of the earlier decisions that had been discussed, inter alia *Foliage Green/Earth Brown* upper surfaces and *Sky Blue* lower surface, and the 36” *Yellow* band around the fuselage and wings.<sup>83</sup>



[AWM colour film F03642]

#### **Camouflaged Wackett Trainers at 2WAGS Parkes NSW c OCT 1942**

All aircraft have **Yellow trainer bands** aft of the fuselage 3:5 *Blue/White* roundels, and most appear to have upper camouflage now extended to the base of the fuselage – not halfway down to the aircraft centreline as in the 2WAGS image of **A3-154**.

A3-154 was modified as a W/T trainer at CAC in APR 1942, then transferred to 2WAGS in MAY. It is unlikely the CAC mod also included painting **undersides in Sky Blue over the previous Yellow**, but as this was cAUG 1942 when national Markings were changing with *Yellow* removed from the roundel, *Sky Blue* undersides were likely added at 2WAGS.

However, not all *Yellow* was eliminated – retaining the *Yellow* trainer bands aft of the Pacific 3:5 roundel and around mainplanes, and **Yellow training numbers** on the nose.

**Training Numbers.** “Training numbers” in the RAAF started in the mid-1930 with 1FTS at Point Cook, and applied to the aircraft then on strength – Avro Cadets, D.H.60 Moths, and Wapitis. With War, in 1940 1FTS became 1SFTS as the first “service” advanced school within the RAAF’s EATS contribution. The RAAF AGI C.11 *Issue 3* in OCT 1940 had covered: “training aircraft are to have the last two numbers of their identification numbers painted on both sides of the fuselage forward of the national markings”. Numbers were to be *Black* on E.1 *Yellow* or *Aluminium* finishes, and *Yellow* on camouflage. *Issue 4* of the AGI of AUG 1942, specified that training numbers were to be marked in *Medium Sea Grey (MSG)* – but over 1942/43, training numbers on Wacketts varied from *Yellow*, *White* to *MSG*. The next major revision of RAAF camouflage and markings in MAY 1944 (AGI Part 3, Section (c), Instruction No.1) had minimal impact on Wackett markings as most aircraft had been retired, or still being withdrawn. Training Numbers on the Wackett can be differentiated into three marking positions;

*side number* – initially applied by CAC from A3-1, 24” x 15” immediately in front of the fuselage roundel;

*forward number* – beneath the forward cockpit, changed by the EFTS and possibly by CAC from around A3-75 or A3-76, necessitating smaller 20” x 10” characters to fit the panel;<sup>84</sup>

*nose number* – applied by CAC from the at least the last *Yellow* trainer, A3-100 (and then subsequent camouflaged aircraft), immediately behind the cowl in the larger 24” x 15” numbers, this becoming the standard at the WAGS units.

## THE ROLE OF THE WACKETT IN EATS

Under EATS, the Commonwealth countries undertook aircrew training, 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, based on RAF syllabi. For pilots, after basic flying training at an Elementary Flying Training School (EFTS) on Wackett Trainers and Tiger Moths, students were passed on to intermediate and advanced training at a Service Flying Training School (SFTS). The SFTS would stream students into specialised single-engined tuition (on Wirraways) for prospective fighter pilots prior, or twin-engined (Ansons/Oxfords) for progression to larger multi-engine aircraft. From the initial EATS conference in London in NOV 1939, the various dominions – Australia, Canada and New Zealand – determined their responsibilities, with Australia providing 40% of the dominion output.

Training Establishment	Number of RAAF Units
Initial Training School (ITS)	5
Elementary Flying Training School (EFTS)	12
Service Flying Training School (SFTS)	8
Air Navigation School (ANS)	3
Air Observer School (AOS)	2
Bombing and Gunnery School (BAGS)	3
Wireless Operator-Air Gunner School (WAGS)	3

The finishing date of the EATS had been MAR 1943, but the conference in Ottawa in MAY 1942 extended this to MAR 1945. For the Australian training commitment to the scheme, a variety of RAF training aircraft had been imported for training – Ansons, Oxfords, Battles and Tiger Moths,<sup>85</sup> all of which retained their RAF serial numbers (and generally delivered camouflaged). The throughput planned for the RAAF contribution to EATS was to provide 1120 crewmen every four weeks – 336 pilot trainees for the EFTS, 280 pilot trainees for the SFTS, 184 observers and 320 WAG trainees.<sup>86</sup> Southern Rhodesia later joined the scheme, establishing four EFTS, four SFTS and a combined AOS/WAGS unit.<sup>87</sup> With regard to the role of the Wackett, by 1943 the CA-6 had served with two EFTS – No 3EFTS at Essendon and 11EFTS at Benalla, in addition to Central Flying School (CFS). However, the Wackett was to contribute more to EATS with operation by Nos 1, 2 and 3 Wireless Air Gunners Schools.

### Elementary Flying Training Schools – EFTS

The two main EFTS units equipped with Wacketts were **3EFTS Essendon** from JUN 1941, and then **11EFTS Benalla** from JAN 1942. With the disbandment of 3EFTS in APR 1942, its aircraft transferred to 11EFTS. Most Wacketts were stored at 8EFTS Narrandera for disposal over 1944-45. One other elementary trainer operator of the Wackett was **1EFTS Parafield**, which had formed in JAN 1940 with D.H.60 Moths transferred from Point Cook. Three Wackett Trainers were flown over JUN-AUG 1941 – while the 1EFTS Unit History records that these arrived at Parafield on 26 JUN 1941, there is no more mention of operating the type.<sup>88</sup> E/E.88s show the three aircraft (**A3-1**, **A3-5** and **A3-10**) were transferred to 3EFTS in AUG 1941. It is not known whether this was for Wackett/Tiger Moth evaluation, but it was at the stage that 1EFTS was expanding to “double strength” – so the decision may have been standardisation on the Tiger Moth. A further unit using the Wackett for the training of elementary instructors was **CFS at Camden** and later at Tamworth.

### Wireless Air Gunnery Schools – WAGS

One airman at 1 WAGS Ballarat during MAR 1943, recorded: “as it was not suitable for pilot training, because it is under-powered and the engine is unreliable due to overheating. So it is being used to give the poor old wireless operators practice in sending morse code while airborne. They were using a couple of Douglas DC-2s, which the RAAF had taken over when they first started training them here, which would have been much more suitable. I guess they just had to find a use for the Wacketts.”<sup>89</sup> This uninformed opinion overlooks the fact that the Wackett was a suitable, long-serving, economic W/T trainer. With regard to power, the 175hp<sup>90</sup> was inferior to the design 200hp of the original Gipsy VI, and reliability with overheating was a problem at the more northern bases where engine cowls were removed.

### “Hacks”

Several Wacketts were used as “hacks” at some of the training establishments. During 1943, **6OTU** at Nowra had three Wacketts (**A3-7**, **A3-57** and **A3-58**) as general observation and spotting aircraft during torpedo dropping exercises, as well as guiding recovery craft to spent torpedoes.<sup>91</sup> **5EFTS** at Narromine flew **A3-49** and **A3-60** during 1943. **8OTU** Narromine and **8EFTS** Narrandera were of course bases where Wacketts were stored from 1944 for disposal in 1945.

## 3EFTS ESSENDON – A3-77 1941-1942

**3EFTS** formed at **Essendon VIC** on **2 JAN 1940** for EATS elementary flying training, with civilian Moth training aircraft from the **Royal Victorian Aero Club, Australian National Airways, Victorian & Interstate Airways** and the **C D Pratt Flying School**.<sup>92</sup> These Moths flew on lease to the RAAF from OCT 1939 with their civilian VH- registrations until impressment in JUL 1940. From JUN **1941**, 3EFTS commenced operating the Wackett which was not without its problems, and required numerous modifications, which interrupted training. From APR 1942, personnel and equipment began to be posted away from Essendon, with flying instructors, trainees and the Wacketts transferred to 11EFTS at Benalla. 3EFTS disbanded on 1 MAY 1942.<sup>93</sup>



[Colourised from RAAF image]

**A3-77 of 3EFTS Essendon on 13 FEB 1942, prior to transfer to 11EFTS Benalla in APR 1942**

A Wackett four-ship formation comprising **A3-77, A3-31, A3-28 and A3-15**. All four aircraft had been delivered to 3EFTS from CAC during the second half of 1941, were with 3EFTS on disbanding, then all were transferred to 11EFTS on 22 APR 1942.



Overall **Yellow** was maintained on production Wacketts up to A3-100, when the scheme changed to the training camouflage, retaining **Yellow** undersides. Underwing serials were maintained on production Wacketts, and in NOV 1941 the position of the large last two 'side' training number was moved forward from the fuselage roundel to below the front cockpit. To fit the side panelling, this 'forward' number was reduced to 20" height x 10" width – it is not the later 'nose' number applied by the WAGS units, which was marked directly aft of the cowl.

## 11EFTS BENALLA – A3-21 1942-1943

**11EFTS** formed at **Benalla** VIC on 26 JUN 1941. The first Tiger Moth aircraft were ferried to Benalla from Richmond in JUL 1941, but training was curtailed initially by poor weather. By JAN 1942 it had been decided to re-equip 11EFTS with the Wackett Trainer, the first received from the factory on 2 JAN 1942 were **A3-90** and **A3-92**. 17 were received during JAN 1942, 23 in FEB, then 14 in MAR. With the disbandment of 3EFTS at Essendon during APR 1942, a further 28 Wacketts were received on 20 APR 1942<sup>94</sup> – with another pair delivered during that month, this made 11EFTS **strength 84 Wacketts**. The establishment of the unit had been doubled in the reorganisation of EATS schools, to more efficiently enable the increasing training demands, and these were tentatively known as “**double schools**”, with the disbanding of 3EFTS and 4EFTS Mascot allowing this expansion over APR-MAY. Also during APR 1942, 32 members of the USAAF successfully completed 4-weeks refresher training on the Wackett.<sup>95</sup> However, because of ongoing serviceability problems all Wacketts were grounded from NOV 1942, and 11EFTS aircraft were ferried to 7 Aircraft Depot (7AD) at Tocumwal from FEB 1943 for the extensive Wackett overhaul program. This effectively ended the Wackett’s career as an elementary trainer and was replaced by the Tiger Moth. By JUN 1945, the School’s elementary flying training ceased, with 11EFTS having graduated 2953 trainees.<sup>96</sup>



*[Colourised from AWM 010753/12]*

### **11EFTS Wacketts A3-9, A3-21 and A3-74 in APR 1942**

This is from an AWM series of 11EFTS trainee pilot LAC Gordon Johnson with Wackett Trainer A3-9, with A3-74 and A3-21 identifiable in the background. All three aircraft were ex-3EFTS, and were transferred to “double” 11EFTS in APR 1942.



The transfer to overhaul of all Wacketts over FEB/MAR 1943 to 7AD ended the Wackett’s original intended role as an elementary trainer. There were ample Tiger Moths being produced at Mascot for this role, and the secondary role found for the Wackett as a W/T trainer proved its efficiency and in the numbers required to equip three WAGS units.



## CENTRAL FLYING SCHOOL (CFS) – 1941-1943

CFS had re-formed on 29 APR 1940 from the Instructors' Training Squadron of 1FTS at Point Cook, and with the expansion of 1SFTS, CFS headquarters moved to Camden on 14 MAY 1940<sup>97</sup> – equipped with Avro Cadets, Ansons and Wirraways. CFS's role was the training of flying instructors for the many dispersed EATS flying training schools and maintaining standardisation across all units. At Camden, CFS utilised contractor overhauls with the Clyde Engineering Company at Granville. The CFS flying instructors' courses undertaken at Camden comprised the six-week Elementary Flying (EF) Instructors' Course, concurrently with the 10-week Service Flying (SF) Instructors' Course.<sup>98</sup> The instructors of 9EFIC, below with a Cadet, typify the wartime CFS flying training effort, and during the war CFS retrained 3600 service pilots as QFIs.<sup>99</sup>



*[colourised from camdenhistorynotes site]*

### **The graduates of No 9 Elementary Flying Instructors' Course with Avro Cadet at CFS Camden on 10 MAY 1941**

No 9 EFIC had started the six-week course on 24 MAR 1941 with 36 students,<sup>100</sup> with 27 graduates on 10 MAY 1941.

For familiarisation, CFS began operating one of the Wackett prototypes, and on 16 DEC 1940 **A3-1002** suffered an engine failure at 250 feet just after take-off from Camden. The pilot was able to complete a successful forced-landing 3km from the airfield.<sup>101</sup> In OCT 1941, CFS 'B' FLT began receiving its first Wacketts, which would be operated until early 1943. In DEC 1941, there were **25 Wacketts** at CFS Camden.<sup>102</sup> On 18 APR 1942 all CFS aircraft transferred north again, this time to Tamworth to take over the aerodrome and facilities vacated on the disbandment of 6EFTS – with the CFS inventory now consisting of 14 Wacketts, 18 Cadets, nine Wirraways and eight Oxfords.<sup>103</sup> In SEP 1944, CFS moved to Point Cook, and flew at least one Wackett (**A3-180**) flew with the Beam Approach FLT until disposal in 1945.



*[colourised from RAAF image]*

### **A3-30 and A3-25 CFS Tamworth, over second/third quarter 1942, with Red National Markings and Grey training numbers**

Both have a partial Yellow 36" trainer bands around the fuselage at the roundel, and around mainplanes. Known CFS Wacketts over 1941-1943: **A3-2, -5, -7, -8, -11, -17, -18, -20, -22, -23, -25, -27, -30, -34, -49, -51/-58, -60, -87**. A handful were on strength over early 1944: **A3-101/-103, 105, -108, -155, -159, -160, 164, -167**; with **A3-180** coming on strength at Point Cook in late 1944.

## 1WAGS BALLARAT – A3-64 1941-1942

**1WAGS** formed at **Ballarat** VIC on 22 APR 1940, but it took six months for the School to receive its first aircraft – four Ansons. During JAN 1941, the first two Douglas DC-2 aircraft were received, joined by seven Wackett Trainers in OCT 1941, the first were from the batch **A3-61 to A3-72**. The School expanded to “double strength” on 8 JAN 1942, to increase training output, equipped with two DC-2s and 51 Wacketts. As at the end of OCT 1943, 3836 wireless air gunners had been trained – the U/E training fleet consisted of 33 Wacketts and five D.H.84 Dragons. By the end of NOV 1944, 3WAGS had been absorbed into 1WAGS, and Wacketts were being despatched to storage. W/T training in the RAAF was changing – radar technology saw 1WAGS with radar and wireless operator trainees, in JAN 1945 a Radar Training Wing was established, and the Radar School from Maryborough was absorbed in SEP 1945. The Air and Ground Radio School was established on 1 NOV 1945, however only to be disbanded on 21 JAN 1946.<sup>104</sup>



*[colourised from AWM VIC 1989]*

### **1WAGS Ballarat on 18 MAR 1942**

This batch of Wackett Trainers were the first production batch (**A3-61 to A3-72**) converted by CAC as W/T trainers in OCT 1941, and was followed by another batch (**A3-131 to A3-142**) to 1WAGS in MAR 1942. The image above has been dated by the AWM as 18 MAR 1942, and shows Wacketts of this first W/T batch, and two DC-2 W/T trainers.



## 2WAGS PARKES – A3-154 1942-1943

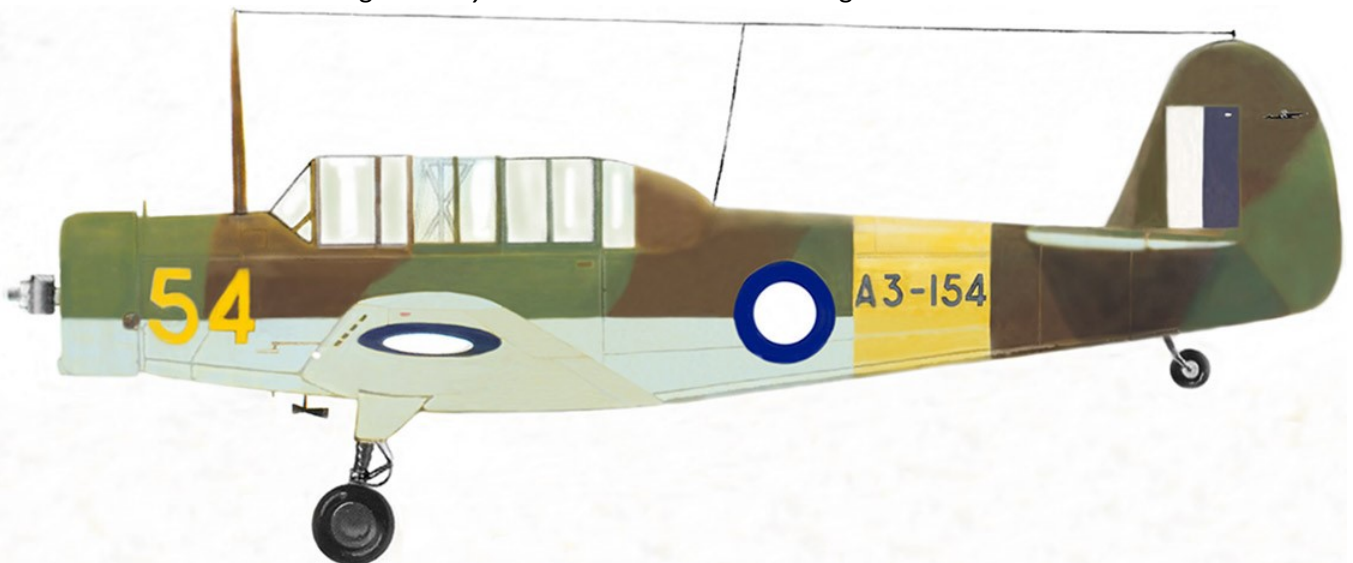
**2WAGS** formed at **Parkes** NSW on 9 JAN 1941 as the advance party to establish the unit, and at the end of the month, had grown to eight officers and 38 airmen. Eighty trainees were posted in to commence training in FEB, and during JUN 1941, two Douglas DC-2s (A30-7 and A30-8) arrived, joined by three Tiger Moths in JUL. By NOV 1942, the training effort was 183 DC-2 hours flown for the month, and 492 Tiger Moth hours. The DC-2s were used for other than training purposes, when on 18 JAN 1942, A30-7 and A30-8 were flown to Darwin for operations to the north. A30-8 was lost to enemy action on 26 JAN 1942. A30-7 was lost on 15 JUN 1942, when it crashed training near the aerodrome, with all crew killed. In FEB 1942, the first Wackett (**A3-95**) arrived, and soon joined by **A3-101 to A3-112**. Now showing the Wackett workload in this role, in MAY 1942 DC-2s flew 73 training hours, the Wacketts flew 996 hours, and the following month the Wacketts clocked 1213 hours.<sup>105</sup> There were several Wackett fatal accidents at 2WAGS over its years of operation: **A3-106** crashed on 25 JUN 1942 near Forbes NSW; **A3-104** crashed north of Parkes at Peak Hill on 21 AUG 1943; and **A3-161** crashed on 4 JAN 1944 at the Parkes aerodrome on ferry to 3WAGS. By the beginning of 1944, plans were underway for the disbandment of 2WAGS.



*[from AWM colour film F03642]*

**A3-154** Parkes SEP/OCT 1942 with *Sky Blue* undersides that still extended half up the fuselage

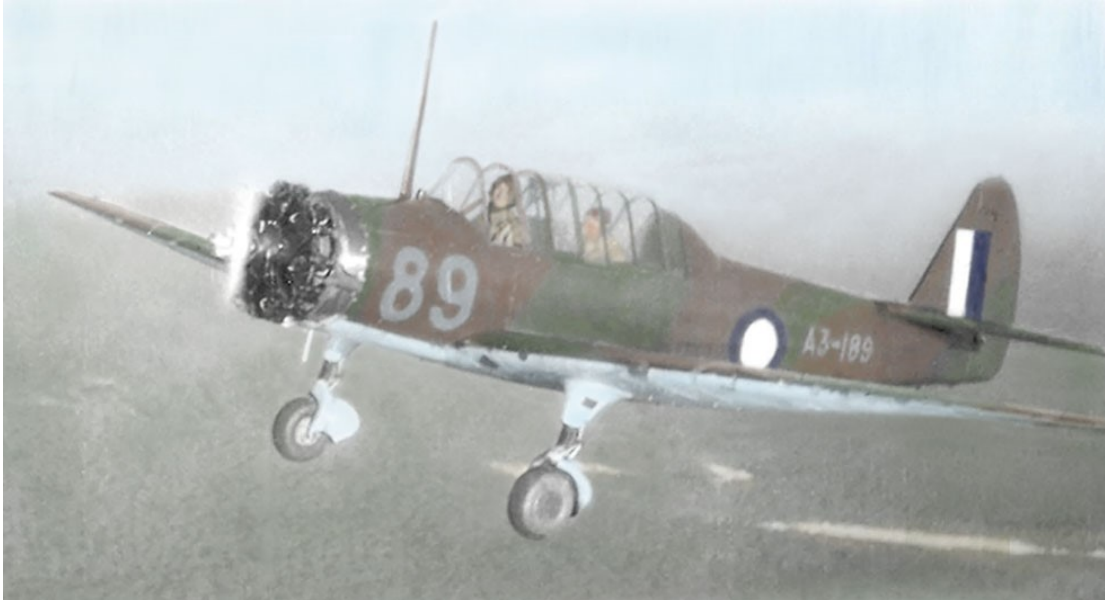
*Yellow* trainer bands 36" around the rear fuselage and upper mainplanes, and *Yellow* training number. The fuselage demarcation between camouflage and *Sky Blue* undersides is mid-fuselage.



**A3-154** was received by 2WAGS Parkes in MAY 1942. As the unit was about to be disbanded, from JAN 1944 2WAGS aircraft began to be dispersed to 1WAGS Ballarat, 3WAGS Maryborough, and to Archerfield, with 2WAGS disbanded on 12 FEB 1944.<sup>106</sup> A3-154 was sold by CDC in NOV 1945 in a 'job lot' of five aircraft (with A3-43, A3-51, A3-162 and A3-165) for £340 total price, to JT Brown (KSAS) and being a single stick W/T Trainer, was kept as an NEI ML-KNIL reserve aircraft and presumably used for spares.

## 3WAGS MARYBOROUGH – A3-189 1942-1944

**3WAGS** formed at **Maryborough** QLD on 18 SEP 1941, with the arrival of the first training course on 15 OCT. Members of this course graduated on 29 APR 1942, and the total strength of the unit had risen to nearly 900 by the end of the year. During MAY 1942, the first Wackett Trainers arrived (from the final production batch **A3-181 to A3-200**) and were supplemented with D.H.84 Dragons in AUG 1943. More Wacketts were taken on strength from 2WAGS during 1943. At the end of DEC 1943, the unit strength was 36 officers and 395 other ranks, three WAAAF officers and 75 airwomen, plus 5-10 trainees, with a strength of 43 Wacketts. On 24 AUG 1944, a signal was advised of the reduction in training, and subsequent Wackett transfer to 1WAGS at Ballarat or to storage. Accordingly, 35 Wacketts were ferried to 8OTU Narromine storage on 25 SEP 1944, with one **A3-185** forced landing with an engine failure at Western Creek Forest, north of Goodiwindi QLD. 3WAGS was officially disbanded on 6 DEC 1944.<sup>107</sup>



[Colourised from GRB Collection adf-serials]

**A3-189 was common with all 3WAGS Wacketts operating with the engine cowl removed**

c1944 with lower *Foliage Green/Earth Brown* camouflage demarcation, no *Yellow* trainer bands, the serial and training number in *Medium Sea Grey*, with the undersides assessed as *Sky Blue*. Pacific 3:5 roundel, with unusually tall fin flash.



[Colourised from QAM via adf-serials]

**A3-185 engine failure forced landing, Western Creek Forest QLD ferry to Narromine, 25 SEP 1944 – converted to components**  
As 3WAGS was disbanded late in the war, most of its aircraft were flown directly to storage at 8OTU Narromine, and A3-185 forced landed enroute. Although on strength at 3WAGS after the MAY 1944 AGI specified either overall *Foliage Green* or overall training *Yellow*, because of the anticipated closure of the Unit, A3-185 shows that aircraft colours were maintained in *green/brown* camouflage, with apparently *Sky Blue* undersurfaces – the disruptive camouflage can be discerned on the original monochrome image. Of interest, however, is the application of *White* serial number and nose '85' training number.

## DISPOSAL

On 18 SEP 1944, the Air Board declared 166 Wackett Trainers as surplus to requirements, with ten to be retained by CFS for instructor training<sup>108</sup> – however with peace in 1945, the service life of the Wackett with the RAAF came to an end. A total of 117 RAAF Wacketts, were listed in the second CDC aircraft disposals document dated 1 OCT 1945, and stated as in various stages of serviceability and to be sold “as and where they lie”.<sup>109</sup> This list below provides the **disposition in SEP 1944** of 59 serviceable Wacketts (not yet available for disposal), and 117 unserviceable (U/S) aircraft that were immediately available for release. **8OTU at Narromine** and **8EFTS at Narrandera** are prominent in the disposal of RAAF Wacketts. The aircraft were stored initially from late 1944 at 8OTU (which had moved in JUN 1944 to Parkes to become Care and Maintenance Unit, CMU Narromine), and then ferried enmasse to 8EFTS at the beginning of JAN 1945 (the unit becoming CMU Narrandera in JUN 1945).

Some interesting details are on the list. 10EFTS Temora had one U/S Wackett (A3-87) for “comm purposes”; 7SFTS Deniliquin held two U/S (A3-25 and A3-52 which would be scrapped by 7CRD); 5SFTS Uranquinty had one flying (A3-163) as a “hack”; 1APU held one (A3-14) for performance testing; and nine were held in storage at 5AD Wagga, to be later ferried to Narrandera. 7AD still had the majority of U/S aircraft, numbering 53, after the discontinued overhaul program which had been halted in 1943, and several aircraft were held by the 2AD nearby sub-units, 2AP and 2CRD.

Type	Unit	S	U/S	Remarks
Wackett Trainer	8 EFTS	1		* Instructional Comm purposes
	10 "	1*		
	7 SFTS		1	allot to 8 OTU. Store 4 Dual allot to CFS. 12 Serv. allotted 8 O.T.U. Storage 35 allotted to 8 OTU.Storage
	5 "	1	2	
	1 WAGS	12	30	
	3 "	35	10	
	5 AD	9		
	Store			
	1 A.P.U		1	
	7 A.D.		53	
	2 A.P		6	
	2 C.R.D.		2	
	A.P.L		2	
	B.A.T.		2	
N.A.C.		8	allot to 2 A.P 5 allot 2 C.R.D.	

*59 + 117 = 176 also 13*

[NAA A705 73/21/1050(5B) ]

**Wackett Contracted Maintenance.** While during RAAF service, most maintenance, minor repairs and overhauls was carried out by the maintenance sections of the training units to which the Wackett Trainers were attached or by 7AD, while some approved civil contractors were used for major overhauls and accident damage repair. These included APL (Aircrafts Pty Ltd, Archerfield), BAT (Butler Air Transport, Mascot, which serviced 3WAGS), and NAC (Newcastle Aero Club, Broadmeadow Newcastle NSW, which did much work for 2 and 3WAGS and CFS). Other Wackett contractors were Ansett Airways, Essendon (for 3EFTS, 11EFTS and 1WAGS) and Mascot NSW (2WAGS); Victorian and Interstate Airways (VIA) Essendon; and Clyde Engineering at Mascot and later Bankstown (for CFS).

As the in-use Wacketts from 1WAGS and 3WAGS were flown to storage at Narromine and subsequently Narrandera, the large disposals from late 1945 drew interest. By JUL 1945, Wacketts held by the CMU Narrandera numbered 102, and CDC disposals by MAR 1946 had dropped this to three aircraft.<sup>110</sup> 98 of the disposals were bought by J T Brown of Kew VIC (representing **Kingsford Smith Air Services, KSAS**), who created a virtual monopoly on Wackett sales and spares. Half of the KSAS purchases were sold to the NEI Air Force (ML-KNIL) in 1946, with 30 of these flying as elementary trainers at its Central Flying School. The KSAS cache also provided airframes for conversion into its KS.3 Cropmaster design, and the subsequent Yeoman YA-1. In addition, CDC sold a few to aero clubs at a 50% discount.

## CIVILIAN WACKETTS

A total of 117 RAAF Wacketts plus 97 spare Warner Super Scarab engines were listed in the second post-war civil sale through the Commonwealth Disposals Commission in 1945. The disposals document, dated 1 OCT 1945, stated the aircraft as in various stages of serviceability and to be sold “as and where they lie”, with DCA approving their civil use as private aircraft or for training. Most Wacketts were disposed of by CDC over late 1945 from storage at CMU Narrandera (the previous base of 8EFTS), with 98 bought by John T Brown of Kew VIC, for his company Kingsford Smith Air Services, creating a virtual monopoly on Wackett sales and spares. DCA allocated these aircraft with a block of 91 civil registrations, most of which were not taken up (ntu) as they were sold overseas. Brown’s largest KSAS purchase was on **26 NOV 1945 for £3840 for 57 aircraft**, and marked in the list below as ‘57\*’. Other KSAS bulk buys were in groups of four or five at a unit cost of £68. Fifty of the KSAS purchases were sold to the NEI Air Force (ML-KNIL) and finalised by a contract on 11 JAN 1946<sup>111</sup> – 30 of these were operated as dual elementary trainers at its Central Flying School at Kalidjati. The table below is listed in RAAF CA-6 registration order from A3-1 (CA-2 A3-1001 at the bottom). The sale dates and prices are from the E/E.88 Cards, representing the recorded date of sale – not the date of pick-up by the purchaser nor the date of civilian registration. [Civil registrations in blue](#) are from the DCA allocated blocks, but were ntu.

RAAF Disposal	C/N	VH- Reg	Details
A3-1 sold A Allesio 10/45 for £75	235	n/a	Issued 6/46, not registered, spares for VH-APD, VH-BAW
A3-2 sold J T Brown 11/45 57*	236	VH-AIM	Issued 8/46 VH-AIM 10/46-5/51 CR nr Cooktown QLD
A3-3 sold J T Brown 11/45 57*	237	VH-AIN	Issued 4/46, to ML-KNIL as B-301 1946
A3-5 sold J T Brown 11/45 for £200	239	VH-AIO	Issued 12/45, ML-KNIL reserve aircraft W/T trainer 1946
A3-6 sold RVAC 9/45 for £150	240	VH-AFE	Issued 9/45 £450 3a/c and spare engines, reg ntu
A3-7 sold J T Brown 11/45 for £200	241	VH-AIP	Issued 2/46, to ML-KNIL as B-302 1946
A3-8 sold J T Brown 11/45 57*	242	VH-AIQ	Issued 5/46, ML-KNIL as reserve W/T trainer 1946
A3-9 sold W P Morgan 10/45 for £250	243	VH-AFG	VH-AFG 12/45-1/54 crashed Taree NSW 30/1/54
A3-10 sold J T Brown 8/46 for £68	244	VH-AKC	VH-AKC 2/47-6/50, sold NZ ZK-AUC 6/50 CR Taupo 6/58
A3-11 sold J T Brown 12/45 for £68	245	VH-ALS	Issued 2/46, to ML-KNIL as B-303 1946
A3-12 sold J T Brown 11/45 57*	246	VH-AIR	Issued 8/46 at Narrandera, probably used as spares
A3-13 sold J T Brown 11/45 for £190	247	VH-AIS	12/45 KSAS, VH-AIS 4/46, NT Aero Club 8/46, wfu 12/47
A3-14 sold J T Brown 11/45 57*	248	VH-AIT	QEA VH-EAY 11/47-1/50, ANA Flg Club VH-AIO CR 6/50
A3-18 sold J T Brown 11/45 57*	252	VH-AIU	Issued 3/46, to ML-KNIL as B-304 1946
A3-19 sold J T Brown 12/45 for £68	253	VH-ALT	Issued 1/46, to ML-KNIL as B-305 1946
A3-20 sold J T Brown 12/45 for £68	254	VH-ALU	Issued PCK 2/46; VH-AQB 4/46, crashed Geelong 4/47
A3-22 sold J T Brown 12/45 for £68	256	VH-ALV	8/46 to series of owners, Moorabbin Air Museum 8/68
A3-23 sold J T Brown 11/45 for £240	257	VH-AIV	2/46-4/53, as Yeoman 175 7/61 VH-CYB (ntu), wfu 2/62
A3-27 sold J T Brown 11/45 for £240	261	VH-AIW	Issued 4/46, to ML-KNIL as B-306 1946
A3-29 sold D Wymark 10/45 for £10	263	n/a	Issued 12/45 Amberley no engine, broken up for parts
A3-30 sold J T Brown 11/45 57*	264	VH-AIX	Issued 3/46, to ML-KNIL as B-307 3/46
A3-31 sold J T Brown 11/45 57*	265	VH-AIY	MacRobertson Miller 6/46-7/64, RAAF Bull Creek 2002
A3-34 sold J T Brown 11/45 for £170	268	VH-AIZ	Issued 12/45, to ML-KNIL as B-308 1946
A3-35 sold T W Cox 11/45 for £250	269	VH-AFL	Issued 12/45, VH-AFL 4/46-8/51 wfu
A3-37 sold J T Brown 11/45 57*	271	VH-AJA	Issued 2/46, to ML-KNIL as B-309 1946
A3-39 sold K Handford 10/45 for £10	273	n/a	Issued 11/45 Amberley no engine, presume broken up
A3-40 sold J T Brown 11/45 for £150	274	VH-AJB	KSAS 1/46, supported 1954 Redex Air Trial, wfu 5/62
A3-41 sold J T Brown 11/45 57*	275	VH-AJC	Issued 3/46, to ML-KNIL as B-310 1946
A3-42 sold P J Norris 10/45 for £250	276	VH-AIG	Issued 11/45, several owners, off register 7/55
A3-43 sold J T Brown 11/45 for £68	277	VH-AJD	Issued 3/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-44 sold J T Brown 11/45 57*	278	VH-AJE	Issued 3/46, possibly used as ML-KNIL spares 1946
A3-45 sold J T Brown 11/45 57*	279	VH-AJF	Issued 4/46, to ML-KNIL as B-311 1946
A3-47 sold J T Brown 11/45 57*	281	VH-AJG	Issued 3/46, to ML-KNIL as B-312 1946
A3-49 sold J T Brown 11/45 for £205	283	VH-AJH	KSAS 4/46, conv KS mods 1957, 3/59 Yeoman Avn, at QAM
A3-51 sold J T Brown 11/45 for £68	285	VH-AJI	Issued 3/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-53 sold J T Brown 11/45 57*	287	VH-AJJ	Issued 3/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-54 sold J T Brown 11/45 57*	288	VH-AJK	Issued 3/46, to ML-KNIL as B-313 1946
A3-55 sold J T Brown 11/45 57*	289	VH-AJL	Issued 5/46, to ML-KNIL as B-314 1946
A3-56 sold J T Brown 11/45 57*	290	VH-AJN	KSAS 8/46, used in 1954 to repair VH-BEC (c/n 373)
A3-57 sold J T Brown 11/45 for £7	291	VH-AJO	Issued 4/47 Richmond no engine, presume to spares

RAAF Disposal	C/N	VH- Reg	Details
A3-58 sold K Handford 10/45 for £15	292	n/a	Issued 11/45 Amberley no engine, presumably to parts
A3-60 sold J T Brown 11/45 57*	294	VH-AJP	Issued 3/46, to ML-KNIL as B-315 1946
A3-61 sold J T Brown 11/45 57*	295	VH-AJQ	Issued 4/47, probably used as spares
A3-63 sold RVAC 10/45 for £40	297	n/a	Issued 1/46 from Ballarat, spare engine, not registered
A3-65 sold J T Brown 11/45 57*	299	VH-AJR	Stored by KSAS, converted to KS.3 reg 12/57 VH-FBD
A3-66 sold J T Brown 11/45 57*	300	VH-AJS	Issued 8/46, presumably to spares
A3-67 sold W J McKeown 10/45 for £20	301	n/a	Issued 4/46 Ballarat without engine, never registered
A3-68 sold J T Brown 11/45 for £185	302	VH-AJT	Issued 1/46, presumably to spares
A3-70 sold A Allesio 10/45 for £170	304	VH-APD	VH-APD 1/46-10/50 destroyed by fire Oodnadatta NT
A3-71 sold W J McKeown 4/46 for £20	305	n/a	Issued from Ballarat without engine, never registered
A3-72 sold RVAC 10/45 for £40	306	n/a	Issued 1/46 from Ballarat, spare engine, not registered
A3-73 sold J T Brown 12/45 for £68	307	VH-ALW	Issued 3/46, to ML-KNIL as B-316 1946
A3-75 sold J T Pile 10/45 for £250	309	VH-AOO	Issued 12/45, VH-AOO /46-2/47 crashed at Ayr QLD
A3-76 sold J T Brown 11/45 57*	310	VH-AJU	Issued 8/46, VH-AJU 9/46-8/62
A3-77 sold J T Brown 11/45 for £7	311	VH-AJV	Issued 4/47 Richmond no engine, presume to spares
A3-78 sold D Wymark 10/45 for £10	312	n/a	Issued 12/45 Amberley no engine, presume to spares
A3-83 sold J T Brown 11/45 57*	317	VH-AJW	Resold QEA VH-EAZ 7/47, VH-AIQ 5/51 crashed 2/56
A3-85 sold S Ash 10/45 for £250	319	VH-BLV	Issued 1/46, VH-BLV 10/48 to 9/63 wfu, stored for rest'n
A3-86 sold J T Brown 11/45 57*	320	VH-AJX	Issued 3/46, to ML-KNIL as B-317 1946
A3-87 sold J T Brown 11/45 57*	321	VH-AJY	Reg 8/46-4/59, Beck Mareeba, 2018 Maryborough Mus'm
A3-89 sold J T Brown 11/45 57*	323	VH-AJZ	Issued 2/46, to ML-KNIL as B-318 1946
A3-93 sold J T Brown 12/45 for £68	327	VH-ALX	Issued 2/46, to ML-KNIL as B-319 1946
A3-95 sold J T Brown 11/45 57*	329	VH-AKA	Issued 8/46, presumably to spares
A3-97 sold J T Brown 12/45 for £68	331	VH-ALY	Issued 3/46, to ML-KNIL as B-320 3/46
A3-99 sold J T Brown 11/45 57*	333	VH-AKB	Issued 3/46, to ML-KNIL as B-321 3/46
A3-100 sold J T Brown 11/45 for £240	334	VH-AKC	Issued 12/45, to ML-KNIL as B-322 1946
A3-103 sold J T Brown 11/45 57*	337	VH-AKD	Issued 8/46, presumably to spares
A3-107 sold I J Hosie 10/45 for £250	341	VH-AGN	VH-AGN 12/45-2/54, VH-BIH 2/54-8/62, convt to YA-1
A3-108 sold F/O Preston 12/45 £250	342	VH-AOJ	Issued 12/45, VH-AOJ 1/46 to 8/54 wfu
A3-111 sold J T Brown 11/45 57*	345	VH-AKE	Issued 3/46, ML-KNIL reserve aircraft, W/T trainer 1946
A3-112 sold J T Brown 11/45 57*	346	VH-AKF	Issued 3/46, presumably to spares, possibly to NEI
A3-113 sold J T Brown 12/45 for £68	347	VH-ALZ	VH-ALZ 1/46-5/54, crashed and burned Streatham VIC
A3-114 sold R V Miles 10/45 for £300	348	VH-AFF	Issued 10/45, VH-AFF 11/45 to 12/47, wfu
A3-116 sold J T Brown 11/45 57*	350	VH-AKB	Issued 3/46, to ML-KNIL as B-323 1946
A3-117 sold J T Brown 12/45 for £68	351	VH-AMC	Issued 3/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-118 sold J T Brown 12/45 for £68	352	VH-AMD	Issued 2/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-119 sold M Cohen-Collins 9/45 for £300	353	VH-AFB	Issued 9/45, VH-AFB 10/45 to 3/55, wfu
A3-121 sold J T Brown 12/45 for £68	355	VH-AME	Issued 1/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-122 sold J T Brown 12/45 for £68	356	VH-AMF	Issued 1/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-123 sold J T Brown 11/45 57*	357	VH-AKH	Issued 3/46, to ML-KNIL as B-324 1946
A3-124 sold J T Brown 12/45 for £68	358	VH-AMG	Issued 3/46, to ML-KNIL as B-325 1946
A3-125 sold J T Brown 11/45 57*	359	VH-AKI	Issued 3/46, to ML-KNIL as B-326 1946
A3-127 sold J T Brown 11/45 57*	361	VH-AKJ	Issued 3/46, to ML-KNIL as B-327 1946
A3-128 sold RVAC 9/45 for £150	362	VH-AFC	Issued 9/45 £450 3a/c, VH-AFC 10/45 to 4/56, wfu
A3-129 sold A R Bennet 10/45 for £250	363	VH-AMA	1/46-8/58, VH-DGR to 5/70, VH-WKT to 12/00, restor'n
A3-130 sold J T Brown 11/45 57*	364	VH-AKK	Issued 5/46, resold 8/46, wfs 12/47
A3-131 sold J T Brown 11/45 57*	365	VH-AKI	Issue 4/47, conv'd to KS.3 VH-FBE 12/57, Air Culture /59
A3-132 sold J T Brown 11/45 57*	366	VH-AKM	Issued 4/47, VH-BQL 7/55-9/62, wfu
A3-134 sold J T Brown 11/45 57*	368	VH-AKN	Issued 4/47, presumably to spares
A3-135 sold J T Brown 11/45 57*	369	VH-AKO	Issued 3/46, presumably to spares, possibly to NEI
A3-136 sold J T Brown 11/45 57*	370	VH-AKP	Issued 3/46, ML-KNIL reserve aircraft W/T trainer 1946
A3-138 sold J Allesio 10/45 for £160	372	VH-AGE	Issued 2/46, VH-AGE 12/49-4/56, wfu
A3-139 sold Huppert & Co 10/45 for £20	373	VH-BEC	Issue 3/46 Ballarat, VH-BEC 4/53-1/62 lost desert, AS Mus
A3-140 sold J T Brown 11/45 57*	374	VH-AKQ	Issued 3/46, presumably to spares
A3-141 sold J T Brown 11/45 57*	375	VH-AKR	Issued 4/47, conv'td to KS.3 VH-FBF 3/58 Airwork
A3-142 sold D Stewart 10/45 for £30	376	n/a	Issued 5/46 from Ballarat, presumably to spares
A3-145 sold RVAC 9/45 for £150	379	VH-AFD	Issued 9/45 £450 3ac, VH-AFD 11/45-12/48 CR Lockhart

RAAF Disposal	C/N	VH- Reg	Details
<b>A3-146</b> sold R S Smith 10/45 for £250	380	VH-BCP	Issued 11/45, VH-BCP 6/47-6/59 crashed Yarram VIC
<b>A3-147</b> sold J Allesio 10/45 for £250	381	VH-BAW	Issued 1/46, VH-BAW 12/47-12/49, cr Donnybrook VIC
<b>A3-148</b> sold Huppert & Co 9/45 for £245	382	VH-AHU	Issued 9/45 from Tocumwal, VH-AHU 9/45-4/56 wfu
<b>A3-149</b> sold J T Brown 11/45 57*	383	VH-AKS	Issued 3/46, to ML-KNIL as B-328 1946
<b>A3-151</b> sold J T Brown 11/45 for £210	385	VH-AKT	Resold 4/46 wfu 12/47; VH-WFM 4/55-3/61 wfu
<b>A3-152</b> sold J T Brown 11/45 57*	386	VH-AKU	Issued 2/46, to ML-KNIL as B-329 1946
<b>A3-154</b> sold J T Brown 11/45 for £68	388	VH-AKV	Issued 3/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-155</b> sold J T Brown 11/45 for £7	389	VH-AKW	Issued 4/47 Richmond no engine, presume to spares
<b>A3-157</b> sold J T Brown 11/45 for £230	391	VH-AKX	Issued 1/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-159</b> sold Newcastle A Club 10/45 £125	393	VH-AFI	Price £250 less 50% discount, VH-AFI 1/46-10/47 wfu
<b>A3-160</b> sold J T Brown 11/45 for £7	394	VH-AKY	Issued 4/47 Richmond no engine, presume to spares
<b>A3-162</b> sold J T Brown 11/45 for £68	396	VH-AKZ	Issue 3/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-163</b> sold J T Brown 11/45 57*	397	VH-ALA	Issued 3/46, to ML-KNIL as B-330 1946
<b>A3-164</b> sold J T Brown 11/45 for £7	398	VH-ALB	Issued 4/47 Richmond no engine, presume to spares
<b>A3-165</b> sold J T Brown 11/45 for £68	399	VH-ALC	Issue 3/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-167</b> sold Newcastle A Club 10/45 £125	401	VH-AGP	VH-AGP 1/46-3/60 wfu, AARG Moorabb, KS.3; stored rest'n
<b>A3-168</b> sold J T Brown 11/45 57*	402	VH-ALD	Issued 8/46, VH-ALD 1/47-2/62 wfu
<b>A3-169</b> sold J T Brown 11/45 57*	403	VH-ALE	Issued 3/46, presumably to spares
<b>A3-172</b> sold J T Brown 11/45 57*	406	VH-ALF	Issued 8/46, resold VH-AKF 3/57-4/63 wfu
<b>A3-173</b> sold J T Brown 11/45 for £225	407	VH-ALG	Issued 12/45, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-174</b> sold WOff Clarkson 10/45 for £75	408	VH-APC	Issued 1/46 at Ballarat, VH-APC 5/46-8/54 wfu
<b>A3-175</b> sold J T Brown 11/45 57*	409	VH-ALH	Issued 8/46, presumably to spares
<b>A3-176</b> sold J T Brown 11/45 57*	410	VH-ALI	KSAS conv't KS.3 VH-FBD 6/58 Airwork, Air Culture 2/60
<b>A3-177</b> sold J T Brown 11/45 57*	411	VH-ALJ	Issued 8/46, presumably to spares
<b>A3-178</b> sold J T Brown 11/45 57*	412	VH-ALK	Issued 4/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-180</b> sold J T Brown 11/45 for £68	414	VH-AMH	Issued PCK 2/46, ML-KNIL reserve trainer 1946 as spares
<b>A3-182</b> sold J T Brown 11/45 for £220	416	VH-ALL	Issued 1/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-183</b> sold J T Brown 11/45 57*	417	VH-ALM	Issued 8/46, presumably to spares
<b>A3-184</b> sold J T Brown 11/45 57*	418	VH-ALN	Issued 3/46, presumably to spares, possibly to NEI
<b>A3-188</b> sold D Wymark 10/45 for £10	422	n/a	Issued 12/45 Amberley no engine, presume to spares
<b>A3-192</b> sold J T Brown 11/45 57*	426	VH-ALO	Issued 4/47, presumably to spares
<b>A3-193</b> sold J T Brown 11/45 57*	427	VH-ALP	Issued 4/47, presumably to spares
<b>A3-196</b> sold J T Brown 11/45 for £215	430	VH-ALQ	Issued 1/46, ML-KNIL reserve aircraft W/T trainer 1946
<b>A3-197</b> sold J T Brown 11/45 for £7	431	VH-ALR	Issued 4/47 Richmond no engine, presume to spares
<b>A3-198</b> sold C E Eather 11/45 for £250	432	VH-AHX	Issued 1/46, VH-AHX 1/46-1/47 crashed Bankstown
<b>A3-199</b> sold J McKeown 10/45 for £250	433	VH-ARH	VH-ARH 10/46-9/56 damaged and possibly destroyed
<b>A3-1001</b> sold D Stewart 10/45 for £50	101	VH-AHV	Issued 1/46 Ballarat, VH-AHV 4/46-12/47 CR Berwick Vic



[Colourised from M de Vreeze image IPMS Netherlands]

**A3-124** with the ML-KNIL as B-325 in 1947, with a Piper L-4 Cub / 'Grasshopper' under the tail



## THE NEI WACKETTS

Fifty ex-RAAF Wacketts were exported to the NEI in 1946 to establish a training capability for the ML-KNIL, the Royal Dutch East Indies Air Force. Thirty aircraft were refurbished (as **B-301 to B-330** sequentially with their RAAF serial) and operated from 1947 by the Central Flying School at Kalidjati, West Java, until about 1950 – the remainder were cannibalised for components. Naturally the CFS was only interested in dual control trainers for pilot training, so any W/T ‘single stickers’ were used for spares. The NEI Wacketts, like the RAAF ‘hot area’ Wacketts, were flown without engine cowls. Only three ML-KNIL Wacketts were involved in training accidents over 1948-1949 (B-303, B-308 and B-311), and apparently following Independence the survivors were passed onto the new Republic of Indonesia Air Force (AURI).<sup>112</sup>



**Wackett B-315 (ex A3-60) in NEI**

*[Colourised from NIMH vis IPMS Netherlands]*

ML-KNIL Serial	RAAF Serial	ML-KNIL Serial	RAAF Serial	ML-KNIL Serial	RAAF Serial
B-301	A3-3	B-311	A3-45	B-321	A3-99
B-302	A3-7	B-312	A3-47	B-322	A3-100
B-303	A3-11	B-313	A3-54	B-323	A3-116
B-304	A3-18	B-3-4	A3-55	B-324	A3-123
B-305	A3-19	B-315	A3-60	B-325	A3-124
B-306	A3-27	B-316	A3-73	B-326	A3-125
B-307	A3-30	B-317	A3-86	B-327	A3-127
B-308	A3-34	B-318	A3-89	B-328	A3-149
B-309	A3-37	B-319	A3-93	B-329	A3-152
B-310	A3-41	B-320	A3-97	B-330	A3-163



*[Colourised from NIMH no. 2158-027408]*

**B-304 (ex A3-18) at Kalidjati AUG 1948**



*[Colourised from Goodall Aviation site]*

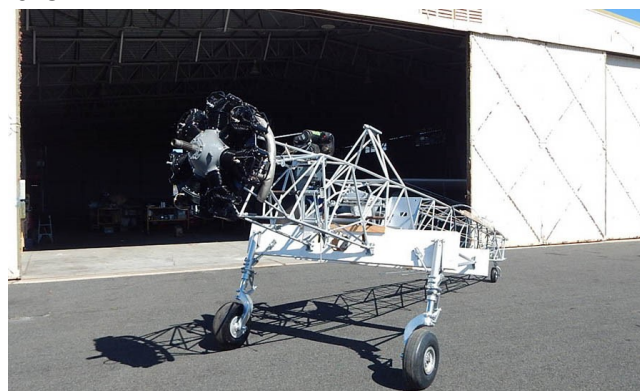
**B-308 (ex A3-34) crashed at Kalidjati FEB 1949**

## SURVIVORS

The potential of the Wackett Trainer has often been raised – could it have been more successful? Once technical problems had been rectified, the Wackett gave postwar service in Indonesia as a trainer, and in Australia with civilian operators. Furthermore it provided the basis for agricultural designs, which were soon overtaken by the influx of US ag aircraft from the 1960s. Perhaps that is the story of the Australian aviation industry. The Wackett had been rushed through development with a change of engines, and production ceased with 200 aircraft primarily because there were such extensive orders with de Havilland for the Tiger Moth. Basically it was pipped at the post on two occasions. Delays in entering production in 1939 coincided with adoption of nearly a thousand Tiger Moths as the RAAF EFTS trainer. Postwar, the influx of modern US agricultural aircraft from the 1960s negated continuing development of local designs.

Most of the Wacketts that do survive as complete static display examples were among the aircraft purchased by John T Brown and sold to domestic operators. The four current complete Wackett static displays are **A3-22/VH-ALV** under restoration at the Australian Aviation Museum Moorabbin; **A3-31/VH-AIY** at the Aviation Heritage Museum at Bull Creek WA; **A3-49/VH-AJH** as a KSAS KS-3 Cropmaster at Queensland Air Museum as Caloundra; and **A3-139/VH-BEC** at the Central Australian Aviation Museum in Alice Springs.

In addition, a new Wackett for static display is **A3-87/VH-AJY** is under restoration at the Maryborough Military Aviation Museum. A3-87 had been sold to J T Brown in 1945 and allocated registration VH-AJY. It flew over 1946 to 1951, then from 1954 to 1959, when it was withdrawn from use, and burnt at Cloncurry Airport. The remains were collected by Syd Beck, and the fuselage frame and engine were displayed at Beck Collection, Mareeba, Qld. It was bought by the Maryborough Military Aviation Museum in MAR 2018.



[Maryborough Military Aviation Museum]

### **A3-87 with the workers at Maryborough Military Aviation Museum in JUL 2020**

Furthermore, several Wacketts are under long-term restoration to airworthiness, enabled by being fitted with KS-3 Cropmaster metal wings.

- **A3-129** was sold through CDC and held registration VH-AMA from 1946 to 1958. Re-registered in MAY 1970 as VH-DGR, it was sold for airworthy restoration in DEC 2000, with the metal Cropmaster wing. Currently the appropriate registration **VH-WKT** is reserved, in the name of J Gallagher of Loftus NSW.<sup>113</sup>



**VH-DGR (A3-129) at Mudgee NSW, SEP 1970**

[Goodall Aviation site]

- Another two Wacketts intended for airworthy restoration – **A3-85/VH-BLV** and **A3-167/VH-AGP** – are stored by Mark Pilkington at Lara VIC, again using metal Cropmaster wings.<sup>114</sup>

## SURVIVOR A3-22

Probably the best known of the four surviving Wackett Trainers in museums in Australia is restored **A3-22/VH-ALV** (c/n 256). A3-22 was sold postwar to J T Brown in DEC 1945 for £68, being registered as VH-ALV from 1946 with a series of civilian owners on and off the Register until 1968. It was acquired by the Moorabbin Museum following a forced landing into the Melbourne Metropolitan Board of Works sewerage farm, southeast of Moorabbin Airport on 26 AUG 1968, being recovered by members of AARG and stored at Casey Airfield, Berwick. It was transported to CAC for display at their 40th Anniversary celebrations in 1977 (after receiving a “cosmetic restoration” with camouflage upper and *Yellow* lower surfaces) and then was on static display at the Australian National Aviation Museum at Moorabbin. Subsequently displayed at Wangaratta in 2004, it was relocated to Ashley Briggs’ hangar at Point Cook in 2005 for overhaul, and is still undergoing restoration at his Moorabbin Airport hangar. As the 22nd production machine, it is the oldest of the remaining four complete Wacketts remaining in Australia.<sup>115</sup>



[RAAF image]

**A3-22/VH-ALV at Point Cook after a “cosmetic” markings restoration for the CAC 40th Anniversary 1977**



[Martin Edwards adf-serials]

**A3-22 on display in Wangaratta, APR 2004**

## SURVIVOR A3-31

**A3-31** (c/n 265) was sold to J T Brown in MAR 1946 and allocated registration VH AIY, and served with MacRobertson Miller Aviation until withdrawn from use in JUL 1964. It was displayed at the Horrie C Miller Museum in Broome WA, then moved to the RAAF Association Aviation Heritage Museum at Bull Creek WA in 2002.



[adf-serials]

**A3-31/VH-AIY at Aviation Heritage Museum, Bull Creek WA**



[Martin Edwards adf-serials]

**A3-31/VH-AIY at Aviation Heritage Museum Bull Creek DEC 2005**

### SURVIVOR A3-49

**A3-49** (c/n 283) was sold to JT Brown in NOV 1945 for £205 and registered VH-AJH to Kingsford Smith Aviation Service in APR 1946, and was stored until being converted into KS-1 in MAR 1957, then a KS-2 in AUG 1957. Registration was transferred to Yeoman Aviation in MAR 1959, which converted into a KS-3 Cropmaster in MAY 1959, selling it to Air Culture Pty Ltd. After withdrawal from use in NOV 1968, it was displayed in the RAAF Association Aviation Heritage Museum at Bull Creek WA. Purchased in 2008, it was moved to Queensland Air Museum at Caloundra, then was donated to QAM in JUN 2011 where it is currently displayed.



[Ron Cuskelly, Goodall Aviation site]

A3-49/VH-AJH at QAM DEC 2009

### SURVIVOR A3-139

**A3-139/VH-BEC** (c/n 373) became lost in JAN 1962 flying from Melbourne to Perth. On the leg from Ceduna, VH-BEC became lost and landed in the Simpson Desert. The aircraft ground looped on landing and the starboard flap was damaged, and a search involving 18 aircraft was conducted over the next 19 days without success. The pilot had initially remained with the aircraft after its forced-landing, but presumably gave up hope of being found and had wandered off into the South Australian desert to look for help, but his remains were never found. Discovered in MAR 1965, 276 NM north-west of Ceduna, evidently 40 degrees off planned course, VH-BEC was in good condition despite three years in the harsh conditions. Recovered in 1977 and restored in 1981, it is displayed at the Central Australian Aviation Museum in Alice Springs.<sup>116</sup>



[Sid Mitchell, adf-serials]

A3-139/VH-BEC at Central Australian Aviation Museum, MAR 2015



## The Wackett Trainer

Some regard the Wackett Trainer as the 'forgotten aircraft of the RAAF', given its modest production run and its *supposed* classification as an 'intermediate' trainer between the elementary Tiger Moth and the more advanced Wirraway. It was, however, a very significant aircraft in the training of pilots, air observers and wireless air gunners in Australia during World War II.<sup>117</sup>

So, when denigrating the Wackett Trainer, be aware that the Tiger Moth was well into its second version (the D.H.82A), its 12th year of operation, with many 100s of them in service world-wide, but it still couldn't provide the advanced training sequences that the CAC product could, in its first model, and with much more potential. It was strangled at birth by political machinations, and had no chance to reach its full potential. All new aircraft need development time...<sup>118</sup>

If any 'bugs' could have been remedied earlier, particularly with the engine, the Wackett may well have proved to be more suitable than the Tiger Moth as an elementary trainer, with its more advanced enclosed cockpit, full instrumentation and advanced aerobatic capability. It proved a very safe trainer, and if early problems had been addressed in time, and the supply of engines guaranteed, a long production run of the CA-6 could have been supplied – either from CAC at Fisherman's Bend or subcontracted out to DHA at Mascot.

An excellent coverage of Wackett/Cropmaster is Geoff Goodall's site: [WACKETT CROPMASTER IN AUSTRALIA \(goodall.com.au\)](http://goodall.com.au)

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# Notes Regarding No.18 (Netherlands East Indies) Squadron B-25s

Garry Shepherdson

## **General**

Formed on 4<sup>th</sup> April, 1942, at Canberra, ACT,<sup>119</sup> with B-25 aircraft, the Squadron commenced flying Anti-Submarine patrols from there on 5<sup>th</sup> June.<sup>120</sup> These and convoy escort duties continued to be performed from Canberra, throughout June and July, often utilising Moruya as a staging base for refuelling and, at times, an overnight stop. These activities were the only operational flights conducted by the Squadron until after it arrived in North Western Area (Macdonald, NT) on December 27<sup>th</sup>, 1942.<sup>121</sup>

Their first operation from North Western Area was MAC1/18 Jan (Macdonald 1 of 18<sup>th</sup> January), an Armed Shipping Reconnaissance around the Tanimbar Islands by 3 aircraft. An Offensive Shipping Reconnaissance was conducted the next day as MAC2/19 Jan to Toeal by another 3 B-25s.<sup>122</sup> These early operations were usually either conducted from Darwin by the rotational detachment of three (or sometimes six) aircraft, or departed from Macdonald and transited to Darwin, landed, refuelled and launched from there. The first operation that actually launched from Macdonald was MAC16/18 Feb. The Darwin “standby” detachment wasn’t popular with the CO 18(NEI)SQN<sup>123</sup> and maintenance of a permanent “standby” detachment seems to have petered out to being one on an “as required” basis by early April. By then it was a “standby” detachment in name only, because its aircraft were already tasked for an operation and were in Darwin only for the purposes of prepositioning and/or overnighing prior to operations. Regular use of Darwin as a refuelling stop (frequently on the return leg) continued.

The Squadron moved from Macdonald to Batchelor on May 8<sup>th</sup>.<sup>124</sup> The last operation from Macdonald was MAC7/7 May (a night operation on Penfoei Aerodrome). The first two missions from Batchelor for 18(NEI)SQN were BAT16/11 May (Dilli) and BAT17/11 May (Penfoei Aerodrome) both with an ordered Time On Target of around 1200Z (9pm Darwin local time) so, BAT17, with further to go, launched first. From June 8<sup>th</sup>, 1943, mission titles changed from BAT (Batchelor) to NEI (Netherlands East Indies).

The B-25C aircraft operated by 18(NEI)SQN from North Western Area (NWA) totalled 11 machines: N5-128, N5-129, N5-131 to N5-136 (inclusive), -138, -139 and N5-145. These were North American Aviation model 82s (NA-82), their B-25C-10 aircraft [3 machines: N5-148, -150 and -153] were model NA-94, and their B-25C-15 aircraft [5 machines: N5-146, -147, -149, -151 and -152] were model NA-93.<sup>125</sup> Their early production B-25Ds [7 machines: N5-130, N5-137 and N5-140 to N5-144 inclusive] and their 8 B-25D-20 aircraft [N5-154 to N5-161 inclusive] were all NAA model NA-87.<sup>126</sup> All of the block-25, -30 and -35 B-25Ds received by the Dutch in Australia were NAA model NA-100,<sup>127</sup> the so-called B-25D2 with factory installed waist and tail gunners’ positions. All B-25Js were NAA model NA-108.<sup>128</sup>

A quick note on American aircraft designations and production block numbers (specifically U.S. Army designations rather than U.S. Navy). Exactly what does the designation (for example) “B-25C-15-NA” mean? The designation commences with a role identifier, in this case “B” which meant medium or heavy Bombardment (other United States Army aircraft designations included: “A” which meant, at the time, “Light Bombardment” – not Attack, “OA” – Amphibian, “F” – Photographic Reconnaissance, “P” – Pursuit, “L” – Liaison),<sup>129</sup> this was followed by a figure indicating the type number within that role, in this case meaning “the 25<sup>th</sup> medium or heavy bombardment type”, which was followed by a series modification letter which usually indicated a significant variation from the original design, a production block number which indicated the level of factory fitted modifications added to the original series design (but not sufficient to warrant a new series modification letter). The production block number would typically re-set with a new series modification letter. These block numbers usually started at “1” and then typically blocks of 5 (e.g. block-1, -5, -10, -15, etc, although there were many exceptions) so, block-15 would usually indicate the fourth modification sequence). And finally, a two-letter code indicating where the aircraft was made, “NA” being the code signifying North American Aviation’s primary Inglewood plant in California. “B-25C-15-NA” literally means: medium (or heavy) Bombardment, type 25, series C, production block 15 from the North American Aviation Inglewood plant. The production code “NC” was for their Kansas City, Missouri, plant. It should be kept in mind that, whilst the series

modification letter usually indicated just that – a modification to the series from previous models, it could also be used to indicate an equivalent level of series modification but produced at a different facility. Up to production block-15, B-25Cs and B-25Ds were essentially the same except that B-25Ds were built at Kansas City. Baugher notes though that "... [p]roduction B-25Ds were identified as being Kansas City products by their series designator [i.e. as being a B-25 "D"] and did not use the NC factory code on their [original] data block stencilling. The NC plant designator did not appear until the B-25J."<sup>130</sup> For some reason however, the RAAF, during its survey of suitable NEI aircraft, identified B-25D aircraft as being both –NA and –NC.<sup>131</sup>

Several aircraft were sent to Eagle Farm to receive a "strafer" modification. Basically, this entailed the removal of the bomb sight and associated equipment and removal of the single fixed and single flexible nose machine guns from the bombaimers nose compartment and, in their place, fitting four fixed 50-calibre machine guns along with the necessary fixtures. Two cartridge ejection slots were cut into the underside of the nose. In addition, two twin-50 package guns were fitted externally to the lower forward fuselage below the cockpit. The ventral turret was deleted. Aircraft so modified were therefore equipped with 8 fixed, forward firing 50-calibre machine guns. Those aircraft were:

N5-130 "C", then "GM-C". Flew 13 Ops in its original configuration before being issued to Eagle Farm for modification as a strafer on 22JUL43. It returned to 18(NEI)SQN on 01OCT43 but was only used operationally in its new configuration three times: on 02 and 15DEC43 and 04JAN44.

N5-137 "L". Flew 8 Ops before being issued to Eagle Farm on 08JUN43. It returned to the Squadron on 23JUN43 and was coded "GM-L". It then successfully completed 7 operations in strafer configuration (07JUL, 27 and 30SEP, 26 and 28OCT, 15DEC43 and 04JAN44). It failed to return from its 8<sup>th</sup> operation in strafer configuration, which was its second operation of the day on 04JAN44.

N5-141 "P", then "GM-P". Completed 6 Ops before being sent to Eagle Farm for strafer modification on 29JUN43. Returned to the Squadron on 20JUL43 and subsequently flew 11 operations in its new configuration between 04AUG43 and 07JAN44.

N5-142 no code letter allocated, never used on operations. Employed by the Squadron as a dedicated transport. Issued to Eagle Farm for strafer modification on 13JUL43 but allocation cancelled. Transferred instead to 119(NEI)SQN for transport duties on 05OCT43.

N5-143 "R", then "GM-R". Flew 10 (or 11) operations before being issued to Eagle Farm for strafer modification on 20JUN43. Returned to the Squadron on 04JUL43, it then flew 10 operations in strafer configuration from 12JUL43 to 09SEP43. It was damaged in a take-off accident on 12OCT and eventually repaired by the Squadron and sent to the NEI Pool towards the end of March 1944.

N5-145 "U", then "GM-U". Completed 9 operations in its original configuration before being sent to Eagle Farm during early May 1943. It returned to the Squadron on 04JUN43 and flew a further 9 operations (8 + 1 re-call) in strafer configuration between 07JUL and 19SEP43. The aircraft ended up suffering a nose wheel collapse which caused substantial damage to the nose section. It isn't clear if this occurred during roll-out after returning from the 19SEP operation or if it was an accident on 18OCT43. The aircraft was held on strength by the Squadron whilst awaiting a replacement forward fuselage. This never materialised and the aircraft had been reduced to spares by 21FEB44. Despite the bomb log painted below the cockpit of this aircraft showing 30 vertical bombs and 6 horizontal bombs, it had only flown on 19 operations.

All of the B-25Cs and early Ds, i.e. the NAA model's 82, 87, 93 and 94, operated by 18(NEI)SQN were visually just about indistinguishable from each other. Except for the few strafer modified machines mentioned above, the only obvious difference between those four different NAA models was the exhaust manifolds. Obviously, there was more to it than that, but you'd have to have more than just a knowledge of the relevant serial numbers to tell the difference. The first big change came with the introduction of the NAA model NA-100s. All of 18(NEI)SQN's model NA-100s came from production blocks-25, -30 and -35. Again, there was very little to tell even the sharpest-eyed plane-spotter the difference between those three blocks, except that the model NA-100s were easily distinguishable from earlier models.



The NA-100 aircraft featured factory – just to be clear: not modification centre, but factory – installed enhancements that were to be found in the forthcoming B-25J (NAA model NA-108) such as waist gun positions immediately aft of the trailing edge of the wing on each side of the fuselage and a tail gun position. The retractable ventral turret and the associated fuselage sighting windows were gone. They were fitted for a second, fixed, 50-cal machine gun in the nose compartment (making two fixed and one flexible 50-cal machine guns), and package guns (a single unit each side containing two 50-cal machine guns). These aircraft then were sent across the taxiway to the Fairfax Modification Centre to have the package guns attached, ammunition boxes and feed chutes installed and the machine guns fitted.<sup>132</sup> These enhancements were changed slightly with the introduction of the model NA-108 in that the package guns were changed to two single gun packs per side, mounted higher up the fuselage, the dorsal turret was relocated to a position just behind the cockpit in the space previously occupied by the navigator's station, both waist gun positions were moved a few inches higher and the port-side position was also moved aft. Additionally, the aft fuselage on model NA-108s was deeper, the tail gun position had its shape altered and the armament was changed from a single to twin-50s. Baugher notes that these "D2" enhancements were introduced in block-20 aircraft. Whilst that might be true, all of the B-25D block-20 aircraft operated by 18(NEI)SQN were NAA model NA-87s and were therefore devoid of waist or tail gun positions.



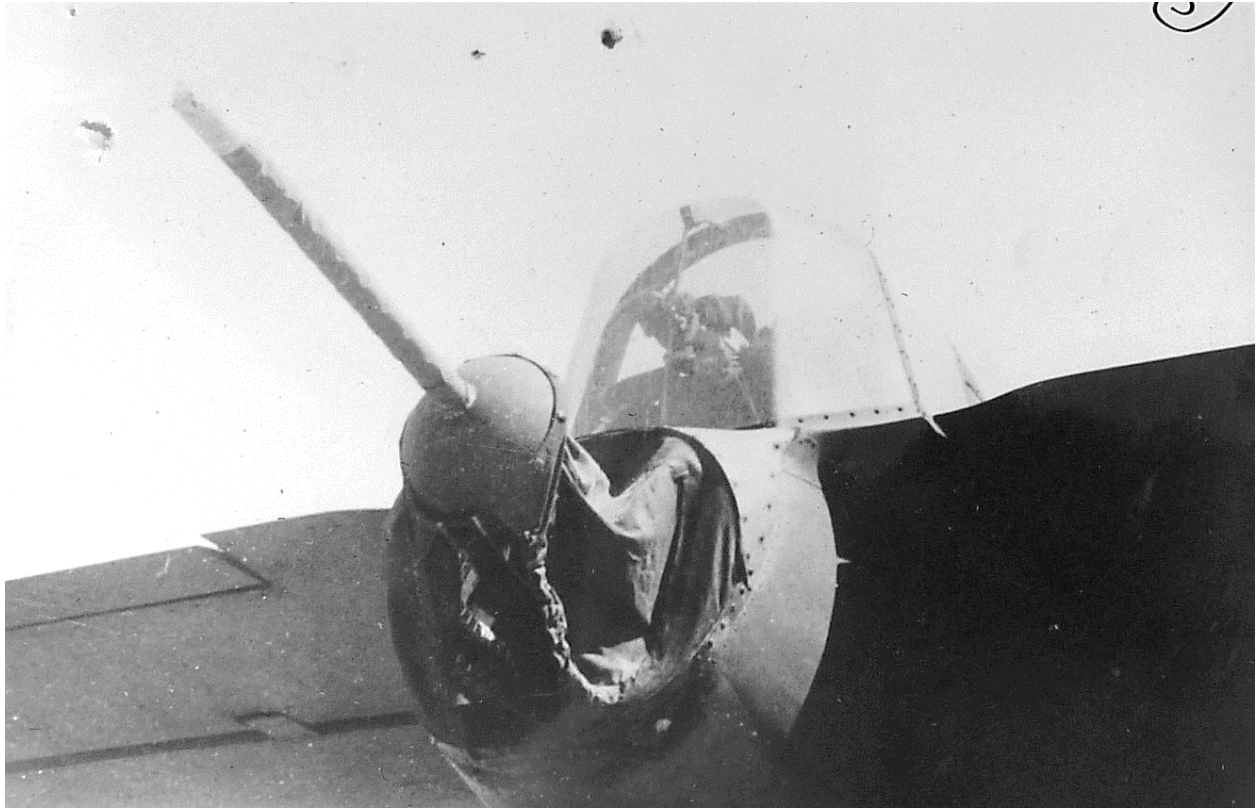
One of a sequence of close-up detail shots illustrating the external differences between B-25D-25-NC (i.e. North American Aviation model NA-100) aircraft and previous models. This one is showing the second fixed forward firing machine gun making two fixed and one flexible nose mounted guns. [Image in *B-25 Aircraft North American Mitchell A47*; NAA: A11093, 452/A47].



These are the package guns typical of B-25D-25 and subsequent blocks. They were made by Consolidated and fitted post production by the modification centre. [NAA: A11093, 452/A47].



This is the port-side waist gunner's position. The starboard side position was identical and occupied the same fuselage stations. These were factory installed on the production line and NOT a modification centre installed accessory, the only changes made by the modification centre by this stage in B-25D production was the actual installation of the weapons and some internal fittings. [NAA: A11093, 452/A47].



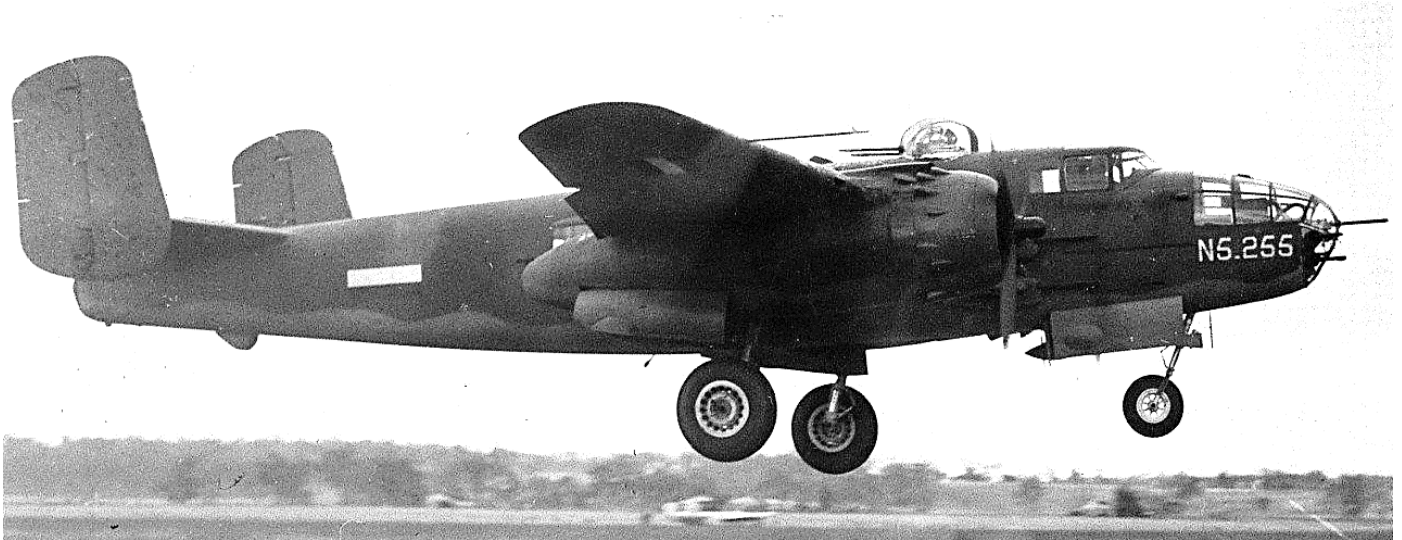
The tail gunner's position. Again, factory made, the modification centre installed the gun and some interior fittings. [NAA: A11093, 452/A47].



This is the subject aircraft for the photographs of the model NA-100 external variations, B-25D-25-NC, 42-87414, the future N5-167/GM-J. It was photographed in Australia just prior to hand-over to 18(NEI)SQN; the photographs were dated 25<sup>th</sup> January, 1944. As can be seen, at the time of the photo shoot, it was still wearing US markings but had already acquired the "Dutch Cleanser" nose art. 18(NEI)SQN formally received this aircraft from the NEI Pool on 27<sup>th</sup> January, 1944. [NAA: A11093, 452/A47].

## Camouflage

All Dutch 18(NEI)SQN B-25C and D aircraft were delivered in standard US Army Olive Drab 41 over Neutral Grey 43 – no Medium Green 42 splotches. Photographs exist of Dutch B-25Js serving with 18(NEI)SQN in Australia with serials up to and including N5-255 and ALL of them were photographed wearing US Olive Drab over Neutral Grey camouflage (or their later ANA equivalents). It is therefore believed that all Dutch B-25Js up to and including production block-25 (i.e. B-25J-25-NC), were delivered to Australia in standard camouflage. Those serial numbers being N5-218 to N5-258 inclusive and N5-266.



This is Dutch B-25J-25-NC, N5-255 (the former 44-30903), cleaning up immediately after take-off from what looks like Canberra (if not, then certainly a southern aerodrome). It's E/E.88 recorded it as being delivered to 18(NEI)SQN on July 27<sup>th</sup>, 1945. It was lost on operations on September 4<sup>th</sup>. [J W Newton via Neville Parnell].

N5-259 to N5-265 inclusive were B-25J-35-NCs. It isn't known if they were delivered in camouflage finish. Those B-25Js from serial number N5-247 and up arrived at 18(NEI)SQN too late to see operational service whilst based at Batchelor and therefore fell outside the period covered by the primary source material which forms the basis for the research which this article summarises. Accordingly, those aircraft are not included in the tables that appear later in this article. They are being discussed here merely in terms of likely surface finish.

Some former 18(NEI)SQN B-25s, serving as transport machines, had their camouflage removed.

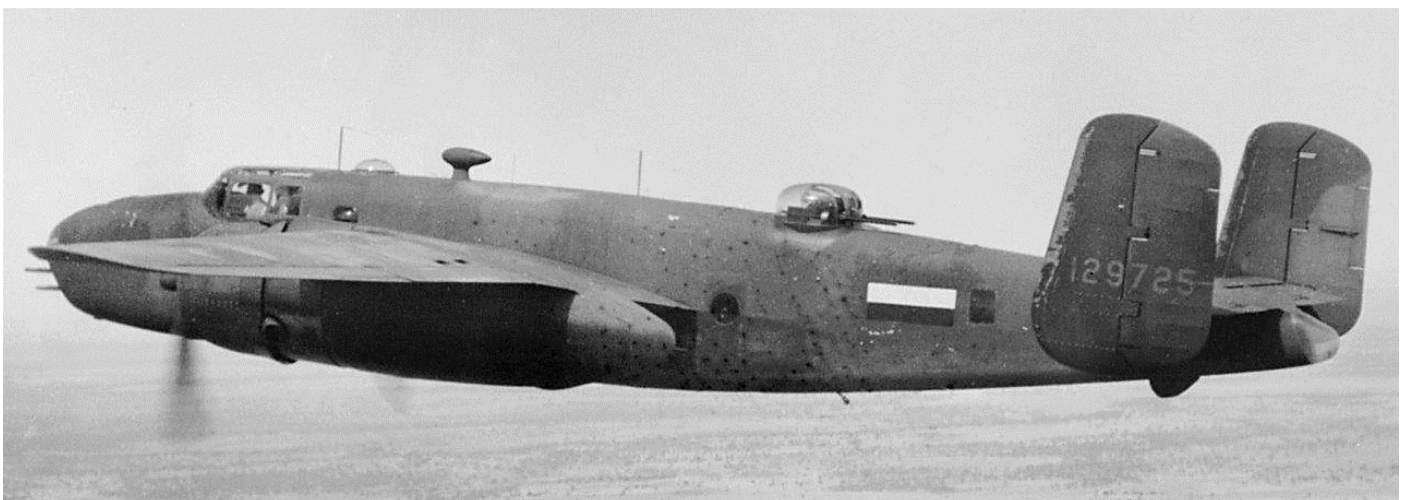


B-25C, N5-128, was a former veteran of 18(NEI)SQN. It joined the squadron on 24<sup>th</sup> August, 1942, and arrived at Macdonald on 27<sup>th</sup> December. Its first operation from Macdonald was on 20<sup>th</sup> January, 1943, and its last operation was from Batchelor on 5<sup>th</sup> January, 1944. It was received by the NEI Pool on January 10<sup>th</sup>. This image being taken at some point after that date. [Collection Netherlands Institute of Military History item 2155\_023138 via [nimh-beeldbank.defensie.nl](http://nimh-beeldbank.defensie.nl)].

Photographs of N5-134 and N5-141 both suggest a disruptive pattern camouflage scheme similar to each other. Whilst the base colour is no doubt Olive Drab 41, other colours are currently unknown.

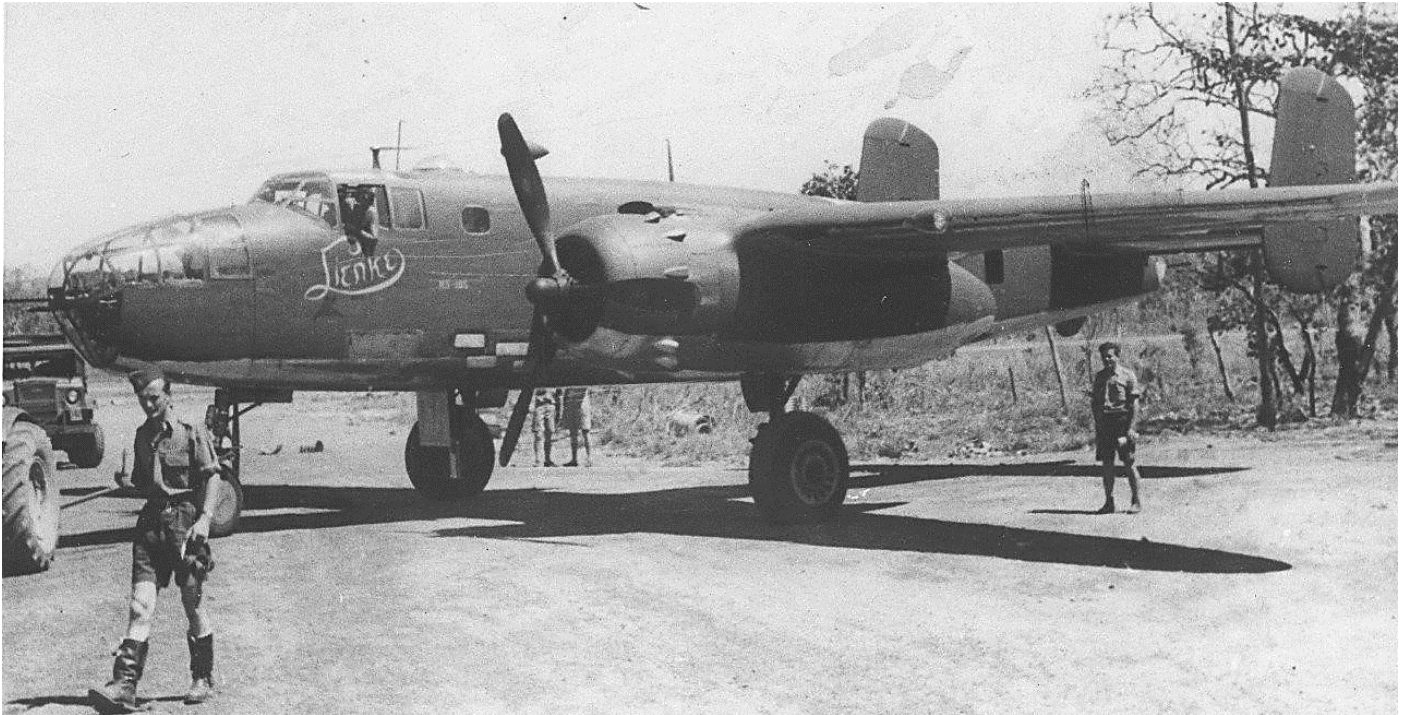


This is 18(NEI)SQN's N5-134, ex 41-12885, a B-25C. It seems that a disruptive scheme had been applied across the upper surface of the wing and across the fuselage centre section as well as the vertical stabilisers. It is difficult to tell if a pattern had been applied to the horizontal stabilizer, although some mottling seems to have been applied to the leading edge on the starboard side. The wedge shape discolouration immediately below the dorsal turret is likely caused by the use of a protective tarpaulin over the turret. [Aviation Heritage Museum of WA image P021898 via Mike Mirkovic].



N5-141, ex 41-29725, a B-25D (Strafer). A disruptive pattern is evident around the nose, across the centre section and on the vertical stabilisers. Again, the wedge-shaped discolouration below the turret is probably caused by a tarp. [AWM image 064758].

And two B-25Ds, N5-180 and N5-185, had camouflage removed from their undersides and oversized national markings applied for a couple of propaganda flights during September 1944 and January 1945.



This is N5-185. The package guns and dorsal turret have been removed as has the camouflage from the under-surfaces. Notice that the recently revealed natural metal has apparently been polished as it mirrors the aircraft's shadow reasonably well. [Collection Netherlands Institute of Military History item 0807\_021-111-02 via [nimh-beeldbank.defensie.nl](http://nimh-beeldbank.defensie.nl)].



This is 18(NEI)SQN's N5-252 at an unidentified location in (I believe) 1946. It is wearing OD uppers. The port engine cowling has been stripped of paint and, although it is difficult to tell with certainty, the undersides seem to have been similarly treated. The bare metal on the engine cowling is dull from exposure. The next aircraft in line is a B-25 in natural metal finish. N5-252, a B-25J-25-NC, was received by 18(NEI)SQN on 12MAY45, too late to participate in any operations from Australia. Another interesting point visible in this image is the blisters on the package guns. This type having two blisters, the larger, forward, blister fairing over the link ejection chute and the smaller blister just aft of it fairing over the guns firing solenoid. [Collection Netherlands Institute of Military History item 2002-336-41 via [nimh-beeldbank.defensie.nl](http://nimh-beeldbank.defensie.nl)].

## Turrets

On B-25Cs and Ds, two types of canopy were fitted to the dorsal turret; an all plexiglass canopy or a reinforced one with lateral ribs extending from one side to the other and two ribbed gun slots.<sup>133</sup>

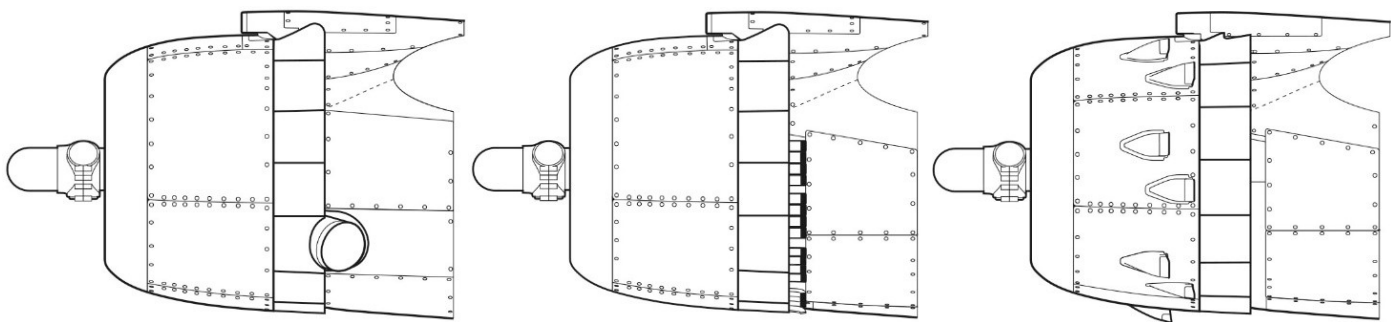
The all plexiglass examples were fitted to N5-131, -141 and -151.<sup>134</sup> This was added to by the NEI Pool at Canberra who reported that N5-128, -130, -134, -147, -148, -149, -154, -155, -158, -160, -164 and -208 were also fitted with the all plexiglass unit.<sup>135</sup> 18(NEI)SQN added the following to their list: N5-163, -165, -166, -167, -170, -172, -173, -178, -184, -188, -209, -211 and -217.<sup>136</sup> Presumably, the missing serial numbers received the reinforced type.

## Exhaust Flame Dampers

B-25C aircraft below 41-13039 and B-25D aircraft below 41-29848 had smooth engine cowling with single, short, large bore exhaust pipe.<sup>137</sup> This should cover N5-128 through N5-145 inclusive.

According to RAAF Publication 472 (the RAAF cover for the American Technical Order TO 01-60GB-2), B-25C aircraft 41-13039 (B-25C-1-NA) and subsequent and B-25D aircraft 41-29848 (B-25D-1-NC) and subsequent had “finger” type flame damper exhaust manifolds as illustrated below.<sup>138</sup> Insofar as 18(NEI)SQN was concerned, the only aircraft fitted with this type of exhaust manifold were its B-25C-10-NA’s (N5-148, N5-150 and N5-153).

All B-25C-15 and B-25D-15 aircraft (and subsequent production blocks) had Clayton S-type individual exhaust stacks protruding through cowling. For 18(NEI)SQN, this meant their B-25C-15-NA’s, N5-146, -147, -149, -151 and -152 and their B-25D-20-NC’s (and subsequent): N5-154 and onwards.



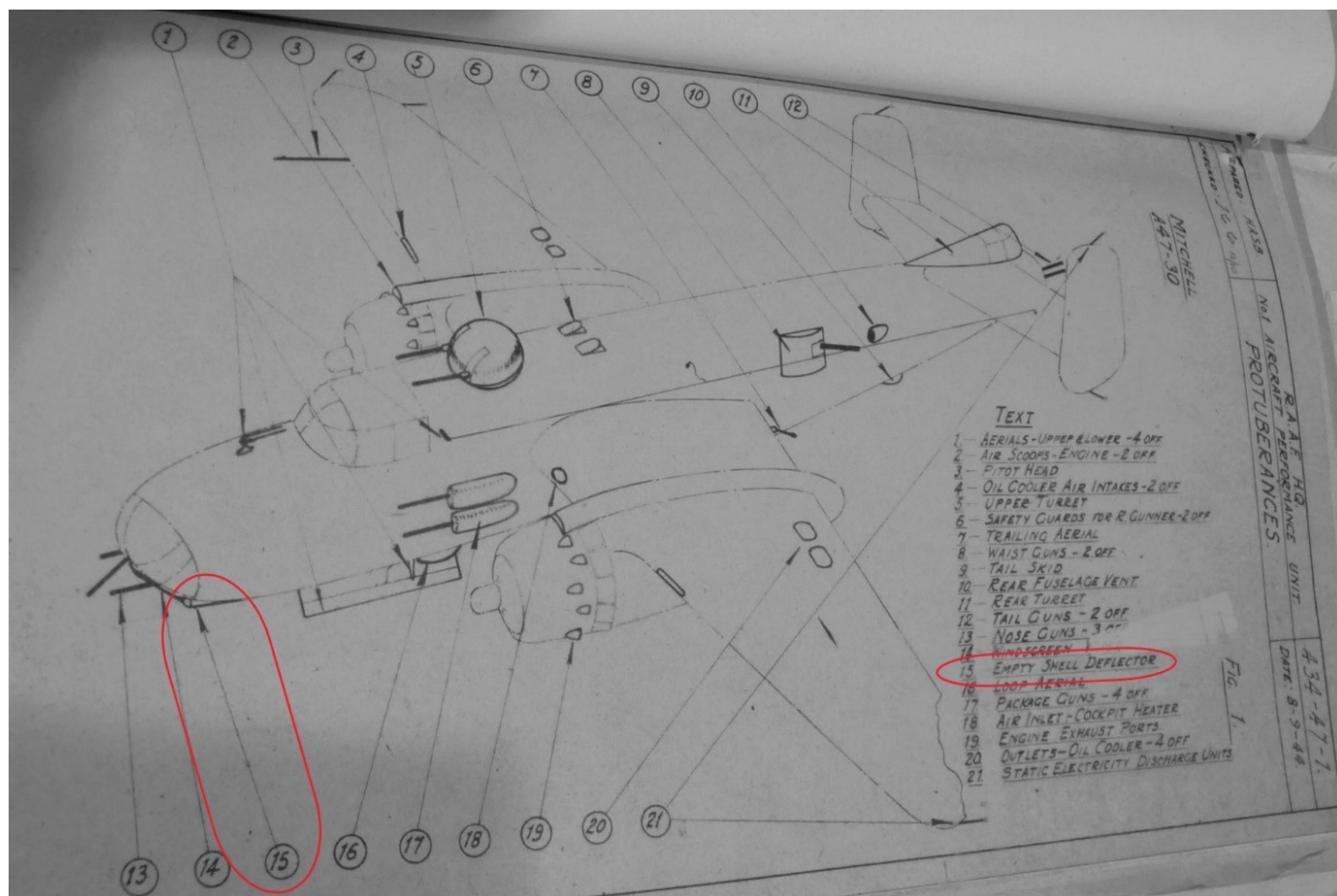
At left, the smooth cowling and single, large bore, exhaust typical of models up to and including B-25C and B-25D (i.e. no block number). In the middle, the same smooth cowling but the single exhaust outlet replaced by small flame suppressing “fingers” these were fitted to B-25C-1 and B-25D-1 through to B-25C-10/D-10. At right, the Clayton S-type individual exhaust stacks. These became standard from B-25C-15/D-15 and were a feature of all subsequent models of B-25. [Copyright: Juanita Franzi, Aero Illustrations].

## Empty Shell Deflector (or Gas Extraction Venturi?)

On the next page is a hand-drawn descriptive diagram detailing “protuberances” on B-25J aircraft, A47-30, which identifies an item as being an “Empty Shell Deflector”. The document that it formed a part of was a report on performance trials and was prepared by No.1 Aircraft Performance Unit for RAAF HQ. I have read forum posts and been told that it was actually a gun gas vent but this idea hasn’t (so far) been verified by any official documentation that I’ve seen. While I’m not entirely sure how the Empty Shell Deflector was supposed to work or why it was required, I’m sceptical as to the idea that it was some sort of fume extraction venturi to aid in the ventilation of the nose compartment.

There seemed to be three minor variations on the theme with this device, but all (if fitted at all) were in the same position. The simplest version was a basic tube-like arrangement commencing immediately aft of the small chin window in the extreme forward right-hand-side floor of the bombaimers compartment and travelling back to the aft edge of the nose-gear door (not the small Strut Flap door that remains open when the gear is down – but the main

door which only opens when the gear is being cycled). The alignment was such that it ran from its forward edge back in a straight line to the leading edge of the nose gear door just to the right-hand side of the Strut Flap door and then paralleled it along the longitudinal axis of the aircraft to the aft edge of the nose gear door. The intermediate version was virtually the same except that the chin window had been faired over to accommodate a funnel like opening for the device. The third version was evidently an extension of the second type, with the addition of a dog-leg type deviation traversing the bulge in the nose-wheel gear door which appeared from block-15 of the J model.



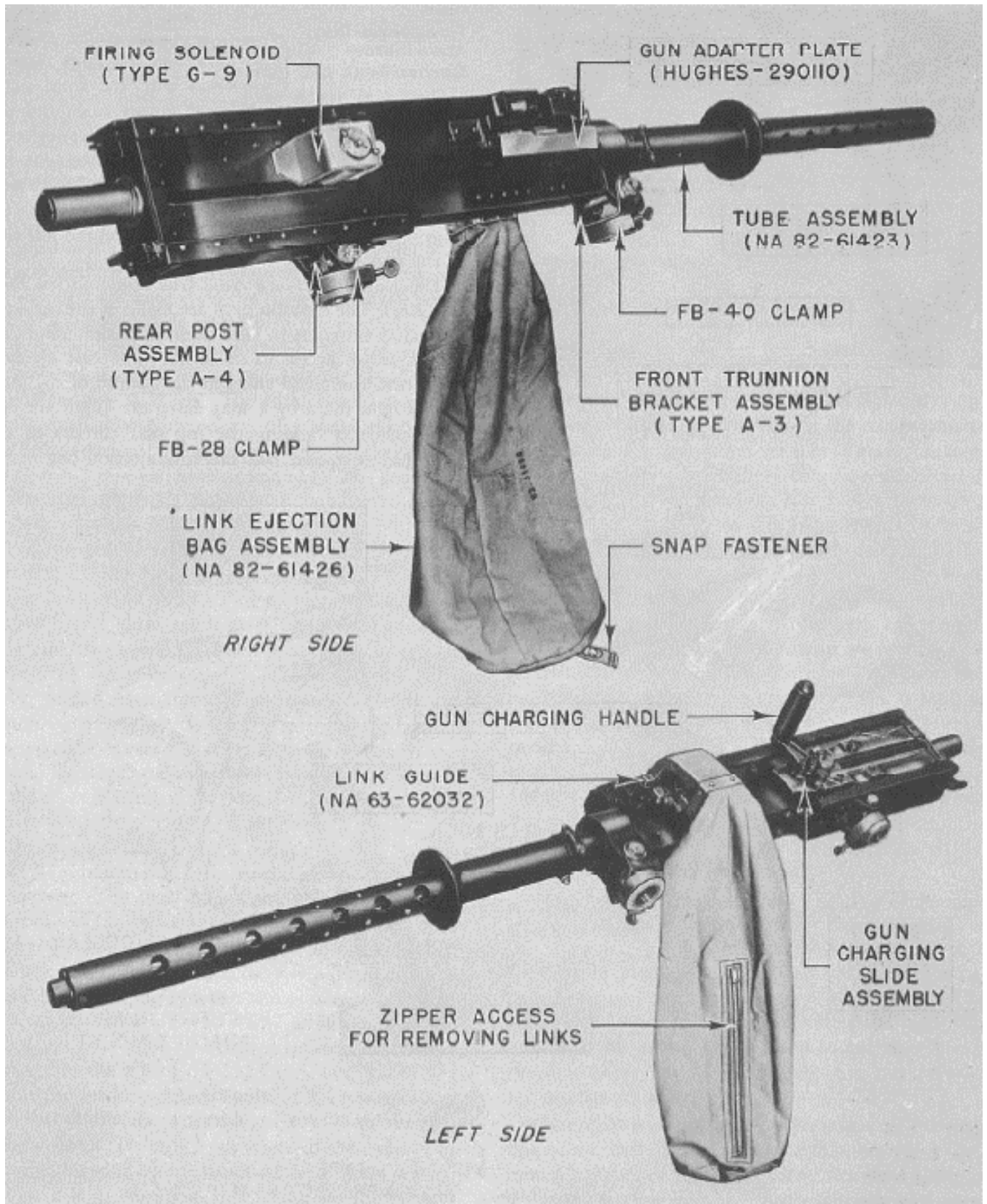
This is Fig 1 (dated 8SEP44) from the No. 1 Aircraft Performance Unit Report on “Brief Performance Trials on a B-25J Mitchell Aircraft”. It is the only official document that I’ve found that mentions the device. [NAA: A11093, 452/A47].

If the purpose of this tube was to extract foul air from the bombaimer’s compartment, why was it necessary? In addition to the air nozzle near the floor on the port side of the compartment providing ventilation, there was a large, circular, inwards opening, “storm window” next to the upper portion of the flat bomb-aiming window, on the right-hand side. This had been a feature since the earliest models of B-25. Why was it decided that with two 50-cal M2s in that compartment, the fumes generated didn’t pose a problem, but with one extra gun it did? Even if ventilation was an issue and the additional gun caused an unacceptable increase in fumes, surely an equally effective, although far less complicated, solution could have been devised rather than cutting a hole in the floor – and then having to fabricate a long metal, segmented, tube (remember it had to facilitate the opening and closing of the nose gear door) and riveting it to the fuselage with a bucket full of rivets to cover it. Something as simple as a small rearward facing outlet in one of the perspex windows adjacent to the rear bulkhead would have done the trick. For my money, I don’t think that ventilation or an unacceptable increase in fumes was the issue.

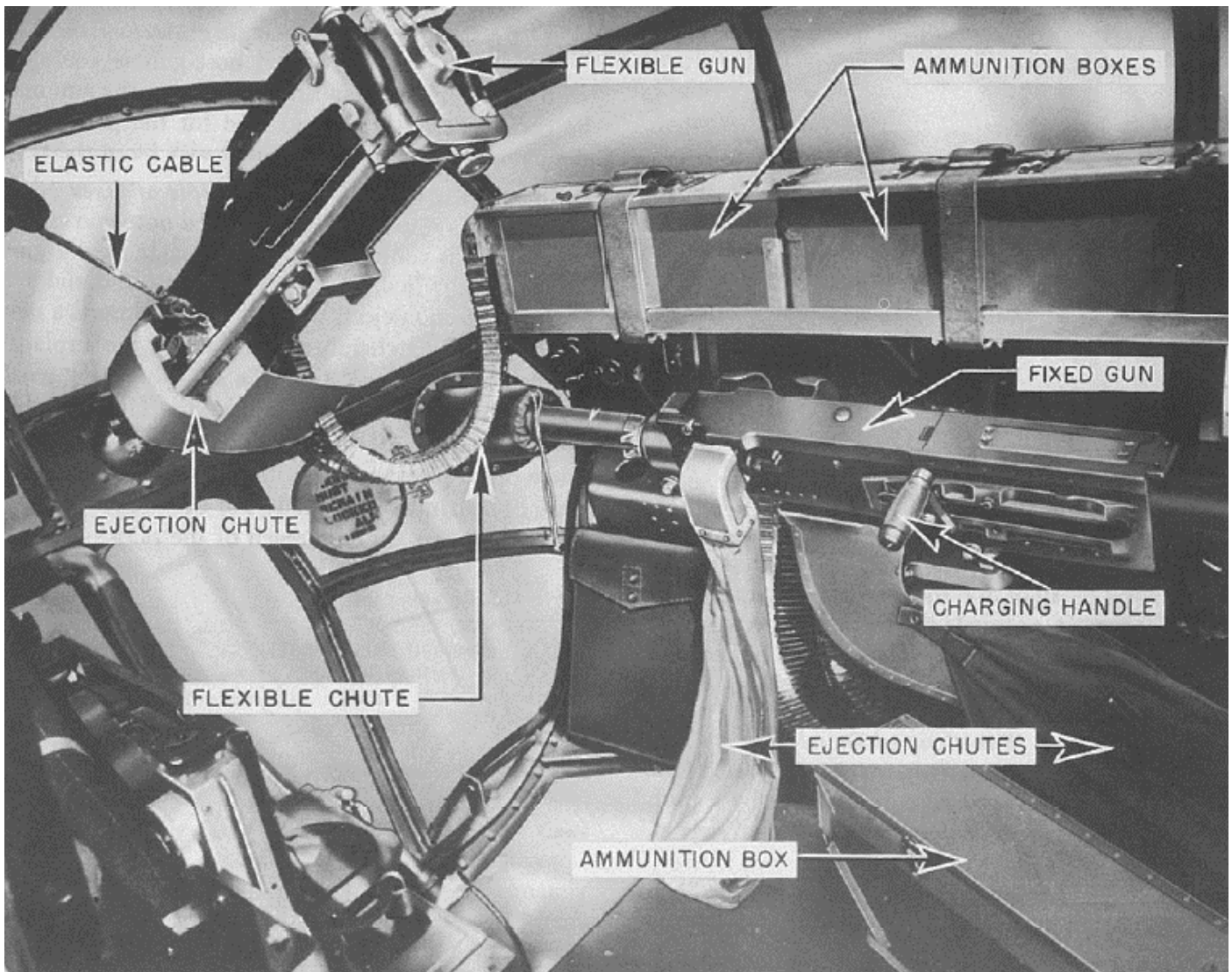
Scutts (2001) calls the contraption a “shell-collector chute fitted to prevent spent brass striking the underside of the aircraft”<sup>139</sup> or a “cartridge case collector”.<sup>140</sup> The first description in particular being much closer in name and purpose to 1APU’s description of “Empty Shell Deflector” than other theories. Still, Scutts suggests that it was a “collector”, 1APU called it a “deflector”. Typically, the spent brass (and link) was either captured in large canvas bags that were attached to the guns ejection chutes (typical for turret mounted or other, internal, fixed guns) or allowed to cascade onto the floor (typical for hand-operated flexible guns). The package guns (in the same way as wing mounted guns in fighter type aircraft), being externally mounted, discharged link and casings directly overboard. As a side note:



Browning M2 50-calibre machine guns were either a left-hand or right-hand, disintegrating-link belt-fed, recoil operated gun that ejected the spent cartridge case downwards from the bottom of the Receiver Group. Since the feed direction could be changed between left-hand or right-hand, the link was ejected out the opposite feed-way to the in-feeding round. Therefore, the shells were ejected straight down and the link was ejected out the left or right-hand side.



A figure from the North American Aviation B-25C/D Maintenance Manual showing the link ejection bag as fitted to the (in this case) single, fixed, nose gun. A second bag, the casing ejection bag, was attached to a metal chute fixed to the underside of the gun to collect the ejected shell casings. [NAA Inc Field Service Department, "Maintenance Manual B-25C & B-25D" (nd c1943) S-33 Fig.54].

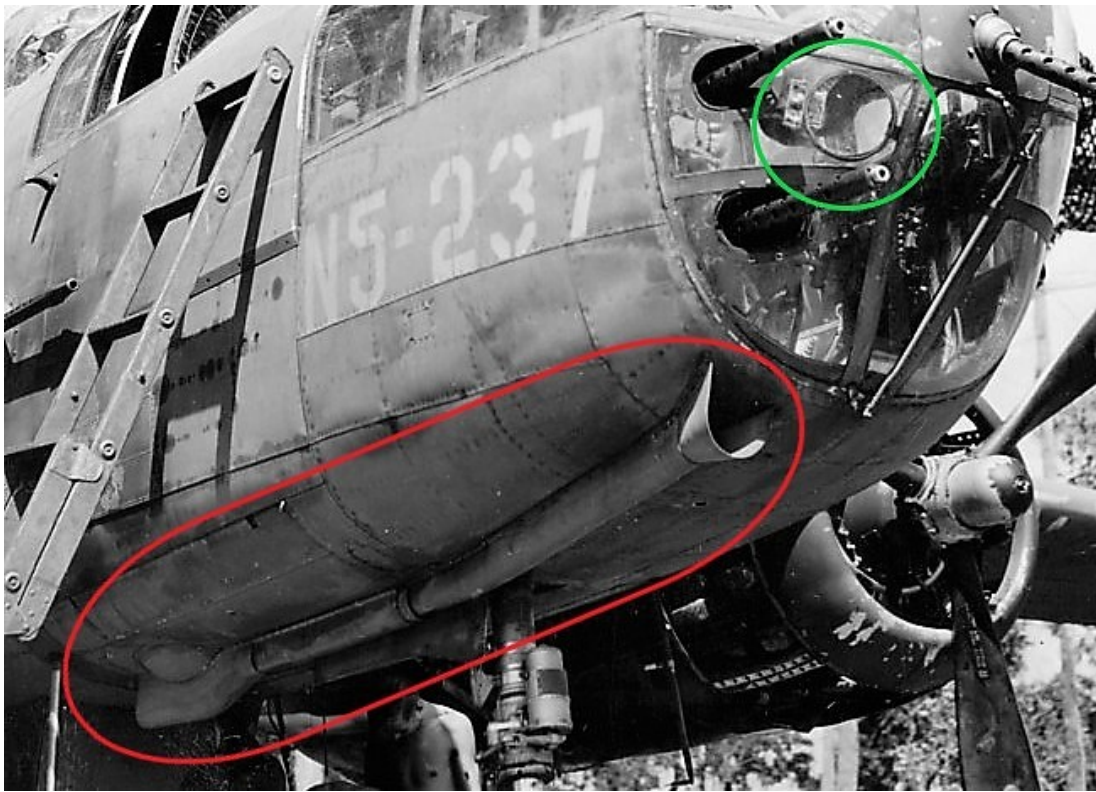


An interior view of the earlier single fixed and single flexible nose guns applicable to all B-25 models prior to B-25D-25s (i.e. all B-25s with an NAA model number below NA100). All block-25 and higher B-25Ds (i.e. NA100s) had a second gun fixed below the one in this image. The ammunition for the single, flexible, gun was contained in 3 interconnected boxes (containing a total of 300 rounds) secured to the shelf above the fixed gun(s) on the starboard side and was fed via a flexible metal chute to the right-hand side feed-way of the M2. Link was ejected out the left-hand side via a "C" shaped chute which opened into the chute for the ejected shell casings which then deflected both the ejected link and the spent casing to the floor. The fixed gun was fed with ammunition from a large box fastened to the floor (containing 300 rounds) via a flexible metal chute, again to the right-hand side feed-way of the gun. Ejected link was collected in its own bag via an ejection chute. Spent brass was collected in a large ejection bag via a fixed metal chute (in this image, for some reason, these ejection bags have both been labelled as "Ejection Chutes"). As mentioned, the only difference between this arrangement and that containing two fixed guns is that the compartment became more cluttered. The second fixed gun was fed, and the ejected link and casings collected, in exactly the same, although duplicated, way. [NAA Inc Field Service Department, "Maintenance Manual B-25C & B-25D" (nd c1943) S-29 Fig.47].

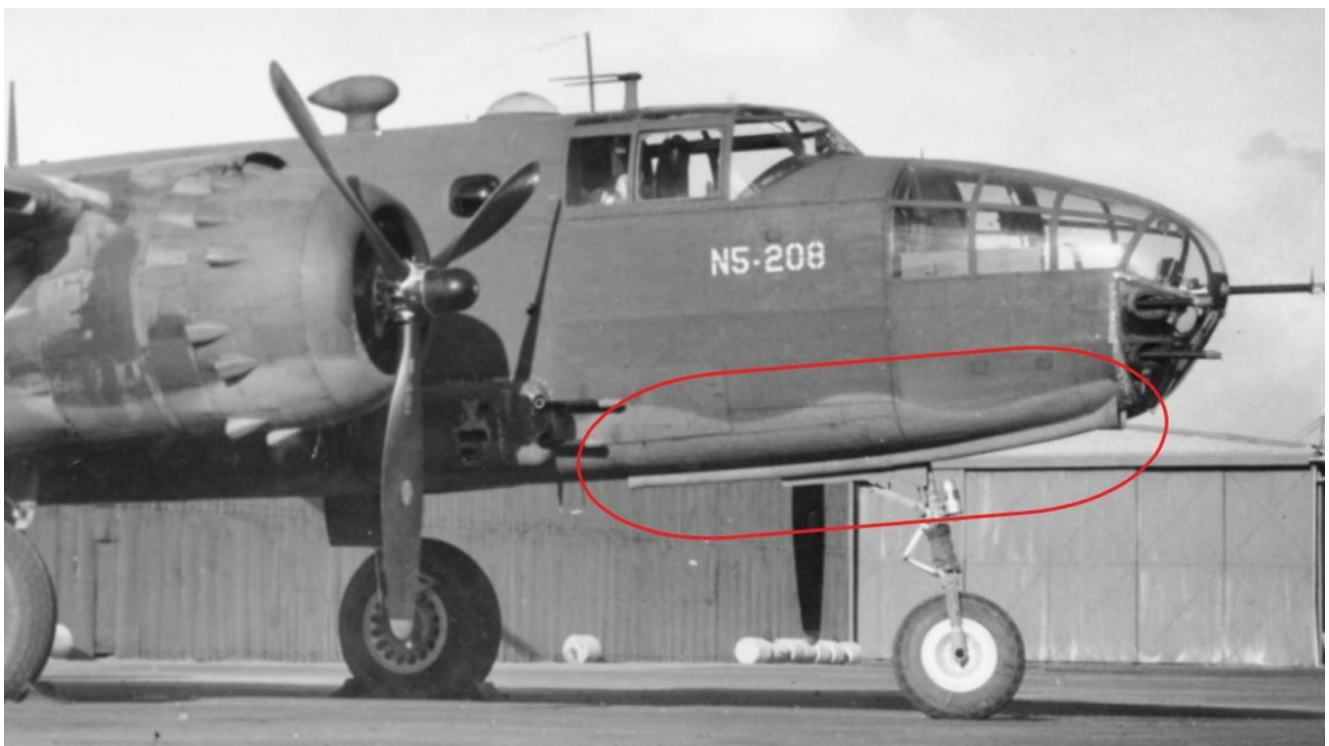
So, why not continue with capturing the spent brass and link from the fixed guns in bags and letting the flexible gun dump its ejected detritus onto the floor as before?

I can't see this device collecting cartridge cases as suggested by Scutts. Where were they being collected? Seeing as the tube runs just about the full length of the Fuselage Nose Section (the bombaimers cabin) and across the full length of the nose gear door at the after end of which it terminates abruptly, and that the ejected link and casings had already been collected in the bombaimers cabin (in bags), then the only place left that it could conceivably be collecting the brass is in the nose gear wheel well. But that doesn't make sense because there is simply no spare room.

Surely the purpose of this thing, if not to provide some extra ventilation in the most complicated way conceivable, must be to dump the spent brass (and perhaps link) overboard.



N5-237, ex 44-29030, a B-25J-15-NC displaying the “empty shell deflector” (circled in red). This device was rivetted to the outer skin under the bombaimer’s position and across the nose gear door, a join being required to facilitate the opening/closing of that door. That straight section on the gear door between the forward join and the portion that traverses the wheel bulge clearly shows the amount of riveting used to fix the device to the skin. The additional ventilation port can be seen cut into the nose glazing (circled in green). The hinge is clearly visible on the outer left-hand edge and the catch on the right-hand edge of this opening. When open, if that didn’t provide enough ventilation ( $\approx 180$  knots of ram air), then I’m not inclined to think that a venturi would do appreciably better. Certainly, a piece of perspex cut so as to form an openable window would seem to be a far easier and simpler solution to any ventilation issue. [Public Domain].



This is B-25D-35-NC, N5-208 (ex 43-3833) at Fairbairn. Whilst this “Empty Shell Deflector” has the funnel shaped opening, it only has a very small fluted terminus because, since most variants of the B-25 didn’t have the small bulge on the nose-gear door, the “dog-leg” wasn’t necessary. The simplest style of “Empty Shell Deflector” seems to one similar to that shown here, but without the funnel-shaped opening at the mouth. [Aviation Heritage Museum of WA image P010872].

But, even if there was now an overwhelming desire to dump the spent casings, etc, from the two fixed guns overboard, why this way? The strafers modified machines, as mentioned earlier, had two ejection chutes cut into the fuselage skin beneath the nose – inboard and slightly aft of where this funnel shaped contraption was later fitted. Perhaps spent casings rattling down the fuselage was a problem with those aircraft – although why it would have been any more of a problem than other external chutes (such as underneath wings or, indeed, fuselage mounted package guns) I couldn't say. But only the strafers had those chutes. Presumably, this device was intended to facilitate the release of spent brass (and perhaps link) by removing it from the cabin and funnelling it to an opening adjacent to the rear edge of the nose gear door. Although, if the idea was to avoid unnecessary damage to the underside of the fuselage, then confining that material within a narrow chute, firmly fixed to the underside of said fuselage would hardly alleviate the problem – although it would restrict the damage to that area within the chute; but the chute itself then inhibits ease of inspection of an area now more likely to have suffered damage.

There was already the provision to capture all of the ejected material from the two fixed guns in bags – these “casing ejection bags” each having a capacity for 300 spent cartridges – the same as their respective ammunition boxes. Surely if there were no ejection chutes, then no casings would be going overboard which, to bring my feeble, simplistic logic to the fore, would mean that the problem of ejected brass striking the underside of the fuselage and potentially knocking an aerial or two from its mounts would therefore be solved. The only plausible reason that I can think of is that, with the space taken by the extra gun, ammunition box and ejection bags, a relatively small amount of space could be reclaimed by removing the ejection bags (at least the casing ejection bags if not the link ejection bags) and having the existing ejection chutes reshaped so as to feed their material through a hole in the floor to be carried away by the ram-air generated by the device under the nose. I wonder though, how these guns were test fired at the gun butts? Without ram-air assisting the removal of brass, this device would be a severe impediment. I suppose the armourer would have to remove the cabin feed chute and reinstall the original chute and casing ejection bag(s) and then reverse the process before the aircraft was ready to go flying.

Unfortunately, neither the B-25C/D Erection Manual or the B-25J Erection Manual makes any mention of this device – by any name or suggested purpose – an omission which I find somewhat confusing. The fact that it wasn't always present suggests to me that it could be removed – although, given the large amount of rivets fixing the tube in place, drilling those out to effect removal would therefore have required not insignificant metal work repairs, not to mention patching over the hole that must have been cut into the fuselage to make this thing work (for whatever purpose) in the first place. Removable or not, surely it is reasonable to assume that it was at least supposed to be inspected from time to time (especially for internal damage or blockage, let alone corrosion) and would accordingly warrant a sentence or two in a maintenance manual.

I still don't believe that this device had anything to do with ventilation of the nose compartment during or after the firing of the nose guns and using it to capture the resultant debris doesn't make a whole lot of sense. However, I'm not able to explain (with any certainty) how such a device as this would assist in stopping spent cartridge casings from striking the underneath of the fuselage, either. My confusion notwithstanding, if 1APU says it was an Empty Shell Deflector, then that should be good enough for me.

## Fixed Forward Firing Package Guns



This seems to be a (poor) version of a Time Life image taken by George Silk during 1943. It shows B-25C strafer, N5-145, (“*De Vliegende Hollander/The Flying Dutchman*”) at Batchelor. These early package guns were subtly different from the later, mass produced, examples that were fitted to NA-100 model B-25Ds. The package guns as illustrated here were a much more angular, less aerodynamic shape and included two large fairings to cater for the firing solenoids. The ejection chutes for the link and for the spent cartridge cases were more agricultural in appearance than later versions. As on later versions, there was one small opening per gun for the link, and a larger chute for the brass. In this image, the link chute for the top gun has been obscured by the propeller disk and the shell casing chute for the lower gun is facing directly downwards and not visible from this angle. Notice also, the slight downwards incidence of these guns and the fact that they have been fitted with flash-suppressors. The large, protective, blast panel beneath the muzzles is obvious. [Public Domain].



The forward fuselage package guns as fitted to NA-100 B-25Ds, whilst still having a generally rectangular “footprint” was a more rounded, aerodynamic shape and lacked the protuberances of the earlier versions fitted to strafers and some block-20 aircraft. On block-25, and later aircraft (i.e. model NA-100) these package guns were catered for on the normal production line but were actually fitted post production by the modification centre. [Image in *B-25 Aircraft North American Mitchell A47*; NAA: A11093, 452/A47].

Compare the form and style of the early “strafer” type package guns with the later production standard version as found on all NA-100s (images on previous page). Notice the more rounded appearance, the lack of lumps and bumps and the recessed ejection chute openings of the later version.

The blast panels fitted to the fuselage were smaller, too. These were necessary because, without them, the concussion from the muzzle blast caused cracking to the skin of the aircraft. Whilst necessary, they were also problematic. Even though a sealant was applied around the inside edge of the blast panel, grit would find its way underneath and, naturally, moisture would develop which, together, formed a corrosion risk. So, the panels had to be removed and the skin beneath cleaned and inspected periodically.

These single “twin-50” type package guns were changed to two “single-50” units for the model NA-108 (B-25J). On B-25Js, they were mounted higher up the fuselage and the leading edge of the units was slightly further forward when compared to the “twin-50” style. Aside from being individual single units, an obvious difference between them and the earlier “twin-50” style was the evident lack of a link ejection chute opening. In fact, there was one (per side) and it was fitted to the lower package gun. There were at least three variations in this new “single-50” type. The most noticeable difference being the size of the “blister” protruding out the side – either being small (early version) or large (later version). This faired over an extraction chute for the expended link. The link extraction chute from the top gun ran down between the two gun packs (the angled fairing between the packs covers this) and met the similar feed chute from the lower gun at a common opening out of which the expended link from both guns fell free. Each gun still had its own shell casing ejection chute. A third version had two blisters, the second of which covered the firing solenoid.



This is N5-233/GM-W, a B-25J-15-NC, photographed during a display in Victoria and shows the two individual package guns fitted to NA-108 aircraft. Notice the large blister type fairing of this later style which made room for the link chutes. Also, the angled fairing between the two gun packs which covered the chute for the link from the top gun to the common link ejection opening on the underside of the lower pack. Compare the single, large, blister of these package guns with those that appear on N5-252 back on p78. [AWM image 114122].

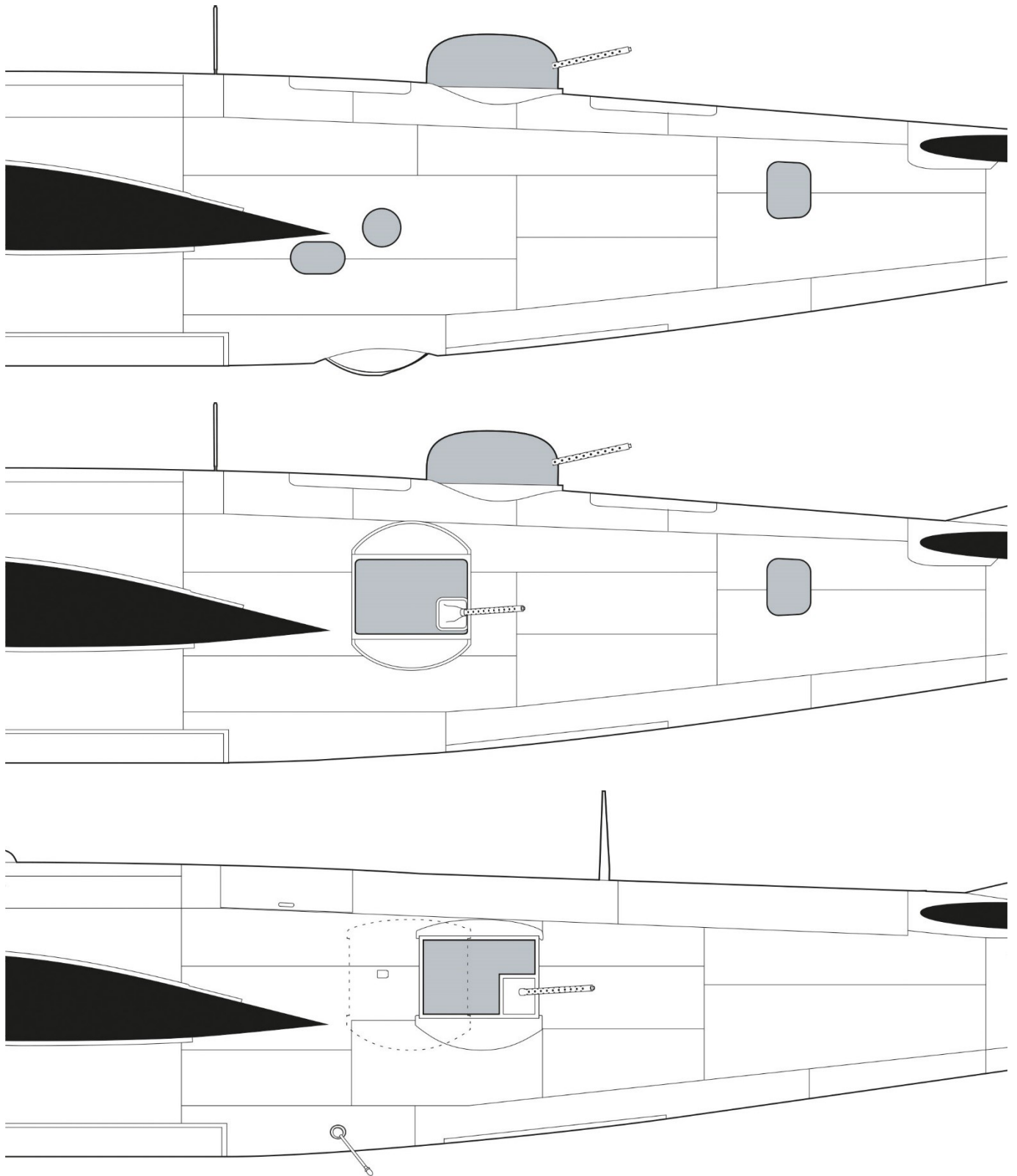
## Waist Gunner's Position (NAA model NA-100 and NA-108 only)



This is a repetition of an earlier image. It is repeated here to compare the NAA model NA-100 port-side waist gunner's position with that on NA-108s (B-25Js) – seen below. Notice the uniform size and shape of the fairings above and below the window. [Image in *B-25 Aircraft North American Mitchell A47*; NAA: A11093, 452/A47].

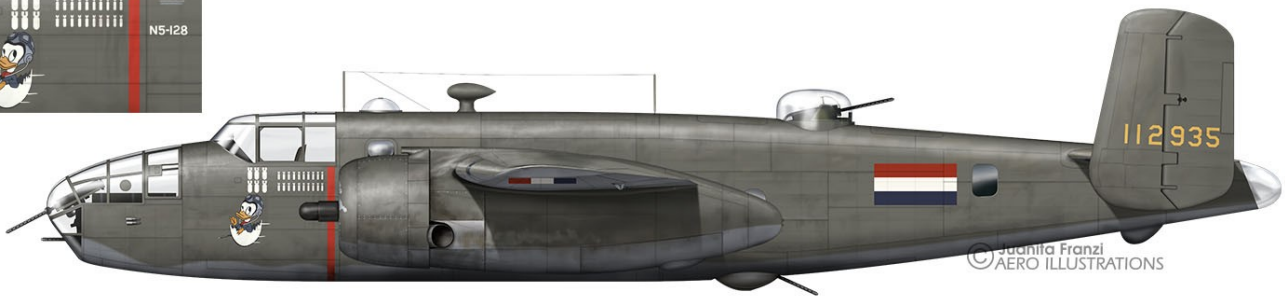
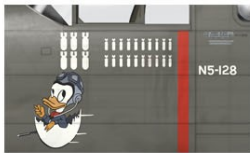


Another angle of B-25J-5-NC, N5-226, at Darwin. This image shows the left-hand waist gunners' position and its different position relative to those found on "D2s". On B-25J models, the starboard waist gunners window occupied the space between fuselage stations (STN) 354 and STN389 (identical to "D2's") but the port position was staggered further aft from about STN373 to STN408. Also, on B-25Js, the windows were higher than on "D2s". Notice the very different upper and lower fairings. Even the lower fairing is very different from that found on "D2s". [Aviation Heritage Museum of WA image P901604 via Mike Mirkovic].

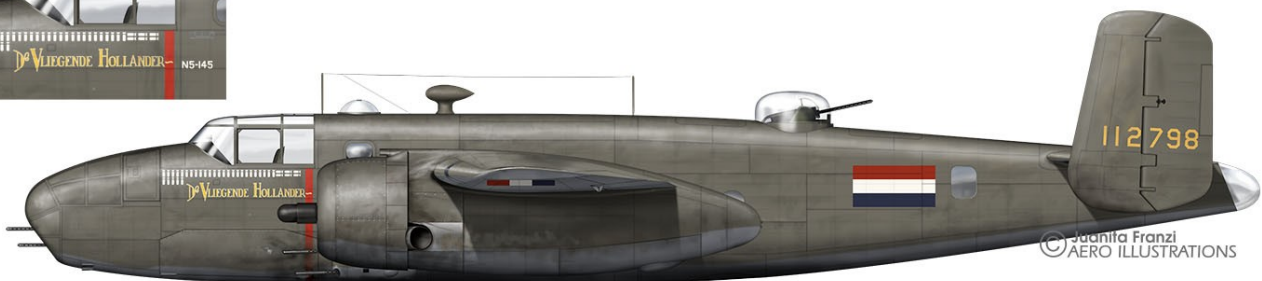


These three line drawings show the obvious differences between the aft fuselages of the principle B-25 models discussed in this article. From top: the “original” style aft fuselage typical of those B-25s with a two-digit North American Aviation model number; the dorsal and ventral turrets are shown as are the gunners sighting windows for the aiming of the ventral turret. Middle: The North American Aviation model 100 (B-25D-25/-30/-35); notice the fuselage structure is largely unchanged from the previous models and, whilst the ventral turret and its associated sighting windows have gone, the dorsal turret is in the same position. The waist gunners’ positions were symmetrical (port-side and starboard-side). Bottom: The North American Aviation model 108 (B-25J); the dorsal turret has been moved to the former navigators compartment, the waist gunners windows are higher and the port-side window has been moved further aft. The aft fuselage is deeper than previous models. [Copyright Juanita Franzi, Aero Illustrations].

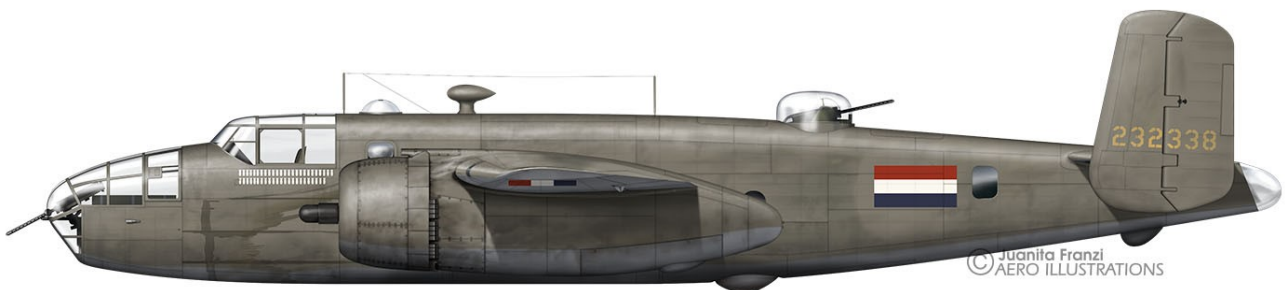




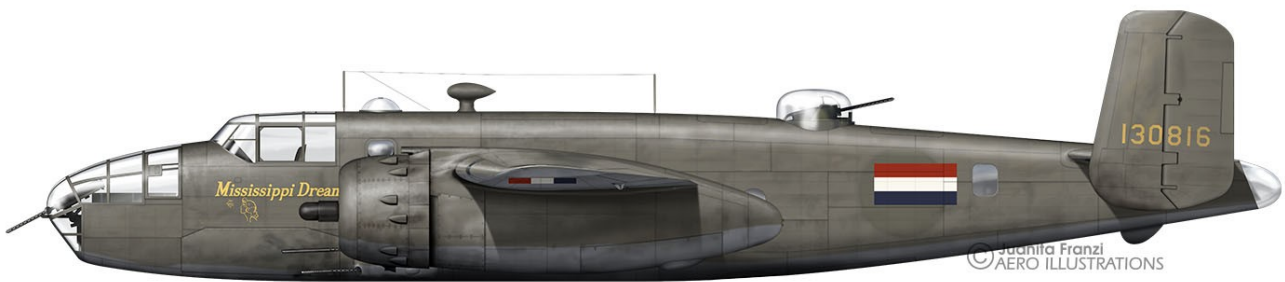
This is an illustration of B-25C, N5-128/GM-A, the former 41-12935, as it appeared in early January 1944. N5-128 was delivered to the Squadron on 24AUG42 and arrived at Macdonald Strip, NT, on 27DEC42. It flew its first operation on 20JAN43 and successfully completed at least 53 ops. It was used as an apparent replacement on 6 more operations giving a grand total of 59 completed operations and 4 RTB's. Its last operation was on 05JAN44. Its bomb log shows two rows of 10 bomb symbols and two rows of 3 large bomb symbols. The Disney hatchling duck nose art was carried on both sides of the nose and, for a period, the machine gun projecting from the egg shell featured a bent barrel. Being a B-25C, it was originally equipped with a single flexible nose gun and a single fixed nose gun. The lower position of the fixed gun, in that position normally occupied by the second fixed gun, is confirmed by the reference photo. [Copyright Juanita Franzl, Aero Illustrations, drawing B25C-051].



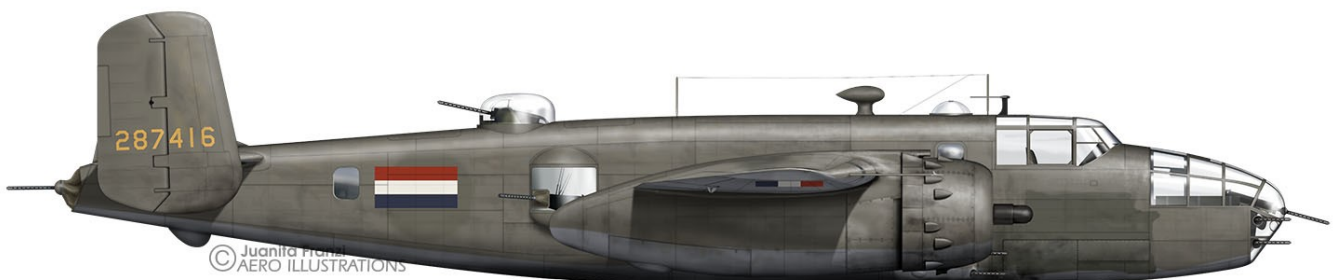
N5-145/GM-U, the former 41-12798, was a B-25C which underwent strafing modification at Eagle Farm. The ventral turret, the nose guns, plus the bomb-aiming equipment, was removed. These were replaced by four fixed forward firing guns, the ejection chutes for which were cut into the underside of the nose. Twin-50 package guns were also mounted on the lower forward fuselage just aft of the prop-disk. This aircraft completed 9 ops (plus 1 RTB) in its original configuration prior to undergoing the strafing mod. It then completed another 8 ops (plus 1 re-called). Photographs of this aircraft show a bomb log of 30 vertical and 6 horizontal bomb symbols. Typically for war-time bomb logs, this one didn't match the history of the aircraft it was applied to. The bomb log appeared on both sides of the nose and the name, "De Vliegende Hollander" appeared on the port-side. The English translation, "The Flying Dutchman" appeared on the starboard-side. [Copyright Juanita Franzl, Aero Illustrations, drawing B25C-041].



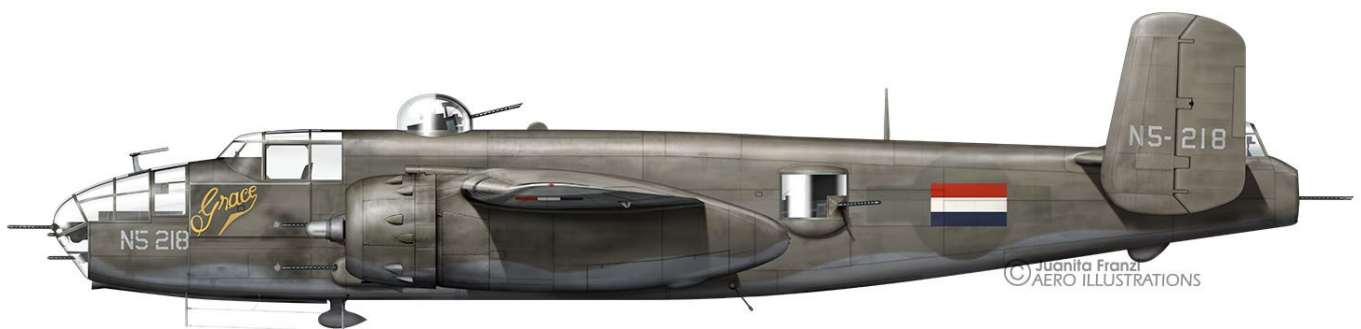
This is B-25C-10-NA, N5-148/GM-X, (ex 42-32338) and shows the finger style flame damping exhaust. Aside from that visual cue, this machine appears otherwise identical to other B-25C/D aircraft on the squadron. It was equipped with a single fixed and single flexible 50-calibre M2 machine gun in the nose compartment, a remotely operated ventral turret and a dorsal turret. Package guns were not fitted. This aircraft had a long operational career. A Time-Life photograph of this aircraft, from which this illustration is based, showed a bomb log of two rows of small bomb symbols: 25 on the top row and 23 on the bottom row. This aircraft flew its first operation on April 24<sup>th</sup>, 1943, and its last on February 10<sup>th</sup>, 1944. In between time, it completed 80 operations as tasked, plus another 5 as a replacement. [Copyright Juanita Franzl, Aero Illustrations, drawing B25C-061].



**"Mississippi Dream", N5-161/GM-J (ex 41-30816) was a B-25D-20-NC. It was made with a ventral turret, but this had been removed and the opening faired over. The earlier "strafe" style package guns had been fitted and the aircraft had a single fixed and single flexible nose gun (it isn't known if a second fixed gun had been retro-fitted or not). "Mississippi Dream" only had a short operational career. Having been delivered to 18(NEI)SQN on 24JUL43, it flew its first operation on October 14<sup>th</sup>. It completed 9 operations (plus a tenth as a replacement machine) before its demise on December 8<sup>th</sup>, 1943, at Drysdale River Mission. On that day, it was one of six B-25's flying through rough weather from Batchelor to Drysdale in preparation for a strike on Koepang that evening. However, on landing at Drysdale, the nose gear on N5-161 collapsed. The crew escaped injury but the forward fuselage, both engines and both props were considered to be seriously damaged. The aircraft remained at Drysdale and was passed to 4RSU in whose hands it was reduced to spares after mid-January, 1944. The remains of the aircraft were recently recovered and transported to Adelaide by Reeves Warbirds. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-011].**



**This is a starboard side profile illustration of N5-168/GM-Y. This aircraft was the former 42-87416, a B-25D-25-NC (a North American Aviation model NA-100) which went on to serve with 2SQN as A47-35/KO-R. It was received by 18(NEI)SQN on 27JAN44 (the sixth example of the new model to be received) and initially received the temporary individual identification letters of "AC" with which it flew its first three operations (commencing on February 15<sup>th</sup>). It was then allocated the individual identification letter "Y" and, from April 1<sup>st</sup>, flew a further 14 operations. Its operational tour concluded at the end of June 1944 and the aircraft was sent to the NEI Pool towards the end of July. It was later transferred to the RAAF and received the serial number "A47-35". It was delivered to 2SQN at Hughes during 1945, but was too late to be used operationally from Australia. It then deployed with that Squadron to Borneo. [Copyright Juanita Franzi, Aero Illustrations, drawing B25D-022].**



**"Grace" was a B-25J-1-NC (ex 43-27692) and was the 2<sup>nd</sup> J-model received by 18(NEI)SQN on 21JUL44. It too was allocated the individual identification letter "Y" – replacing N5-168 which had recently left the Squadron. It flew its first operation on July 25<sup>th</sup> (which, incidentally, was the first 18(NEI)SQN mission to have a J-model participating) and its 24<sup>th</sup> and last on October 24<sup>th</sup>. It wasn't replaced on any of its planned missions, it was never used as a replacement, nor was it ever required to return to base prior to reaching its objective. [Copyright Juanita Franzi, Aero Illustrations, drawing B25J-131(1)].**

## ***B-25 Models and Serial Numbers***

This is a list of NEI B-25 models<sup>141</sup> and serial numbers<sup>142</sup> used operationally by Number 18 (NEI) Squadron whilst under the operational control of North Western Area. Those later B-25Js that weren't used operationally in Australia have been omitted from this listing as well as the tabular analysis commencing on p98.<sup>143</sup>

<u>Model</u>	<u>NEI Serial</u>	<u>Former US Serial</u>
B-25C	N5-128	41-12935
	N5-129	41-12916 [B-25C (Strafer) NA]
	N5-131	41-12936
	N5-132	41-12919
	N5-133	41-12914
	N5-134	41-12885 [B-25C-NA]
	N5-135	41-12912
	N5-136	41-12933
	N5-138	41-12934 [B-25C-NA]
	N5-139	41-12913
	N5-145	41-12798 [B-25C (Strafer) NA]
B-25C-10-NA	N5-148	42-32338
	N5-150	42-32337
	N5-153	42-32339
B-25C-15-NA	N5-146	42-32512
	N5-147	42-32484
	N5-149	42-32511
	N5-151	42-32485
	N5-152	42-32483
B-25D	N5-130	41-29713 [B-25D (Strafer) NA]
	N5-137	41-29735
	N5-140	41-29723
	N5-141	41-29725 [B-25D (Strafer) NA]
	N5-142	41-29716 [B-25D (Transport) NA]
	N5-143	41-29722 [B-25D (Strafer) NA]
	N5-144	41-29717
B-25D-20-NA	N5-154	41-30584
	N5-155	41-30586
	N5-156	41-30587
	N5-157	41-30588
	N5-158	41-30589
	N5-159	41-30682
	N5-160	41-30713
	N5-161	41-30816

<u>Model</u>	<u>NEI Serial</u>	<u>Former US Serial</u>	
B-25D-25-NC	N5-162	42-87349	
	N5-163	42-87350	
	N5-164	42-87305	
	N5-166	42-87398 <sup>144</sup>	
	N5-167	42-87414	
	N5-168	42-87416 <sup>145</sup>	To RAAF as A47-35
	N5-169	42-87366	
	N5-170	42-87254	
	N5-171	42-87255	To RAAF as A47-36
	N5-172	42-87256	
	N5-173	42-87257	
	N5-174	42-87258	To RAAF as A47-37
	N5-175	42-87259	To RAAF as A47-33
	N5-176	42-87313	
	N5-177	42-87311	
	N5-178	42-87312	
	N5-179	42-87307	
	N5-180	42-87321	
	N5-188	42-87260	
B-25D-30-NC	N5-165	42-87595	
	N5-181	43-3423	To RAAF as A47-3
	N5-182	42-87597	
	N5-183	42-87607	To RAAF as A47-1
	N5-184	43-3282	
	N5-185	43-3421	
	N5-186	42-87608	To RAAF as A47-34
	N5-187	43-3422	To RAAF as A47-2
	N5-189	43-3424	To RAAF as A47-4
	N5-192	43-3426	To RAAF as A47-5
	N5-193	43-3427	To RAAF as A47-6
	N5-194	43-3607	To RAAF as A47-7
	N5-195	43-3613	To RAAF as A47-8
B-25D-35-NC	N5-190	43-3830	To RAAF as A47-22
	N5-196	43-3621	To RAAF as A47-9
	N5-197	43-3623	To RAAF as A47-10
	N5-198	43-3624	To RAAF as A47-11
	N5-199	43-3625	To RAAF as A47-12
	N5-200	43-3626	To RAAF as A47-13
	N5-201	43-3766	To RAAF as A47-14
	N5-202	43-3767	To RAAF as A47-15
	N5-203	43-3768	To RAAF as A47-16
	N5-204	43-3769	To RAAF as A47-17
	N5-205	43-3770	To RAAF as A47-18
	N5-206	43-3790	To RAAF as A47-19 <sup>146</sup>
	N5-207	43-3791	To RAAF as A47-20
	N5-208	43-3833	
	N5-209	43-3835	
	N5-210	43-3834	
	N5-211	43-3836	
N5-212	43-3832	To RAAF as A47-23	

<u>Model</u>	<u>NEI Serial</u>	<u>Former US Serial</u>	
B-25D-35-NC	N5-213	43-3789	To RAAF as A47-21 (43-3868) <sup>147</sup>
	N5-214	(43-3868) <sup>147</sup>	
	N5-215	43-3869	To RAAF as A47-25
	N5-216	43-3867	To RAAF as A47-24
	N5-217	(43-3620 or -3765) <sup>148</sup>	
B-25J-1-NC	N5-218	43-27692	
	N5-219	43-27691	To RAAF as A47-27
	N5-220	43-27689	To RAAF as A47-26
	N5-221	43-27688	
	N5-222	43-27690	
B-25J-5-NC	N5-223	43-27926	
	N5-224	43-27927	To RAAF as A47-28
	N5-225	43-27928	To RAAF as A47-29
	N5-226	43-27929	
B-25J-10-NC	N5-227	43-28181	To RAAF as A47-32
	N5-228	43-28182	
	N5-229	43-28185	To RAAF as A47-30
	N5-230	43-28184	
	N5-231	43-28183	To RAAF as A47-31
B-25J-15-NC	N5-232	44-29021	To RAAF as A47-38
	N5-233	44-29022	
	N5-234	44-29023	
	N5-235	44-29024	To RAAF as A47-39
	N5-237	44-29030	
	N5-239	44-29032	
B-25J-20-NC	N5-242	44-29260	
	N5-243	44-29261	
	N5-245	44-29263	
	N5-246	44-29514	



This is N5-217 (serial clearly visible on vertical stabilizer) after a mishap at Pell on 09FEB45. This picture has been quoted as being of B-25J, 43-27925, which is obviously incorrect. All of the NAA model NA-100 diagnostic features are visible to prove that this simply cannot be a model NA-108 (B-25J): Consolidated twin-50 package guns, astrodome at navigator's station (immediately behind cockpit), large fairing above starboard side waist gunners window, dorsal turret aft of trailing edge of wing and steeper fairing for tail gunner's position. This aircraft is a B-25D and most likely a B-25D-35-NC. I believe it is either the former 43-3620 or 43-3765. [Image via ozatwar.com/ozcrashes/nt130a].

## Code Letters

18(NEI)SQN seems not to have marked code letters, either individual letters or full three-letter codes, on their aircraft. However, since moving to North Western Area, each of 18(NEI)SQN's B-25s was allocated an individual identification letter and the Squadron consistently identified each aircraft operationally by that letter, and administratively by its serial number.

As I mentioned in the first paragraph of the first "Notes Regarding" back in Volume 10, Issue 5 (p74), these articles are based on manuscripts which were the cumulation of my research into serial number and code letter associations for certain aircraft. I then went on to remark that the purpose of that research was to, "establish, beyond reasonable doubt, that a certain serial number was (or at least was most likely to be) a particular identification letter [and] to provide evidence of each time the information [matched and each] time it didn't".<sup>149</sup> Whilst there seems to be no photographic evidence to support the serial number to individual identification letter associations that I claim for 18(NEI)SQN B-25s, the tables of evidence that I prepared as a method of displaying the accuracy (or otherwise) of the data that I was collecting reveals an accuracy of association no different from units which did mark their aircraft with individual identification letters (see also the "Tabular Analysis" a little later in this article).

1943:

Mission/Duty Date	Aircraft Letter	W/T Call sign	R/T Call sign	Remarks
MAC6/8 23/1	<i>K</i>	IP3K		Bal. A51 records as duty 5.
MAC7/4 26/1	<i>K</i>	3Q7K		Bal.
MAC11/9 05/2	<i>K</i>	4W7K		Bal. A51 records as duty 5.
MAC12/5 08/2	<i>K</i>	7G7K		Bal. Op Rep 12 records as duty 4.
MAC13/5 13/2	<i>K</i>	5WPK		Cancelled.
MAC15/2 18/2	<i>K</i>	UN5K		Hagers.
MAC16/8 23/2	<i>K</i>	2Y6K		Bal.
MAC17/4 03/3	<i>K</i>	3CHK		Bal.
MAC18/2 07/3	<i>K</i>	4Y7K		Heikoop.
MAC19/3 12/3	<i>K</i>	6N5K		Kuneman. Flew as duty 6.
MAC20/1 14/3	<i>K</i>	G3BK		Moorrees.
MAC22/2 15/3	<i>K</i>	5Z4K		Bal.
MAC24/2 17/3	<i>K</i>	7DNK		de Jongh.
MAC26/3 21/3	<i>K</i>	3CHK		Bal.
MAC29/3 24/3	<i>K</i>	1Q8K		de Jongh.

Mission/Duty Date	Aircraft Letters	W/T Call sign	R/T Call sign	Remarks
MAC38/2 14/4	GM-K	7P1K		Bal.
MAC41/1 19/4	GM-K	K9DK		Harteveld.
MAC42/3 21/4	GM-K	2H9K		Oudraad.
MAC48/4 28/4	GM-K	5W9K		Cooke.
MAC2/3 02/5	GM-K	4R9K		Harteveld.
MAC5/6 05/5	GM-K	1Y3K		de Jongh.
BAT23/10 17/5	GM-K	B6NK		Apparently replaced by N5-148.
BAT25/2 20/5	GM-K	3E3K		Reijns.
BAT29/2 22/5	GM-K	4H1K		Cooke. RTB.
NEI18/5 26/6	GM-K	1N5K		Deenik.
NEI19/3 30/6	GM-K	2B1K		van der Schroeff. A51: Janssen.

A portion of the serial number to code letter association tables that I prepared for N5-136. The break between the two tables (text removed) indicates the period when the aircraft was sent away from the Squadron for maintenance. Only the information in *italics* has been assumed – in the top table you can see that the "Aircraft Letter" is in *italics*. This shows that the original documentation didn't include that information; here it has been derived from the "W/T Call sign" suffix letter. In the second table, all of the information was contained in the original documentation (no *italics*) – including the full three-letter aircraft identification letters; notice how the individual letter matches the W/T call sign suffix letter. These tables were developed so that code letter allocations could be easily seen and show the accumulated evidence from my research; every "hit" and every "miss". The top table shows 14 "hits" and 1 "miss" and the bottom, 10 "hits" and 1 "miss": 93.3% and 90.9% accuracy respectively. A basic analysis of these tables appears towards the end of this article – in the same way as it has in previous "Notes Regarding" articles. [Garry Shepherdson].

1944:

Mission/Duty Date	Aircraft Letters	W/T Call sign	R/T Call sign	Remarks
NEI16/10 15/2	GM-AB	LL4AB		Holswilder.
NEI20/4 19/2	GM-AB	4KJAB		Theunissen Smr.
NEI43/8 06/3	GM-AB	OX6AB YS4AB		Deknatel. C/S change over 061200Z.
NEI24/2 03/4	GM-J	4KJJ 3VYJ		J Kiewiet. C/S change over 031200Z.
NEI26/3 06/4	GM-J	LG7J 1NBJ		J Kiewiet. C/S change over 061200Z.
NEI28/4 09/4	GM-J	4OXJ		J Kiewiet.
NEI30/2 11/4	GM-J	Q17J ML8J		Unserviceable.

Mission/Duty Date	Aircraft Letters	W/T Call sign	R/T Call sign	Remarks
NEI45/9 10/5	GM-J	CX8J		J Kiewiet.
NEI47/10 12/5	GM-J	ZN4J		Lukkien.
NEI9/11 19/5	GM-J	GP8J		Dreher.
NEI12/4 22/5	GM-J	GN4J		Ruige.
NEI20/1 28/5	GM-J	MF5J		van der Ende.
NEI22/1 29/5	GM-J	HT7J		Smits van Burgst.
NEI24/1 31/5	GM-J	ZN4J		del la Porte.
NEI33/5 06/6	GM-J	8X4J Y35J		Buwalda. C/S change over 051200Z.
NEI38/3 09/6	GM-J	UP4J		van der Ende.
NEI39/7 10/6	GM-J	PZ5J		Ruige.
NEI44/8 14/6	GM-J	FK8J	Nightdash	Sjouw.
NEI5/6 19/6	GM-J	PZ5J		Kiewiet.
NEI13/2 23/6	GM-J	4JWJ		Redelmeiger. A51: Kiewiet.

Another example, this is the first two tables for N5-167, the aircraft that was photographed whilst still in US markings to illustrate the major differences that marked a NA100 compared to earlier models. As before, the break between the two tables (text removed) indicates the period when the aircraft was sent away for maintenance. By consulting the analysis tables at the end of this article, you will see that this aircraft flew many more operations and returned a very high accuracy figure – proving the identification letter assignment to this serial number. Just using these two tables from N5-167s operational history shows a 95% accuracy figure. [Garry Shepherdson].

This practice of actually allocating individual identification letters without physical marking them on a unit's aircraft wasn't unique to 18(NEI)SQN. From about the third week of April 1944, 1PRU's operational aircraft received individual identification letter assignments and this carried through to 87SQN. It seems though, that none of their aircraft were marked with their individual code letter assignments either.

## Aircraft Code Letter Allocations

GM-	Jan-Apr 1943 (single letter)	Apr-Jun 1943	Jul-Dec 1943	Jan-Jun 1944	Jul-Dec 1944	Jan-Jun 1945
A	128	128	128	128 / 162	221	221
B	129	129	129	129 / 172	172	239
C	130	130	130	130 / 174	210 / 211	211 / 242
D	131	131	131	165	165	165
E	-	-	-	-	-	-
F	132	151	151	151/179/188	188	188
G	133	152	156 / 155	155 / 169	169 / 234	234
H	134	134	134 / 160	160 / 180	180	-
I	-	-	-	-	-	-
J	135	135	161	167	167	246
K	136	136	136 / 158	158	230	230
L	137	-	137	137 / 164	164/223/228	228
M	138	138	138	138 / 166	166	166
N	139	153	153	184	184	184
O	140	-	155	-	-	-
P	141	141	141	141/176/217	217	217
Q	-	-	159	163	163	185
R	143	143	143	178	178	178
S	144	-	158	-	226	226
T	-	-	-	-	-	-
U	145	145	145	170	170	170 / 245
V	-	146	146	146 / 171	171/222/237	237
W	-	147	157	157 / 185	185 / 233	233 / 243
X	-	148	148	148 / 177	214 / 209	209
Y	-	149	149	149 / 168	218	-
Z	-	150	154	154 / 173	173	173
AB	-	-	-	167	-	-
AC	-	-	-	168	-	-
AD	-	-	-	169	-	-
AG	-	-	-	184	-	-
none	142	142	142	-	-	-
unk	-	-	-	-	"189" / 240	240/244/ 247/248/ 250/252

N5-189 was recorded by 18(NEI)SQN as flying an operation with them on 13<sup>th</sup> August, 1944, as a replacement machine. It should be noted though, that N5-189 was never officially on strength with 18(NEI)SQN and the recording of N5-189 could easily have been a corruption of N5-184 – which was the tasked airframe. N5-189 became A47-4 with 2SQN and during 1944 was something of a mystery machine.

As alluded to on p76, six of 18(NEI)SQN's B-25Js were delivered to the Squadron too late to participate in any operations whilst based in Australia so therefore no operational documentation was raised in relation to them. Accordingly, it was impossible to determine what, if any, letters were allocated to those aircraft.



### **Code Letter Re-Assignments**

It would seem that seven of 18(NEI)SQN's B-25s had more than one identification letter assigned at some point during their service.

N5-155	GM-O	became	GM-G
N5-158	GM-S		GM-K
N5-167	GM-AB		GM-J
N5-168	GM-AC		GM-Y
N5-169	GM-AD		GM-G
N5-184	GM-AG		GM-N
N5-185	GM-W		[GM-Q]

N5-155 relinquished the letter "O" and assumed the letter "G" shortly after that letter became vacant with the loss of N5-156.

N5-158 changed from "S" to "K"

N5-167 was temporarily assigned the letters "AB" before acquiring the letter "J".

N5-168 was "AC" before becoming "Y".

N5-169 was "AD" before picking up the letter "G".

N5-184 was "AG" before taking over the letter "N".

N5-185 spent just about all of its service as "W", but apparently changed to "Q".

N5-189 allocation unknown (believed to have never been allocated to 18(NEI)SQN).

The letters "E", "I" and "T" were not allocated to any of 18(NEI)SQN's aircraft.

## Tabular Analysis

In an effort to provide additional weight to my hypothesis that the allocation of individual identification letters to 18(NEI)SQN's B-25s was real and not merely chance, here is a tabular analysis of the accuracy of the identification letter to serial number associations for each of their B-25s in NWA.

As usual, 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	Letter(s)	Tasked	Known Cancellations	Tasked and Recorded in A51 as Flying	Tasked but Not Recorded (Apparently replaced by...)	Not Tasked but Recorded (Apparently replaced...)	Accuracy (%)
N5-128	A	7	1	6	0	0	100
	GM-A	58	2	51	5	6	82.2
N5-129	B	9	1	8	0	1	88.8
	GM-B	54	3	49	1	3	92.4
N5-130	C	12	2	10	0	0	100
	GM-C	6	0	6	0	0	100
N5-131	D	8	0	7	1	0	87.5
	GM-D	55	1	50	5	3	86.2
N5-132	F	4	0	4	0	2	66.6
N5-133	G	12	1	11	0	0	100
N5-134	H	8	0	8	0	1	88.8
	GM-H	14	0	12	2	1	80.0
N5-135	J	9	1	8	0	0	100
	GM-J	5	0	5	0	0	100
N5-136	K	15	1	14	0	0	100
	GM-K	38	0	38	1	1	95.0
N5-137	L	8	0	8	0	1	88.8
	GM-L	8	0	8	0	0	100
N5-138	M	13	2	10	1	0	90.9
	GM-M	85	1	76	8	1	89.4
N5-139	N	2	0	2	0	0	100
N5-140	O	12	1	10	1	0	90.9
N5-141	P	6	1	5	0	0	100
	GM-P	13	1	12	0	0	100
N5-143	R	10	1	9	0	0	100
	GM-R	11	0	11	0	1	91.6
N5-144	S	8	3	4	1	0	80.0
N5-145	U	9	1	8	0	0	100
	GM-U	13	1	11	1	0	91.6
N5-146	GM-V	83	7	74	2	6	90.2
N5-147	GM-W	10	0	10	0	0	100
N5-148	GM-X	93	6	81	6	5	88.0
N5-149	GM-Y	92	6	82	4	4	91.1

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 (%)
N5-150	GM-Z	11	2	9	0	0	100
N5-151	GM-F	71	6	64	1	3	94.1
N5-152	GM-G	9	3	6	0	0	100
N5-153	GM-N	33	1	32	0	0	100
N5-154	GM-Z	15	0	14	1	0	93.3
N5-155	GM-O	2	0	2	0	0	100
	GM-G	10	0	10	0	0	100
N5-156	GM-G	5	0	5	0	0	100
N5-157	GM-W	21	0	20	1	1	90.9
N5-158	GM-S	1	0	1	0	0	100
	GM-K	24	1	22	1	0	95.6
N5-159	GM-Q	12	0	12	0	0	100
N5-160	GM-H	33	5	27	1	0	96.4
N5-161	GM-J	10	1	9	0	2	81.8
N5-162	GM-A	39	6	32	1	2	91.4
N5-163	GM-Q	56	4	52	0	1	98.1
N5-164	GM-L	28	0	28	0	2	93.3
N5-165	GM-D	70	2	67	1	5	91.7
N5-166	GM-M	58	1	52	5	3	86.6
N5-167	GM-AB	3	0	3	0	0	100
	GM-J	59	3	54	2	2	93.1
N5-168	GM-AC	4	0	3	1	0	75.0
	GM-Y	15	1	14	0	0	100
N5-169	GM-AD	3	1	2	0	0	100
	GM-G	38	2	35	1	3	89.7
N5-170	GM-U	65	2	60	3	3	90.9
N5-171	GM-V	24	1	23	0	1	95.8
N5-172	GM-B	49	3	44	2	2	91.6
N5-173	GM-Z	62	5	56	1	4	91.8
N5-174	GM-C	24	3	20	1	0	95.2
N5-176	GM-P	18	0	17	1	0	94.4
N5-177	GM-X	11	1	10	0	0	100
N5-178	GM-R	64	1	60	3	1	93.7
N5-179	GM-F	2	0	1	1	0	50.0
N5-180	GM-H	27	1	26	0	2	92.8
N5-184	GM-AG	1	0	1	0	0	100
	GM-N	59	4	49	7	2	84.5
N5-185	GM-W	27	1	25	1	1	92.5
	Q	1	0	1	0	0	100
N5-188	GM-F	60	0	58	2	3	92.0
N5-189	?	0	0	0	0	1	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 (%)
N5-209	GM-X	32	2	28	2	0	93.3
N5-210	GM-C	11	1	10	0	0	100
N5-211	GM-C	29	2	25	2	1	89.2
N5-214	GM-X	25	1	24	0	1	96.0
N5-217	GM-P	40	0	38	2	2	90.4
N5-218	GM-Y	24	0	24	0	0	100
N5-221	GM-A	44	0	42	2	2	91.3
N5-222	GM-V	14	1	13	0	0	100
N5-223	GM-L	1	0	1	0	0	100
N5-226	GM-S	31	3	27	1	2	90.0
N5-228	GM-L	47	5	41	1	5	87.2
N5-230	GM-K	49	2	46	1	1	95.8
N5-233	GM-W	18	0	17	1	1	89.4
N5-234	GM-G	31	0	29	2	0	93.5
N5-237	GM-V	26	1	24	1	2	88.8
N5-239	GM-B	13	4	9	0	1	90.0
N5-242	GM-C	9	1	6	2	0	75.0
N5-243	GM-W	5	0	3	2	0	60.0
N5-245	GM-U	2	0	2	0	0	100
N5-246	GM-J	12	2	9	1	0	90.0

The highest accuracy figure recorded was 100% which occurred on 33 out of 94 occasions. The lowest accuracy figure recorded was 0% recorded for N5-189 whereby its actual use was either a simple typographical error in the units A51 and therefore didn't fly at all or was a replacement used only once, so no association between its serial number and any particular letter is known. The next lowest recorded figure was 50% for N5-179 which was only tasked to fly on two operations and was apparently replaced on one of them. Then came one at 60%, one at 66.6% and two at 75%. After that, there were 18 returns with percentage figures in the 80s, 37 in the 90s and, as previously mentioned, 33 at 100%. That shows that 90 aircraft out of 94 returned an accuracy figure greater than or equal to, 75%. So, even though no evidence has been found to show that individual identification letters were actually marked on any of these aircraft, I believe that these figures prove that the allocations were not only real but that they were consistently used throughout 18(NEI)SQN's tenure in NWA.

In keeping with similar tables in other editions of "Notes Regarding", accuracy figures for individual aircraft suffer if that aircraft was used as a replacement. They also suffer if relatively simple errors occurred in administrative record keeping. This has evidently affected some aircraft which flew during the November and December, 1943, period when the Squadron's A51 was riddled with typing errors. Whoever compiled those records during that period seems to have had particular difficulty with distinguishing between N5-128 / N5-138 and N5-128 / N5-129. Similarly, they were frequently confused with N5-146 / N5-148 / N5-149. Other, similar, errors are sure to exist. Therefore, many of the entries in the preceding analysis which show aircraft as having been "apparently replaced by" or as having "apparently replaced" another machine may not have occurred and consequently the "real" accuracy figure might be higher than indicated.

As mentioned previously, photographic verification of these allocations isn't possible.



18(NEI)SQN aircraft returning from NEI26/2 Aug (1944). B-25Ds N5-180 and N5-184 are the two closest aircraft. B-25J, N5-218 is at bottom right. [AWM image P02769.001].



It has been written by others that the Dutch didn't apply national markings to the upper wings of their B-25s until AFTER the end of WW2. The fact is that, whilst that was true for their B-25Cs and D's, it wasn't so for their B-25Js. As evidenced by N5-218 in this 2<sup>nd</sup> August, 1944, photograph. N5-218 acquired the name "Grace", although that must have occurred after this image was taken. [AWM image P02769.001].



Not the best quality, but good enough to see the presence or otherwise of the Dutch flag on the tops of wings. B-25D, N5-188 (left), leading B-25Js, N5-218 (top – in echelon starboard), -226 (bottom – in echelon port) and -230 (right). Each of the B-25Js carries the Dutch flag on the upper portside wing. The date of this photograph isn't known, but it must have been prior to 26<sup>th</sup> December, 1944, because that is the date that N5-218 was recorded as having been received back in Canberra with the NEI Pool. N5-188 served with the Squadron from 26MAR44 to 14MAY45, N5-218 from 21JUL44, N5-226 from 06AUG44 to MAY45 - it lost its starboard vertical stabilizer in flight on 02MAY and N5-230 served from 06AUG44 to July 1945. [Charles Eaton Collection via ozatwar.com image P920747].



N5-180 returning from NEI26/2 Aug in company with other aircraft from the Squadron. [AWM image P02769.001].

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

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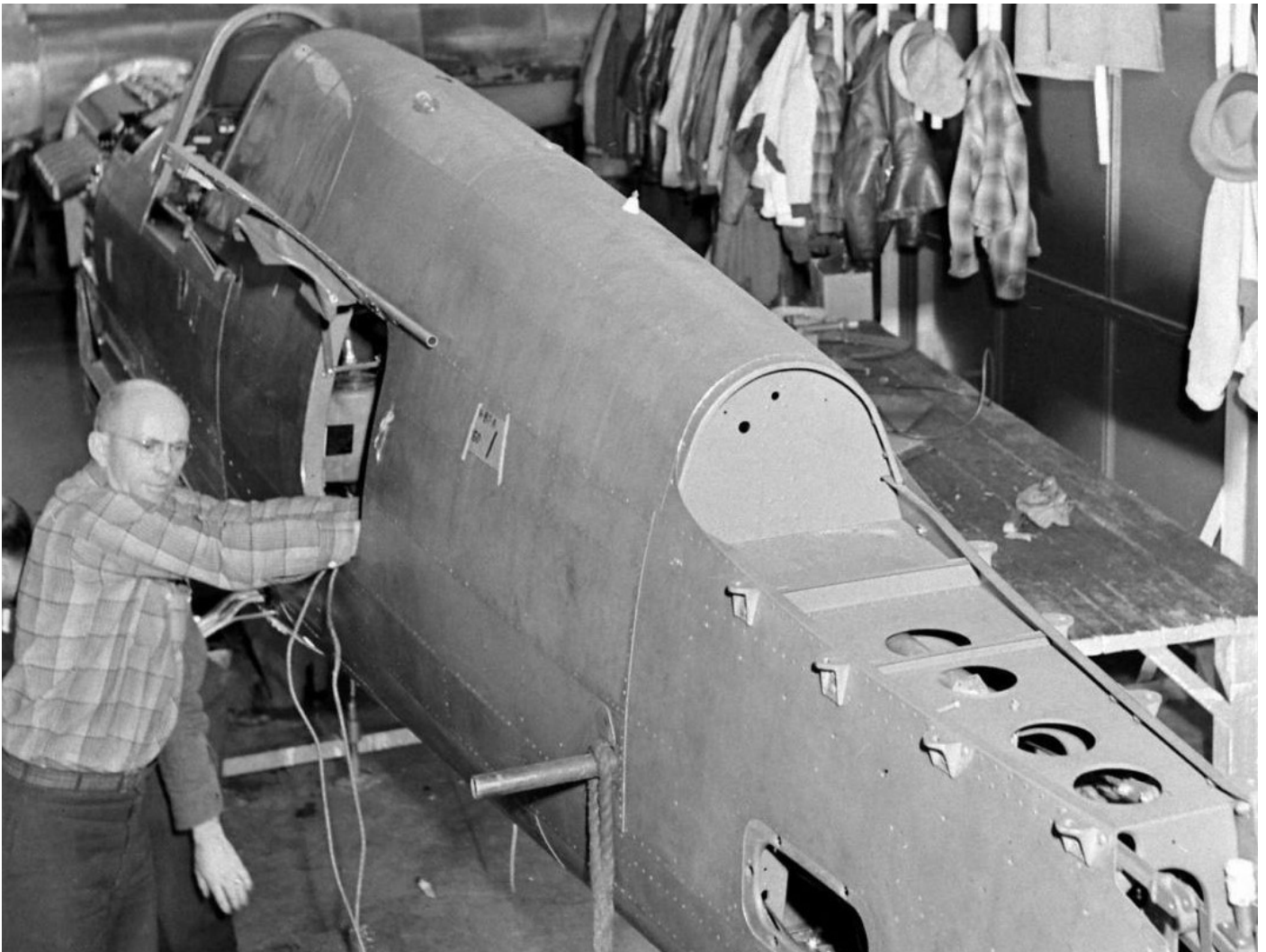
Jerry Scutts, *North American B-25 Mitchell* (2001).



## Curtiss Corner: P-40D/E/E-1; we salute you! Happy 80<sup>th</sup> Birthday Miss Kitty!

Gordon Birkett

With early Allison V-1710-33 "C -Series" engines powering P-40/P-40B/P-40Cs, Tomahawk Mk.I and Mk.IIs being produced for the USAAC and Royal Air Force, Allison was continuing the development of a "F-Series" engine on behalf of Curtiss, the V-1710-39, which would power a newer, but redesigned version of their intended new product: The P-40D.



P-40D #1 40-358 pictured being built in April 1941, with Curtiss Customer Sequence Number taped on (H87-A #1). [*Life Magazine Collection*].

In developing this new Allison engine, the installation required a redesign of the forward fuselage of the basic of the product. A deeper and enlarged cowling, the carburettor intake enlarged and placed forward towards the top of the cowling were amongst the major signature redesigns.



More followed with the redesign of the cockpit glass area and canopy, the removal of fuselage 0.50 cal guns for the engine cowl and placing all armaments in the wings. Redesigned rear fuselage, wings, tail plane, and much more which basically resulted in an almost new design. As such, delays in development resulted in a further 193 aircraft order of the original Allison V-1710-33 design, now the P-40C, to be placed in 1941 fiscal year for the USAAF. The new P-40D model actually had a smaller wing span (37 feet 3.5 inches versus 37 feet 4 inches) and a shorter fuselage (31 feet 2 inches versus 31 feet and 9 inches) compared to the P-40C.

The P-40D was ordered by the United States Army Air Corp (USAAC) on the 13<sup>th</sup> September, 1940, with its first flight being made on 22<sup>nd</sup> May, 1941.



**P-40D #1 in flight.** [Curtiss Wright].

As well, the RAF having ordered 560 Kittyhawk Mk.IIs (powered by the RAF contracted Allison V-1710-F3R) on 7<sup>th</sup> May, 1941, also had recently ordered more Tomahawks, pending development of their P-40D based version, with a later version of the P-40C, being called the Tomahawk Mk.IIB.



**P-40D #2 40-359, the first with four-gun armament in final assembly May, 1941.** [Paramount News Collection].

On 11<sup>th</sup> July, 1941, the first three USAAF P-40Ds delivered were 40-359, 40-361 and 40-364. P-40D Curtiss Wright Sequence #1(CW#1) 40-358 had continued in its tests after its first flight and had suffered damage and needed repairs before being finally accepted in to the USAAF on 24<sup>th</sup> August, 1941.



**P-40D #1 pictured sometime in June 1941, following a nose over following on landing in a wet conditions. [Curtiss Wright].**

The fate of P-40D #1 was sealed however on 4<sup>th</sup> January, 1942, when it crash-landed at Sand Point, Idaho, following a flight from Geiger Field, Washington State. The pilot, 2nd Lt Nelson McCoy, was slightly injured.

The original Kittyhawk Mk.I, AK571, after exhaustive Curtiss and RAF tests in the USA, finally left the factory and was shipped to the Middle East on 8<sup>th</sup> January, 1942.



**Kittyhawk Mk I AK571 in original colours as first flown in the USA. [Curtiss Wright].**

RAF deliveries would commence in Egypt in October, 1941, following trials; six aircraft being sent direct to the United Kingdom a month earlier: AK572 AK573, AK575, AK576, AK579 and AK580 (a seventh and eighth AH764 and AH751,

were received two months later, with a final pair of Mk.IIs, with the last of two direct contracted Kittyhawk Mk.IAs, AL229 and AL230, arriving January, 1942). The final UK bound RAF Kittyhawks, two Lend Lease P-40E-1s, ET573 and ET580, were sent to the UK in May, 1942.



The latter, ET580, eventually was returned to the USAAF in the UK as a Hack in the 8<sup>th</sup> AAF. [USAF Museum].

From the 26<sup>th</sup> airframe built, now fitted with six 0.50 cal guns in the wings, the new model designation of P-40E was applied to the increased four gunned P-40D. This aircraft, P-40E, 40-382, would remain with Curtiss until the 29<sup>th</sup> August, 1941. The first three P-40Es (40-383, 40-384 and 40-385) were handed over on the 15<sup>th</sup> July, 1941, to the USAAF, along with two P-40Ds (40-368 and 40-369).



P-40E 40-383, the first built P-40E. It was later written off on 15<sup>th</sup> February, 1942. [USAF Museum].

The 29<sup>th</sup> P-40D/E built, or to be factual, the fourth P-40E built, **40-386**, was held by Curtiss for exhaustive tests until 17<sup>th</sup> January, 1942, accumulating some 168 hours on the airframe, before it was accepted by the USAAF. It should be noted that the first 225 P-40Es were not initially equipped with self-sealing tanks, whereas from the 226<sup>th</sup> airframe, P-40E (40-584), they were equipped with metal fuel tanks with self-sealing liners on production.

### Combat Tactics evolved

Coupled with a non-supercharged Allison V1710-39 1150 HP engine and a high wing loading, it did not perform particularly well at altitudes higher than 15,000 ft, when required to dogfight.

The solution eventually came, after much combat experience, which was to use its strengths, particularly in diving, of sturdy construction and speed, to overcome its disadvantages when weighed against more agile Japanese aircraft. With increasing numbers available, trained pilots and the use of improved tactics, resulted in blunting the Japanese waves of success from April, 1942, onwards.

In the RAAF operational context, an effort was made to produce a periodical information Fighter Bulletin, referring to fighter tactics, both enemy and successful allied and other important details that came to light, was being circulated from mid-42. These were sent to RAAF Fighter Squadrons (i.e. 75, 76, 77, 30 and 31 etc) as well to fighter flights within Citizen Squadrons (i.e. 25 Sqn at Pearce, WA, that had Buffaloes) in order improve Allied preparedness and to understand Japanese formation tactics used.

Up to six Bulletins were issued to the end of 1942. They ranged from simple “stay alive” tactics of weaving, a climbing turn into a Zero attack to attacking Japanese Bomber “V” formations, to minimize exposure to supporting bomber machinegun fire. The before mentioned tactics were written by the 49<sup>th</sup> FG P-40E squadrons on their successful defensive attacks on Japanese bombers over Darwin during June to August, 1942. This was important, as the USAAF in Australia did not receive any further imported or assembled P-40Es after June, 1942, (having had around some 514 airframes delivered by then under Project X and SUMAC), as further deliveries were being sent to other theatres that were in more need.

The last P-40E-1 was accepted by the USAAF on 26<sup>th</sup> June, 1942, and was shipped off to Russia as Defence Aid.

Back to P-40E, **40-386**, the fourth P-40E built. On acceptance by the USAAF, it was crated and sent to Project X on the SS *Robin Tuxworth* along with a further 18 late production P-40Es delivered. She became **A29-64** in the RAAF and was used to equip No 77 Squadron at Pearce, Western Australia, after being assembled on the 13<sup>th</sup> April 1942. **Of historical note, she was the oldest P-40E sent out to the South West Pacific.** Her life was short lived though, when on the 15<sup>th</sup> May, 1942, at 0720hrs Western Standard time, after just getting airborne at Geraldton, Western Australia, an inexperienced Kittyhawk pilot, F/Lt D N Dale had difficulties, resulting in a crash landing further down the strip with the undercarriage partially retracted. The aircraft caught on fire and was subsequently burnt out. Approval was given to write it off along with Allison V1710-39 #337. Sadly A29-64 was destroyed just one week short of a year following the first flight of the first P-40D that started the legend the *Kittyhawk* in RAAF and Allied Service.

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## End Notes

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<sup>1</sup> Bert Rice, *A History of No. 22 (City of Sydney) Squadron, 1936 – 1946* (2018) pp13-16.

### RAAF WWII in Colour, No. 10 – RAAF Wackett Trainer

<sup>2</sup> R J Francillon, *The RAAF & RNZAF in the Pacific*, Aero Pictorials 3, Aero Publishers, Fallbrook CA, 1970, p.3.

<sup>3</sup> Derek Buckmaster provides details of early CA-1 production on his website: <https://dbdesignbureau.net/2020/05/09/wirraway-batch-numbers-mark-i-aircraft/>

<sup>4</sup> From NAA files, A3-10 is referenced as 06-B5, A3-31 as 06-D11, A3-75 06-F15, A3-138 as J19, A3-151 as 06-K11, A3-168 as 06-L8. Maryborough Aviation Museum has data plates A3-85/319/06-G5 and A3-87/321/06-G7. Also Geoff Goodall's Wackett sites mention some batch numbers, for example A3-56 as E16.

<sup>5</sup> Email Derek Buckmaster to author 24 FEB 2021.

<sup>6</sup> NAA A705 9/26/32(16A) of 2 SEP 1941.

<sup>7</sup> NAA A705 9/26/32(29A) of 14 OCT 1941.

<sup>8</sup> NAA A705 9/26/32(36A) of 15 JAN 1942.

<sup>9</sup> Mark Pilkington, AHSa website, 5 NOV 2020.

<sup>10</sup> K R Meggs, *Australian-built Aircraft and the Industry Vol 2*, Echelon Starboard, Nimbin NSW, 2020, pp.3, 413.

<sup>11</sup> C D Coulthard-Clark, *The Third Brother*, Allen & Unwin, Sydney, 1991, p.273.

<sup>12</sup> <https://www.goodall.com.au/australian-aviation/tugan-gannet/tugan-gannet.htm>

<sup>13</sup> Meggs, p.178.

<sup>14</sup> As Mascot closed, Tugan tooling, equipment and some staff were transferred to Melbourne. Sets of parts for the last four Gannets planned for manufacture were boxed and sent to Melbourne, but were not used to build any more aircraft, although three sets of auxiliary fins were fitted at Fisherman's Bend. Parts and material did go into other aircraft – oleos in the Wackett Trainer, wheels in the Wackett Bomber, and spruce and ply in the Wackett Trainer. Meggs p.31.

<sup>15</sup> Meggs, p.631.

<sup>16</sup> E/E.88 Aircraft Status Card for A15-1.

<sup>17</sup> Meggs, p.633.

<sup>18</sup> *Aircraft of the Royal Australian Air Force*, Big Sky Publishing, Sydney, 2021, p.60.

<sup>19</sup> Meggs, p.37.

<sup>20</sup> N Parnell & T Boughton, *Flypast*, AGPS, Canberra, 1988, p.175.

<sup>21</sup> Meggs, p.413.

<sup>22</sup> Meggs, p.390.

<sup>23</sup> Meggs, p.389.

<sup>24</sup> The four-cylinder Gipsy Major is sometimes referred to as the Gipsy Four or 'Gipsy IV', and its power output as 130hp. While this is the case for the Gipsy Major series I, the Gipsy Major series II as installed in the Wackett provided 140hp. Meggs, p.413.

<sup>25</sup> Meggs, p.413; Parnell & Boughton, p.175.

<sup>26</sup> Meggs, p.413.

<sup>27</sup> J M Andrade, *US Military Aircraft Designations and Serials since 1909*, Midland Counties, Leicester, 1979, p.236.

<sup>28</sup> Meggs, pp.414-5.

<sup>29</sup> Parnell & Boughton, p.176.

<sup>30</sup> NAA A4181 Vol 18, Air Board Agenda 2837 of 1 JUN 1940; also filed as 9/26/7(2A) NAA 14487 15/AB/2837.

<sup>31</sup> Meggs, p.417.

<sup>32</sup> NAA A705 9/26/32(7A) of 27 MAY 1941.

<sup>33</sup> NAA A705 9/26/75(23A) letter by RAAF RTO at CAC, of 2 DEC 1941.

<sup>34</sup> NAA A705 9/26/24 M.1 of 28 FEB 1941.

<sup>35</sup> NAA A705 9/26/32(1A) of 17 APR 1941.

<sup>36</sup> J Forsyth, *The D.H.82A Tiger Moth in Australia*, Skyline, Melbourne, 1995, pp.246-247.

<sup>37</sup> NAA A705 9/26/32(10A) of 7 MAY 1941; A705 9/26/32(11A) of 18 JUL 1941.

<sup>38</sup> NAA A705 9/26/32(16A) of 2 SEP 1941.

<sup>39</sup> NAA A705 9/26/32(49A) of 2 AUG 1942.

<sup>40</sup> NAA A705 9/26/32(29A) of 14 OCT 1941.

<sup>41</sup> NAA A705 9/26/32(36A) of 15 JAN 1942; 9/26/32(59A) of 23 FEB 1942.

<sup>42</sup> NAA A705 9/26/32(42A) mid 1942.

<sup>43</sup> NAA A705 MP287/1 1128, of 26 AUG 1941.

<sup>44</sup> NAA A705 9/26/24 M.66 of 11 AUG 1942, and M.79 of 3 OCT 1942.

<sup>45</sup> NAA A705 9/26/24 M.74 of 23 SEP 1942.

<sup>46</sup> NAA A705 9/26/32(59A) 2 FEB 1944.

<sup>47</sup> NAA A705 9/26/75(17A) of 2 DEC 1941.

<sup>48</sup> NAA A705 9/26/75(11A) of 26 NOV 1941.

<sup>49</sup> NAA A705 150/4/2043 (2A), RAAFHQ Technical Order Wackett Trainer Instruction No.17, of 12 JUN 1942.

<sup>50</sup> Meggs, p.417.

<sup>51</sup> A CAC investigation at this stage (JUL 1942) of all the Wackett units showed that "they were standing up to service in an excellent manner, and most had reached very high flying hours, beyond 1,000 and up to 1,300"; Meggs, p.419.

<sup>52</sup> Meggs, p.453.

<sup>53</sup> This was belatedly issued on 13 AUG 1943, at which stage the Wacketts had been withdrawn as EFTS elementary trainers. Meggs, p.417.

<sup>54</sup> *Aircraft of the Royal Australian Air Force*, p.62.

<sup>55</sup> 11EFTS Unit History A.50, NOV-DEC 1942.

<sup>56</sup> L H Sullivan, *Not to be Shot At or Exported*, RAAF Museum, Point Cook, 1995, p.65.

<sup>57</sup> 7AD Unit History A.50, FEB-MAR 1943.

<sup>58</sup> NAA A705 73/21/1050(5B), of 11 SEP 1944.

<sup>59</sup> Meggs, p.454.

<sup>60</sup> AWM has a series of images of this flight: AC0144, AC0145, AC0146 and AC0154. These provide details of the personnel involved.

<sup>61</sup> RAF ADM.332 (Issue 3) filed as RAAFHQ 150/4/852(12).

<sup>62</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>63</sup> RAAFHQ Aircraft General Instruction No.C.11 (Issue 4), Appendix I, of 31 AUG 1942.

<sup>64</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>65</sup> Neither the Kittyhawk nor Vengeance were listed.

<sup>66</sup> NAA A11083 21/4/AIR, *NEA HQ Camouflage of Aircraft*, A.D.1167 pp.71-72.

<sup>67</sup> P Lucas, *Camouflage & Markings No.2*, Scale Aircraft Monographs, Guideline, Luton, Beds, 2000, p.13.

<sup>68</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>69</sup> RAAFHQ DTS 9/1/442 of 12 SEP 1939.

<sup>70</sup> *RAF 2:5 type-B wing roundels varied in size with aircraft type, and with some as 25":63", 22":56", 20":50", or 16":40"; Goulding & Jones, Camouflage & Markings 1936-1945, Doubleday, New York, 1971. For the Walrus, this was typically 24":60"*

<sup>71</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>72</sup> J Tanner, *British Aviation Colours of World War Two*, Arms & Armour Press, London, 1986, p.1.

<sup>73</sup> Cited in Tanner, p.9.

<sup>74</sup> The Hurricane 'B' scheme was abandoned in JAN 1941 and future Hurricanes were produced in the 'A' scheme only. Goulding & Jones, p.64. For the Spitfire, on 14 JAN 1941 the 'A' and 'B' mirror scheme merged to become the 'A' scheme only; Morgan & Shacklady, p.624. However, the choice of which pattern to use as standard was left to individual companies, and for the Oxford in 1941 the 'B' scheme became the sole pattern.

<sup>75</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>76</sup> I K Baker, *Aviation History Colouring Book 70, RAAF Colour Schemes & Markings Part 5a*, Queenscliff Vic, 2010, p.28.

<sup>77</sup> RAAFHQ S.A.S. 2699 1/501/329(55A), undated but c JUL 1940.

<sup>78</sup> Lucas, p.9.

<sup>79</sup> This apparent 'choose your own A or B option' to manufacturers is not consistent with military policy for standardisation, as the RAF downsized in 1941 to just five camouflage patterns across its fleet. But what is apparent in the study of post-1941 imagery, is that visually all schemes standardised in what we have simply termed "*sloping forward on the port side, aft on the starboard*" – so this must have been dictating the new schemes, not whether they had previously been 'A' or 'B'.

<sup>80</sup> AGI No. C.11 Issue 1, A/L 5, of 26 JAN 1940, RAAF file 150/4/658. See the Avro Cadet article, [ADF-Serials Telegraph \(adf-serials.com.au\)](#)

<sup>81</sup> DTS Minute to AMOE 62/3/431(31A) of 26 MAR 1940.

<sup>82</sup> RAAFHQ AGI No. C.11, Issue 3, para. 1(a) Training Aircraft, of 3 OCT 1940.

<sup>83</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>84</sup> **Mensuration:** The *smaller forward* Wackett training number below the front cockpit position of 20" x 10" in a 2½" stroke is determined by mensuration – the sizes of some aircraft markings are often provided here from mensuration, checked against surviving policy documents. 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 were standard at 8" high and 5" wide (Imperial measures used, as that was the standard of the day), and the *larger nose* numbers at 24" x 15" in 3" stroke are in these proportions. Some Tech Orders provide roundel and fin flash dimensions. Generally, unit markings vary, 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 the larger markings can be provided inside a 2" (50mm) margin of error.

<sup>85</sup> Australian-produced Wacketts, Wirraways and Tiger Moths also served on EATS and SFTS units.

<sup>86</sup> N M Parnell & C A Lynch, *Australian Air Force since 1911*, Reed, Sydney, 1976, p.54. From initial training, Australia would hand over 194 trainees per month for further training in Canada.

<sup>87</sup> J Forsyth, *The D.H.82A Tiger Moth in Australia*, Skyline, Melbourne, 1995, p.xxiii.

<sup>88</sup> 1EFTS Unit History A.50 26 JUN 1941.

<sup>89</sup> Sullivan, p.63.

<sup>90</sup> Maximum power for the Super Scarab is given as 175hp for take-off at 2250rpm, and 165hp at 2100rpm at sea-level; Meggs, p.422.

<sup>91</sup> J Lever, *6OTU, Base Torpedo Unit*, self published Koorlong VIC, 1999, p.84.

<sup>92</sup> 3EFTS Unit History A.50.

<sup>93</sup> *Vol.8 Training Units*, pp.18-19.

<sup>94</sup> 11EFTS Unit History A.50, JAN-APR 1942. Although the E/E.88s for the ex-3EFTS Wacketts show delivery to 11EFTS as 22 APR, the A.50 records them as being received on 20 APR 1942.

<sup>95</sup> 11EFTS training of US pilots is cited in Meggs, p.418. The month previous, two USAAF pilots were killed in a 1AD aircraft A3-166 on 21 MAR 1942 near Woolamanatta VIC during aerobatics; RAAF Preliminary Accident Report TD96/41, # 853 1941/42.

<sup>96</sup> *Vol.8 Training Units*, pp.33-34.

<sup>97</sup> *Units of the RAAF, Vol.8 Training Units*, pp.137-138.

<sup>98</sup> CFS Unit History A.50 1940-1941.

<sup>99</sup> *Units of the RAAF, Vol.8 Training Units*, pp.137-138.

<sup>100</sup> CFS Unit History A.50 24 MAR 1941.

<sup>101</sup> CFS Unit History A.50 16 DEC 1940.

<sup>102</sup> NAA A705 9/26/75(23A) letter by RAAF RTO at CAC, of 2 DEC 1941.

<sup>103</sup> CFS Unit History A.50 18 APR 1942.

<sup>104</sup> *Vol 8, Training Units*, pp.121-2.

<sup>105</sup> 2WAGS Unit History A.50 31 MAY-JUN 1942.

<sup>106</sup> *Vol 8, Training Units*, p.123.

<sup>107</sup> *Vol 8, Training Units*, p.125.

<sup>108</sup> Meggs, p.419.

<sup>109</sup> [CAC WACKETT TRAINER IN AUSTRALIA \(goodall.com.au\)](#)

<sup>110</sup> CMU Narrandera A.50 Unit History, JUL 1945 – MAR 1946.

<sup>111</sup> [CAC WACKETT TRAINER IN AUSTRALIA \(goodall.com.au\)](#) 50 seems the apparent total that were sent to NEI, however the Goodall site does provide 54 RAAF serials that were exported. The Dutch IPMS website gives this total as 49 – [IPMS Nederland - Commonwealth Wackett](#)

<sup>112</sup> IPMS Netherlands 2004, [IPMS Nederland - Commonwealth Wackett](#)

<sup>113</sup> [Aircraft register search | Civil Aviation Safety Authority \(casa.gov.au\)](#)

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<sup>114</sup> [Home | Wings Over New Zealand \(proboards.com\) of 16 FEB 2011](#)

<sup>115</sup> [CAC Wackett - Australian National Aviation Museum \(aarg.com.au\)](#)

<sup>116</sup> [Incident CAC CA-6 Wackett Trainer VH-BEC, 14 Jan 1962 \(aviation-safety.net\)](#)

<sup>117</sup> *Aircraft of the RAAF*, p.62.

<sup>118</sup> Meggs, p.453.

### Notes Regarding 18(NEI)SQN B-25s

<sup>119</sup> RAAF Form A.50 Operations Record Book of No. 18 N.E.I. Squadron entry for 4-4-42 in RAAF Unit History Sheets Number 18 (NEI) Squadron; NAA: A9186, 40.

<sup>120</sup> RAAF Form A.50 Operations Record Book of No. 18 N.E.I. Squadron entry for 5/6/42, *ibid*.

<sup>121</sup> RAAF Form A.50 Operations Record Book of No. 18 N.E.I. Squadron entry for 27/12/42, *ibid*.

<sup>122</sup> The difference between an Armed Shipping Reconnaissance and an Offensive Shipping Reconnaissance was that, with the "Offensive" mission, if no shipping was found by a certain point, then a bombing attack was to be made on a pre-determined land target.

<sup>123</sup> Letter from CO No. 18 Squadron NEI to AOC Advance Headquarters (NWA) dated 24/1/43 in No 18 Netherlands East Indies Squadron – Conduct of Operations; NAA: A11310, 6/1/AIR PART 1.

<sup>124</sup> RAAF Form A.50 Operations Record Book of No. 18 (N.E.I.) Squadron entry for May 8 (1943) in RAAF Unit History Sheets Number 18 (NEI) Squadron; NAA: A9186, 40.

<sup>125</sup> Web page titled North American B-25C Mitchell; [http://www.joebaugher.com/usaf\\_bombers/b25\\_6.html](http://www.joebaugher.com/usaf_bombers/b25_6.html) at 29MAY2014.

<sup>126</sup> Web page titled North American B-25D Mitchell; [http://www.joebaugher.com/usaf\\_bombers/b25\\_7.html](http://www.joebaugher.com/usaf_bombers/b25_7.html) at 29MAY2014.

<sup>127</sup> *Ibid*.

<sup>128</sup> Web page titled North American B-25J Mitchell; [http://www.joebaugher.com/usaf\\_bombers/b25\\_17.html](http://www.joebaugher.com/usaf_bombers/b25_17.html) at 29MAY2014.

<sup>129</sup> War Department, FM30-30 Recognition Pictorial Manual (1943) p9, Letter Designations of U.S. Aircraft.

<sup>130</sup> Web page titled North American B-25D Mitchell; [http://www.joebaugher.com/usaf\\_bombers/b25\\_7.html](http://www.joebaugher.com/usaf_bombers/b25_7.html) at 29MAY2014.

<sup>131</sup> Department of Air Minute Paper titled "B-25 Aircraft Taken Over from the N.E.I.A.F." dated 25.4.44 in Directorate of Technical Services – B25 General – Technical – Mitchell Instruction No.13; NAA: A705, 9/41/37 PART 1.

<sup>132</sup> In a letter titled, "Structural Modification of B-25D Airplanes at Kansas City Factory", dated June 10, 1943, it was made clear that the Modification Centre at Fairfax was most certainly involved but, that involvement was the fabrication and installation of gun mounts, boxes, ammunition feed chutes and the installation of the M2 50-calibre machine guns in the new waist and tail positions plus the installation of the package guns; via Phil Marchese facebook page, B-25 History Page.

<sup>133</sup> RAAF Headquarters postgram T448/PGM of 8 Sep (1944) in Directorate Technical Services – B25 General – Technical – Mitchell Instruction Number 13; NAA: A705, 9/41/37 PART 1.

<sup>134</sup> 5AD signal R72 of 12 Sep (1944), *ibid*.

<sup>135</sup> NEI Pool signal T4 of 16 Sep (1944), *ibid*.

<sup>136</sup> 18SQN signal T53 of 18 Sep (1944), *ibid*.

<sup>137</sup> RAAF Publication No. 472, Mitchell (B-25C and D) Airplanes Erection and Maintenance Instructions, May, 1944, (T.O. No. 01-60GB-2) Section XIII, paragraph 1h "Exhaust Manifold".

<sup>138</sup> *Ibid*.

<sup>139</sup> Jerry Scutts, *North American B-25 Mitchell* (2001) 107.

<sup>140</sup> *Ibid* p154.

<sup>141</sup> AN 01-60GB-1 Pilot's Flight Operating Instructions for Army Models B-25C and D Series, Section 1, paragraph 2, Block Numbering System, dated 25 December, 1943, revised 15 July, 1944.

<sup>142</sup> Joe Baugher web site [http://www.joebaugher.com/usaf\\_bombers/b25\\_23.html](http://www.joebaugher.com/usaf_bombers/b25_23.html) at 18th October 2013.

<sup>143</sup> For those that might be interested, those aircraft that missed the list were: B-25J-15-NC, N5-240 (ex 44-29033), B-25J-20-NCs, N5-244 (ex 44-29262), N5-247 (44-29515) and N5-248 (44-29516) and B-25J-25-NCs, N5-250 (44-30504) and N5-252 (44-30507).

<sup>144</sup> Incorrectly recorded as being B-25D-10-NA, 41-30298 on its E/E.88 for serial N5-166.

<sup>145</sup> Incorrectly recorded as being 41-30416 on its E/E.88 for serial N5-168 however, its E/E.88 as A47-35 correctly identifies it as 42-87416.

<sup>146</sup> Baugher notes "conflict here". What the conflict actually was wasn't elaborated on.

<sup>147</sup> In Serial Numbers of Dutch B-25 Mitchells via [http://www.joebaugher.com/usaf\\_bombers/b25\\_23](http://www.joebaugher.com/usaf_bombers/b25_23) at 18/10/2013, Baugher notes this serial number as becoming an NEIAF aircraft, but doesn't record a Dutch serial number. That list has three vacant US serial numbers: 43-3620, -3765 and -3868. The E/E.88 for this aircraft doesn't list a former US serial number. N5-214 was lost on 01SEP44 and the website, "aviation-safety.net/wikibase/dblist.php?AcType=B25&sorteer=date&key&page=7" has an entry for N5-214 on that date which quotes the manufacturers serial number for this aircraft as being "100-24194". That NAA serial shows the aircraft to be NAA model NA100, 24194, which was the second last B-25D built and corresponds to USAAF serial number 43-3868.

<sup>148</sup> In Serial Numbers of Dutch B-25 Mitchells via [http://www.joebaugher.com/usaf\\_bombers/b25\\_23](http://www.joebaugher.com/usaf_bombers/b25_23) at 18/10/2013, Baugher notes this serial number as becoming an NEIAF aircraft, but doesn't record a Dutch serial number. That list has three vacant US serial numbers: 43-3620, -3765 and -3868. The E/E.88 for this aircraft doesn't list a former US serial number. If 43-3868 had become N5-214, then either 43-3620 or -3765 became N5-217.

<sup>149</sup> ADF-Serials Telegraph Vol 10, Iss 5 (2020) pp74, 75.