



# ADF Serials Telegraph Newsletter



Volume 10 Issue 1: Autumn 2020

# Welcome to the ADF-Serials Telegraph.

Articles for those interested in Australian Military Aircraft History and Serials

***Our Staff this issue are:***

***Editor and contributing Author: Gordon R Birkett***

***Co-Editor and contributing Author: John Bennett***

***Contributing Author: "Shep"***



As stated on our Web Page; <http://www.adf-serials.com.au/newsletter.htm>

"First published in November 2002, then regularly until July 2008, the ADF-Serials Newsletter provided subscribers various news and articles that would be of interest to those in Australian Military Heritage. Darren Crick was the first Editor and Site Host; the later role he maintains.

The Newsletter from December 2002 was compiled by Jan Herivel who tirelessly composed each issue for nearly six years. She was supported by contributors from a variety of backgrounds on subjects ranging from 1914 to the current period. It wasn't easy due to the ebb and flow of contributions, but regular columns were kept by those who always made Jan's deadlines. Jan has since left this site to further her professional ambitions.

As stated "The Current ADF-Serials Telegraph is a more modest version than its predecessor, but maintains the direction of being an outlet and circulating Email Newsletter for this site".

Words from me

*I would argue that it is not a modest version anymore as recent years issues are breaking both page records populated with top quality articles! John and I say that comment is now truly being too modest!*

As stated, the original Newsletter that started from December 2002 and ended in 2008, and was circulated for 38 Editions, where by now...excluding this edition, the Telegraph has been posted 43 editions since 2011 to the end of last year, 2019. The ebb and flow of contributions is still a major problem and concern and if it wasn't for stalwarts like John Bennett and a few recent authors who have contributed alone and by me, I'm sure new articles and public interest would have died long ago. Like other parts of the ADF Serials.com.au site, we all do this for free and to share history.

From my prospective, all research and presented articles are produced in good faith, based on thorough research with official documentation and accumulated knowledge that, in most parts is considered "air tight", but we are always willing to include discussion should they conflict with written history, by presenting evidence, or new evidence presented.

The included Authors in each edition, are also providing their articles, based on their research that is supported by official period documentation and photos, that may provide interest and insight in lesser known subjects' or circumstances, otherwise forgotten or not fully covered by recorded History to date. Other Stories may be of a personal account or passed down as viewed through their eyes only, and will be stated as such.

Our Bottom Line:

We do reserve the final say and do standby our presented article's accuracy; until alternative or official documentation are provisioned to state the facts are otherwise. *We will not accept or publish any knee jerk comment or unsupportive counter arguments.*

*As you can see with positive feedback, we now include page numbering and have also included a new refreshing format*

*Yours, Gordy*

## ADF-Serials Generic House Rules:

Please support the main ADF-Serials website with your patronage. It's free and is the product of thousands of hours of dedicated, ongoing work by our volunteer membership. Many of the answers to your questions can be found there. It is located at <http://www.adf-serials.com.au/home.htm>

The main site also includes:

- Our image gallery at <http://www.adf-serials.com.au/Gallery.htm>
- Our message board at <http://www.adf-messageboard.com.au/invboard/>
- The Aircraft of the New Zealand Defence Force website at <http://www.nzdf-serials.co.nz/nz-serials/nzaircraft.htm>
- The Aircraft of the Papua New Guinea Defence Force (PNGDF) website at <http://www.adf-serials.com/PNGDF.htm>

Any photographs posted must be your own or where possible, have the photographer's permission. At the absolute least, ALWAYS ensure credit is given.

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### Vale Martin Edwards

It is with great sadness that we confirm that Martin Edwards, a long time stalwart of ADF-Serials since 2003 has passed. His never unending contributions continued up to and including the day before his passing on the 24<sup>th</sup> February 2020. He has been battling a long illness for some time.

I can say this much on behalf of the ADF-Serial's Team Members; we all have been enriched by knowing him. He gave and gave to the end.

Our sincere condolences to his loved ones from a very much saddened Editor, Friend and Cobber

Gordy

**News Briefs:** Discontinued as a regular feature, refer ADF-Serials Face Book for news  
<https://www.facebook.com/groups/ADFSerials>

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



## Curtiss Corner: ~~A29-28~~ A29-90

This edition the **Contributing Researchers:** Buz Busby, Anthony Koch, Richard L and Gordon Birkett @2003 to 2020

It is great relief to our faithful P-40 Mafia Researchers, and I might add, and *immense* satisfaction for our original “lead” researcher of our group, that after years of continuous follow-up to the RAAF Museum, that a decision has been made on the origin and true identity of their aircraft, currently undergoing refurbishment to flight for the centenary birthday of the RAAF in 2021.

After approaching the RAAF Heritage mid last year, I have been advised by the Director-General History and Heritage – Air Force History and Heritage Branch - Air Force Air Force Headquarters, Air Commodore John Meier, on the 7<sup>th</sup> February 2020 that their aircraft, previously stated as P-40E A29-28 (41-5336) is actually P-40E-1 A29-90 (41-25123), as identified by the Curtiss Wright Sequence Number “908” stamped on its centre airframe in several places.

I truly wish to thank John for his open mindedness and especially his decision based on submitted facts and data that have ended this 17 year campaign by our lead researcher and others.

More information and the “official” release of such will be in the Friends of RAAF Museum magazine “Aerogramme” which is due out first week of March, 2020.

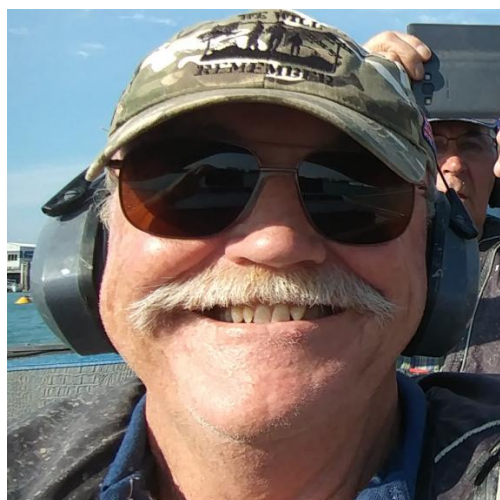
Whether the aircraft is painted up as another is entirely up to the RAAF Heritage, but knowing its real identity as A29-90, ex 76 Sqn F RAAF’s 1942-1943 “IH” “Ming the Merciless” is a joy by all concerned, especially me.

A true combat veteran claiming 76 Sqn’s first aerial kill in August 1942.

Signing off on this 17 year work effort and stating a “big thanks” and “Job well done” to Cobbers Buz, Richard L and Anthony. Have I’ve missed anyone? Thanks to you too!!

Best

Gordy



Winners are grinners



## **Issue#1: P40Es in short supply: An overview, by Gordon Birkett @ 2003:**

Redressed 2020 with additional Pictures and corrections

The P-40E represented the first modern massed produced fighter that the RAAF had at that time to carry the fight to the then relentless Japanese onslaught, up to March 1942.

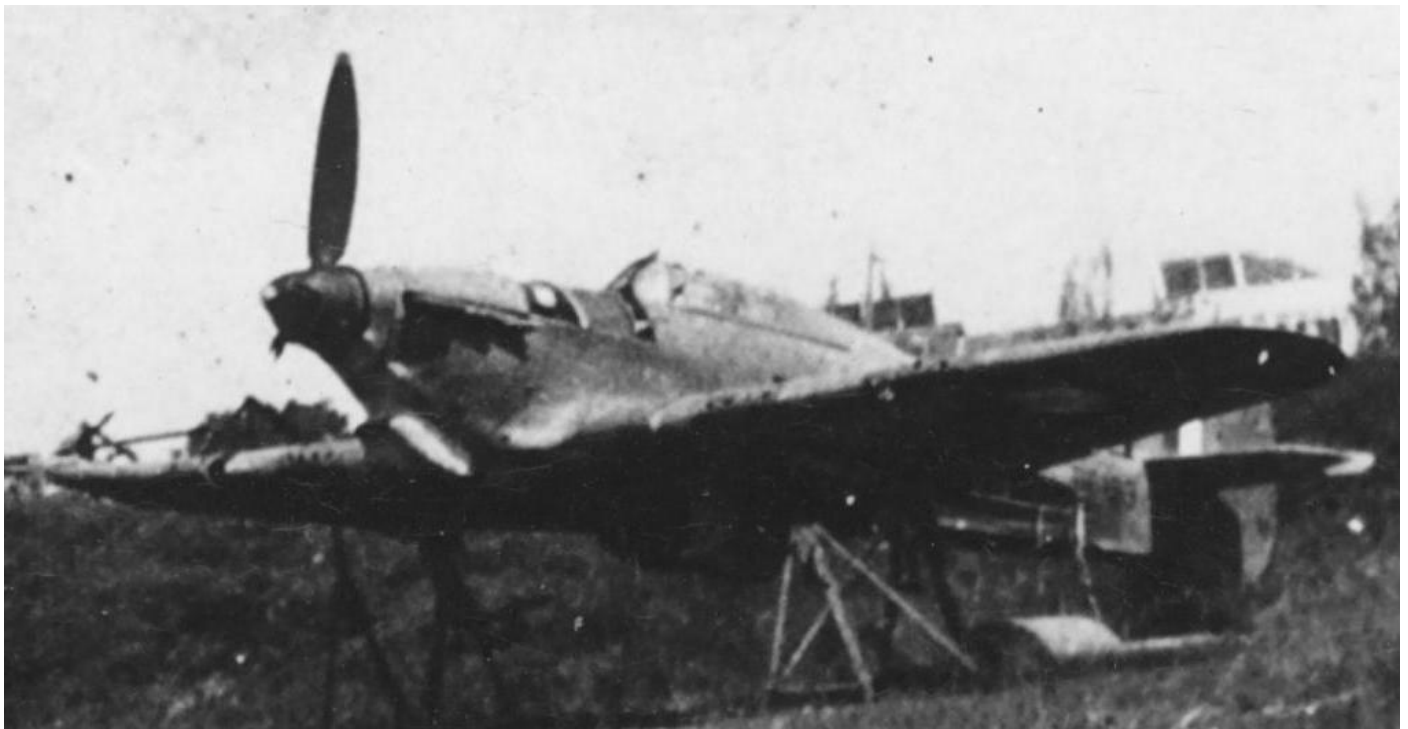
Up to that time, apart from Brewster Buffaloes operated in Malaya in forward defense by 21 and 453 Squadrons, Australia had no front line Fighter aircraft equipping its air force on the mainland of Australia. That force had been whittled down to a few serviceable airframes by the 17<sup>th</sup> February 1942 in Sumatra, NEI.

P-40Es were being flown to Java by the USAAF in small numbers and were also separately shipped in two ships to Java for re-equipping those depleted RAF and NEI air force fighter squadrons there. That proved to be an exercise in futility from the start, as it would have been seen in hindsight.

It must be remembered that the British also did reinforce the Far East in January and February 1942 with over 48 Hudson Bombers (flown out) and over 100 Hurricanes fighters (51 crated by sea and the balance by aircraft carrier).

*However they were consumed by the fighting during this period within ABDA NEI/Singapore Theatre.*

During this time, the Australian Government realizing the imminent collapse of the Netherlands East Indies commenced making numerous requests to both the British and American Governments for a early allocation of suitable Tomahawk type fighters as used by Australian Squadrons in the Middle East.



A Hurricane IIB from 232 Sqn RAF captured in March 1942. The Unit was part of 267 (Fighter) Wing consisting of 17, 135, 136 and 232 Squadrons RAF: Photo Credit Unknown Japanese discovered post war.

The choice was based on the availability of experienced pilots being seconded back to Australia, and the fact that the supply of Spitfires or Hurricanes was practically non-existent due to heavy fighting in the Europe/Middle East theatres.



The January 1942 requests initially centered on the British Government to reallocate some 250 P-40 Type fighters to equip 6 fighter squadrons and an OTU, along with attrition replacements for a period of 6 months.

These figures were based on the strength of 16 in-use and 8 in-use reserve aircraft for each squadron and twelve aircraft in an OTU. The balance of 94 would be held for training and attrition.

After several telegrams to Britain, an early February reply came back whereby they agreed to allow 125 airframes from their next production allocation, along with the proviso that the Americans supply the 125 airframe balance from their production allocation.

This would provide a single squadron at Port Moresby, Sydney, Brisbane, Canberra, and with two for Darwin. But the P-40Es weren't allocated. However at this time, General Marshall, was insisted that there was an outstanding ABDA requirement to provide this command with all available Australian assembled P-40Es to Java.

To this end the first three USAAF Provisional Squadrons had departed to Java by the 14<sup>th</sup> February 1942 via Darwin.

These P-40E were drawn from the first the two shipments to Brisbane, 18 P-40Es 22/12/41 and 55 P-40Es 15/01/42 resulting in only 39 out of 73 assembled at Amberley, arriving in Java.

Two further squadrons were dispatched from the 11th February, formed from previous balance and the third shipment of seventy-one P-40Es, arriving in Brisbane on the 30<sup>th</sup> January 1942.

*A note should be made that at this time, that the returned Pilots from the Middle East and those who were to be the initial cadre of trained pilots for the first two P-40E squadrons, had undertaken conversion training on P-40Es.*

*This was done at Archerfield and Amberley (23Sqn and 3 SFTS respectively) whilst providing dual control checks on Wirraways for the new USAAF P-40E pilots from the States.*

*This was a joint RAAF and USAAF agreement, which was the answer to stem the number of accidents, caused by limited trained pilots, fresh out of training schools from the United States.*



One of the first P-40Es (#3, FY 41-5334) seen here after assembly and test flight early January 1942 at Amberley. Photo Credit: GRB Collection



"B" Flight 13<sup>th</sup> PS (Prov) P-40E Box #35 at Richmond RAAF Station on the 14<sup>th</sup> February 1942. This aircraft along with 31 others went down with the USS Langley a fortnight later off Java. Note reduced under wing Red cockade of P-40E to right. Photo Credit: GRB and Buz Collection

Meanwhile, General Barnes, who was in charge of the USAAF in Australia at the time, was concerned about the ferry losses to Java, did consider and implemented a reinforcement plan whereby the force would embark the USS Langley at Fremantle and would be sailed to Java. Needless to say, this force was split in transit at Port Pirie, with the majority of the 33<sup>rd</sup> Pursuit Squadron (Provisional) being redirected to provide fighter cover for transiting convoys out of Darwin.

Three further fighter squadrons were to be sent to complete the need of eight squadrons for ABDA before consideration in completing the requirement of forming numbers nine and ten, being the new RAAF fighter squadrons, to defend the Australian mainland.

Prior to the sailing of the USS Langley on the 21<sup>st</sup> February 1942 from Fremantle, the Australian Government telegram the American Government requesting that these two squadron worth of aircraft be re-directed to Darwin, which had suffered its first air raid on the 19<sup>th</sup> February 1942.

This did not happen and the convoy, MS-5 (Melbourne to Singapore #5) sailed to its fate, its P-40Es destined to be destroyed. The Japanese at this time had invaded Sumatra by the end of February and Java at the beginning of

March 1942, caused therefore a major rethink of where the next assembling three P-40E Squadrons would eventually go.



2<sup>nd</sup> Lt Pingree's 33<sup>rd</sup> PS (Prov) P-40E Box #180 undergoing repairs at Port Pirie RAAF Station in February 1942. Sadly on test flight a day or more after this picture was taken, he crashed nearby and was killed. Photo Credit RAAF WA Museum



2<sup>nd</sup> Lt Al Borden's P-40E Box #190 also undergoing repairs at Port Pirie RAAF Station in February 1942. This and another 31 aircraft went down with the USS Langley a fortnight later. Photo Credit RAAF WA Museum

This unit of three squadrons (7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> PS) was the 49<sup>th</sup> Pursuit Group, the first whole fighter group to be deployed since the commencement of hostilities to the pacific theatre. It too was still waiting for P-40E aircraft, as the remnants of the first three convoys weren't enough to equip it.

It wasn't till mid February when the assembled P40E/E-1s of the forth shipment (5<sup>th</sup> February 1942) started arriving mid February 1942 for each squadron to equip with.

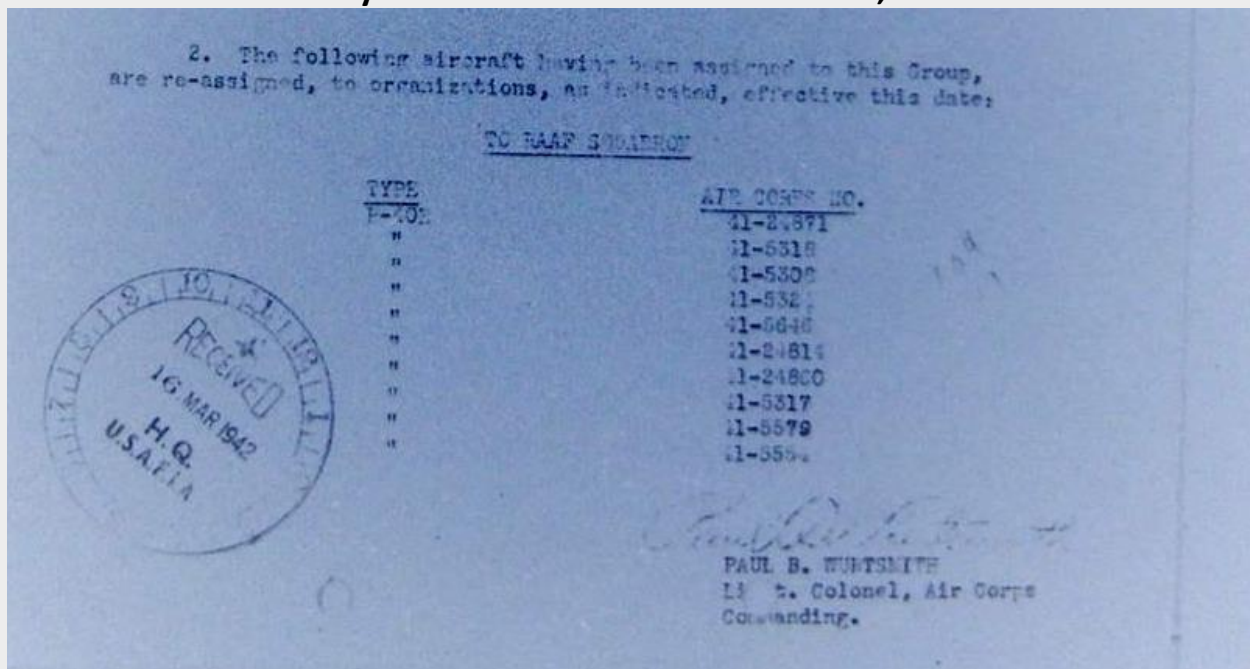
*Editor 2020: A 1<sup>st</sup> sprinkle of P-40E-1s arrived on the Phoenix Convoy per 02/02/42, in Melbourne.*

Latter in March, we would see the 7<sup>th</sup> Pursuit was sent to Horn Island, so as to keep that air route open for the reinforcement of Port Moresby. The 9<sup>th</sup> Pursuit Squadron would also be sent to Darwin in March 1942. The remaining 8<sup>th</sup> Pursuit Squadron would remain at Canberra till the 8<sup>th</sup> April, till it too went north to Darwin.

Again, the Australian Government requested again in late February (22<sup>nd</sup>) and was at last granted two allocations. Split between 125 supplied by the RAAF and a further 125 from the USAAF.



## First 10 RAAF Kittyhawks : 10<sup>th</sup> March 1942 Mascot, NSW: Editor 2020



*Editor 2020: The first Ten P-40E/E-1s for the RAAF were flown up by RAAF pilots from Mascot, above is the USAFIA Order authoring them to be transferred to the RAAF from the 49<sup>th</sup> Pursuit Group, dated 10<sup>th</sup> March 1942. (They are P-40E-1 41-24814/41-24860/41-24871 and P-40Es 41-5308/41-5317/41-5318/41-5324/41-5554//41-5579 and 41-5646. Signed by the OC 49<sup>th</sup> Pursuit Group, Lt Col Paul Wurstmith 10/03/42*

*These were later marked within A29 serial range A29-1 to A29-25, along with two further groups ex Archerfield and Amberley) interestingly, 41-5646 had crashed-landed at Canberra ACT on the 27th February 42.*

***There was A numbering error which resulted in several P-40E/E-1s dual numbered in Townsville,...A29-1 to A29-4, then rectified..The repaired A29-1 may have been repaired A29-4!! Editor 2020:***

*In the end, the USAAF merely loaned 81 airframes and requested that we pay that total back within our RAF supply of 125(141 redirected DA3 Contracted P-40E-1s, less 14 sunk on route). In effect, the RAAF received around 47 new P-40E-1 airframes from some 141 sent out under the RAF Allotment, paid by the UK.*

*Not quite what written history has recorded over the year that the UK abandoned us in 1942 eh?*



A brand new RAAF P-40E-1 41-36231/ET877 sans USAAF/RAF Markings out of the box and assembled, ready to be reprocessed by the USAAF in Australia. IRC states: Shipped ex New Orleans departed 2/4/42; Australia. Photo Credit: GRB Collection

One further USAAF Unit that was to be allocated P-40E/E-1s in Australia, the 68<sup>th</sup> Pursuit Squadron, prior to moving to New Caledonia in May 1942. These repossessed ex RAAF (of the 125 original RAF Supplied DA3 P-40E-1s) were shipped in crates from Brisbane during early May 1942 to its destination. (One exists today, rebuilt and owned by Col Pay, flying out of Scone: Editor 2020)

Firstly, a request for a limited number for training (6-12) was granted, followed by a monthly allocation from March 1942 of 42, 40, and then 40 up to May 1942. The order from the American Government was immediately affected, whereby a limited number of airframes, approximately 6, were allocated, still with USAAF Cockades to 3 SFTS at Amberley, in late February 1942.

Thus from this period, started the beginning of a long association between the *RAAF and the P-40*.

### **The P-40E/E-1 from the RAAF View**

Coupled with a non-supercharged Allison V1710-F3R (39) 1150 HP Engine and a high wing loading, it did not perform particularly well at altitudes higher than 15000 ft when required to dogfight. The solution eventually came, after much combat experience, was to use its strengths, particularly in diving, 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 42 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 1942. These were sent to RAAF Fighter Squadrons (i.e. 75, 76, 77, 30, 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 latter successful tactics were written by the 49<sup>th</sup> FG P-40E Squadron’s on their 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-40E-1s after June 1942 (having had around some 552 Airframes delivered by then), as further deliveries were being sent to other theatres in more need.



It would be nearly January 1943 before deliveries of P-40Ks begun to arrive for the USAAF in PNG. Thus the need to conserve those airframes, either by changing tactics or by prolonging them by careful use and maintenance, had to be done. This had a knock on effect to the RAAF, who initially were issued 140 approximately up to June 1942, as the pool of reserve aircraft held by both the USAAF and RAAF dwindled to very low levels by September 1942.

There were cases in early April 1942, due to heavy losses by the 49<sup>th</sup> FG, where RAAF allocated airframes were repossessed by the USAAF before being issue to RAAF Squadrons. (*Editor 2020: Total was eventually in excess of 100 airframes with not all getting a A29 number allotted/cancelled*)

For example:

- **A29-94 41-25163** returned USAAF 28/4/42 **41-25176** becomes then **A29-94** 13/5/42
- **A29-95 41-25185** returned USAAF 28/4/42 **41-25177** becomes then **A29-95** 13/5/42
- **A29-96 41-25181** returned USAAF 28/4/42 **41-35966** ET612 becomes then **A29-96** 13/5/42
- **A29-97 41-25174** returned USAAF 28/4/42 **41-35970** ET616 becomes then **A29-97** 13/5/42
- **A29-98 41-25167** returned USAAF 28/4/42 **41-35973** ET619 becomes then **A29-98** 13/5/42
- **A29-99 41-25177** returned USAAF 28/4/42 **41-35974** ET620 becomes then **A29-99** 13/5/42

More examples:

- **P-40E-1 41-25164**(A29-92) Returned USAAF 28/4/42 then new card states **"A29-92" now 41-25166 13/5/42** and was kept on RAAF Strength
- **P-40E-1 41-25180**(A29-93) returned USAAF 28/4/42 the remains were found 12/4/1967 at Gurney Strip, Milne Bay and the record states that the aircraft was s/d 11/8/42 there, so it would seem that it came back into the RAAF? (Editor, 2020: Hardly)

A further trickle of 23 or so airframes flowed on until September 1942. This is also the first case I have found whereby the RAAF re-used serials for different USAAF Serialized aircraft (i.e. A29-91). There were also cases where attrition aircraft were refused to the RAAF by the then USAAF 5<sup>th</sup> Air Force, because there was no extra P-40E/E-1s 's left to spare, as the 49thFG was down to some 64 airframes by September 1942. Well below the establish strength of 80 airframes required by their table of equipment.

In some respects the actual number of RAAF P40E/E-1s hasn't been concluded as yet due to the problem of identification of the original issues. Though they were serialized from A29-1 to A29-163, some were never taken on charge while others crashed on delivery ex-USAAF or were taken on charged, damaged but then returned following repair, to the USAAF.

Confusing? Yes it is, as some of my counts hover around approximately 170 or more P40E/E-1s RAAF nominated airframes, with at least five (maybe even up to seven), being returned to the USAAF.

Questions like did A29-73 exist? What were the USAAF Serials of those first Kittyhawks? We do have speculative answers for those questions. But more on that in latter newsletters?

So there appears to be a long way to go, and therefore we welcome any information or photographs pertaining to pre-march 42 period and early 75 Sqn photos during the period in PNG.

But perhaps over the next few newsletters, it would be better to share the whole picture from the very first day they arrived in Australia to the end of 1941. This, we'll do, but first what the difference between a P40E-CU and a P40E-1-CU?

Next issue we'll examine the differences and identification points of the P40E-CU's and P40E-1-CU's by comparison, with a P40N-1, in more detail than has ever been read by the average Aviation Buff.

**Editor 2020: No...Another story perhaps later.....out**

# Teaching you “Skills for life” for our ADF-Serial Readers! Anonymously presented of course

## ADF Military Language Conversion Chart:

NAVY	ARMY	AIR FORCE
Heads	Latrine	Powder Room
Rack	Bunk / Farter	Queen bed electric blanket & doona
Cafe / SCRAN Hall	Mess / Mess Tent	Dining Facility
Pussers Cook	Cook / Fitter & Turner	Contract Chef
Brew	Brew	Vanilla Skim Latte' with a bickie
Limers / Goffa	Goffa/ jebwby juice (can of coke/cordial	Shirley Temple
W9's/Coveralls	Cams /DPCUs	Casual Attire
Seaman	Private	Bobby / Jimmy
Chief	WO2	Timothy / Justin
Captain	Colonel	Rupert / James
The Table(chooks)	Article 15	Time Out
Mess/Onboard	Barracks	Self contained Apartment
Durps/Trolleys	Underwear	Knickers
Cells	Piss Can	Grounded
Cero's	Pollys	Armani Suit
Lid / Cap	Beret/Head Gear	Optional
AFT Stores	Q Store	Westfield Shopping Mall
Hammered	Pissed	Oops. Little tipsy.
Deployment/ Detachment	Deploy / Ops / Bush / Scrub / Field	Huh?
Runners	Runners	Moccasin's
Die for your Country	Die for your Mate	Die for Air Conditioning
Shipmate/Oppo/Besty	Mate/digger	Honey/Babe/Pookie
Terminate / Contact	Take Out	Back on Base for Nuck Night
Boiler Boots	Jump Boots / GPs	Ugg Boots
Pussers Sandals	JC Sandals	Patent Leather Stilettos
SEAL	SAS	Librarian
Shore Patrol	MPs	Chaperone's
Oooh-Rah!	Hoo-ah!	Hip-Hip hurray! Jolly Good
Hot Packs	Rat Packs	Al a Carte
Throw a Goffa	Salute / Chuck a Boxer	Wave
Obstacle Course	Obs Course	Typing Course
Parade Drill/Parade Ground	Drill Practice/Parade Ground	What?
Canteen	AAFCANS	McHappy Meal
RANPFT	PTI	Smoko Ping Pong Comps
Chief Swain	RSM (GOD)	OIC Cuddles
Midshipman	Officer Cadet	Debutant
Jack Tar	AJ	RAAFY Chappy

# A Moment in Time



## Memories from my Service

### “Two-Jobs”

#### Shep

I have always tried to be obedient, respectful and to do the right thing. One reason for that is probably because I don't (ordinarily) like to draw attention to myself.

Not wanting to draw attention to myself was most likely in response to a series of incidents that occurred very early in my schooling, the first of which occurred back in grade 1.

An incident that I have not yet forgotten.

The Handkerchief Incident. You've probably heard of it, but I'll refresh your memory.

Infant School, 1971; Morning – just before the first lesson. A class room full of little five-and-a-half to just turned six-year-olds sitting on the floor in just about nearly straight lines, cross legged, gibbering away amongst ourselves. Then, our class teacher, without warning, sprung a *HANKIE INSPECTION*. She'd done it before and being the good, clean and appropriately dressed boy that I was (thanks, mum) I had always passed inspection. But this time – this time, there was no neatly ironed and folded handkerchief in the front left pocket of my grey shorts. Today of all days was the only day I'd ever forgotten my handkerchief. That awful flush – that prickly heat sensation that flashes over you flashed over me. The feelings of guilt, shame, dread. Naturally, I was singled out. The cunning old bag made it impossible to cheat – hankies had to be held up in your left hand – arms straight – and I was the only little child without my arm up. Stand-up – where's your hankie? I – I – I forgot to bring it ... Then – I'm sure it happened – that cinematic pulling of depth of field. I, alone, standing shamed and indefensibly guilty of the abhorrent crime of being hankie-less, and the rest of the children (the hankied ones) seemingly shrinking rapidly into the distance of the shot – into the unreachable distance, the walls and windows now forming the far horizon; the bright sunlight beaming into the class room through large windows suddenly blotted out by fearsome, dark, turbulent clouds. No more friends. No possibility of rescue. Just little pitiful me and the savage, hankie hungry, ogress. The intervening period between being revealed – unmasked, if you must – as the hankie-less one and serving my punishment I no longer have memory of. I was probably starved or beaten or pulled limb from limb, I don't remember which – starved I think. I was summarily sentenced to stand beside the water fountains that were on the outside wall of the Administration Block during that mornings recess break. To stand, alone, not to lean against the wall. Not to slouch. Not to talk to anyone. And absolutely NOT to drink from the fountains. Stand up straight and don't you dare put your hands in your pockets. To stand in shame and watch the hankied ones at liberty, playing and laughing for the duration of morning recess. I had to stand still and watch them all flitting about at play, squealing and laughing. So all recess I stood there as an example to all the other inmates. Occasionally a child would bounce up the four or five steps to the water troughs where I was serving my sentence. One of them, an older girl, probably a wizened old seven-year-old, guzzled and slurped her fill and when she had finished she stood up and looked at me with a stern look on her face. What are you standing there for? I told her of my crime (even though forbidden to speak). So? she retorted and flew off to her games. Easy for her to say, she probably had a hankie.

Then, one day, much, much later, in grade 2. I remember that there was a period during the day when we were permitted to listen to music whilst we were about our grade 2 activities. It was most likely only permitted on a certain day of the week so as the activity would be viewed as a treat to be looked forward to. And look forward to it each and every one of us did, as I recall. The music was by way of vinyl records that members of the class, who might have access to such items at their residence, were allowed to bring in (with the appropriate permission from that member of classes parent or guardian, naturally). These records, when the time came, would be played on a small turn-table – all Bakelite and woven built in speakers. Under the general supervision of the teacher, the playing of said record would be the direct responsibility of a member of the class, appointed by way of a ballot type system (by holding your hand up and saying “me, me” when the question was put to all and sundry “who wants to be record monitor?” The successful candidate was selected and after duly receiving, by some manner which I can’t quite remember, appropriate instruction on the technicalities of the device and the finesse of its correct manipulation, the day’s Record Monitor was thusly appointed. On the day in question I had been selected from a field of highly competitive candidates as the player of records, the one with whom the responsibility of playing the records rested. I was the *Record Monitor*. And I had a handkerchief. The play list of the day was provided courtesy of a girl named L [REDACTED]. She was allowed to bring in a Beatles single. “*Hard Day’s Night*” if I remember. The time came. With the reverence that the occasion demanded, I turned the contraption on, I carefully removed the single from its little paper jacket and correctly placed it on the turn table. I gently lifted the stylus – the needle had a bit of lint on it. Un-phased by being confronted by an emergency situation and realising that my training hadn’t covered this sort of significant and serious deviation from normal operations, I had to think quickly and clearly. The day’s record playing depended on it. I rapidly assessed the situation and then, calmly and deliberately I implemented the procedure which I considered would resolve the situation efficiently and effectively. I scrapped the offending fluff away with my finger. A loud rasp was emitted by the speakers as the needle recorded its relative progress across the lands and valleys of my finger print. Fluff removed. Day saved. The stylus was moved across towards the record which started to turn and with the dexterity of a professional – well, of a six-year-old – I placed it at the start of the track. Some static, then – Music. I had done it. I had proven myself worthy of trust. I had elevated myself above the shame and guilt of the previous year. I was a worthy *Record Monitor*. So, I celebrated by getting into the groove. I allowed myself to get caught up in my moment of triumph and danced a bit of a jig to and in concurrence with The Beatles and their *Hard Day’s Night*. And jig I did. Life was good. This was what having a hankie was all about. Responsibility, competence, happiness. Then, I bumped the record player. Hard apparently. Scratched the record. L [REDACTED] was upset. I was stunned. Everyone else was bitterly disappointed. No more record playing. Ever.

Later that same (now music-less) year, on a sunny afternoon in our class room, one of my classmates – without warning (well none that I noticed) – vomited. On his books. On my books. On the little work table that we shared. On the floor. And on me. He only bought forth once, but it was a gushing belly full of stinking material that was still audibly splashing onto the floor from the desk several minutes later (that’s how I remember it – it might have been seconds). Warm, wholemeal coloured, lumpy cottage cheese textured, spew, that must have covered more than 10 square feet (pre-metric you understand; a metre was something dad had to put one or two cent pieces into if he had to park the car on the road side in the city). Poor Thomas! Are you alright? We’ll get a bucket of sawdust on that – better make it three – and you had better go to sick bay until your mum can come and pick you up and take you home. Yes, poor bloody Thomas. No “poor, Garry”. No: all I got (apart from a sleeve, side and lap full of someone else’s warm stomach contents) was, “Go to the toilets and clean yourself up.” And no – I didn’t bring my hankie into action. I didn’t want the stuff inside my pocket as well.

Because of these traumatic incidents occurring so early in my formal education, I largely shunned outside attention; I also learned to *ALWAYS* be on the lookout for people who might be about to spew on you; don’t dance for joy and **NEVER** forget to carry a clean hankie – you might have to hold it up at someone.

So, aside from the occasional blunder, that is how I tried to deport myself throughout my childhood and into my young adult years.

I had always had an interest in aviation and, for as long as I can remember, had wanted to be in the air force. Various distractions and a “pre-occupation with flippancy” meant that, despite not really struggling, my interests had well-and-truly moved elsewhere and that final year of high school for me was, academically speaking, shall we say – sub-optimal. I had a great social year, but that and having joined the army reserve halfway through the year, meant that I had very little time (or inclination) to actually attend school.

I had had enough of a grasp of actions and consequences to know that, even if I (somehow) focused myself exclusively on the remainder of year-12, I simply wasn't going to be able lift myself up high enough to be realistically considered for any sort of officer entry – and I knew very well that I wouldn't be able to maintain scholastic focus for that long, anyway.

So, my RAAF sights were set – not for a proverbial “head shot”, but for a more realistically attainable crack at the “centre of the seeing mass”. I had joined the army reserve, not because I had any particular interest in the army, as valuable and esteem-able entity though it was (is) but, because I wanted to gain military experience to support/reinforce any future application to join the RAAF. The most easily accessible unit for me was an infantry battalion so, I joined as a rifleman.

I didn't realise it at the time, but that decision probably pigeon-holed my entry into the RAAF, despite whatever else I might have thought about doing or whatever else was actively recruiting at the time, to just one air force occupation – ADG [Airfield Defence Guard].

So, in the middle of 1984, it came to pass that, after two years in the army reserve and a week or so after my 19<sup>th</sup> birthday, I was enlisted in the RAAF as an ADG/T [Airfield Defence Guard/Trainee].

My first posting was, naturally enough, to 1RTU [Number 1 Recruit Training Unit] at RAAF Edinburgh.

After a short period in the “pool”, I was placed on a recruit course. I graduated “Dux” of my course and was shortly thereafter piled into a TAA Boeing 727 enroute to Brisbane via Sydney (where the landing was firm enough to ensure that most of the oxygen masks deployed from the ceiling!) for my next posting – to DSTS [Defence Security Training School] at RAAF Amberley. I don't recall the flight from Sydney to Brisbane, but I was met by a commonwealth driver and “chauffeured” out to the base. It was dark when I was deposited at the front gates, not knowing where to go or to whom I was to report to but, having just stepped through the front gate, I was presented with an unforgettable sight and sound – a night launch of an F-111. Sensational.



DSTS was situated off base, just outside of and across the road from the front gates of the base in a former school. I have isolated memories of the sunny, warm, humid, conditions (coming from dry Adelaide the spring time air of Amberley seemed humid to me), the grass parade ground out the front, of lectures, cross country running, weapons training, gym workouts, infantry minor tactics, F-111's, Chinooks and Iroquois flying about, the “Roach Coach” for smoko in the morning and a big, shady tree behind one of the buildings; a great big thing it was – I don't recall ever being able to avail myself of its cool shade to relax and watch the world go by, but I do have one particular memory which took place beneath its branches.

Towards the end of ADG Basic Course, we were to be unknowingly subjected to a “rapid deployment” exercise whereby we just-about ADGies, having been lulled into a false sense of peace and serenity, would be dragged away from whatever it was the we were doing, be airlifted in waves by 12SQN Chinook and plonked out in the bush somewhere for a few days of patrolling and ambushing and digging holes, etc. When the time came, it was all a big rush (obviously) with orders flying about in all directions, duties being assigned and reassigned and counter-manded.

Young self was underneath the cool, shady, branches of the previously mentioned tree, sweating away trying to diligently accomplish whatever the highly involved and vitally important task was that I had hurriedly been entrusted with when the WOD [Warrant Officer Disciplinary] appeared. The WOD was a mountain of a man (of course he was). He was about 7-foot, 11 ½ inches tall, about 5 and a half feet across the shoulders with a massive handle-bar moustache, piercing blue eyes and a booming voice. In 1975, he had been one of the 4 ADG's who had been left stranded on the tarmac at Saigon's Tan Son Nhut air base, armed only with pistols containing a few rounds, wondering if they would be evacuated or overrun by the North Vietnamese army. Not a man to question.



New Northern Owners arrive: Editor

Anyway, here I was toiling away with some task that I had to finish an hour ago and can't yet see any end to it, when my tiny (although pleasantly shady) little world of stress and sweat was darkened by the towering presence of this fearsome man. In his booming authority, he, somehow oblivious to the urgency of my current not-nearly-finished task, ordered me away on some other long winded, although clearly vital job.

I rolled my eyes and said, "six months ago I was unemployed, now I've got two jobs ... !"

Oh, shit!

Too late, I realised that I had said that out loud – and He had heard me. With clarity. I froze and stared at him wide-eyed, waiting for the inevitable thunderous roar that would see me charged with insubordination and in more trouble than I could comprehend. It must have stunned him, though. I bet no-one, ever, had said anything like that in his presence before, let alone actually to him!! The world stood still. He didn't say or do anything for what seemed like a long time. Then, I saw the corners of his eyes wrinkle a little, presumably he was smiling – or at least grinning – beneath that enormous moustache.

Quietly he recommended, "just get on with it" and he walked away.

ADG: Active, Daring and Gifted. In my case, just lucky to be alive!



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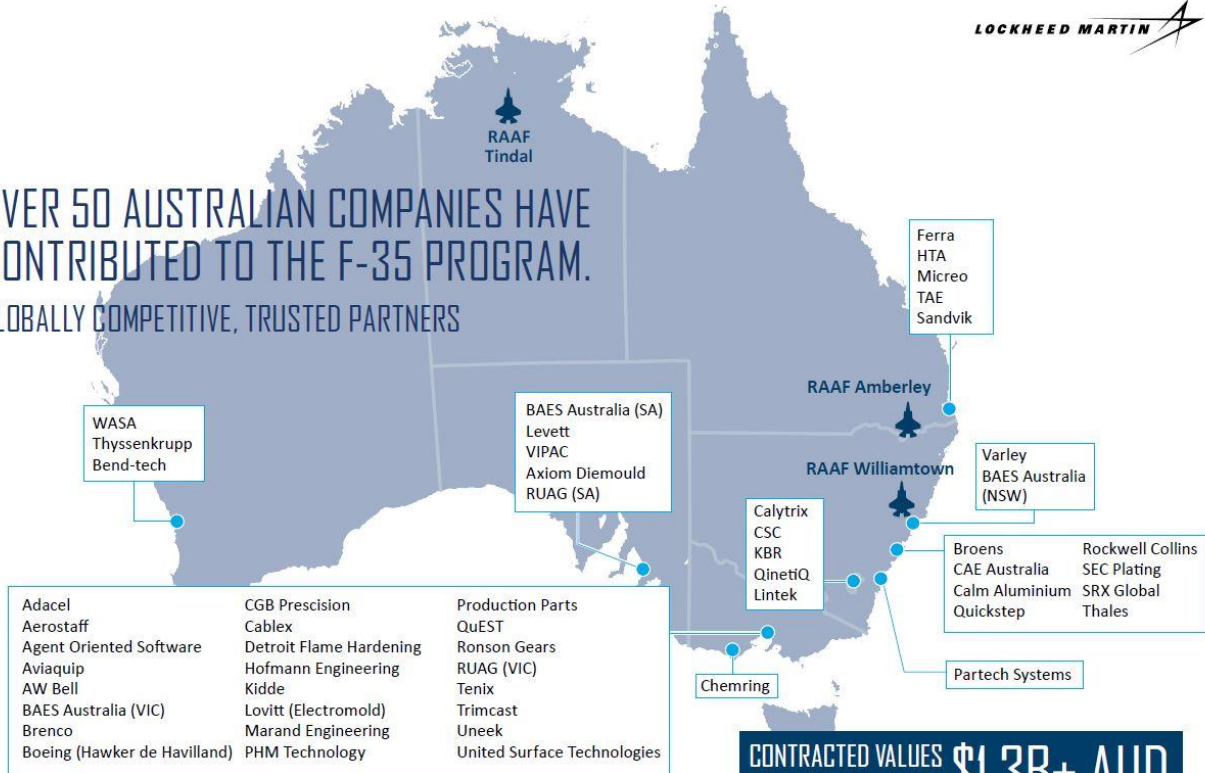


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# How to Read RAAF Historical Records

## Part 1

Shep

### *Unit History Sheets*

For anyone interested in learning about historical details of an RAAF unit during the Second World War or perhaps to find out about a relative's RAAF service during that period, the first official reference source referred to is typically a unit's "Unit History Sheet". Many of these have been digitised and are freely available on-line via RecordSearch on the National Archives of Australia website ([naa.gov.au](http://naa.gov.au)).

An "RAAF Form A50, Operations Record Book" was typically used as a diary type narrative to describe a unit's activities. In some units, the information was limited to brief administrative entries, other units recorded more information. An "RAAF Form A51, Unit History Sheet – Detail of Operations", was a closely related form that recorded a flying unit's airborne activities; usually recording aircraft serial numbers, aircraft captain's names (sometimes the names of the entire crew) operation number, wheels up and wheels down times and then, sometimes, a narrative of events, for each operational flight. As with the compilation of A50's, A51's varied in detail from unit to unit and month to month – some are extremely detailed, some were just a waste of paper. Together, the Forms A50 and A51 comprise a unit's history and are typically referred to as being one and the same – either the Unit History Sheet, or a unit's Operations Record Book (ORB).

This source usually contains crucial pieces of information and those pieces of information are nearly always misunderstood. In a typical A51, the column headed "Duty" and, to a lesser extent, "Time", are those that seem self-evident, but aren't necessarily so and should be explained.

#### *Operations Title.*

The Title of an operation was made up of the identification letters of the operational base from which the mission originated (not necessarily from where it launched from) and a number either between "1" and "49" or between "51" and "99". If the operation was ordered by an Area Air Operations Room or Wing Headquarters, then the identification letters were followed by a number starting at "1" for each authorised aerodrome and continued sequentially to "49". The next number in the sequence for each operational base after "49" was "1" – not "50", which was never *supposed* to be used, but "1" – and on it went. It was not a daily system such as existed prior to June 8<sup>th</sup>, 1942, but a never-ending loop from 1 to 49 which kept rolling around and around. If, however, the operation was authorised by the Commanding Officer of a squadron, then the identification letters were followed by a sequential number between "51" and "99". The next number after "99" was "51". Consider the Operation Title to be exactly the same thing as a mission number.

#### *Duty numbers.*

Immediately after the numbers in an Operation Title there might appear numbers such as "1 2 3", etc. This simply meant: duty numbers 1, 2, and 3. Duty number 1 would have been the first aircraft *planned* to take off from a base (on an operation) that day. If the operation was a search with different aircraft flying different sectors of the same search area, the duty numbers would run in a clock-wise direction according to their tracks. Which would mean that, duty 1 would have been to the left of duty 2 which would have been to the left of duty 3, etc. Typically, however, they indicated the *planned* launch sequence.

*Aeroplane Identification Group.*

When the Operation Title was combined with the duty number, the result was the “Aeroplane Identification Group”. For example, mission COOKTOWN 21 duty 1, could have been recorded variously as either CTN211, CTN21/1 or CTN21-1 – they each mean exactly the same thing. However, if they appear as a group of characters run together without a hyphen or a slash, such as “CTN21”, it could be either the Operation Title as described above, or the Aeroplane Identification Group for COOKTOWN 2 duty 1. So, if you come across a two-digit number like that, check its context.

It is vitally important to remember that an Operation Title or an Aeroplane Identification Group was *not* ever a call sign either W/T (Wireless Telegraphy i.e. morse code) or R/T (Radio Telephony i.e. voice).

Aircraft Type and No.	Crew	Duty	Time Up	Time Down	Description of Operation
V. VENG A27-203	F/O Bond	<u>BAT 39</u> a/s patrol	302130	310034	First detail located convoy at 302158g . patrols carried out until 310540g, when relieved by
A27-205	F/sgt Blanche	Van Diemen gulf with force M :-	302311	310227	Hudson. convoy then in position 11.00.g 132.15.E
A27-209	F/sgt Blanche F/sgt Blaubaum F/sgt Lockley	HMAS SWAN	310045	310355	Course 076T. speed 13 kts. NIL enemy sightings
A27-216	F/O Davey F/sgt Hodges sgt. Elliott	H/T DUNTRON	310208	310526	vis.- 10 - 15 miles
A27-215	F/sgt Pedder F/sgt Worena		310314	310638	

This is an example of an “Operation Title” taken from 12SQN’s A51 for a mission on 31<sup>st</sup> May, 1943. The Operation Title, seen here at the start of the third column which is headed “Duty”, was “BAT39”. At the time, 12SQN was based at BATCHELOR, south of DARWIN. The authorised abbreviation for BATCHELOR was “BAT”, which was *always* pronounced “Batchelor” (the place) and *not* “Bat” (the flying mammal). The Operation Title therefore was “Batchelor 39”. [RAAF Form A51, Unit History Sheet Detail of Operations by No.12 Squadron, sheet number 9 for May, 1943 in RAAF Unit History Sheets Number 12 Squadron Feb 39 – Feb 48; NAA: A9186, 33.]

Aircraft Type and No.	Crew	Duty	Time Up	Time Down	Task	Description of Operation
V. Vengeance A27-213	F/Lt. McPherson F/Sgt. Smith	<u>Ctn. 201</u>	042142Z	050144Z	Outer A/S Patrol. Force G from via Graf-ton passage	Patrol carried out and convoy left at 050715Z in position 1529'S 14644E,
V. Vengeance A27-217	S/Ldr. Hooper F/O. Richardson	Ctn. 202	042323Z	050049Z	042230Z. Last aircraft to land base by dusk.	
A27-205	F/O. Logan F/Sgt. Kefford	Ctn. 203	050234Z	050603Z		
A27-219	F/O. Newman F/Sgt. Davies	Ctn. 204	050442Z	050800Z		
A27-238	F/O. See F/O. Hodgson	Ctn. 205	Cancelled			

Here’s an example of an “Aeroplane Identification Group” again taken from 12SQN’s A51, this time for a mission on 5<sup>th</sup> July, 1943. The Aeroplane Identification Group was simply the Operation Title (here “Cooktown 20”) plus the respective duty numbers (here, 1 through 5). By this time, the squadron had moved to COOKTOWN, far north Queensland. The authorised abbreviation for COOKTOWN was “CTN”, which, as in the previous example, was *always* pronounced “Cooktown” (the place) and *not* “Carton” (the cardboard box). [RAAF Form A51, Unit History

Here are some common locations and their abbreviations,

BATCHELOR	BAT,
CAIRNS	CAI, then CFB, then ZCA,
COOKTOWN	CTN, then CMI [Cooktown Mission]
COOMALIE CREEK	COO, then CML, then COO again,
DARWIN	DAR,
DOCTOR'S GULLY	ZDG,
EAST ARM	ZEA,
FENTON	FEN,
GOULD	GLD,
HIGGINS	HIG,
HORN ISLAND	HOR,
HUGHES	HUG, then HGS, then HUG again,
LONG	LON,
MANBULLOO	MAN,
MERAUKE	MER,
MILLINGIMBI	MIL, then MMI, then MIL again,
PARAP	DCV (Darwin Civil),
RATHMINES	RAT, then ZRA,
SEPINGGANG	SEP,
TARAKAN	TKN,
TRUSCOTT	TRS.

Bases such as COOMALIE CREEK, HUGHES and MILLINGIMBI had their abbreviations changed on 4<sup>th</sup> January, 1944. Each of them was changed back again six weeks later.

Flying boat bases had their abbreviations changed early in 1944 to one commencing with a "Z". Like many changes in policy or procedure during that period, the change seemed to take time for it to be accepted (!) and there were variations in interpretation. RATHMINES for example continued to record their missions as "RAT" until the end of February, 1944, only commencing with "ZRA" at the start of March. CAIRNS slowly metamorphosed from "CAI" to "CFB" and then seemed to stabilise on "ZCA" from the start of February, 1944, even though "ZCA" first appeared on 11<sup>th</sup> January.

*Time.*

Most times referred to in official records are suffixed with the letter "Z". Each time zone has an identifying letter. "Z" is the identifier for the zero-degree (0°) meridian – the Prime Meridian – which runs through Greenwich, England; the location of the Royal Observatory. Accordingly, Greenwich Mean Time, also known as UTC (Universal Time Coordinated), is used as the base-line time around the world and is used extensively in aviation and armed forces.

The time zone in which the eastern states of Australia fall is referred to by the letter "K". This time zone is 10 hours ahead of "Z". The Northern Territory and South Australia are on a half time zone called "IK" which is 9 ½ hours ahead of "Z". Western Australia, "H", is 8 hours ahead of "Z" time.

The 24-hour Clock. The 24-hour clock means that 1 am is 0100 (“zero one hundred hours” or just “zero one hundred”), 2 am: 0200, mid-day or 12 pm: 1200 (“twelve hundred”) which makes 1 pm: 1300 (“thirteen hundred”), etc. Early on, the time was recorded followed by a slash and then the date, e.g. “2330Z/10”. The more typical way – and the way that a “Date/Time Group” is still recorded is – “102330Z”. Either way it means 2330 hours (11:30 pm) Zulu time on the 10<sup>th</sup>. Which, to use a Northern Territory example, equates to 9 am local time on the 11<sup>th</sup>.

Not many people realise that Daylight Savings was introduced in Australia in 1942 and every State and Territory was affected. Daylight savings commenced at 2 am on Thursday 1<sup>st</sup> January, 1942, with clocks being advanced by one hour; so 2 am on the 1<sup>st</sup> immediately became 3 am. It remained in force until 2 am on Sunday 29<sup>th</sup> March, 1942.<sup>1</sup> It came in again at 2 am on Sunday 27<sup>th</sup> September, 1942. Again, each State and Territory was affected and “summer time” was to continue until 2 am on Sunday 28<sup>th</sup> March, 1943.<sup>2</sup> It came into force for a third time with effect 2 am Sunday, 3<sup>rd</sup> October, 1943, but this time WA was exempt.<sup>3</sup> That period of “summer time” ended on March 26<sup>th</sup>, 1944. Daylight savings was not brought back for the 1944/45 summer. This should be remembered when deciphering recorded “Z” times in unit records.

Other abbreviations occur from time to time in the “Remarks” and “References” columns – some A50’s or A51’s include them, others don’t. These are not necessarily self-evident.

### *Lettered Coordinates*

Lettered Coordinates were a group of four letters and four numbers (in that order e.g. MTGG2312) used as a low-grade code to describe a latitude and longitude position to the minute without the coordinates being given in the clear.

Since I don’t have the key to these Lettered Coordinates, let us assume, for the sake of clarity and understanding, that the parallels 30°S, 31°S and 32°S had been assigned the letters “FD”, “MT” and “QW” respectively and that the meridians 153°E and 154°E had been assigned the letters “ZU” and “GG”.

So, for the example “MTGG2312”, the 1<sup>st</sup> two letters (MT) taken as a pair encodes a parallel of latitude (degree only). The last two letters (GG), again, taken as a pair, encodes a meridian of longitude (again, degree only). Pairs of letters were assigned at random to degrees of latitude and pairs of letters were assigned at random to degrees of longitude and you have to refer to a key to work them out – the letters themselves do not mean anything – and the key, like any code, changed from time to time.

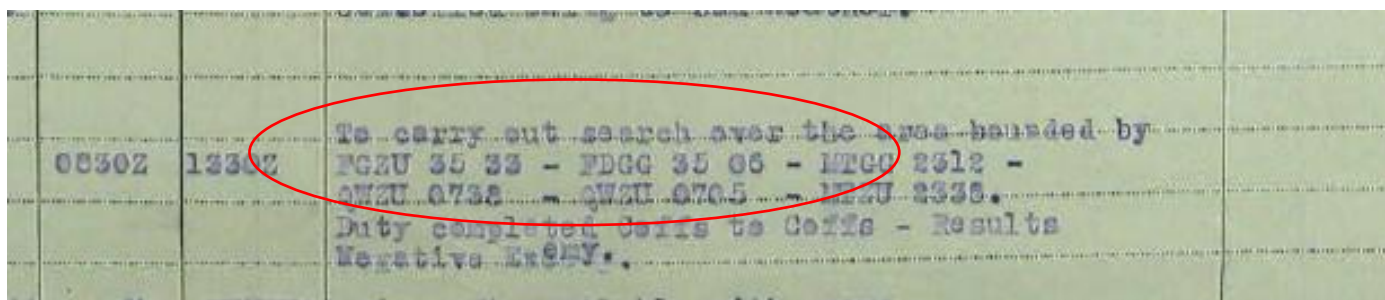
The numbers are easier, and you can work them out without a key. The 1<sup>st</sup> two numbers (23) equals the minutes of latitude *ABOVE* the whole degrees of latitude encoded by the first two letters so, “23” means 23 minutes *above* parallel “MT” which equals 37 minutes south, and, the last two numbers equals the minutes of longitude to the *RIGHT* of the meridian of longitude encoded so, “12” simply equals 12 minutes east.

Using our assumed key, we would find that “MTGG2312” would equal:

MT = 31°S, GG = 154°E; 23 = 37°S, 12 = 12°E.

Therefore, the lettered coordinates MTGG2312 would refer specifically to 30°37’S 154°12’E. Remember, the minutes of latitude are *above* the nominated parallel so, if the encoded parallel was 31°S, then the *actual* parallel is 30°S. Using the same key, 31°00’S would begin with MT (e.g. MTxx00xx) but 31°01’S and onwards would begin with QW (e.g. QWxx59xx, etc.). This “reversal” does not apply to longitude, because the encoded coordinates count to the *right* for longitude – remember, encoded latitude minutes are counting *above* of and encoded longitude minutes are counting to the *right* of the relevant letters.

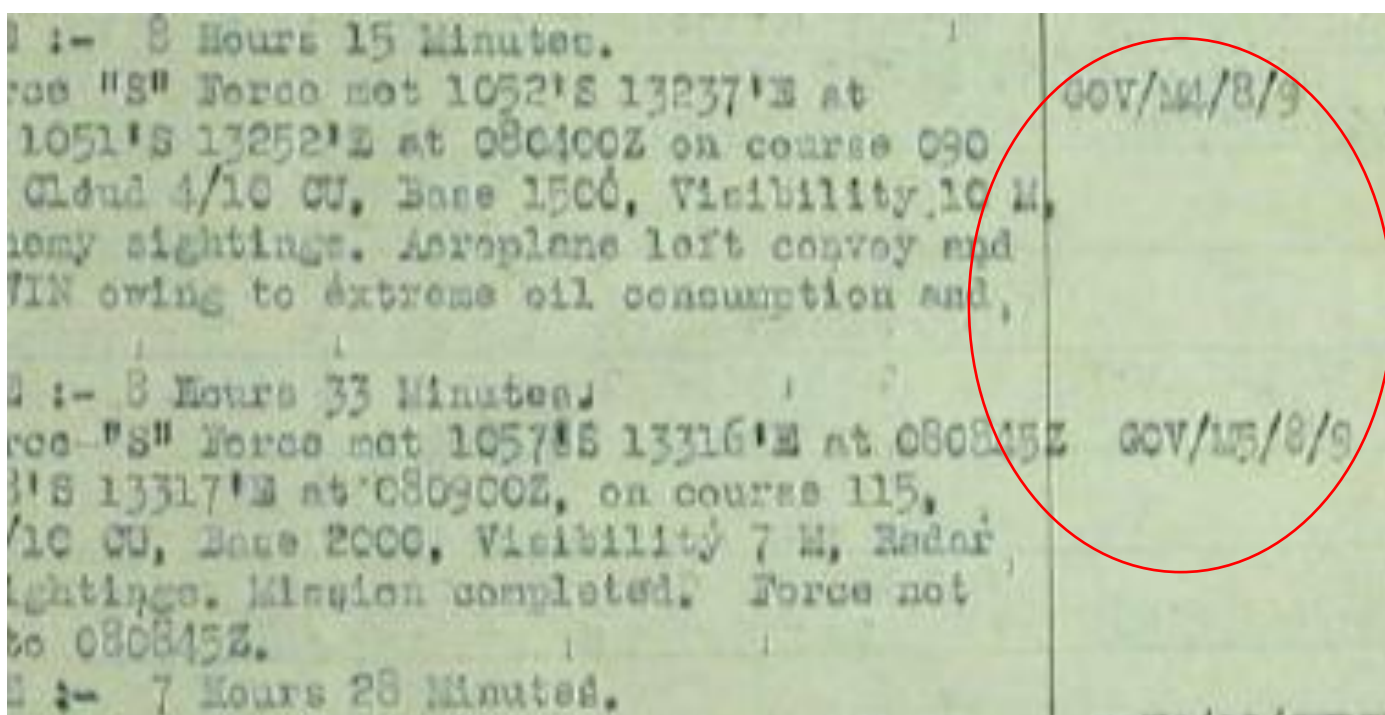
Remember also, that I am simply making up the significations for “MT” and “GG” (as well as “FD”, “QW” and “ZU”) because I don’t have a copy of the relevant table.



These six blocks of 4-letters and 4-numbers are examples of Letter Coordinates. Very rare to see these in 1944, they were however, in much more common use during 1942 and into 1943. It is interesting to note here that one or the other of the first two latitude identifiers seems to be wrong – it was either “FG” or “FD” because it is describing a directly east (or west) track; notice the lettered coordinates “MTGG2312” and “MTZU2335” as well as “QWZU0738” and “QWZU0705” each are directly east/west. [RAAF Form A51, Unit History Sheet Detail of the Work Carried Out by No.13 Squadron, sheet number 6/2 for February, 1944 in RAAF Unit History Sheets Number 13 Squadron Jun 40 – Dec 45; NAA: A9186, 35.]

#### Rainbow Forms References

These are a subject all to themselves which I’ll cover at a later time. But, to illustrate, this is what they looked like,



These two sequences of letters and numbers are examples of identifiers for, in these two cases, Forms Mauve; this’ll be covered in another instalment about reading “Rainbow Forms”. [RAAF Form A51, Unit History Sheet Detail of Operations by No.13 Squadron, sheet number 6 for September, 1944 in RAAF Unit History Sheets Number 13 Squadron Jun 40 – Dec 45; NAA: A9186, 35.]

There’ll be a test later.

# RAAF Reconnaissance Development: Part 3

@Gordon R Birkett 2019



*When the Canberra Replacement aircraft, the F-111A, was ordered in 1963 by the RAAF, a commitment was made to order an additional six F-111R/ RF-111As types (Latter a designated purposed USAF Reconnaissance version that would enter USAF service in 1970) to the then Project total of twenty-four aircraft. A gap of seven years for a Strategic or even Tactical Reconnaissance aircraft (to 1970) was considered acceptable by the RAAF, with the current F52/F24 system use in the Canberra to soldier on.*

*One of the original F-111A Research, Development, Testing and Evaluation aircraft, 63-9776 was converted into the prototype RF-111A. It first flew on the 17 December, 1967. Imagery testing of the converted RF-111A took place between December 1967 and October 1968 indicating that the RF-111A would make a good reconnaissance aircraft.*



At AMARC, but since painted up as F-111A 66-0022 as a memorial to the first F-111 combat loss in South-East Asia during 1968, 63-9776 years prior to becoming located at Mountain Home AFB. Photo Credit Stephan Miller USA

*However as costs rose, engineering delays extended on its development resulting in the strike version, F-111C, only entering RAAF service years later in 1973. Project Definition Study on the acquisition of a reconnaissance capability for the F-111C, was finally commenced in 1974.*



Air Staff Requirement 14, later Project 5014, was developed to modify four F-111C to provide a strategic and tactical reconnaissance capability with a reconnaissance pallet being installed in the weapons bay.

Fortunately, the design had already been completed and validated by General Dynamics back in 1971 which included an infra-red line scan system and various cameras. The deletion of the side scan radar was one of the major changes.

*The gap had now extended from seven years to fourteen years until the first RF-111C (A8-126) was converted and 18th April 1979. A further three were converted by No 3 Air Depot at Amberley the following year.*

*A “Recce” Flight within No 6 Squadron RAAF was added in 1980 to operate this quartet, and only then, did the RAAF had finally its first true Strategic all weather (day/night) recce jet.*



In addition, two Photographic Processing and Interpretation Facilities (PIIF), one for permanent installation and the other, a mobile Unit for deployment were established at Amberley to process the film and interpret the results and disseminate.

The four modified RF-111C aircraft (A8-126/134/143/146<sup>4</sup>) were passed to No 1 Squadron, in a separate flight when No 6 Squadron’s dedicated flight was disbanded on 1 July 1996. *It must be noted that the airframes still retained the ability to carry all RAAF weapons; they could not self designate LGBs.*

RF-111C A8-134 now the “sole surviving RF-111C, is now at the Australian War Memorial given that it has the sole operational provenance of the RAAF F-111 fleet by RAAF Crew. It had participated in recce missions over East Timor in 1999.

One other RF-111C, A8-143 below, has the distinction in the RAAF as the first and only ever RAAF F-111 fully retracted landing. The Glass apertures certainly got abraded. Below Pic RAAF Official



# RF-111C Reconnaissance Imagery



KA 93



KA 56



KB 18a



KS 87 - 12"



KS 87 - 6"



KS 87 - 3"

## Target Designation; the offset being real time imaging and recording.

In 1978, USAF embarked on the Weapons Systems Improvement Program (WSIP) to upgrade their F-111A and F-111E models with a digital navigation and bombing system and to re-equip the aircraft with the Pave Tack system.

The Ford Aerospace AN/AVQ-26 Pave Tack is an electro-optical targeting pod developed by the United States Air Force. The Pave Tack is a large installation, with the pod alone weighing some 629 kg (1,385 lb) and measuring 4,220 mm (166 inches) in length.<sup>5</sup>

The RAAF became a partner in this for their F-111C, however with the cancellation of the program; a separate upgrade program was eventually approved and designed via an Analogue and Digital interface to the RAAF's F-111C. All USAF F-111 Pave Tack Pods were only integrated with the single USAF F-111F Wing based in the United Kingdom.

The RAAF Project Air 65 Pave Tack was finally approved in July 1980 with a Letter of Offer and Acceptance for A\$160m to the General Dynamics. The letter allowed for conversion of the 18 remaining F-111C aircraft, but only ten weapons bay cradles and pods were to be acquired, although all 18 aircraft were modified to accept Pave Tack pods when available.



The modifications started on the prototype in December 1983 and continued until January 1985, followed by flight testing. The remaining aircraft were modified at Amberley from 4 March 1985 and the first locally modified aircraft was officially rolled out on 24 September 1985.

About 150 AN/AVQ-26 pods had been built, substantially less than originally planned total with the last of in-use Pave Tacks being withdrawn in USAF Service with the retirement of the F-111F in 1996. More surplus USAF Pods were procured, with enough to satisfy the RAAF's requirement to have all serviceable aircraft equipped.

### A New Use, Immediate in flight reconnaissance and "plinking"

In December 1990, a month before the beginning of the air campaign in the Gulf War, the US Air Force wings equipped with infrared navigation and targeting pods began flying night training missions against VII Corps armoured forces.

These training missions, known collectively as **Operation Night Camel**, were intended to determine whether IR-equipped aircraft could carry out night interdiction against supply lines and cluster-bomb attacks against armour.

Night Camel had an unintended consequence, however. The majority of Low-Altitude Navigation and Pave Tack peacetime training had been oriented toward low-altitude, first-look strikes against fixed, high-value targets. Crews did not fly medium-altitude night missions in search of armour and armoured personnel carriers (APCs) routinely in peacetime.

On cockpit videotapes from the training missions, armoured vehicles showed up clearly on IR screens between sunset and midnight. This key piece of information led directly to the tank-plinking idea.

The videotapes also demonstrated that IR-equipped aircraft could be used for Night/Real-time search and target designation in medium-altitude attacks.

Each aircraft was loaded with four GBU-12 500-pound, laser-guided bombs. Each bomb was to be dropped on any tank, APC, truck, artillery piece, command-and-control bunker, or supply dump that crews could find in their box.

The two initial sorties were so successful that planners scheduled forty-four more sorties for the next night. They sent two-ship and four-ship formations into kill boxes to fly medium-altitude attacks against the enemy's field army. This mission was a radical departure for F-111 crews, but it proved so effective that F-111Fs flew 664 successful sorties over twenty-three days. For most of the F-111F crews who flew in these tests, medium-altitude attack on field armies was a new mission.

In the end, all 20 then in service RAAF F-111A/Cs were modified and fitted for pods. These could provide an additional limited Tactical Reconnaissance capacity (Video recording) in post strike role, and as discussed, real time Infra Red Search for targets, in addition to their main role as Precision Guidance of Laser Gravity Bomb weapons.

### **Post Mirage Tactical Recce, possible 1990 replacement**

With the phasing out of the Mirage planned in the mid 1980's with the introduction of the F/A-18A as the RAAF's Multirole aircraft, consideration in the late seventies in maintaining a limited Tactical Reconnaissance was included in the decision making of its purchase. On selection of the F/A-18A/B Aircraft for the RAAF in 1981, it was an obvious choice to base a replacement capability on that type. What was encouraging, was that a version was under design and development by the United States Marines Corp( USMC).

### **F/A-18(R)**

The USMC, currently using the RF-4B Phantom in the Tactical Reconnaissance, was having its Photo Phantoms replaced by the F/A-18(R).

A development contract to fit a Reconnaissance package to the nose of a F/A-18 was let. Aerodynamic testing was done on the first prototype per below.



The F/A-18(R) was a proposed reconnaissance version of the F/A-18A. It included a sensor package that replaced the 20 mm cannon. The first of two prototypes, AF-1, flew in August 1984. The F/A-18(R) program was cancelled soon after.

Later,...a proposed two-seat reconnaissance version for the US Marine Corps was made with the RF-18D in the mid-1980s. It was to carry a radar reconnaissance pod but this was canceled after it was unfunded in 1988.

Years later, in the mid 1990's it was resurrected for a third time into a reconnaissance version of the two-seat F/A-18D and successfully entered service by the end of the 1990's.



With the amended designation of F/A-18D(RC), some 48 F/A-18D Hornets had their M61A1 cannon replaced by a pallet-mounted electro-optical suite comprising a blister-mounted IR linescan and two roll-stabilized sensor units, all of these units recording onto video tape.

A datalink pod can be added to the centerline pylon for instantaneous transmission of data, but the same position can also be used for a Loral AN/UPD-8 side-looking airborne radar. The F/A-18D(RC) can be reconfigured for standard attack operations in only a few hours.

The ability to carry the Martin Marietta ATARS (Advanced Tactical Airborne Reconnaissance System) centerline pod was added, starting with BuNo 164649, the first aircraft in Block 36 that was delivered to VMFA(AW)-225 on 14 Feb 1992.



Whether Numbers 77 Sqn RAAF Squadron would have operated their Recce Equipped F/A-18(R) in a separate fight like the Mirage Recce aircraft will never be answered. Pic USMC

## **Designation and Infrared Imagery Pods.**

The Lockheed Martin AN/AAS-38 "Nitehawk" is a FLIR & laser designator & laser tracker pod system for use with laser-guided munitions.

The "Nighthawk" has been used with the F/A-18 Hornet, and has presumably been tested with the A-7E Corsair II. The Lockheed Martin [ex Loral / Texas Instruments ex Ford Aerospace / Texas Instruments] AAS-38A/B Nite Hawk forward-looking infrared (FLIR) is the Night Attack Hornet [F/A-18C and F/A-18D] Laser Target Designation (LTD) system for laser-guided munitions delivery. Mounted on the port fuselage (Station 4), the AAS-38 enhances the Hornet's night attack capability by providing real-time Forward Looking Infrared [FLIR] thermal imagery displayed on one of the cockpit CRTs and HUD.

The AAS-38 FLIR could be fully integrated with other Hornet avionics, and data from the unit was used for the calculation of weapons release solutions. Only four of these were available during the Gulf War, seeing service with VMFA(AW)-121. The improved AAS-38A Laser Target Designator/Rangefinder (LTD/R) was cleared for Fleet service on Hornet-C/Ds in January 1993.

The Martin-Marietta ASQ-173 Laser Detector Tracker/CAMera (LDT/CAM), a derivative of the Air Force PAVE PENNY pod, does not have the ability to laser designate targets. It is a passive tracking device that detects laser light reflected from targets illuminated by ground troops, other aircraft or the Hornet's own AAS-38 targeting FLIR on the other side of the fuselage. The ASQ-173 relays target location information to the cockpit displays and mission computers.

The AAS-38 pod came in 2 varieties: The AAS-38 (non LASER Designator/TV FLIR only) AAS-38A LASER Target Designator/Ranger (LTD/R). The LASER Spot Tracker (LST) capability came from the use of the ASQ-173 pod. The AAS-38A and ASQ-173 pods are meant to be used together to be able to Designate for Laser Guided Weapons (Example: GBU-12) and "see" another source's LASER designator (LST capability of the ASQ-173 pod. The AN/AAS-38A is commonly referred to by the US Navy as TFLIR or Targeting FLIR. The AAS-38 pod system, as of May 2008, is being phased out and replaced by the ASQ-228 ATFLIR pod. This will be a sequential replacement as the ATFLIR pods become available. The introduction of the ATFLIR is seen as a significant capability increase in all Hornet US Navy fleet aircraft.

### **Its replacement: AN/ASQ-228 ATFLIR**

ATFLIR (Advanced Targeting Forward-Looking Infrared) presently is used only by the US Navy on the Boeing F/A-18E/F Super Hornet and the earlier F/A-18C/D and with Marine Corps F/A-18Cs.

This pod is a multi-sensor, electro-optical targeting pod incorporating thermographic camera, low-light television camera, target laser rangefinder/laser designator, and laser spot tracker developed and manufactured by Raytheon. It is used to provide navigation and targeting for military aircraft in adverse weather and using precision-guided munitions such as laser-guided bombs. It was intended to replace the earlier AN/AAS-38 Nite Hawk pod in US Navy service. It is normally carried on one of the fuselage hardpoints otherwise used for AIM-120 AMRAAM missiles. 410 pods were delivered to the U.S. Navy.

Whilst originally obtaining Loral AN/AAS-38 Nite Hawk FLIR targeting pod in the late 80's for its F/A-18A/B Fleet, in 2005, the RAAF ordered as it's own replacement for the F/A-18A/B, not the ASQ-228 ATFLIR pod, but a batch of Northrop Grumman AN/AAQ-28(V)5 LITENING AT Block 1 targeting pods, with those pods entering service in 2007.

This pod is an integrated targeting pod that mounts externally to the aircraft. The targeting pod contains a high-resolution, forward-looking infrared (FLIR) sensor that displays an infrared image of the target to the aircrew; it has a wide field of view search capability and a narrow field of view acquisition/targeting capability of battlefield-sized targets. The pod also contains a CCD camera used to obtain target imagery in the visible portion of the electromagnetic spectrum. An on-gimbal inertial navigation sensor establishes line-of-sight and automatic boresighting capability.



LITENING targeting pod features included:

- Full 1K FLIR and CCD, the highest resolution available in any fielded targeting pod
- Digital, high definition video to the cockpit
- Laser imaging sensors for more accurate identification
- Colour symbology for reduced pilot workload and integration with new cockpit displays
- Multiple fields of view for a complete view of the situation
- Advanced two-way plug-and-play datalinks, including NET-T integration, that seamlessly communicate with ground stations
- Flexible upgrade path to bring older pods to the latest configuration affordably.

With the reduction and replacement of the F/A-18A/B fleet by the F-35A, the RAAF is now integrating some of the surplus Northrop Grumman AN/AAQ-28 Litening AT pods with its fleet of 12 C-130J Hercules airlifters.

However, when ordering the F/A-18F/F+ in 2006, we stuck to the the standard ASQ-228 ATFLIR pod. On accepting the EA-18G, we also ensured that this pod can be used on that version as well.

### Summary

Despite the loss of all remaining dedicated manned Reconnaissance role Aircraft in the RAAF from 2010 when the final RF-111Cs were retired, it seems the role has been enhanced and increased in number by various platforms.

These include:

- P-8A which is optimized for maritime, littoral and overland surveillance<sup>6</sup>.
- E-7A is equipped with one of the most advanced air battle space management capabilities in the world.
- The forthcoming MQ-4C Triton Unmanned Aircraft System (UAS) which will be used for both maritime patrol and other surveillance roles

- The F/A-18F Super Hornet and EA-18G Growler's Raytheon AAQ-228 Advanced Targeting Forward Looking Infrared (ATFLIR) pod. The fitted AN/APG-79 AESA radar, is capable of executing simultaneous air-to-air and air-to-ground attacks, and providing higher quality high-resolution ground mapping at long standoff ranges
- The F-35A Lightning II has an in-built Electro-Optical Targeting System.
- Army and Navy operated UAVs of various sizes and types
- Satellite and other platform intelligence data as shared by the US/NATO

They are all deemed as net-enablers, passing tracking and targeting information to other nodes and aircraft in the networked battle space with the speed, real time and precision.

Recce has certainly come long way from wet film, getting through (and perhaps home) and hours of waiting for Targeting data to be presented and interpreted.

***Author note: The RAAF has begun flight trials on Lockheed Martin C-130J-30 Hercules A97-448 fitted with Northrop Grumman's AN/AAQ-28(v) Litening sensor pod on an underwing pylon from the 17 January 2020. The Litening pod is intended to provide electro-optic and infra-red (EO/IR) video in day and night conditions, which will be used to provide enhanced situational awareness to both the flight crew and commanders on the ground, via wideband satellite communications (SATCOM). The targeting modules have been made in-operative ...for now. Photo: RAAF Official***



Sources:

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## RAAF WWII IN COLOUR

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



### No.3 – RAAF Catalinas

The Catalina was our maritime stalwart in the Pacific War, equipping the patrol attack squadrons, air-sea rescue (ASR) flights, and flying boat transport and communications units. Recommended reading for the Catalina in RAAF service are David Vincent's *Catalina Chronicle*,<sup>7</sup> and Cleworth & Linton's *RAAF Black Cats*.<sup>8</sup> Starting life as the Consolidated Model 28 flying boat, a total of 168 Catalinas were delivered, in the variants described below.

Serial Number	Model Type	Aircraft Mark	Remarks
A24-1 to A24-18 A24-19 to A27-27 A24-28 / A24-29 A24-30 A24-31 to A24-68 A24-69 to A24-114 <sup>9</sup>	PBY	28-5MA Catalina I 28-5MC Catalina IIA PBY-4 PBY-5 PBY-5 Catalina IVA PBY-5A Catalina IIIA	PBY-5 built to commercial contract; A24-1 28-5ME. PBY-5 diverted from RCAF commercial contract. USN evacuated from Philippines (Bu 1219 and 1216). Composite evacuated from NEI (Bu 2305 / MLD Y-72). PBY-5 was a flying boat, Lend-Lease contracts. PBY-5A Lend-Lease amphibians. As the alighting gear was not required for the 'Black Cat' long-range sorties it was removed, to become PBY-5A(M). Later aircraft were re-serialled.
A24-200 to -206 A24-300 to -309 A24-350 to -386	PB2B	PB2B-1 Catalina IVB PB2B-2 Catalina VI PB2B-2R <sup>10</sup> Catalina VI	Lend-Lease contracts, Boeing PB2B-1 variant of PBY-5 flying boat, and PB2B-2 having the "tall tail" of the PBN-1/PBY-6A. All our PB2B had RAF serials allotted.



[colour image from du Plessis collection]

**A24-7 soon after arrival at Rose Bay in Sydney in July 1941**<sup>11</sup>

The first eighteen Catalinas were ordered by Australia in 1940 – the War Cabinet in JUN 1940 approved the purchase of seven PBY-5 flying boats on Contract AUS-58 of 5 AUG 1940, then the following month Cabinet decided to order a further eleven.<sup>12</sup> The *adf-serials* website provides a detailed explanation of these earlier procured

Catalinas. The first Catalina for Australia was built under Contract AUS-58 at the Consolidated Aircraft Corporation's factory in San Diego; however it would not be ready for flight delivery until the Feb 1941.

Meanwhile similar aircraft for Britain were being produced faster than the RAF could induct, so it was agreed that one of the British aircraft would be handed to Australia in exchange for the second Australian aircraft built under AUS-58. The British aircraft handed over to Australia as A24-1 was AH534 (part of the original French contract F-210 which was taken over by the British after the surrender of France), which meant that the first Australian Catalina built under contract AUS-58 would be delivered to Australia as originally planned, but the second Catalina from AUS-58 (A24-2) would be swapped with the British in exchange for AH534. In order to satisfy the US Neutrality Act, the Catalinas would be accepted in San Diego and flown by Consolidated crews to Honolulu where legal title would pass to Australia. Civilian crews arranged by Qantas would then deliver the Catalinas from Hawaii using civilian call signs.<sup>13</sup>

In addition to civilian delivery ferries, the US Neutrality Act stipulated that combat aircraft exports were by commercial contract, with commercial aircraft designators. The PBV-5 was the Model 28-5 – for Australia this was the Model 5-28MA (i.e. 'MA' for Military Australia, RAAF), 5-28ME ('ME' for England, RAF), 5-28MC ('MC' for Canada, RCAF), and 5-28MN ('MN' for Netherlands, Dutch MLD). The principal difference between Australia's 5-28MA and the RAF's 5-28ME was that the RAF had two radios instead of the RAAF's one. RAF camouflage was applied to RAAF and RCAF aircraft.

As the first RAAF Catalina was AH534/A24-1, the first Catalina built under contract AUS-58 had already been marked in the factory as A24-1, so on delivery to Australia it was re-serialised A24-2. (The original A24-2 was swapped from the line to the RAF to become DP202.) Our first aircraft, AH534, departed San Diego on 25 JAN 1941 for the 22-hour flight to Honolulu using registration VH-AFA under a Consolidated pilot.<sup>14</sup> A full history of A24-1 is available here by Sivano Jung.<sup>15</sup> Final delivery of these 18 was made in OCT 1941, the delivery program utilised practically every senior Qantas captain and first officer, assisted by seven RAAF officers and six technical NCOs.<sup>16</sup>



**AH534, in San Diego in JAN 1941, was ferried to Australia as VH-AFA and became A24-1** [adf-serials]

The next batch of nine accepted by the RAAF after the initial 18 were a similar specification – diverted from an RCAF commercial 28-5MC contract. In late OCT 1941 RAAF enquiries began regarding the acquisition of a further nine Catalina flying boats – to increase the establishment of the two flying boat units (11 and 20SQN) from four active and two reserve, to six active and three reserve aircraft, plus additional attrition aircraft.

To enable this order, nine Catalinas from the Canadian CAN-78 contract would be diverted to the RAAF (as A24-19 to A24-27) via the RAF to fulfil Australia's request. These arrived over MAR/APR 1942, and were in part due to the RCAF repaying the supply of nine Catalina previously loaned to them by the RAF, and to the threat of Australia recalling 10SQN RAAF (our Sunderland unit) from Britain.

Contract CAN-78 consisted of 36 Catalina flying boats (subsequently designated Canso by the RCAF) and 14 Catalina amphibians (subsequently designated Canso A) built by Canadian Vickers, plus major components for a further 55 Catalina amphibians to be assembled by Boeing of Canada – the 36 28-5MC flying boats were given RCAF serials 9701 to 9736 (and RAF serials VA701 to VA736).<sup>17</sup>



[colour image from du Plessis collection]

**RCAF 9741 in TSS colours – a Canso A of the 28-5MCA/PBY-5A amphibian order following the 28-5MC flying boats**

## RAF Catalina Mark Numbers

The RAF preferred to “name” its aircraft, and “Catalina” was adopted for its first order of these patrol bombers in SEP 1939, which was followed in DEC 1939 by a US Navy order for 200 PBY-5s. Following the British lead, the US Navy officially adopted the name Catalina in OCT 1941.<sup>18</sup>

Below is a summary of the **RAF Catalina mark numbers** with serial numbers, some of which were applicable to RAAF deliveries.<sup>19</sup> Most were flying boat variants.

**Catalina I.** Flying boats – following evaluation of the Model 28-5 (PBY-5) flying boat in 1939, orders were placed by the British Purchasing Commission (BPC) for 109 aircraft to be designated Catalina I.

These were PBY-5s with 0.303 guns (one in the bow, four in two waist blisters, one aft of the hull step), powered by two 1200hp Wright R-1830-S1C3-G engines. 99 aircraft, serials in the RAF W84xx, Z21xx, AH5xx, and AJ1xx ranges. An odd serial was DP202, the original A24-2 which was swapped with the RAF for AH534 (which became A24-1). The Mk.IA was the first Canso model for the RCAF, 14 being delivered. The Mk.IB was the Lend-Lease PBY-5B, 225 aircraft in the FPxxx serial range (two, *Altair Star* and *Vega Star*, were QANTAS ‘Double Sunrise’ flying boats), and some of which were taken over by the US Navy.

**Catalina II.** Flying boats – similar to Mk.I, but equipment differences. Six aircraft only, serials AM26x range. The Mk.IIA was similar and 50 built by Canadian Vickers of Montreal as 9701/9736 (28-5MC) and 9737/9750 (PBY-5A). Nine 28-5MC were diverted to the RAAF as A24-19 to A24-27. Also another, 9726, ended up in the US Navy at Pensacola.<sup>20</sup>

**Catalina III.** Amphibian – Mk.IIIA was the Lend-Lease PBY-5A for the North Atlantic Ferry Service, 11 with FP5xx serials.

**Catalina IV.** Flying boats – Lend-Lease PBY-5 was the Mk.IVA, with 97 delivered serialised with JV and JX serials. The similar Boeing Canadian-built PB2B-1 from Vancouver was the Mk.IVB, 200 delivered with JX serials (seven to RAAF).

**Catalina V.** Flying boats – Reserved for the Philadelphia Naval Air Factory (NAF)-built PBN-1 flying boat extensively modified variant of the PBY-5, of which 155 built for RAF and not taken up, most diverted to Russia.<sup>21</sup>

**Catalina VI.** Flying boats – Lend-Lease Boeing Canadian-built PB2B-2 with the tall PBY-6A tail. 77 serials in the JX and JZ ranges, with 47 delivered to RAAF (no record of any of the final batch – JZ828 to JZ859 – going to the RAF).<sup>22</sup>

### The Delivery Colours

By MAY 1942, 27 Catalinas out of an order of 119 (according to the RAAF official history) had been received.<sup>23</sup> These first 27 – 28-5ME, 28-5MA and 28-5MC flying boats – were virtually the same Catalina Mk.I and Mk.IIA specification, and all were camouflaged in the British *Temperate Sea Scheme*, which was laid down in the RAF policy in Air Ministry Order (AMO) A.926/40 of DEC 1940.<sup>24</sup> These colours were initially *Dark Grey* and *Extra Dark Sea Grey (EDSG)*, but in JAN 41 *Dark Grey* was changed to the *greener* shade *Dark Slate Grey*.<sup>25</sup> The standard type-A1 fuselage roundels and type-B over the mainplanes marked all early Commonwealth aircraft in 1941 – because of this timing the underside *Sky* was probably unavailable in the US, and *Sky Grey* used.<sup>26</sup>



[colour image IWM CM 6524]

RAF Catalina I Z2147, which shows *TSS* colours, type-A1 roundels on the fuselage and type-B above the wings



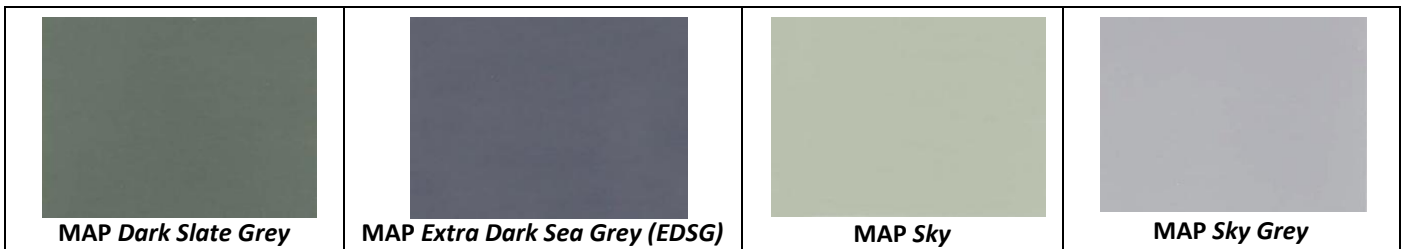
RAAF Catalina A24-3 on finals to Rose Bay, showing her sky under main planes and darker anti foul hull paint.

## Temperate Sea Scheme – The Original Delivery Colours



*[colour image of Library of Congress]*

**A PB5Y-5B<sup>27</sup> in US National Markings and RAF TSS in 1942 at Naval Air Station Corpus Christi training base, Texas**  
A beautiful colour image showing the TSS colours demarcation on the upper surfaces.



Du Pont evidently produced reasonably close matches to the Air Ministry standards, and these were used by some manufacturers throughout the War, but differed slightly from the later 'equivalent' colours introduced as a result of a Joint Committee which standardised colours in 1942. **Du Pont made specific colours for the manufacturers making aircraft on British orders, most with the correct British name, if not hue.**<sup>28</sup> Some of them were pretty close matches, as the ones corresponding to the TSS (used by Grumman on Martlets, Avengers and Hellcats) and some were not, like the ones in the *Temperate Land Scheme* (on the P-40).

The delivery scheme of the RAAF's first 27 Catalinas – which were Model 28-5MA and 28-5MC flying boats – was the British *Temperate Sea Scheme* camouflage of the RAF 28-5ME and in accordance with the British AMO A.926/40 of DEC 1940. The standard A1 fuselage roundels marked all early Commonwealth aircraft in 1941, as was the type-B on the upper surfaces. Because of this timing, the underside *Sky* might have been unavailable in US, and *Sky Grey* may have been used. Ian Baker suggests the hull bottom may have been unpainted and *Sky*-tinted lanolin<sup>29</sup> (the colour image below of A24-7 highlights this, but may just be a discoloured *Sky* or *Sky Grey*), either way, it was glossy.

National Markings were standard RAF type-A1 roundels on the fuselage, tri-colour flash either side of the fin, type-B blue/red roundels on the upper surfaces, no roundels underneath, with serial numbers in black. The type-B on upper surfaces became significant for RAAF operations – the faded roundel *Blue* blended into the TSS camouflage, which ominously accentuated the hue of the central *Red* disc, which would have dangerous implications.

## Temperate Sea Scheme – The Original Delivery Colours



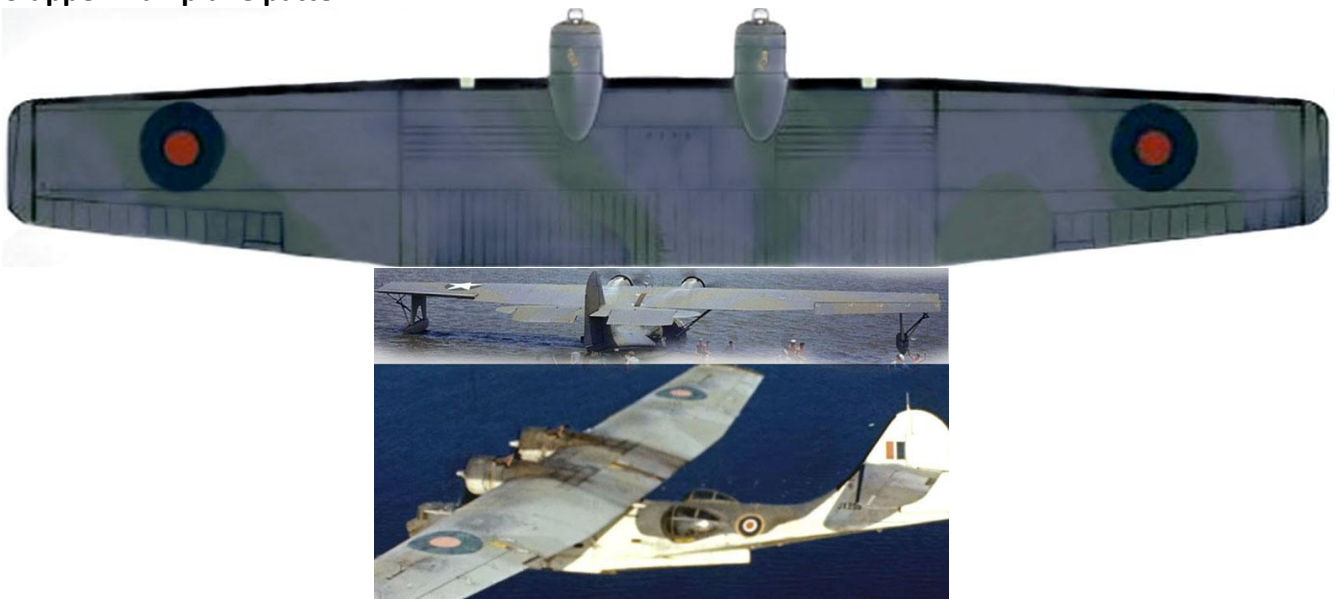
A faded 28-5MA delivery scheme – TSS RAF 35" type-A1 fuselage roundels, 72" type-B upper roundels, fin flash 24" x 24" <sup>30</sup>  
Dark Slate Grey had a marked greenish hue, EDSG faded quickly in the tropics to a bluish hue



A24-18 on beaching gear in San Diego OCT 1941 with the TSS camouflage demarcation visible

For the initial delivery flights, the RAAF Model 28-5MA flying boats could not be ferried by foreign military crews in the US because of their neutrality laws, so civil Consolidated crews flew the aircraft from San Diego to Honolulu. Ownership to the Australian Government was exchanged in Hawaii, and Australian crews, primarily from QANTAS, then ferried the aircraft to Australia. The original route was to be Honolulu-Canton-Noumea-Brisbane and then on to Sydney,<sup>31</sup> but it was found the favourable winds enabled direct track to Sydney, bypassing Brisbane. These ferries featured such Australian aviation luminaries as Captains Lester Brain, P G Taylor and 'Scotty' Allen.

### TSS upper mainplane pattern



TSS mainplane referenced colour and pattern images, with 72" diameter type-B roundels

## Follow-on Receipts from 1942

After the initial Model 28-5s (up to A24-27), the following three RAAF Catalinas (A24-28 to A24-30) were 'refugees' fleeing south from the Japanese invasion. These USN flying boats (including two PBY-4s) would have initially been received in a variation of hastily-applied USN camouflage, and were refurbished to serve initially at Rathmines.

In AUG 1942, the RAAF issued its amended camouflage policy, Aircraft General Instruction No. C.11 Issue 4. Paragraph 2 of this policy read:<sup>32</sup>

### 2. Sea Planes –

- (a) All seaplanes are to be camouflaged using *Dark Slate Grey (K3/189)* and *Extra Dark Sea Grey (K3/187)* on the upper surfaces.
- (b) The undersurfaces of all seaplanes are to be painted in *Sky Blue* camouflage (K3/195).

Apart from *Sky Blue*, these colours were basically the RAF *TSS* that the aircraft had been delivered in over 1941-42.

**USN *Blue Gray / TSS*.** The next RAAF deliveries were through Lend-Lease diverted from USN orders. Although images are few of these orders for PBY-5s (A24-31 to A24-68) over 1943, they were received in the USN standard *Blue Gray* and *Light Gray*, but quickly *Black* underside were added. This delivery scheme was *Blue Gray* M-485 on upper and side surfaces, *Light Gray* M-495 on undersides, and quite matt<sup>33</sup> – the standard USN patrol aircraft colours from 1941 until the US 'three-tone' blue introduced in early 1943. These USN colours evidently were not considered long-term RAAF colours – these were not inducted into our stores vocabulary. It appears the *Black* undersides were added soon on arrival from early 1943, and then within months RAAF dark camouflage was trialled for nighttime operations.

**Dark Camouflage.** With the emphasis moving to night operations – mine-laying in particular – in 1943 the RAAF introduced a darker blue/black camouflage as *TSS* and USN blue/grey faded. *Extra Dark Sea Grey (K3/187)* and *Dark Ocean Blue (K3/318)*, with *Black/Night (K3/179)* undersides, were initially adopted to break up the planform for night operations,<sup>34</sup> in a pattern referenced to the flying-boat camouflage scheme A.D.1164.<sup>35</sup> At this stage too, the 2:5 RAAF *Pacific* upper roundels were being toned-down, the *White* required darkening and was overpainted grey, probably by *EDSG*. Now, from the beginning of 1944, the PBY-5A amphibians (A24-69 to A24-114) were being delivered, but there is no record of receipt from the factory in *Black/Night*. Because of the priority placed on mine-laying, PBY-5A amphibians were stripped of their landing gear (not required for long over-water missions), with these RAAF-unique PBY-5A(M)s being advantaged by weight saving to increase range.



[coloured from *adf-serials*]


A24-44 OX-K – a PBY-5 flying boat of 43SQN at Darwin c1944, with the darker camouflage blue and grey (the lighter shade)

**Black Cats.** In APR 1944 the colours specified for RAAF aircraft were: *Green* for attack, transports, GR/B, Tac/R and ASR aircraft; *Blue* for PRU aircraft; *Night* for the patrol bomber "aircraft specially used on night flying operations, e.g. the **Blackcats**".<sup>36</sup> This was formalised in MAY 1944 by the re-issue of the AGI C.11 Issue 4, which discarded *Dark Ocean Blue* and for the Catalinas adopted all-over *Night*.



**Foliage Green.** However, some PBY-5As retained the amphibian capability as this was useful in the rescue mission carried out by the Air-Sea Rescue (ASR) Flights. In addition, Catalinas used as transports by Communication Units and ASR aircraft were camouflaged in overall *Foliage Green (K3/177)* in accordance with the MAY 1944 policy.


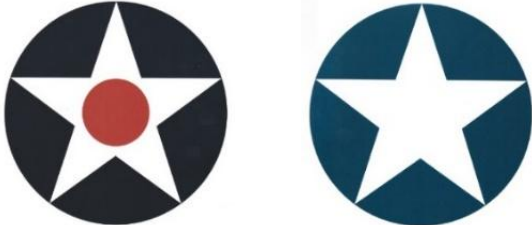

## RAAF CAMOUFLAGE AND MARKINGS

In past instalments covering RAAF Beaufighters and Vengeances, the RAAF camouflage and marking details from 1939 were covered, with the changes up to 1945.<sup>37</sup> This, by origin of that aircraft, covered the RAF delivery colours as both types were diverted from RAF orders, in the latter case from US production with matches for the RAF colours. To some extent those points do not vary too much for the Catalina – as the early aircraft were mainly delivered in RAF TSS colours, even when subsequently diverted for Lend-Lease. Below is a chronological summary of RAAF policy for generic and Catalina specific markings, so this can be followed in a logical timeline through to postwar service.

Year	Change	Policy and References
<b>1939</b>	RAAF aircraft finishes, identification markings, and squadron code letters.	<b>RAAFHQ Aircraft General Instruction No. C.11, of 22 SEP 1939, 9/1/396 (13A).</b>
<b>1940</b>	<p>RAAF camouflage stores numbers were K3/177 <i>Foliage Green</i>, K3/178 <i>Earth Brown</i>, over K3/195 <i>Sky Blue</i>.</p> <p><b>OCT 1940.</b> Policy AGI No. C.11 Issue 3 specified National Markings:</p> <ul style="list-style-type: none"> <li>○ <i>Marking M.1</i> – a <i>Blue</i> ring surrounding a red centre, the diameter of the <i>Red</i> to be 2/5 of the <i>Blue</i> circle, on upper wings (i.e. type-B roundel).</li> <li>○ <i>Marking M.2</i> – a <i>Blue</i> ring surrounding a <i>White</i> ring surrounding a <i>Red</i> circle, the proportions to be 1:3:5 (type-A roundel).</li> <li>○ <i>Marking M.3</i> – three colour circle (i.e. <i>M.2</i>) surrounded by a <i>Yellow</i> ring, proportions as for <i>M.2</i> and the <i>Yellow</i> the same width as the <i>Blue</i> circle, i.e. 1:3:5:7 proportions (type-A1 roundel).</li> <li>○ <i>Marking M.4</i> – <i>Red</i>, <i>White</i> and <i>Blue</i> stripes on the fin, stripes the same widths as the rings of the roundel, <i>Blue</i> nearest rudder (Seagull only).</li> </ul> <p><b>NOV 1940.</b> The <b>RAF's Aircraft Design Memorandum (ADM) No.332</b> specified Air Diagrams for camouflage schemes for different types of service aircraft. The <b>RAF <i>Temperate Land Scheme (TLS)</i></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>.</p>	<p><b>RAAFHQ Aircraft General Instruction No. C.11, Issue 3, of 3 OCT 1940</b>, AFHQ file 1/501/329. P.3 stipulated grey serial number and code letters on camouflaged aircraft.</p> <p><b>RAF ADM 332 (Issue 3) of 15 NOV 1940, <i>External Colour Schemes of Aircraft</i></b>, RAAFHQ file 150/4/852 AGI C.11, <i>Standard Finishes and Markings</i>. Air Diagram A.D.1164 “Twin-engined Monoplanes – G/R (Flying Boats)” applied to the Catalina. <b>A.D.1164 drawing No. A5189-1.</b><sup>38</sup></p> <p><b>AMO A.926/40 of 12 DEC 1940.</b><sup>39</sup></p>
<b>1941</b>	<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>Already in 1941, Catalinas were being received in the RAF colours of <b><i>Temperate Sea Scheme (TSS)</i></b>. This was the prime Catalina delivery colours over 1941-1942), and over Beaufighters diverted from RAF Coastal Command orders from late 1942. The <b>RAF <i>Temperate Sea Scheme</i></b> had been mandated by <b>RAF AMO A.926 in DEC 1940</b> – upper surfaces in Ministry of Aircraft Production (MAP) <i>Dark Grey</i> (soon changed to <i>Dark Slate Grey</i>) and <i>Extra Dark Sea Grey</i>, undersides MAP <i>Sky</i>. However, <i>Sky Grey</i> probably used.</p>	<p><b>RAAFHQ DTS directive 368/41, file 150/4/852(53A) of 23 DEC 1941</b>, signal SAS 9984, paras.2 and 4.</p> <p><b>RAF ADM 332 (Issue 3) of 15 NOV 1940, <i>External Colour Schemes of Aircraft</i>,</b></p> <p><b>AMO A.926/40 of 12 DEC 1940; and AMO A.30/41 of 9 JAN 1941.</b></p>
		



<p><b>1942</b></p>	<p><b>US colours:</b> When US-produced aircraft began to arrive for the RAAF in 1942, these continued in British colours and markings being diverted from RAF contracts; US manufacturers tried to match their paint to the RAF colours. (Later, RAAF aircraft were delivered in USAAF standard camouflage of <i>Dark Olive Drab</i> and <i>Neutral Gray</i>, adopted for the Curtiss P-40 in 1940 and remaining the benchmark until late 1943 until natural metal.)</p> <p><b>JUN 1942.</b> Deletion of <i>Yellow</i> from RAAF roundels.</p> <p><b>JUL 1942.</b> RAF changes to TSS, DFS and Desert Scheme, and type-A1 roundel to type-C1 National Markings.</p>  <p><b>AUG 1942.</b> The RAAF <i>Technical Order, Aircraft General Instruction (AGI) No.C.11</i> was changed by Issue 4 of 31 AUG 1942, for operational aircraft retained <i>Red/White/Blue</i> National Markings, dropped 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 on 26 JUN 1942 a USN fighter had attacked a RAAF Catalina confused by the <i>M.1</i> roundel <i>Blue/Red</i> roundel.</li> <li>○ Fuselage sides – <i>Dull Red</i>, <i>White</i>, and <i>Dull Blue</i> roundels in the 1:3:5 proportions.</li> <li>○ Undersurfaces – the same <i>Dull Red</i>, <i>White</i>, and <i>Dull Blue</i> roundels but only for day fighters and trainers, but not for bombers or seaplanes.</li> <li>○ Fin markings – all aircraft marked with <i>Dull Red</i>, <i>White</i> and <i>Dull Blue</i> stripes of the same width, with red leading.</li> </ul> <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>Matching US paints to MAP colours<sup>40</sup></p> <p><b>USAAC Spec 24114, Air Corps Bulletin No.41, of 22 OCT 1940.</b><sup>41</sup></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>RAF AMO A.664/42 of 2 JUL 1942, para.5.</b><sup>42</sup></p> <p><b>RAAFHQ Technical Order AGI No.C.11 (issue 4) of 31 AUG 1942.</b></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> <p><b>USAAF War Dept Circular #141, 12 MAY 1942</b>, had removed <i>Red</i> from the US National Markings.<sup>43</sup></p>
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<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, the third as an individual aircraft identifier.</p> <p><b>1943 2nd Quarter.</b> RAAF Blue/Grey camouflage.</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> RAAFHQ D/DTS AMEM specified that the roundel <i>White</i> circle was to be smaller, at 2:5 the size of the <i>Blue</i>.</p>  <p><b>AUG 1943.</b> US bars added to star roundel, with <i>Blue</i> surrounds.</p>  <p><b>AUG 1943.</b> Retention of US OD/NG not requiring RAAF camouflaging.</p> <p><b>DEC 1943.</b> US elimination of camouflage from combat aircraft.</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" Blue roundel, 12" White, i.e. 3:8 (approx 2:5) and fin flash 24"x16".<sup>44</sup></p> <p><b>US amendment AN-1-9b 14 AUG 1943,</b> replaced short-lived <i>Red</i> surround of T.O. 07-1-1B 29JUN43.<sup>45</sup></p>  <p><b>RAAFHQ signal TJ.436 of 18 AUG 1943.</b><sup>46</sup></p> <p><b>US T.O 07-1-1 26 DEC 1943,</b> followed from Mil Requirements Policy No.15 of 16 NOV 1943, and GEN Arnold's preliminary order of 30 OCT 1943.<sup>47</sup></p> <p><b>RAAF Washington message WL657A of 29 OCT 1943 advice to RAAF HQ,</b> re cam be eliminated.<sup>48</sup></p>
<p><b>1944</b></p>	<p><b>APR 1944.</b> RAAFHQ DTS advise of <i>Night</i> for "aircraft specially used on night flying operations, e.g. <i>Blackcats</i>."</p> <p><b>MAY 1944.</b> Colour K3/318 <i>Dark Ocean Blue</i> discontinued.</p> <p><b>MAY 1944.</b> "Catalinas for night reconnaissance roles to be camouflaged upper and lower surfaces colour <i>Night</i>."</p> <p><b>MAY 1944.</b> Revision of AGI "Camouflage Schemes and Identification Markings": Appendix C <i>Foliage Green</i> (for ASR and the CUs), and Appendix D <i>Night</i>, and RAAF Diagram A.5524 Sheets 1 to 4 applied.</p> <p><b>JUN 1944.</b> Painting flying boats below the chine – 1FBRD at Lake Boga queried AGI Pt 3(c), Appendix C of MAY 1944 that flying boats on day ops to have undersurface of hull, below the chine, unpainted.</p> <p><b>OCT 1944.</b> RAF camouflage Scheme and Marking changes.</p>	<p><b>RAAFHQ DTS "Removal of Camouflage Paint from Aircraft", para.4, 1/501/329(156A), of c27 APR 1944.</b></p> <p><b>RAAFHQ DTS signal QQ 457 of 2 MAY 1944, 1/501/329(162A).</b></p> <p><b>RAAFHQ DTS signal T 160 of 10 MAY 1944, file 62/4/93(33A).</b></p> <p><b>RAAFHQ T.O. AGI Pt 3(c), Instruction 1, file 150/4/5056 (1A), of 26 MAY 1944.</b></p> <p><b>Also issued as DTS Special Instr Gen/34 1 MAY 44.</b></p> <p><b>RAAFHQ Message T.532/PGM to 1FBRD of 13 JUN 1944, file 62/4/93(43A).</b><sup>49</sup></p> <p>This 'unpainting' was cancelled by <b>AGI Amendment List (A/L) 61 of 24 MAR 1945, file 140/4/5056.</b></p> <p><b>RAF Air Publication A.P.2656A of OCT 1944.</b><sup>50</sup></p>

<p><b>1945</b></p>	<p><b>APR 1945.</b> RAAF squadron code letters, more added to the list of AFCO A.3/43 – colour changed to <i>Medium Sea Grey</i>.</p> <p><b>APR 1945.</b> No removal of camouflage from transport aircraft.</p> <p><b>OCT 1945.</b> Enquiries were made, as camouflage was being removed from RAAF transport aircraft, could Foliage Green be removed from the ASR Catalinas.</p> <p>Approval granted 18 OCT 1945 that camouflage be removed from Catalinas during major overhaul. In the interim, Catalinas could remain in delivery scheme: “undersurface <i>White</i>, uppersurface <i>Blue Grey</i>”, i.e. still the Coastal Command colours of <i>White</i> with TSS uppersurface camouflage of <i>EDSG</i> [“blue”] and <i>Dark Slate Grey</i> [“grey”].</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><b>AFCO A.11/45, Code Letters for Operational and Reserve Squadrons, of 26 APR 1945, 62/1/271.</b></p> <p><b>RAAF Command letter 2198 of 27 APR 1945, 1/501/329 (21A).</b></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> <p><b>RAAFHQ DTS SIG/71 of 13 NOV 1945.</b> Filed as message T.1219 PGM, TSD 443/45, 62/4/93 (51A). Inter alia, for post-war aircraft undergoing complete overhaul to have camouflage removed; aircraft undergoing repair requiring repaint, to have camouflage removed; other aircraft to have camouflage removed when manpower and materials permit.</p>
<p><b>1946</b></p>	<p><b>SEP 1946.</b> RAAFHQ D/Ops reviewing AGI of 26 MAY 1944.</p>	<p><b>RAAFHQ 1/501/329 Pt.2 M.34 of 3 SEP 1946.</b> Also recommended that domestic aircraft production be delivered uncamouflaged.</p>
<p><b>1947</b></p>	<p><b>MAY 1947.</b> DTS issue of SIG/88 cancelling the marking of VH-series radio callsigns.</p> <p><b>MAY 1947.</b> RAF re-introduce <i>Red</i> to National Markings.</p> <p><b>JUL 1947.</b> Slight amendment to SIG/88 by SIG/90, in only removing the “VH” from the callsign marking.</p> <p><b>AUG 1947.</b> RAAFHQ assessed that “Red in roundels is not a requirement”.</p> <p><b>AUG 1947.</b> Squadron code markings no longer required.</p> <p><b>SEP 1947.</b> RAAF flying boats “to be painted with <i>Aluminium</i> and with the smoothest possible finish”.</p>	<p><b>RAAFHQ DTS SIG/88 of 1 MAY 1947.</b> Filed as message T.1650 PGM, TSD 23/47, 1/501/329 Pt.2 (35A).</p> <p><b>RAF Air Ministry Order (AMO) A.413/47 para 18, of 15 MAY 1947.</b></p> <p><b>RAAFHQ DTS SIG/90 of 10 JUL 1947.</b> Filed as message T.1708 PGM, 1/501/329 Pt.2(41A). Cancelled by SIG/102 of 28 JUL 1948, callsign no longer need marking.</p> <p><b>RAAFHQ 9/1/1595 Aircraft Markings – General Technical File 1945-1950, M.12 of 4 AUG 1947.</b></p> <p><b>RAAFHQ DTS SIG/92 of 5 AUG 1947.</b> Filed as message T.1740 PGM, 1/501/329 Pt.2(46A).</p> <p><b>RAAFHQ 9/1/1595 Aircraft Markings – General Technical File 1945-1950, duplicated from 9/1/1755(5A) of 30 SEP 1947.</b></p>
<p><b>1948</b></p>	<p><b>JAN 1948.</b> <i>Red/White/Blue</i> National Markings reintroduced to RAAF in ‘bright’ colours.</p> <div data-bbox="416 1621 699 1899" data-label="Image"> </div>	<p><b>RAAFHQ DTS SIG/96 of 14 JAN 1948.</b> Filed as message T.1840 PGM, 9/1/1595. Reintroduction of <i>Red</i> to RAAF National Markings, para D(8); colours of flying boats enamel matt <i>Medium Sea Grey</i> hull, <i>Aluminium</i> above the waterline, para D(4).</p>

## US NAVY – Blue Gray / Light Gray

Blue Gray/Light Gray was the standard US Navy Catalina camouflage scheme from 1941. The RAAF's Lend-Lease PBY-5 and PBY-5A aircraft (A24-31 to A24-114) were delivered in these colours but were soon darkened, firstly with Black undersides from JAN 1943, then the RAAF Blue/Black/Grey later in 1943, and overall Night in 1944.



[internet colourised by Royston]

### US Navy PBY-5A 1942 in the standard patrol colours of M-485 upper, M-495 undersides

*The Official USN & USMC Aircraft Colour Guide Vol 2 1940-49* develops USN aircraft colours, and equates these two ship colours to the later Bulletins and specifications. For M-485 Blue Gray a sample from the National Air and Space Museum matches this to FS35189 as the closest equivalent in Federal Standard 595a. M-495 was adopted in ANA Bulletin No.166 of 4 DEC 1943 as 602 Light Gray (not carried over to the new FS595a spec, but combined with ANA 620 Light Gull Gray<sup>51</sup>, equivalent of FS36440).



Blue Gray M-485 (later FS595a 35189) Light Gray M-495 (later ANA 602)

These colours were USN ship colours, used before the ANA Bulletin colours were specified in 1943



[colour image from History Channel]

### US Navy PBY-5 in 1942 in standard matt blue/grey, with US National Marking on the nose

Over 1941-42, the blue/grey camouflage that the USN specified was to have the Blue Gray wrapped under the aft fuselage, and defined the Light Gray undersurfaces as the "hull planing surface" only.<sup>52</sup>

**Serialling.** Although USN aircraft carried Bu numbers as small serials, squadron identities (which changed) were marked in larger characters as the primary reference. PatWing 10 aircraft were numbered 101-P-1 to 101-P-14, and 102-P-16 to 102-P-29.<sup>53</sup> As war approached, serials changed to reflect only "1" to "29". When VP-22 joined PatWing 10, its PBY-5 serials 22-P-1 to 22-P-12 reclaimed vacant numbers from "10", from PBY-4s that had been lost. Five ex-MLD PBY-5s were transferred to the USN in JAN 1942, and they were numbered in this system as "41" to "45".<sup>54</sup> A cannibalised 22-P-12 became hybrid "46", being mated with the fuselage of MLD Y-72. The arrival of VP-21 in Perth again saw the system "simplified": "5" changed to "15", "46" to "14".

### Odd Acquisitions

After the first 27 Model 28-5s were received in Australia, any Catalina that could be acquired would be of help in manning the Seaplane Training Squadron (which would become 3OTU at the end of 1942). Three such odd acquisitions, in mid-1942, were as the Allied forces were driven south from the Philippines through the Netherlands East Indies by the invading Japanese forces. On the eve of war, the US Navy's Patrol Wing 10 (PatWing 10) had 28 PBY-4s headquartered in the Philippines at Cavite Naval Station<sup>55</sup> assigned to squadrons VP-101 and VP-102. PatWing 10 had been newly commissioned at Cavite in 1940, and the designation of its subordinate squadrons was changed to fit this new organisation – squadron VP-1 became VP-101, and VP-26 became VP-102.<sup>56</sup> The epic drama of PatWing 10's fighting rearguard evacuation is the story of Dwight Messimer's *In the Hands of Fate*.<sup>57</sup>

By 13 DEC 1941, PatWing 10 had only eleven aircraft flyable, so the decision was made to move south to the Dutch base at Manado, Celebes. The move then continued south to Surabaya where, on 23 DEC, the remaining crews and aircraft were merged as VP-101, the other squadron VP-102 being decommissioned. As the Japanese advance through the NEI continued, PatWing 10 withdrew further south, eventually reaching Australia in late FEB 1942, with only four surviving Catalinas.<sup>58</sup> Two of these PBY-4s – distinguishable by a shorter fin and rounded rudder, and without blisters for the waist gunners – were handed over to the RAAF, and VP-101 received PBY-5s ferried out from the US. The third RAAF acquisition under similar circumstances was a composite made from a salvaged Dutch MLD 28-5MN fuselage with the wings of USN PBY-5.<sup>59</sup> So, only four PatWing 10 Catalinas reached the safety of Perth in MAR 1942.

### USN PBY-4 Colours

From DEC 1940, all USN patrol aircraft were required to be finished in non-specular (matt) *Light Gray* with upper surfaces in *Blue Gray*. The PBY-4s of PatWing 10 arrived in the Philippines just before this instruction was issued, and at that time they would have been carrying an *Aluminium* scheme with *Yellow* upperwing surfaces.<sup>60</sup> They were subsequently camouflaged as war approached – Messimer records this as “by late 1941 PatWing 10 had camouflaged its airplanes a mottled *jungle green* and *brown*...The camouflage scheme was abandoned by the time the war started.”<sup>61</sup> In operations in the first weeks of the war, the colours were described as “a locally developed camouflage scheme...colours not identified but believed to be shades of *Gray* and *Blue*.”<sup>62</sup> So it would appear to be a rushed mixture of schemes.

### USN PBY-5 Colours

In JAN 1942 VP-22 flew its PBY-5s from Hawaii to Australia, and then onto Surabaya in NEI.<sup>63</sup> The standard for USN patrol PBYs was camouflage in matt *Blue Gray* on “all surfaces viewed from above”, with *Light Gray* undersides – the dividing line between upper and lower colours became the hull/float chine.<sup>64</sup> One of these PBY-5s – 22-P-12, which was re-numbered “46” – would subsequently be salvaged by the Dutch to fly to safety in Australia.

### USN Serial Numbers

Unfortunately, the USN did not consistently refer to its PBYs by their Bureau of Aeronautics (**BuAer**) serial numbers which *never changed*. Units used the **squadron number** – for instance 101-P-1 was the lead ship in VP-101 – but as aircraft moved between units, these numbers *would change*. Over the short period of 1940-1942, a PatWing 10 PBY-4 could have had *three different numbers*. This adds difficulty to tracking an individual USN airframe.

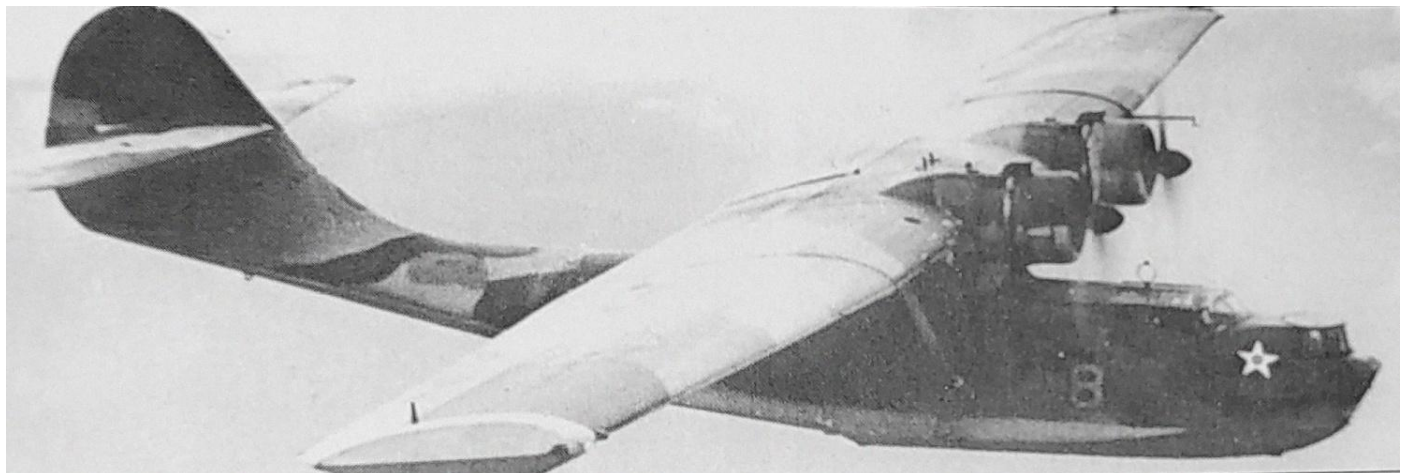
### Dutch MLD PBY-5 Colours

The first Dutch PBY order was Contract N-36, placed in JUL 1940 for 36 Model 28-5MN flying boats (similar to the USN's PBY-5) and numbered **Y-37 to Y-73**.<sup>65</sup> These were delivered to the NEI Netherlands Naval Air Force (*Marine Luchtvaart Dienst* – MLD) from SEP 1941. A further 12 aircraft, Model 28-5AMN similar to the PBY-5A amphibian, were ordered under Contract N-36 in SEP 1941, and numbered **Y-74 to Y-85**. MLD colours and markings, from 1941 were a low-visibility scheme of matt *dark grey* being adopted on the upper surfaces (similar to FS36152), with *Sky-*

coloured *light grey-green* undersurfaces (around FS34554) – this *dark grey* over *light grey-green* scheme is referred to as “mud & milk”. The Dutch orange triangle national marking was used from OCT 1939 until FEB 1942.<sup>66</sup> Before moving onto a detailed analysis of these three “odd acquisitions” (A24-28 to A24-30), a general review of the period USN and MLD Catalina standard colours is helpful.

**Serialling.** Although USN aircraft carried Bu numbers as small serials, squadron identities (which changed) were marked in larger characters as the primary reference. PatWing 10 aircraft were numbered 101-P-1 to 101-P-14, and 102-P-16 to 102-P-29.<sup>67</sup> As war approached, serials changed to reflect only “1” to “29”. When VP-22 joined PatWing 10, its PBY-5 serials 22-P-1 to 22-P-12 reclaimed vacant numbers from “10”, from PBY-4s that had been lost. Five ex-MLD PBY-5s were transferred to the USN in JAN 1942, and they were numbered in this system as “41” to “45”.<sup>68</sup> A cannibalised 22-P-12 became hybrid “46”, being mated with the fuselage of MLD Y-72. The arrival of VP-21 in Perth again saw the system “simplified”: “5” changed to “15”, “46” to “14”.

**Editor: Unique 1941-42 US Navy Camo finish: Asiatic Fleet**



PBY-4 Bu No1233 #8 of VP101 in US Navy Asiatic Camouflage. This PBY-4 was sunk in Darwin Harbour on the 19<sup>th</sup> February 1942. Credit Lous B Dorney



**Editor Note:** 22-P-10 of VP22 was lost NAS Ford 7th Dec 1941...Pictured here at Darwin transiting earlier in late August 1941. US Navy

## MLD Model 28-5MN “Mud & Milk”

The administration of the NEI had two colonial air forces – the Royal Netherlands Naval Air Service (MLD), and the air service of the Royal Netherlands Indies Army (MLKNIL). As of 7 DEC 1941, the MND flying boat fleet consisted of 33 Dornier Do-24s, and 35 PBY-5 Catalinas.<sup>69</sup> As described, Dutch MLD Catalina colours from 1941 were a low-visibility scheme of matt *dark grey* on the upper surfaces with *Sky*-coloured *light grey-green* undersurfaces, referred to as “mud & milk”. The dark grey (*Donkerblauwgrijs*, *dark blue grey*) was referred to as mud, for the muddy waters close to the banks of river mouths where aircraft were moored. Do-24Ks were painted in a similar scheme with dirty brown uppers and scruffy pale grey underneath – i.e. the “mud & milk”.<sup>70</sup>



[image from colour film from Netherlands Institute of Military History]

### MLD 28-5MN flying boat pre-delivery at San Diego in 1941

With the Japanese invasion, the Dutch flew six Dornier Do-24K and nine Catalina flying boats to Australia in MAR 1942. By the morning of 3 MAR 1942, a total of 15 flying boats were moored on Roebuck Bay Broome, including Catalinas Y-59, Y-60, Y-67, and Y-70, which were all sunk in the Jap raid with most of their occupants.<sup>71</sup> The RAAF later acquired a further five Do-24 flying boats (and a sixth, X-24, was initially retained by the MLD for their use within Australia). USN “46” escaped from the NEI mated with the “muddy” coloured fuselage of Y-72, to become A24-30.

Four MLD PBY-5 survivors<sup>72</sup> were flown from NEI to Koggala, Ceylon, where they equipped 321 (Dutch) SQN as part of the RAF, with 321SQN headquartered at China Bay, then to be joined by a further five.<sup>73</sup> Later two newer PBY-5As (Y-86 and Y-87) flew to Australia to replace Do-24 X-24 for intelligence missions into the former Dutch territories.<sup>74</sup>



[image from colour film from Netherlands Institute of Military History]

### Another MLD 28-5MN colour image at San Diego

## THOSE ODD ACQUISITIONS

The chaotic evacuation of the Philippines meant that only four Catalinas reached refuge in Perth in MAR 1942 – the unit had lost 41 out of its 45 PBYS.<sup>75</sup> Of the four aircraft (“3”, “5”, “10” and “46”),<sup>76</sup> three were transferred to the RAAF. While the decimation had mainly occurred in the Philippines and the NEI, even on reaching Australia the Japanese air attacks continued to exact a toll, with the loss of three in Darwin on 19 FEB 1942 (“4”, “8” and “41”), and two at Broome on 3 MAR 1942 (“6” and “7”).

### **A24-28 PBY-4 Bu 1219 / “3”**

One of only two PBY-4s operated by the RAAF, from the USN batch of 33 PBY-4s serialised Bu 1213 to Bu 1245. (Although Vincent, *adf-serials* and other authoritative sources give the BuNo as 1219, Joe Baugher’s USN serials incorrectly lists it as 1215.<sup>77</sup>) Note: Purchased under USN, Contract 58101, 18/12/38; Delivered 5/38 - 6/39: Without waist blisters.

One of only four Catalinas from PatWing 10 to survive the withdrawal from the Philippines and coded 101-P-3 (“3”), in early MAR 1942 it was abandoned by the USN at the port of Tjilatjap during the evacuation of Java, and subsequently struck off charge.<sup>78</sup> Several days later it was repaired by the evacuating Dutch MLD, and adopting USN side number “3” (perhaps casually referred to as MLD “Y-3”, but not formally taken on charge). The Dutch flew it out of Tjilatjap with half a tank of fuel and a defective compass for Australia. Arriving at Broome on 7 MAR, the Dutch obtained an anchor from one of the Catalina wrecks (from the Japanese air raid on 3 MAR) and a map so they could proceed to Perth. After stopping at Port Headland for repairs and refuel, they arrived at Perth. The MLD retained custody of “3”,<sup>79</sup> and then flew it from Perth across southern Australia stopping at Albany, Adelaide and Melbourne, before arriving at the Seaplane Training Squadron (STS), at Rathmines, where it was handed to the RAAF.

On 5 JUN 1942 the E/E.88 records “Received Rathmines ex Dutch”, becoming **A24-28**. After extensive refurbishment at the Rathmines workshops, it was not until OCT 1942 that A24-28 was issued as airworthy for training with STS, but noted in NOV 1942 as “Unsuitable for operations”. In DEC 1942, STS became 30TU with A24-28 being coded “C”. In DEC 1943 it was passed to 11SQN as FJ-L (as 11SQN had moved south), and its card was marked “For Training Purposes”. Below pictured per latter



A24-28 1943: GRB Collection

### **A24-29 PBY-4 Bu 1216 / “5” and “15”**

The second of the two PBY-4s operated by the RAAF, was with VP-101 of PatWing 10 as 101-P-5 (“5”). After the withdrawal, PatWing 10 relocated along the Swan River, Perth WA, where it was reinforced with 12 new PBY-5s



from USN VP-21. The addition of the new PBY-5s led to a further reorganisation of the Wing, and "5" was renumbered to "15". In JUN 1942, "15" departed Perth and arrived at Rathmines, where on 20 JUN its E/E.88 card records it as "Late U.S.A.15", on being handed over to the RAAF as **A24-29**. It underwent extensive overhaul with QANTAS at Rose Bay over JUN-NOV 1942, and some PBY-5 modifications were carried out. A24-29 then returned to Rathmines in NOV 1942 with the STS and marked as "Unsuitable for operations", to remain with 3OTU. A24-29 was coded "D" with 3OTU and named "*Flag Ship*", as the Rathmines CO's 'ship'.

#### **A24-30 PBY-5 ex NEI Y-72 and Bu 2305 / "12", "46" and "14"**

One of the four PatWing 10 Catalinas to survive the withdrawal from the Philippines and the NEI was a PBY-5, and a composite construction of two aircraft.<sup>80</sup> The wings and engines were from USN PBY-5 "12" of VP-22 (BuNo 2305, c/n 22, marked as 22-P-12), and the fuselage was of Dutch MLD Model 28-5MN serialled "Y-72".<sup>81</sup> The composite Catalina was completed on 28 FEB 1942 at Morokrembangan, Surabaya, in Java.

The "12" airframe was then re-serialled "46" with PatWing 10 as a "salvage construction".<sup>82</sup> After the withdrawal from the Philippines and the NEI, PatWing 10 relocated along the Swan River, Perth WA, where it was reinforced with 12 new PBY-5s from USN VP-21<sup>83</sup> – the new PBY-5s led to another reorganisation, and "46" was renumbered to "14". On 2 JUL 1942, "14" left the West, arriving at Rathmines on 5 JUL, to receive the serial **A24-30** – its E/E.88 records "Received Rathmines ex US Navy PBY-5 No.14". Issued to 20SQN in OCT 1942, in FEB 1943 A24-30 returned to Rathmines on the strength of 3OTU and coded "E". So to clarify this confusing lineage, it was: "22-P-12", "12" mated with Y-72 as hybrid "46", then "14", to become A24-30. For a detailed assessment of this composite Catalina refer to Wynnum Graham's A24-30 site.<sup>84</sup>



## A24-29 / D – 30TU *Flag Ship*

**A24-29** was one of two RAAF PBY-4s from PatWing 10 to survive the withdrawal from the Philippines and the NEI. With VP-101 of PatWing 10, it was coded 101-P-5, abbreviated to "5". As the survivors of the Wing withdrew to Perth, to be reinforced with new PBY-5s from USN VP-21, this aircraft was renumbered to "15". In JUN 1942, the E/E.88 records "Late USA 15" as being taken on charge as **A24-29**, then unserviceable with QANTAS at Rose Bay while refurbishment was carried out, and then in OCT 1942 issued to the Seaplane Training Squadron (STS) Rathmines, which became 30TU in DEC 1942. Some PBY-5 modifications had been carried out, such as engines, but waist blisters were apparently never fitted, and it was recorded as "Unsuitable for operations". Accordingly A24-29 remained with 30TU, coded "D" and named "*Flag Ship*", as the CO's 'ship'.



**The original configured PBY-4 with propeller spinners, rounded rudder and no blisters** [RAAF]

Camouflage demarcation is evident, probably hastily applied in the Philippines. This before the full repaint shown below, as the code "D" on the fin is in *White* – later after major modification with PBY-5 engines and rudder the code "D" was *Black* (below).

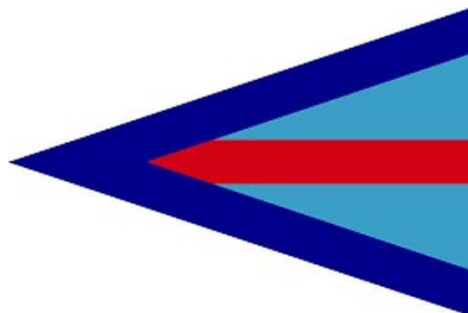
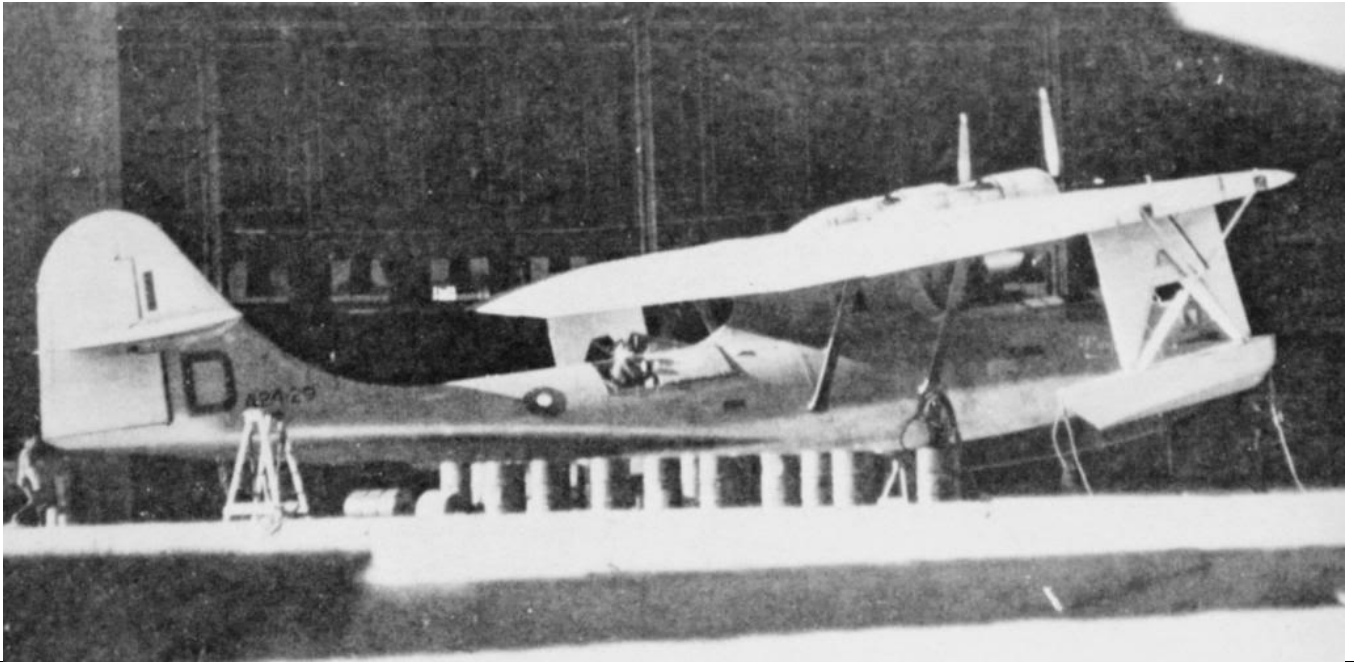
### **A24-29 at Rathmines 1944, possibly overall grey with "*Flag Ship*" nose art**

Refurbishment has removed the PBY-4 spinners and the taller PBY-5 tail has been added, but remained without waist blisters



**Subtle variations in "*Flag Ship*" nose art, below with base commander GPCAPT pennant**

[RAAF images]



## US NAVY – Blue Gray / Light Gray

Blue Gray/Light Gray was the standard US Navy Catalina camouflage scheme from 1941. The RAAF's Lend-Lease PBY-5 and PBY-5A aircraft (A24-31 to A24-114) were delivered in these colours but were soon darkened, firstly with *Black* undersides from JAN 1943, then the RAAF *Blue/Black/Grey* later in 1943, and overall *Night* in 1944.



[internet colourised by Royston]

### US Navy PBY-5A 1942 in the standard patrol colours of M-485 upper, M-495 undersides

*The Official USN & USMC Aircraft Colour Guide Vol 2 1940-49* develops USN aircraft colours, and equates these two ship colours to the later Bulletins and specifications. For M-485 *Blue Gray* a sample from the National Air and Space Museum matches this to FS35189 as the closest equivalent in Federal Standard 595a. M-495 was adopted in ANA Bulletin No.166 of 4 DEC 1943 as 602 *Light Gray* (not carried over to the new FS595a spec, but combined with ANA 620 *Light Gull Gray*<sup>85</sup>, equivalent of FS36440).



**Blue Gray M-485 (later FS595a 35189)    Light Gray M-495 (later ANA 602)**

These colours were USN ship colours, used before the ANA Bulletin colours were specified in 1943



[colour image from History Channel]

### US Navy PBY-5 in 1942 in standard matt blue/grey, with US National Marking on the nose

Over 1941-42, the blue/grey camouflage that the USN specified was to have the *Blue Gray* wrapped under the aft fuselage, and defined the *Light Gray* undersurfaces as the "hull planing surface" only.<sup>86</sup>

### Lend-Lease Orders in 1942/1943 in *TSS*

By MAY 1942, 119 Catalinas were on order for the RAAF, with the first 27 5-MA/MC aircraft delivered.<sup>87</sup> Consolidated production at San Diego switched in 1943 to the PBY-5A amphibian, delivered by Lend-Lease in the standard USN *Blue Gray* over *Light Gray*.<sup>88</sup> Ultimately the Lend-Lease PBY deliveries would stop at A24-114 as orders were switched to Canadian production of PB2B flying boats.<sup>89</sup> The Boeing Canada production continued making flying boats and not amphibians, which better suited the RAAF requirements in 1944 for strategic long-range minelaying. First were the PB2B-1 (basically PBY-5s serialled in the A24-200 block), and the “tall tail” PB2B-2 (in A24-300 blocks).



[USN colour image via internet]

**USN PBY-5A No.51 in *Blue and Gray* 1942**

Even though the US Navy were operating ‘Black Cat’ squadrons over 1943, there is no record of these being delivered from the factory at this stage in all-over matt *Black*. With RAAF Catalinas in *TSS* and USN schemes, a darker camouflage for night operations was required on arrival in Australia at a Flying Boat Repair Depot.



[colourised from *adf-serials*]

**Canadian-contracted 28-5MC A24-23 of 20SQN at Bowen in *TSS* camouflage (later to become RB-X)**

RAAF receipts of PBY-5/5As were in standard USN camouflage of *Blue* upper/*Gray* lower colours for all the Lend-Lease Bu-numbered deliveries from San Diego in 1943; deliveries continued too in this scheme when PBY production switched to New Orleans in 1944. While an RAF PBY-5A Catalina IIIA FP233 (Bu 05006) was a Lend-Lease delivery to UK in APR 1942 in *TSS*,<sup>90</sup> this had probably changed by 1943 – two RAF PBY-5s (A24-62/JX238 and A24-63/JX239) received by the RAAF in MAY 1943 (which were LL Bu08416 and 08417) would have been received in USN colours. (However, later when the RAF-serialled Canadian PB2B Cat IVBs and VIs were diverted from Canadian production with the *Coastal White* scheme from late 1944, they were received in Australia in this scheme and required repainting.)

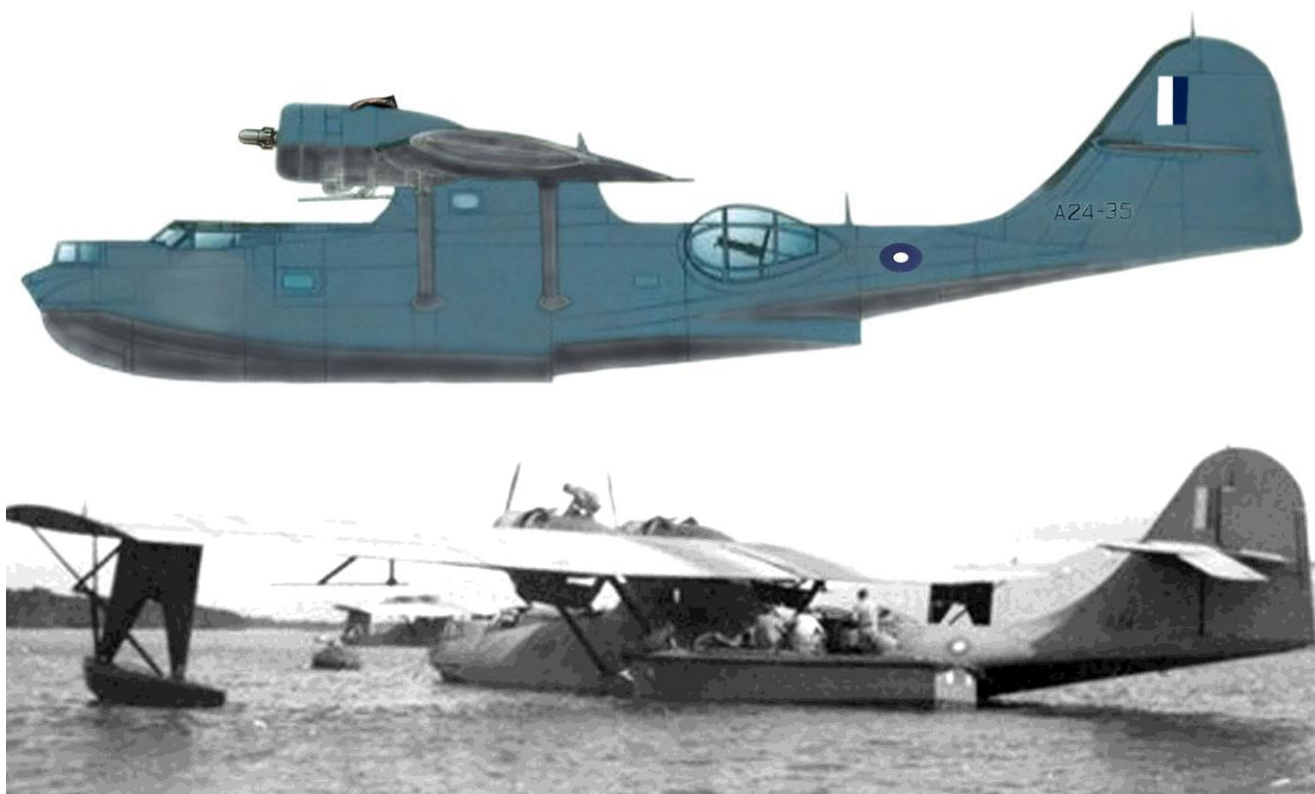
## RAAF COLOURS – USN *BLUE/GRAY* 1943

As the Lend-Lease PBY-5s arrived from the US at Rathmines with 2 Flying Boat Repair Depot from JAN 1943, the RAAF serial numbers were added consecutively at this time. Then they were immediately despatched to 1FBRD at Lake Boga for RAAF induction – this involved an 80-hourly inspection, and bringing up to the current RAAF Catalina modification state (referred to as “operational fitment”); also probably the *Black* was added to undersides. **A24-35** (below) has the even, light scheme expected from USN *Blue Gray* upper surfaces – no hint of TSS camouflage demarcation evident, but with the first attempt at “darkening”, with its *Black* undersides (and obvious on the engines).



[Peter Malone]

**A24-35** *Blue Gray*, and *Black* undersides, flame dampened ‘fish-tail’ exhausts: 1943 served 3OTU, 20SQN (RB-V), 11SQN (FJ-A)



[GRB image]

**Probably A24-51 at Rathmines in 1943, in USN *Blue Gray* uppers with *Black* undersides**

Again, this image is before repainting in darker camouflage. **A24-51** was received at Rathmines on 17 APR 1943, and sent within days to Lake Boga, where *Black* would have been applied to the undersides. Like A24-35, it has small fuselage 20” 2:5 roundels; fin flash 24” x 16”, and *Black* serials. A24-51 served on 20SQN (RB-W) from JUN 1943, then with 11SQN (FJ-K).

## RAAF COLOURS – CAMOUFLAGE TRIALS AT RATHMINES 1943

Experimenting with seaplane camouflage had begun at Rathmines in NOV 1942 with the Kingfisher – apparently A48-11 trialled a dark *Night* and *Dark Ocean Blue* scheme.<sup>91</sup> The subsequent Catalina camouflage trials at Rathmines were using these dark disruptive colours to break up the aircraft's outline.



[AWM NEA 0165T]

### Although A24-53 appears to be in the same scheme as A24-51...

...there are several marking differences – its serial is marked in *Grey*, not *Black*, indicative of a darker camouflage; and the roundel is larger than the 20" roundel, possibly 30" diameter, with the smaller, more operational 1:5 *White* centre. A24-53 served with 11SQN (FJ-B) and 43SQN (OX-J) over 1943-44. 'Fish-tail' exhausts shown to good effect.

In referring to this application of *Black* undersides to the USN *Blue/Gray* as the *first attempt at "darkening"*, then the next step – which would have come out of the early 1943 camouflage trials at Rathmines – was a mixed camouflage of *Black* or probably a dark blue with the lighter USN *Blue/Gray*. This could therefore be considered as the *second attempt at "darkening"*. Ultimately, darkened camouflage was the RAAF's distinctive upper two-colour flying boat camouflage of *Dark Ocean Blue* and *EDSG*, which began appearing during the second quarter of 1943.<sup>92</sup> By JUL 1943, darker camouflage became the standard, and new Catalinas on arrival at Lake Boga were receiving the "operational fitment" and "repaint".<sup>93</sup>



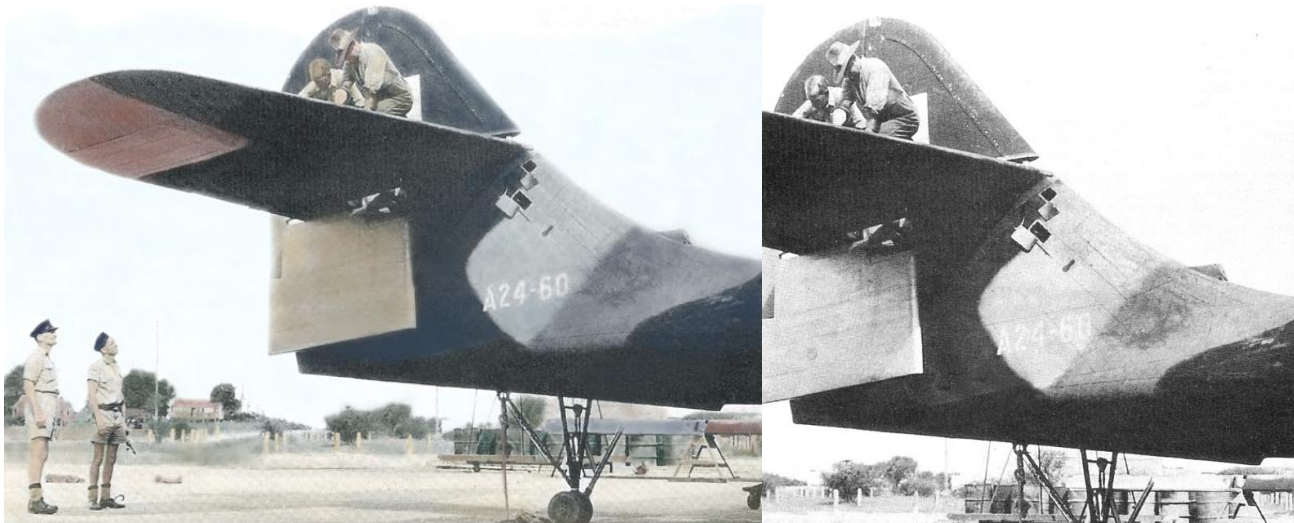
[Jason Lunnon via GRB]

### PBY-5 A24-60, beautiful example of early dark camouflage at Cairns mid-1943 – but oddly, "box" exhausts

A24-60 was at 1FBRD Lake Boga from US delivery through JUN 1943, where these colours were added, then in JUL 43 serving on 20SQN (RB-N) over 1943-1944. The predominant lighter colour is USN *Blue Gray*, with the lower surfaces *Black*. Of interest is the darker disruptive colours added to the fuselage, and presumably the upper mainplane – probably various shadings of dark blue and grey from the 1943 trials. The serial is marked in *Grey*, not the *Black* that had initially been applied on the USN *Blue/Gray* scheme. Historian Peter Malone has speculated that dark colours are painted over the lighter colour, which is logical and further supported by his argument that images of A24-64 OX-D *'The Dabster'* in 1944 clearly show that codes, serial, markings are painted over the *Black* and are flaking off – while the *Grey* patches on the wing are in good condition and not flaking off.<sup>94</sup> As noted the aircraft has "box"-style exhausts, not as flame dampers but as anti-ice heat exchangers, used by USN in the Aleutians. But why in Australia, perhaps a trial?

## RAAF COLOURS – CAMOUFLAGE TRIALS AT RATHMINES 1943

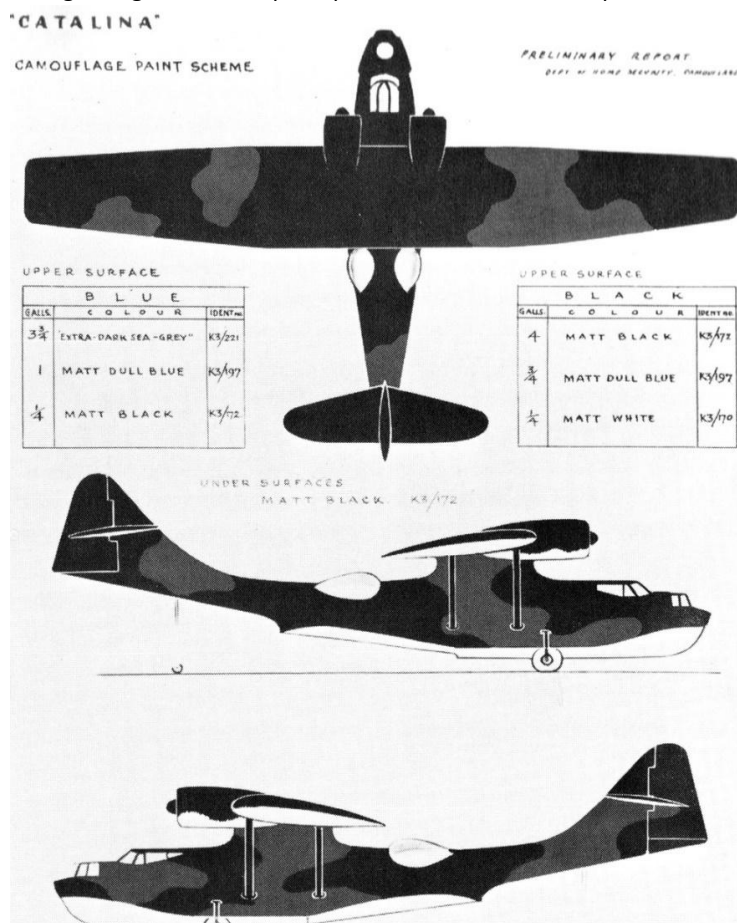
PBY-5 A24-60 (port view above) and the starboard empennage (below) provides a good example of what was happening with RAAF Catalina colours in 1943. Darkened colours, at least one shade of a dark blue and possibly a dark grey (perhaps *EDSG*), were painted over the upper surface *USN Blue Gray*.



*[colourised from AWM NEA 0448]*

### Working on the tailplane of A24-60 at 1FBMU Bowen in 1943

The original monochrome image clearly shows three shades of grey or blue up the fin leading edge. The light colour appears to be *US Blue Gray*, the dark a mixed RAAF *Dark Blue*, the mid colour could be a blue or grey, in this artwork opting for *EDSG*. Both port and starboard views of A24-60 give a general disruptive pattern similar to this Dept of Home Security preliminary image.



*[image from Pentland, Vol 1, p.122]*

The upper surface Blue is given as a mix of matt Black and a Blue – 3 3/4 gallons of *EDSG* (K3/187), 1 gall of matt *Dull Blue* (K3/197), and 1/4 gall of matt *Black* (K3/179).<sup>95</sup> Ultimately the RAAF *Dark Ocean Blue* (K3/318) was adopted from the second half of 1943.



### Dark Camouflage 1943/1944

During 1943, having “blackened” the undersides of its Catalinas, the RAAF undertook trials with the darker camouflage of *Dark Ocean Blue* or *Night* for nocturnal operations. This may have started as an adaption of the *TSS* and *USN Blue* patterns – painting shades of blue and grey over the *USN blue*, then deciding on *Dark Ocean Blue*. For the ‘Black Cats’, undersides were blackened with *Night* (K3/179). *Dark Ocean Blue* (K3/318) would seem to have very closely resembled *USN Sea Blue 607*. Imagery shows that *Dark Ocean Blue* resisted fading quite well, while *EDSG* (K3/187) areas rapidly faded as always, giving contrasting light and dark tones. This flying boat camouflage only lasted for about a year, when superseded by the MAY 1944 policy changes for overall *Night* for Black Cats.

Amphibians delivered from late 1943 were stripped, in a temporary modification, of their landing gear for the ferry, which also were not required for long over-water mine-laying missions, saving weight for deeper penetration to enemy targets. The *PBY-5A(M)* permanent modification in mid-1944, at Lake Boga, involved the removal of the tricycle landing gear and the redundant hydraulics (some having been removed in the US), and removal of self-sealing fuel tanks and armour plating<sup>96</sup> – these modifications involved 23 aircraft.<sup>97</sup> RAAF work was undertaken by the depots at Lake Boga (1FBRD) and to a lesser extent at Rathmines (2FBRD) and Bowen (1FBRU).

### Overall Black Night 1944/1945

A RAAFHQ signal of 10 MAY 1944 specified that: “Catalinas for night reconnaissance roles to be camouflaged upper and lower surfaces colour *Night*”.<sup>98</sup> A fortnight later this policy was formalised by a the revision of Aircraft General Instruction (AGI) “Camouflage Schemes and Identification Markings” Part 3, where Appendix D specified for night reconnaissance *Night* for the upper and lower surfaces.<sup>99</sup> Also referenced were that roundels were to be on uppersurfaces and fuselage only, and any identification marks (i.e. aircraft serial and squadron codes) were to be *Medium Sea Grey*. With the blackness of the *Night* (K3/179) mandated by MAY 1944 policy, toned-down markings, and with flame dampers installed over their exhaust ports, ‘Black Cats’ were all but invisible in the darkness.

### Foliage Green ASRF PBY-5As 1944/1945

Some *PBY-5As* did however retain the amphibian capability, as this was useful in the rescue mission carried out by the Air-Sea Rescue (ASR) Flights. These ASR aircraft were camouflaged in overall *Foliage Green* in accordance with the MAY 1944 policy. The *PBY-5A* of 113ASRF (below) could be either A24-104 (NR-F) or A24-112 (NR-B).



[AWM OG 3228 as colourised by ‘RAAF Black Cats’]

FLTLT Wally Mills DFC (with monkey) and crew of *PBY-5A*, 113ASRF at Labuan on 15 AUG 1945

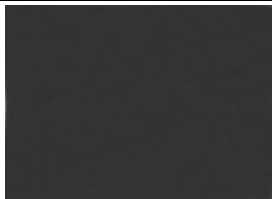
## RAAF Dark Ocean Blue / EDSG Camouflage

With PBY-5 flying boats and PBY-5A amphibians being received in Australia in schemes too light for night operations, a darker camouflage was required for this priority tasking – resulting in 1943 as *Dark Ocean Blue* camouflage. Trialled from about MAR 1943 was a mixed dark blue, with disruptive patches of *EDSG* on the upper wing. As stated, the Dept of Home Security camouflage department developed the disruptive pattern using matt Black and a mix of Blue – 3¼ gallons of *EDSG* (K3/187), 1 gall of matt *Dull Blue* (K3/197), and ¼ gall of matt *Black* (K3/179). From the trials at Rathmines (which also involved Kingfisher aircraft tested in these colours) saw an in-service scheme of *EDSG* and the dark blue, to become *Dark Ocean Blue* (K3/318). On the exposed topside, *EDSG* soon faded to a much lighter shade, evident in imagery. Undersides were matt black for the night intruding over enemy territory/waters. The disruptive blue/grey pattern was only roughly consistent between aircraft.<sup>100</sup>



*[colourised from adf serials]*

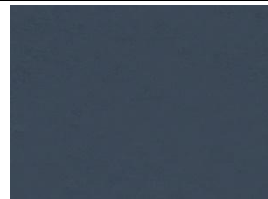
**A24-59 RB-L – a PBY-5 flying boat of 20SQN MAR 1944 with *Dark Ocean Blue*, and (the lighter) *EDSG* camouflage**



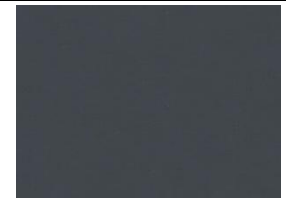
**Night K3/179**



**Extra Dark Sea Grey K3/187**

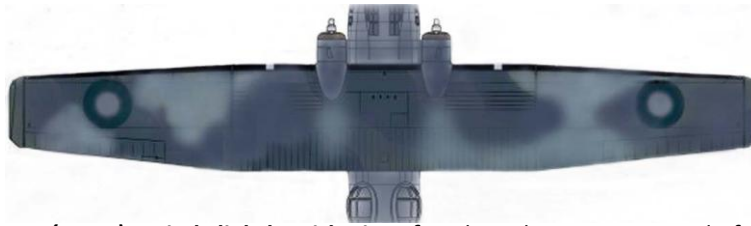


**Dark Ocean Blue K3/318**

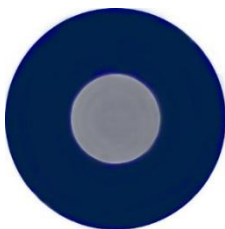


**USN ANA 607 Sea Blue**

**Dark Ocean Blue (DOB)** was adopted for use in combination with *EDSG* on flying boats through dissatisfaction with the fading of previous colour combinations. DOB bears a resemblance to USN *Sea Blue*,<sup>101</sup> primarily the ‘non-specular’ (matt) ANA 607.<sup>102</sup> It was mainly the upper mainplanes that received DOB to break up the outline, but sometimes on fuselages too with *Night*.



**Patterns of blue (DOB) and grey (EDSG) varied slightly with aircraft** – this scheme was typical of A24-59/RB-L and A24-78/FJ-J



**Overwing 2:5 roundel with EDSG**



**The later fuselage roundel 1:5 (reduced White)**



**24" x 12" narrow Fin Flash**

**National Markings for night operations.** In 1942, *Red* overpainted in the overwing type-B roundel with *White*, it was necessary to decrease the observability of Catalinas from above for increasing night operations in 1943. Not only did this include disruptive dark *Grey/Blue* camouflage, but also toning-down roundels. On uppersurfaces this resulted in overpainting *White* with *EDSG*, and sometimes even all-*Blue*. Fin flash had narrower 6"-wide stripes, not the 24"x16" standard flash. In 1944, the *White* of the fuselage roundel was reduced from the 3:5 or 2:5 proportions, to 1:5 with a very small 6" *White* circle in the 30" roundel.

## PBY-5A(M) FLYING BOAT CONVERSION

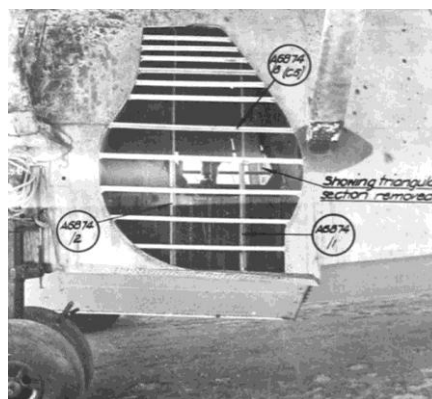
In JUL 1944 1FBRD had commenced begun Order No.60 for converting the RAAF's PBY-5A amphibians into a permanent flying boat configuration. The versatility of the PBY-5A had come at a cost – its extra weight. Aircraft had been ferried from DEC 1943 with a “temporary modification” of undercarriage removed and wheelwells sealed,<sup>103</sup> but a permanent upgrade was required to properly seal the undercarriage housings and remove the associated hydraulics. With 46 amphibians planned for delivery, the conversion of a number enhancing range and load carrying capability was required for the primary strategic mine-laying role. By this stage too, colours were changing to overall *Night*.



[colourised from AWM P00448.039]

**A24-69 FJ-P in overall *Night* having its temporary modification upgraded to permanent flying boat PBY-5A(M) configuration at Lake Boga AUG 1944– PBY-5As were ferried from the US as flying boats with no undercarriage**

As most PBY-5As had the “temporary modification” in the US,<sup>104</sup> it was fully implemented by RAAF Catalina Technical Order No.60 released by DTS in JUL 1944.<sup>105</sup> This had stout and more permanent coverings over wheelwells – with a series of stringers rivetted into position, the fuselage wheelwells flush sealed with duralium sheeting. Likewise the nosewheel bay doors were removed, that area reverting to a fixed flush contoured bow. This procedure (typically tied to 240-hourly servicing) consumed an average of 1500 man hours, and reduced aircraft weight by a like number in pounds. This conversion also allowed a return to an improved internal layout.<sup>106</sup>



[NAA A705 9/30/203]

**Catalina Order No.60 – Removal of Landing Gear modification, main wheelwell stringers in position**

According to the E/E.88s only 23 PBY-5As (between A24-69 and A24-102) were modified to flying boats from amphibians, most with preliminary conversion work in the US before delivery.<sup>107</sup> In Australia, 1FBRD undertook the bulk of this work with A24-69 and A24-70 from JUL 1944 and into AUG 1944; 2FBRD commenced with A24-71 in OCT 1944.<sup>108</sup> Not all PBY-5As were converted – by late 1944 amphibians were now required for ASR duties; some flying boats were even *remodified back to amphibians*.<sup>109</sup>

## PBY-5A(M) FLYING BOAT CONVERSION IN USA

The original batch of PBY-5As delivered from the San Diego factory (from A24-69) were all ferried out with the “temporary modification” as flying boats,<sup>110</sup> and subsequently had E/E.88s annotated as “PBY-5A(M)”. The intent was for the full Catalina Order No.60 modification to be undertaken in Australia. All the New Orleans produced PBY-5As (A24-104 to A24-114) were temporarily modified with landing gear removal and sealing of the wells, but ultimately all would be *converted back to amphibians* for the RAAF ASR requirement, and many served in this capacity postwar.

*Encl 6071A*

### CONSOLIDATED VULTEE AIRCRAFT CORPORATION



NEW ORLEANS DIVISION  
NEW ORLEANS, LOUISIANA  
2876E 30 August 1944

*c.c. dispatcher  
to S/O Tech 715  
MS*

To: Staff Officer Equipment R.A.A.F., Washington  
 From: Sgt. J. Lowrie at C.V.A.C., New Orleans  
 Ref: Progress and Work Carried Out On Our Aircraft

RECEIVED  
 AUG 31 1944  
 WASHINGTON

**Progress:**

Aircraft No. 46094 has now been on the final assembly line for three days. I am informed that its completion in this section is anticipated for Thursday, 31 August 1944. However, from observation I think that it may be a little longer. Nine days is the estimated time for painting, engine and flight tests, which brings delivery to about 10 September 1944, if everything runs to schedule.

Aircraft No. 46592 is to follow the above at approximately a weeks interval.

Aircraft No. 46593 will follow 92 in approximately two weeks. This longer interval is due to there being another hull separating these two numbers.

Aircraft Nos. 46605-6-7 have passed through the water test and are now moving along the hull line in sequence. Between 46593 and 46605 there are three hulls which should place delivery of the first of the next three about three to four weeks after 46593, that is if the information gained from final assembly foreman as to their speed of progress is at all accurate.

**Deletions carried out.**

**Fuel Cell:** These have been deleted as instructed.

The self-sealing cell fuel contents gauge calibrations had been partially installed, however I spoke to the line foreman and it was rectified.

**Landing Gear:** This deletion also has been carried out, likewise the necessary sealing of hull fittings.

**De-Icer Equipment:** This has been carried out entirely.

Arrangements during our visit could not be made to remove the engine exhaust heat transfer as it would necessitate the installation of the exhaust collector replacement which the Company was not prepared to do. However, the heat exchangers have been removed and the exhaust collector replacements made.



This advice (above) from the RAAF resident engineering NCO at Consolidated New Orleans, describes the progress of RAAF Catalina Order No.60 modifications into PBY-5A(M) configuration to RAAF Washington.<sup>111</sup> The first six aircraft are mentioned: **Bu 46594 became A24-104** on arrival at RAAF Ferry Det San Pedro; the next **Bu 46592 became A24-105**. The aircraft due after this was Bu 46593, which unfortunately crashed on arriving at San Pedro on 25 SEP 1944 – it was a write-off but presumably would have become A24-106.

In the event, the next serial block of **A24-106 to A24-122 was reserved for 17 PB2Bs** from Boeing Canada. Therefore the next serial allotments for the modified PBY-5A(M)s were Bu 46605 to 46608, skipping these 17 consecutive numbers, with four **New Orleans flying boats becoming A24-123 to A24-126** in OCT 1944. The following five PBY-5As from the New Orleans plant were Bu 46619 to 46623, which on arrival in DEC 1944 at San Pedro became **A24-127 to A24-131**. All eleven PBY-5As (plus the twelfth which had crashed) from the New Orleans/San Pedro modification received more substantial work than the earlier “temporary modifications”, and also the excess 12 sets of landing gear and hydraulic lines were retained by Consolidated if required for further re-modification.<sup>112</sup>

## BLACK CATS

The USN began 'Black Cat' operations in the New Guinea theatre from SEP 1943, with Catalinas of VP-11, VP-52 and VP-101 wearing a matt 'non-specular' *Black* overall finish.<sup>113</sup> These aircraft were specifically painted for their night roles, not being delivered from the factory in this scheme.<sup>114</sup> The RAAF had adopted its own dark black/blue/grey flying boat camouflage during 1943<sup>115</sup> – *Dark Ocean Blue* was discontinued from 2 MAY 1944, directives stating that *Night* (K3/179) would be the standard nocturnal colour.<sup>116</sup> This was the final stage in RAAF darkened Catalina camouflage.



**PBY-5A(M) A24-75 FJ-D of 11SQN over 1944-45 showing a Black Cat disruptive blue/black/grey scheme**

**National Markings.** To complete the overall tone-down required for night operations, Catalinas had unique roundels – smaller-than-usual white centres of the fuselage roundels, and the *White* centres of the upper mainplane roundels completely overpainted, either with EDSG or even insignia *Blue*; no roundels were marked on the wing undersides. Documentation of the unique roundels has not survived, perhaps being a local modification implemented on first-line or second-line servicing, and bypassing the Dept of Technical Services (DTS) at RAAFHQ. All the required night operations dark camouflage – dark blue and then *Night* – was applied upon arrival in Australia.<sup>117</sup> Serials and codes were *Medium Sea Grey* (K3/183) from 1944. With the delivery of the Canadian-built Boeing PB2Bs, factory paintwork conformed to RAF Coastal Command '*Coastal White*' – a scheme of *EDSG* upper surfaces confined to plan-view only, otherwise all *White*; again the overall *Night* was typically applied immediately on arrival at a FBRD.<sup>118</sup>



[colourised from 'RAAF Black Cats']

**PBY-5 A24-66/R which served with 30TU at Rathmines throughout 1945 in overall *Night***

**"Courting".** Black Cat operations increased with the enlarged force of 76 Wing, headquartered at Townsville in JAN 1944. Moving to Darwin in SEP 1944, 76WG coordinated and controlled the "Courting" minelaying operations by 20, 42 and 43SQNs.<sup>119</sup> Minelaying missions already carried out by the RAAF had successfully disrupted enemy shipping more effectively than conventional bombing, and were thus considered profitable enough to dedicate a wing of three squadrons. On 7 DEC 1944, the RAAF began its largest mining operation of the war, in terms of aircraft involved and the distances flown – the mining of Manila Bay. Black Cat operations were conducted as far afield as Java, Borneo, the Philippines, and China until ending on 30 JUL 1945 – and then a major role became return of prisoners held by the Japanese, with 1200 POWs returned to Australia by Catalinas.<sup>120</sup> 76WG headquarters disbanded in NOV 1945.

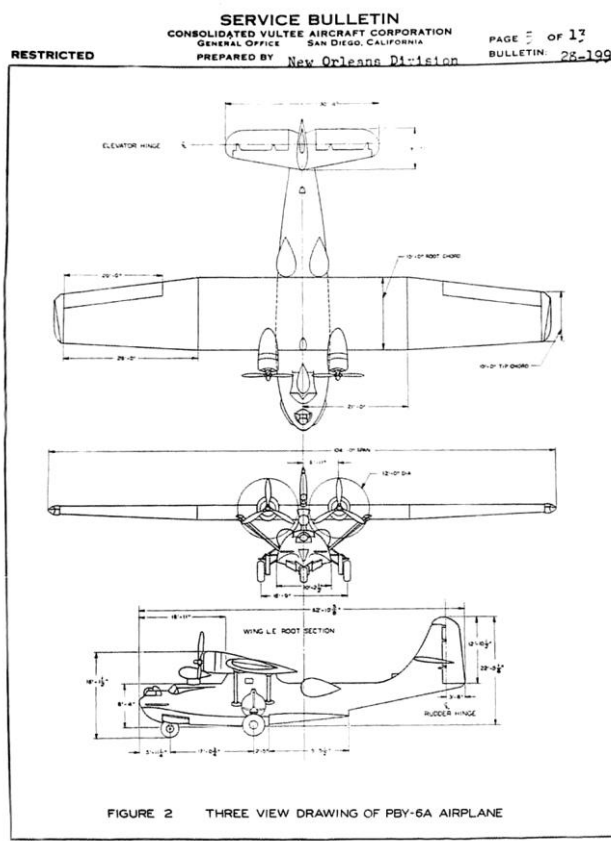
**“Tall-tail” Catalinas, PB2B / PBY-6A – 2B or not 2B**

A problem over 1944-45 for the RAAF was that US production was only for amphibians, and not flying boats. Canada was, however, building flying boats: the PB2B-1 was their production of the PBY-5, and the PB2B-2 was a flying boat version of the PBY-6A. For the all-important mining role, flying boats were required. The “PB” designated a USN Patrol Bomber (as for PBY-5), the PBY-5’s “Y” signified the USN manufacturer’s code for Consolidated. For PB2Bs, the “B” showed the manufacturer as Boeing Canada, the “2” meant Boeing Canada’s 2nd design for a Patrol Bomber.<sup>121</sup> To satisfy the RAAF requirement, the RAF agreed to divert Canadian production of PB2B flying boats to the RAAF:

- The first deliveries were of 17 PB2Bs, but it was not until NOV 1944 that RAAF Washington<sup>122</sup> realised this actually comprised seven PB2B-1s (eventually becoming A24-200/-206) serving primarily with 20SQN, and ten PB2B-2s (eventually A24-300/-309).
- The next two RAAF batches, totalling 37 were PB2B-2Rs (A24-350/-386), made virtually all PB2B-2 production being diverted to the RAAF.

All PB2Bs were fitted with the teardrop radome above the cockpit, which replaced the earlier variety of Yagi arrays.<sup>123</sup> The RAAF submission for War Cabinet approval in NOV 1944 observed: *“Apart from the fact that it is not an amphibian, the Canadian produced Catalina is identical with the USA type PBY”*.<sup>124</sup> Originally 20 Catalinas had been requested in MAY 1944 for 1945 delivery. By NOV with New Orleans battling to supply USN PBY-5As and ramping up PBY-6A production, the supply was switched to Boeing Canada PB2Bs – and the initial 1945 supply reduced to 17, although a further 37 would be transferred from RAF orders.

**CONSOLIDATED SERVICE BULLETIN 28-199 – PBY-6A 3-view**



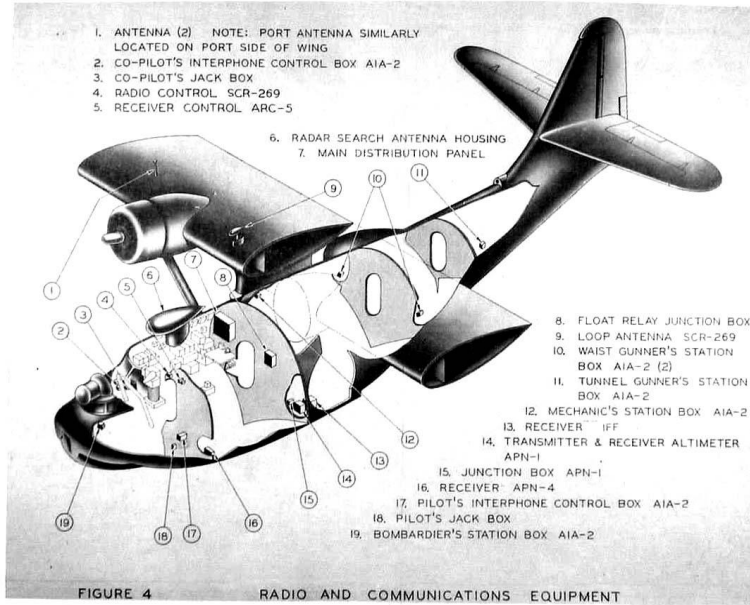
[NAA A1695 281/209/EQ, of 23 Aug 44]

**PBY-6A Order.** In JUL 1945, under the consideration of MAC(Air) No.700/1, the assignment of 24 PBY-6As for delivery Australia over late 1945 was submitted to the US by the British Air Commission under BAC/N-2026 AUS requisition.<sup>125</sup> This was probably as the RAAF still had a requirement for amphibians for ASR. But with the end of the war this requisition did not proceed – we could speculate such PBY-6As would have become A24-400 to A24-423.

# BOEING-CANADA PB2Bs

SERVICE BULLETIN  
 CONSOLIDATED VULTEE AIRCRAFT CORPORATION  
 GENERAL OFFICE - SAN DIEGO, CALIFORNIA  
 PREPARED BY NEW ORLEANS DIVISION

28-199 PAGE 7 OF 13



[NAA A1695 281/209/EQ, of 23 Aug 44]

More of PB2B SERVICE BULLETIN 28-199 – PB2B-2 was essentially the same but not amphibian



## SERVICE BULLETIN

Consolidated Vultee Aircraft Corporation  
 General Office, San Diego, California

**RESTRICTED**

PREPARED BY NEW ORLEANS DIVISION

**BUREAU CHANGE:** PAGE 1 OF 13  
**MASTER CHANGE:** BULLETIN: 28-199  
**SUBJECT:** Identification of PB2B Aircraft DATE: 8-23-44

**1. REASON FOR BULLETIN:**

The reason for this Bulletin is to outline the identifying characteristics of the PB2B airplane.

**2. AIRPLANES AFFECTED:**

A. The information contained in this Bulletin is applicable to the following airplanes:

<u>Model</u>	<u>Contract</u>	<u>Bureau Serial Nos.</u>
PB2B-6A	NOa(s)-464	*46639 - 46695 incl. and - 46724 only.
PB2B-6A	NOa(s)-259	63993 - 64441 incl.
*Tentative		

**3. MAINTENANCE (SPARE) PARTS AFFECTED:**

None

**4. ACCOMPLISHMENT:**

This Service Bulletin is for information only.

**5. DESCRIPTION OF CHANGE:**

PB2B type amphibians which have been modified prior to delivery as outlined below will be designated as "PB2B-6A" airplanes.

**Part I - Tail**

A. To improve directional stability by eliminating rudder reversal at high angles of yaw, the conventional PB2B tail has been replaced with a PBN tail on the PB2B-6A airplanes. The PBN tail differs from the PB2B tail as follows and as shown on figures 1 and 2.

- (1) The fin height has been increased 27 inches.
- (2) The rudder contour has been changed to incorporate an overhanging counterbalance.
- (3) The elevators have been changed to incorporate overhanging counterbalances at the stabilizer tips.
- (4) An additional hinge point has been added to the rudder, making four hinge points instead of three.

## COASTAL WHITE

Trials from 1942 in both the US and Britain had concluded that the best to camouflage an aircraft's silhouette from below was to paint the undersides White. This resulted in the RAF 'Coastal White' scheme – as well as the USAAF Seasearch scheme, and the USN Basic (Non-Specular) Camouflage, requiring *White* undersides.<sup>126</sup> *Coastal White* comprised the TSS uppersurface colours – *Dark Slate Grey* and *Extra Dark Sea Grey* – with matt *White* sides and gloss *White* hull. In FEB 1943, Coastal Command introduced the 'Coastal White' scheme via the Directorate of Technical Development (DTD 360),<sup>127</sup> and soon into 1943 RCAF PBV-5As (Canso As) were wearing RAF *Coastal White*.<sup>128</sup> In 1944, the RAF Air Publication AP.2656A formalised this into 'Special Coastal Duties – Scheme A',<sup>129</sup> which also applied to the coastal Beaufighters, as we saw in No.1 of this series.



[internet colour image]

### PBV-5 JX209 Catalina IVA in the US-applied colours for RAF deliveries, researched by historian Dana Bell:

A MAR 1942 memo from the British Air Commission to the US Defense Aid Organization listed new camouflage requirements for B-17E ASV aircraft to be based on Air Diagram 1161 with the following exceptions: upper surfaces were to be *Extra Dark Sea Grey* duPont 71-19324 and *Dark Slate Grey* duPont 71-19323; undersurfaces were to be dull *White* duPont 71-001, carried  $\frac{3}{4}$  the way up the sides and on fins and rudders. The dull British *Red* and *Blue* were required for the insignia, not the brighter US colours.<sup>130</sup>

Other RAAF interest in *Coastal White* led to the one-off 71SQN Anson trials at Lowood in OCT 1943 to test this as an anti-submarine patrol scheme. Anson AW665/PP-B had gloss *White* undersides and matt *White* vertical surfaces, and the tests showed a small advantage in detection.<sup>131</sup> However, RAAF Command replied in NOV 1943 that as Ansons would be transferred between units and repaints necessary, the resources to adopt this scheme across the Anson fleet were not justified.<sup>132</sup>



[colourised from adf-serials]

### PB2B-2R JZ841 (A24-360) with the RAF name "David Hornell VC", in Canada before ferry

This was the last Canadian-produced Catalina, and was christened with RAAF approval at Vancouver on 28 FEB 1945.<sup>133</sup> The "R" suffix on the late delivery PB2B-2s, which were serialised in the block A24-350 to A24-386, indicated the deletion of some operational mission equipment and were prepared for transport duties.<sup>134</sup> But as RAF *Coastal White* had become the standard PB2B-2 delivery scheme by 1945, this colour was quickly overpainted with *Night* on arrival in Australia. However, at least one, A24-367 ex JZ839, retained this coastal scheme as NR-E with 113 ASR FLT as late as DEC 1945, with the *Red* of the 'type-C1' roundel and fin flash overpainted by *White*.<sup>135</sup>



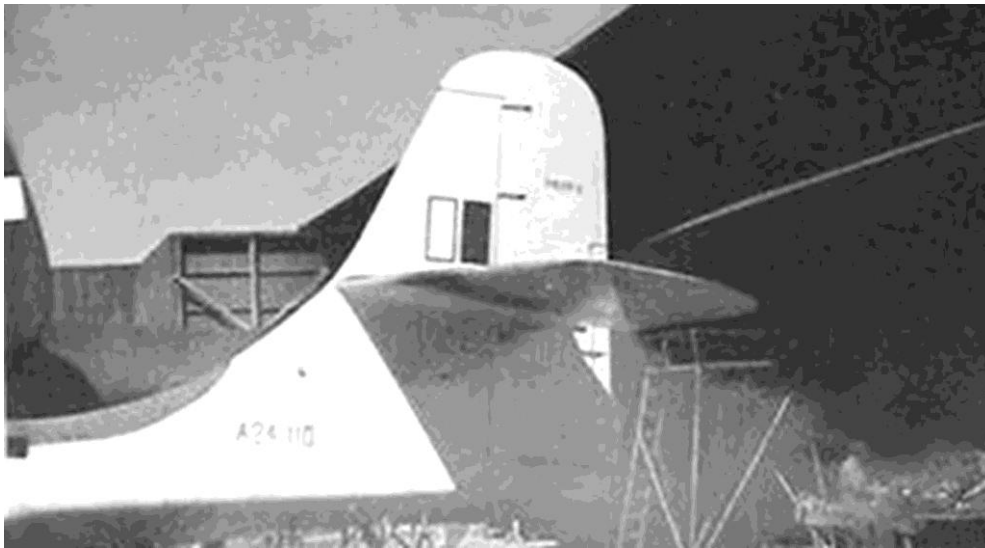
## RAAF PB2Bs IN COASTAL WHITE 1945



[colourised from aaj-serials]

### **PB2B-2R A24-367 NR-E still in *Coastal White* (after service with 42SQN) with 113 ASR FLT, Labuan DEC 1945**

Delivered in MAY 1945, was one example confirmed to have retained its *Coastal White* scheme in RAAF service. The *Yellow* surround to the C1 roundel appears to have been painted over; the fin flash hollow outline colour is unknown - *Red*, *Blue* or *Black*? The serial and 113ASRF code letters in *Black*. Ian Baker states that apparently from mid-1945 the RAAF decided to retain their perfectly good delivery scheme as there was no longer the urgency for *Black Cat* minelayers.<sup>136</sup> This may have been just informal advice, as it was not until OCT 1945 that RAAF HQ directed that camouflage could be removed from ASR Catalinas in lieu of the current *Foliage Green*.<sup>137</sup>



[NAA A705 9/30/297 via GRB]

### **An extremely interesting *Coastal White* image of PB2B-2 A24-110 in early DEC 1944**

Here at 1FBRD (Mariner in the background), the date can be virtually identified to the day because of the serial number applied, probably 4-7 DEC 1944. The small font on the rudder reads **PB2B-2**.

**Serial numbering.** The Catalinas were delivered from the USA with 'consecutive numbers' from A24-1. But by the stage the PB2Bs were being delivered from DEC 1944, these different models were ideally suited for the RAAF 'block numbering' system. Initially the decision was made that PB2Bs be numbered in the 200 block; but the PB2Bs were not all the same – there were PB2B-1s, PB2B-2s, and PB2B-2Rs, which resulted in 'block numbers' from A24-200, A24-300, and A24-350. This particular PB2B-2 Bu 44234 was numbered consecutively in the sequence following the PB2B-1s (that at that stage had been serialised up to A24-105) as **A24-110** on 3 DEC 1944. Then immediately it was decided it was to be in the 200-block as **A24-204**, but this block was intended for the PB2B-1s. Several days later, RAAF HQ decided to renumber in the 300-block as **A24-301**.

**National Markings.** The following image of A24-350 shows that the ex-RAF type-C1 roundel has the *Red* overpainted but retains the thin outer *Yellow* ring. Also for the fin flash, there is no *Red*, and the *White* has been bordered as a "hollow rectangle", shown to good effect above on A24-110.

## RAAF PB2Bs IN COASTAL WHITE 1944

Catalinas had been numbered in RAAF practice in 1941 consecutively from A24-1. Conventional wisdom has been that PB2B-1s finished at A24-114 – however, there had been other allocations up to A24-131. Also it is not that straightforward, as numbers from A24-106 had been allocated to PB2Bs, and then confusingly reserialled – and in two cases twice – and there are inconsistencies in records. So to do this series justice (in what, after all, is “*adf serials*”) here is a review of RAAF numbering policy, as with the Catalina this was not a simple case of renumbering.

**PBY-5A.** This “consecutive” series ran for PBY-5As from A24-69 up to A24-105 in SEP 1944 – and soon PB2Bs were being delivered and numbering continued sequentially (however, follow-on PBY-5As were numbered in a reserved batch from A24-123 to A24-131). With PB2B flying boats being accepted in two sub-types – the PB2B-1 (basically a PBY-5) and the PB2B-2 (a flying boat variant of the PBY-6A) – RAAF HQ decided to implement its policy of “block” numbering for different models soon after arrival in mid-NOV 1944, which had successfully been used for A27 and A29 aircraft. By the stage was occurring, numbers had to be retrospectively altered.<sup>138</sup>

**PB2B-1.** PB2B-1s were renumbered from A24-200, with only seven were received up to A24-206. (A24-200 to -206 had originally been in a group amongst the numbers A24-106 to -116.) The next PB2B-2s were also confusingly allocated numbers amongst this consecutive 100 block from A24-109, changed to the 200 “block”, and changed again to 300s.

**PB2B-2.** The “block” policy meant major sub-types had their own series, for PB2B-2s this was from A24-300. Bu 44234 **A24-110**, which had already been re-numbered **A24-204** was reallocated **A24-301** in this new 300 series. These ten aircraft numbers ran up to A24-309; but then the PB2B-2 itself bred a new sub-type.

**PB2B-2R.** The USN suffix “R” indicated a modification to transport duties, which meant the stripping of some operational mission equipment, primarily radios. Aircraft serials were continued on for the PB2B-2Rs from A24-310 to A24-312. But for policy consistency, these were then allocated in a new block as A24-350 to A24-352 (which eventually ran up to A24-386). These aircraft were ferried with RAF serials, not Bus, which were changed on arrival at Rathmines.



[du Plessis collection]

**JX661/A24-310/A24-350 in RAF Coastal White, probably at San Pedro in MAR 1945, prior to delivery to Australia**  
*Red* in the RAF national markings has been overpainted by *White*; JX661 was allotted A24-310 on arrival, then reserialled A24-350.

### PB2B National Markings



Modified RAF type C1 Roundel and Fin Flash – both with *Red* Removed



September 1943, respraying Roundels Bowen: GRB Collection

### Catalina Ferries

**PBY-5As.** Most of the later delivery PBY-5As and PB2B were fitted out at the RAAF Ferry Det at Terminal Island, San Pedro, near Los Angeles – it had moved there from North Island, San Diego in 1944, which coincided with PBY-5A production being moved from San Diego to New Orleans, Louisiana. Aircraft would arrive from the factories in 1944 – either Consolidated at New Orleans or from Boeing Canada in Vancouver – and undergo modification with the fitment of equipment, and this could involve the major Modification 60 from AUG 1944 for the removal of undercarriage from amphibians. Late contract changes with New Orleans also specified application of RAAF markings – so it is unsure whether National Marking application actually occurred at the Louisiana factory, or during modification at RAAF Ferry Det San Pedro (which would only have involved over painting *Red* from ex-RAF PB2Bs), or on arrival in Australia at 1FBRD. However, from SEP 1944 RAAF serials were applied at San Pedro on many aircraft.

**PB2Bs.** PB2Bs were diverted from the RAF from as far afield as the UK and the modification centre in Elizabeth City, North Carolina, to San Pedro for fitting out to RAAF requirements before despatch to San Diego for the trans-Pacific ferry. As they were diverted from RAF contracts, PB2Bs were received from the factory in the standard *Coastal White* scheme, and repainted in *Black* on arrival in Australia at 1FBRD at Lake Boga before issue to units. Another role taken over by San Pedro in SEP 1944 was the re-serialling of Catalinas from aircraft A24-104, and allotting numbers up to A24-131. After the routine of the PB2B “block” serials was properly understood and institutionalised back in Australia, PB2Bs continued on their trans-Pacific ferries with RAF numbers until changed at 2FBRD

Rathmines. It was interesting that in MAY 1945, San Pedro wrote to 2FBRD about removal of RAF serials: “It appears that when the JX or JZ number is painted off the aircraft [i.e. at Rathmines], no one keeps a record.”<sup>139</sup> This was true to some extent, as E/E.88s only cross-referenced the A24- number with the USN Bu number.

### The Great Reserialling Mix-up

Re-serialling of Catalinas was confusing – and still is, so a clarification is listed on the next page. Many serials were allotted twice, while aircraft could be allotted two different RAAF serials (two PB2B-2s even had three RAAF serials – A24-109 as A24-201 then A24-300, and A24-110 as A24-204 then A24-301; A24-201 and A24-204 were re-allotted).<sup>140</sup>

**PBY-5A(M).** PBY-5As were direct US Lend-Lease,<sup>141</sup> not diverted from RAF contracts, and our last eleven were modified to PBY-5A(M) flying-boats at the Consolidated New Orleans factory.<sup>142</sup> In SEP 1944, for the first time RAAF Det at San Pedro allotted RAAF A24- serials to Catalinas (previously having being allotted at Rathmines consecutively on arrival ex-USA). The first aircraft numbered by San Pedro was A24-104 (Bu 46594) on 13 SEP, then A24-105 (46592) on 18 SEP. Following PBY-5A(M)s coming from the New Orleans plant would be in OCT 1944, with nine aircraft numbered from A24-123. Now this 17 serial number gap (A24-106 to A24-122) was intentional, as San Pedro was expecting 17 PB2B-1s from Boeing in Canada, which were replacing PBY-5As from Australia’s 1945 allocation.<sup>143</sup>

**PB2Bs.** The PB2B allocation – which eventually totalled 54 aircraft – was diverted from British contracts, when the RAF decided it wanted no more of these variants, which freed up supplies for the RAAF and RNZAF. The initial supply Indent AIR 2361A incorrectly listed the 54 PB2B to be supplied to Australia as follows:<sup>144</sup>

Type	Quantity	RAF Serial Numbers	Remarks and Subsequent RAAF Serials
PB2B-1	17	JX611 through JX627	But only <b>seven were PB2B-1</b> – JX611 to JX617, re-serialled in the RAAF “block” A24-200 to A24-206. The other <b>ten were PB2B-2</b> – JX618 to JX627, re-serialled in the RAAF “block” A24-300 to A24-309.
PB2B-2	17	JX660 through JX662 JZ828 through JZ841	Mission equipped removed for transport role as PB2B-2R, re-serialled in a new “block” A24-350 to A24-366.
PB2B-2	20	JX628 through JX643 JX645, JX646, JX648, JX652	Also PB2B-2R serialled as A24-367 to A24-386.

In general, PB2Bs initially crossed the Pacific with RAAF serials allotted by San Pedro, and then subsequently with RAF serials, in both cases to be re-serialled at Rathmines. But this was not as straightforward as this list implies. After allotment of serials by San Pedro was halted, and after the “block” system was understood, there were still problems! For instance, **PB2B-1 A24-106** arrived at 2FBRD Rathmines on 11 NOV 1944, and RAAF HQ signal Q0324 advised on 16 NOV that the aircraft was to be re-serialled **A24-200**, but the aircraft had already departed for induction at 1FBRD Lake Boga. On 2 DEC 1944 the aircraft returned to Rathmines with 3OTU, but the number applied was still A24-106. On 9 FEB 1945 RAAFHQ queried by signal Q0164: “Advise why renumbering not inscribed on A/c. In future A/c to be shown as A24-200”. The original signal had been misplaced.



A24-205 RB-X GRB Collection

## CATALINA RE-SERIALLING

The RAAF Washington files show San Pedro's first A24- allocation was in SEP 1944 with the arrival of **A24-104**, the first of twelve PBY-5A(M)s modified to flying-boats in New Orleans.<sup>145</sup> These included four (A24-123 and A24-126), to be serialled at San Pedro from 20 OCT 1944. This however was not recorded on the E/E.88s – which were only raised on arrival at Rathmines. The confusing A24-serialling by San Pedro was accentuated by the concurrent introduction in Australia of the A24 “block” numbers. The **PBY-5A allocation of A24-123 to A24-131** was reserved by San Pedro around the anticipated **PB2B-1 and PB2B-2 deliveries from A24-106 to A24-122**, i.e. before the concept of A24 “blocks” was implemented by RAAF HQ in Melbourne from NOV 1944, then refined in DEC 1944.<sup>146</sup>

First RAAF No by San Pedro	Date Allocated	Catalina Model	Bu No. and RAF Serial for Production	Subsequent RAAF No in Australia	New No. Allocated
A24-106	OCT 44	PB2B-1	44227 / JX617	A24-200	16 NOV 44
A24-107	OCT 44	PB2B-1	44225 / JX615	A24-203	3 DEC 44
A24-108	NOV 44	PB2B-1	44226 / JX616	A24-202	24 NOV 44
A24-109	NOV 44	PB2B-2	44229 / JX619	A24-201 #1 A24-300	23 NOV 44 7 DEC 44
A24-110	NOV 44	PB2B-2	44234/ JX624	A24-204 #1 A24-301	3 DEC 44 7 DEC 44
A24-111	6 DEC 44	PB2B-2	44230 / JX620	A24-302	6 JAN 45
A24-112	DEC 44	PB2B-1	44217 / JX611	A24-206	9 FEB 45
A24-113	DEC 44	PB2B-1	44218 / JX612	A24-201 #2 <sup>147</sup>	27 DEC 44
A24-114	6 DEC 44	PB2B-2	44231 / JX621	A24-303	6 JAN 45
A24-115	DEC 44	PB2B-1	44219 / JX613	A24-204 #2	27 DEC 44
A24-116	DEC 44	PB2B-1	44224/ JX614	A24-205	6 JAN 45
A24-117	DEC 44	PB2B-2	44233 / JX623	A24-306	18 JAN 45
A24-118	DEC 44	PB2B-2	44236 / JX626	A24-309	23 FEB 45
A24-119	DEC 44	PB2B-2	44232 / JX622	A24-307	23 JAN 45
A24-120	DEC 44	PB2B-2	44235 / JX625	A24-308	9 FEB 45
A24-121	DEC 44	PB2B-2	44237 / JX627	A24-304	6 JAN 45
A24-122	DEC 44	PB2B-2	44228 / JX618	A24-305	16 JAN 45
A24-123	20 OCT 44	PBY-5A(M)	46605	A24-106	14 DEC 44
A24-124	28 OCT 44	PBY-5A(M)	46606	A24-107	14 DEC 44
A24-125	28 OCT 44	PBY-5A(M)	46607	A24-108	19 DEC 44
A24-126	28 OCT 44	PBY-5A(M)	46608	A24-109	19 DEC 44
A24-127	1 DEC 44	PBY-5A(M)	46619	A24-110	23 FEB 45
A24-128	7 DEC 44	PBY-5A(M)	46620	A24-111	23 FEB 45
A24-129	11 DEC 44	PBY-5A(M)	46621	A24-112	6 MAR 45
A24-130	19 DEC 44	PBY-5A(M)	46622	A24-113	6 MAR 45
A24-131	19 DEC 44	PBY-5A(M)	46623	A24-114	21 MAR 45
A24-310	19 MAR 45	PB2B-2R	44279 / JX661	A24-350	29 MAR 45
A24-311	19 MAR 45	PB2B-2R	44286 / JZ833	A24-351	29 MAR 45
A24-312	21 MAR 45	PB2B-2R	44278 / JX660	A24-352	29 MAR 45



[colourised from Percy, p.81]

**PB2B-2R JX632 (Bu 44250 / A24-382) produced by Boeing at Vancouver, before ferry via the US across the Pacific**

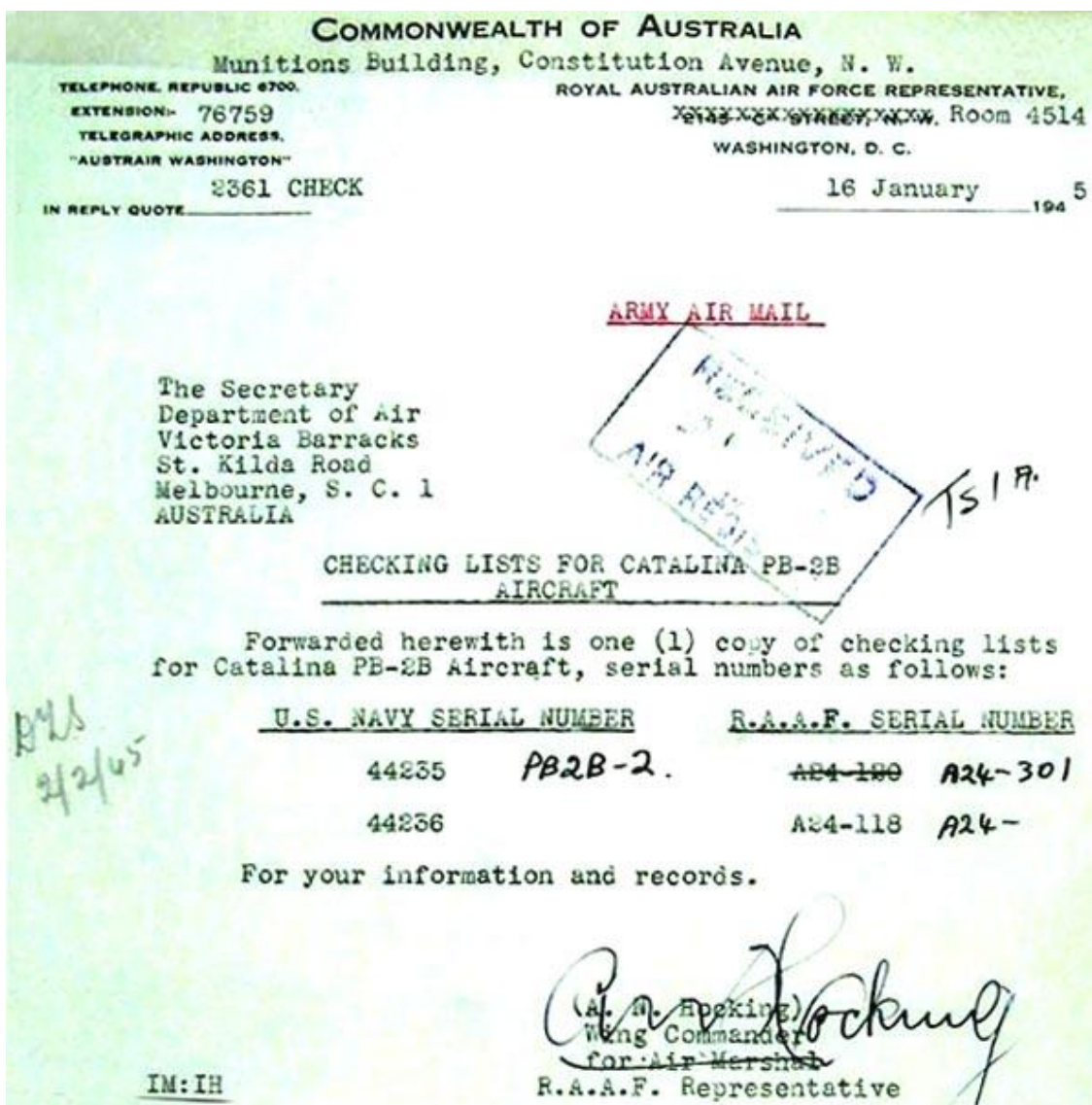
Made as Lend-Lease Bu 44250 / JX632 and diverted from its RAF contract, all PB2B-2Rs were ferried with RAF serials. On arrival at Rathmines, the RAF serial was immediately changed to A24-382 for despatch to Lake Boga for RAAF induction. This image shows the upper mainplane markings – a modified TSS pattern of *EDSG/Dark Slate Grey*, with upper type-C roundels replacing type-Bs.

## CATALINA RE-SERIALLING

The confusion in re-serialling Catalinas is evident in a JAN 1945 letter from RAAF Washington to Dept of Air in Melbourne showing Catalina serials.<sup>148</sup> Two PB2B-2s are mentioned: Bu 44235 was serialled A24-120 by the RAAF Ferry Det at San Pedro, and Bu 44236 became A24-118.

This letter, below, shows how much RAAF staff at Washington were out of the loop with Catalina serialling. On 16 JAN 1945 it was claimed that PB2B-2 Bu 44235 (*ex A24-120*) had become A24-301. But... A24-301 was **44234**, serialled at San Pedro as A24-110, and had arrived at Rathmines in DEC 1944 – its E/E.88 is recorded as **A24-110** and on 2 DEC at Rathmines was “**renumbered A24-204**” for the introduction of “block” serials for PB2Bs. However, the “block” was extended from -200 series to the -300 series to **differentiate** between PB2B-1s and PB2B-2s, so accordingly the E/E.88 records this for 7 DEC as “**renumbered 301**”. Both these “block” series were numbered sequentially by Rathmines on arrival. [*Later Bu 44235/A24-120 – which Washington had thought became A24-301 – arrived at Rathmines on 8 FEB 1945, and the following day was renumbered as A24-308.*]

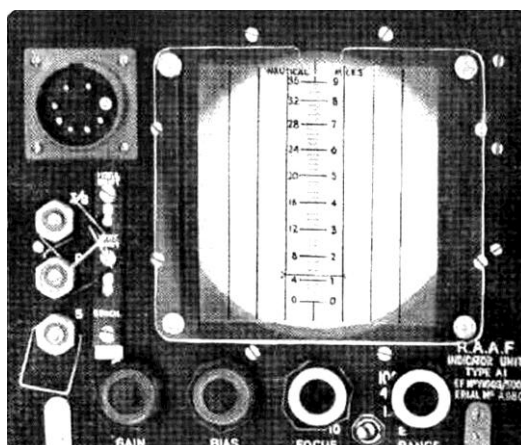
The new serial for Bu 44236 / A24-118 at that stage was unknown by Washington in JAN 1945, unsurprisingly as it did not arrive at 2FBRD Rathmines until FEB. It ultimately was “renumbered” (according to its E/E.88) as A24-309 on 23 FEB 1945. Often with the conflicting information from files, records and E/E.88s, resolution is determined by known dates – the timeline when a particular aircraft departs and arrives, and in company with what other aircraft being ferried, and below being a good example.



## RADAR

The first radar carried by the Catalina was known as **ASV.II**, an abbreviation for “air-to-surface vessel”, and not a US designator. The ASV.II aerial configuration was the forward-looking, or homing, Yagi aerial configuration – this was common to all aircraft carrying this radar. ASV.II normally featured a single transmit aerial in the nose and a receiving aerial under each wing angled out by 20-45 degrees from the airframe centreline. A second aerial array was the sideways-looking “search” array fitted to larger aircraft.

ASV.II was productionised in Britain in early 1941. It was then given to the US (with the forward-looking Yagi transmit and separate receive arrays) where it was renamed the SCR-521 or **ASE**, with US-produced components. ASE was “long-wave”, a 1.5m wavelength, with its fixed underwing Yagi aerials indicative of ASE radar. Next came “medium-wave” radar (i.e. shorter wavelength) – the ASE-II Spec known as the **ASB** – similar to ASE but with steerable aerials. All these systems were referred to generically as “ASV” (and not as radar), with ASB-equipped PBY-5As delivered to the RAAF through 1943 and 1944. The latest variant, ASB-7, equipped the last RAAF PBY-5A deliveries.<sup>149</sup>



[NAA file A705 9/30/182 (39D)]

**RAAF Catalina navigator's ASB radar L-scope**

One of the most significant technological leaps of WWII was the development of “centimetric” radar. The breakthrough of radar operating on a wavelength below 10cm had become possible by the British invented cavity magnetron valve. Being capable of generating powerful transmissions at short wavelengths (microwaves), centimetric radars were able to overcome the main problems that had plagued earlier generation airborne radars, by being beamed by a directional antenna and largely eliminating the target return being lost in ground clutter.<sup>150</sup> From AUG 1940, cooperation between Britain and the US enabled transfer of radar technology, and the cavity magnetron's generation of high-power radio waves of a few centimetres length was of particular importance to US airborne radar.<sup>151</sup> So the final radar on RAAF Catalinas (the PB2Bs) utilised this technology. This was the US **AN/APS-3** (initially known as the ASD-1), which had a considerably smaller 3cm wavelength antenna that could be fitted into a radome – a teardrop shaped dome above the Catalina cockpit to PB2B aircraft. AN/APS-3 was fitted to RAAF PB2B deliveries.<sup>152</sup>

Other Catalina radar and radio equipment fitted to various versions of the Catalina in 1944 included:<sup>153</sup>

- SCR-522A VHF radio, replaced by the AN/ARC-5 VHF/HF;
- SCR-729 air-to-air IFF Mk.III with Rebecca homing beacon (replaced by AN/APX-8);
- ABK-1 IFF, replaced by AN/APX-2;
- SCR-269 radio compass/ADF;
- AN/APN-4 LORAN;
- AN/APN-1 radio altimeter (had replaced AYD).

**PBY-5As.** The E/E.88s for individual aircraft record fitting during 1944 of ASE and ASB at 1FBRD. The ungainly Yagi transmitter array, mounted under the wings, was also fitted to the Beaufort and Walrus for air-sea rescue.

**PB2Bs.** The AN/APS-3 search radar, with its antenna mounted in a teardrop radome above cockpit, was fitted to PB2B-1s (A24-200/206) – similar to the PBY-5 – and the later “tall tail” PB2B-2s (A24-300/309 and A24-350/386) – which were basically a flying boat variant of the PBY-6A amphibian.

## WEAPONS

From 1943, RAAF Catalinas settled in what became their primary role for the remainder of the war – minelaying, which became synonymous with “Black Cats”. Several foreign postwar assessments of the RAAF’s minelaying operations highlight the value of the Catalina nocturnal missions. A USAF Air University thesis reported: “Australian aerial mining began 22 APR 1943 when eight aircraft laid sixteen magnetic mines at Kavieng, New Ireland. Those mines, and others at Lorengau in the Admiralty Islands, convinced the Japanese to abandon fleet anchorages there after mines sank five ships and damaged seven Others. In AUG 1943, the RAAF flew over 1,000 miles to attack the headquarters for Japan’s Second Southern Expeditionary Fleet at Surabaya. Their mines sank seven ships, and damaged eleven. On this, and other, long-range flights, the Catalinas extended their reach by refuelling with USN seaplane tenders on the return route. For the next two years the Australians flew missions throughout the NEI, including New Guinea, Halmahera, Celebes, Java, and Borneo. Additionally, in 1944, they laid mines to support amphibious landings in the Carolines, Marshalls, and Philippine Islands. Ultimately the RAAF extended their reach as far north as the Chinese coast, while still mining all major harbours in the East Indies. Out of 1,130 successful sorties that laid 2,498 mines, the Australians lost nine aircraft, a 0.8 percent loss rate. Altogether, the postwar US Strategic Bombing Survey estimated these mines sank 90 ships totalling 250,000 tons, or approximately 40 percent of Japanese losses in the NEI.”<sup>154</sup>

In another assessment of the minelaying campaign, a British naval historian concluded: “The blockade had, in fact, been far more successful than we realized at the time. Though the submarines had been the first and main instruments for its enforcement, it was the air-laid mines which finally strangled Japan.”<sup>155</sup>

### Guns

On early PBVs, in fact, the bow “turret” was nothing more than a semi-open bombardier/observer’s post. Guns came later — ineffective single or twin .30s in the nose (replaced in British and RAAF service by .303s). Further aft, single .50s armed each waist blister from 1943, with sometimes a .303 firing from a belly hatch near the tail. From mid-1944 eyeball nose turrets started to be fitted.<sup>156</sup>



Two images of 43SQN eye-ball turret at Darwin, JUN 1944 [AWM NWA0879 and NWA0880]      An ASR FLT at Morotai, FEB 1945 [AWM OG2230]

The “eye-ball” nose turret, 2x.303 guns, which could be retrofitted to the open bow observer position



.303” scaled with a .50-cal



[internet]



[ipms Stockholm]

USN colour images showing the waist blister and .50-cal Browning armament



## Bombs, Depth Charges and Torpedoes

The original 18 28-5MA Catalinas carried 16 Universal Carriers under the mainplane, capable of carrying a maximum bombload of 4,000 pounds.<sup>157</sup> By JUN 1942, standard Catalina weaponry was 500lb HE bombs and 20lb fragmentation bombs; generally for attacking airfield and ports, US or UK 500lb or 250lb bombs were carried. From A24-19 the universal carriers were replaced by eight Mk.XXXV bomb racks (2 x external, 2 x internal per wing); from A24-31 these were replaced by eight Mk.51 racks.<sup>158</sup> Each Mk.51 rack could carry loads up to 1000lb.<sup>159</sup> To carry loads up to 2,000lb, external cradles could be fitted below the centresection, outboard of the wing struts and inboard of the internal racks – each could carry two 1,000lb bombs, although two 500lb bombs was a more normal fit. For depth bombs, 8 x 325lb Mk.17 or 4 x 625 lb Mk.37 (shown below) became the acceptable loads.<sup>160</sup>

And at this stage beer bottles were dropped – having been emptied, and “armed” with used razor blades taped across the spout, they were thrown from the waist position, emitting an ear-piercing whistle which was supposed to demoralize the Japanese.<sup>161</sup> RAAF trials were even carried out in 1943 with 2200lb Mk.XIII aerial torpedoes, but evidently were not used operationally.<sup>162</sup>



[internet]



[Creed, p.110]

4 x Mk.37 625lb depth bombs loaded underwings, 2 on the cart with a 500lb GP bomb

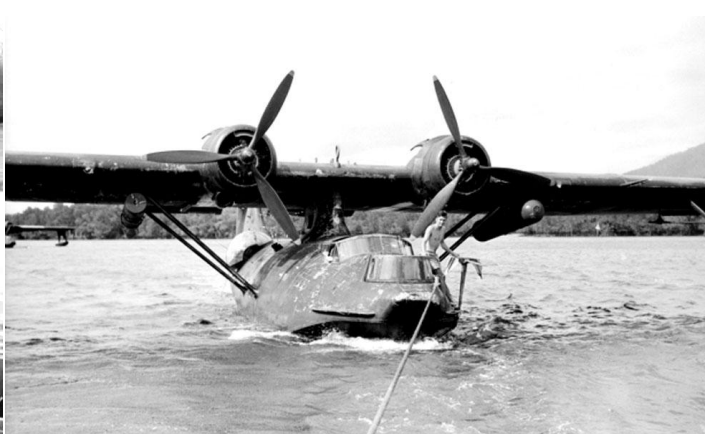
A 2200lb Mk.XIII torpedo

## Mines

Mine laying operations started in early 1943, and by 1944, under the codename “*Courting*”, these operations had taken priority. Both US and UK parachute-retarded aerial mines could be carried, and these had different methods of setting them off. Mines would weigh 500-2000lb each,<sup>163</sup> with one carried under each wing on the inboard hardpoint. Later in the war, American made bombs had lugs for both US and British bomb shackles and tail fins. The British shackles used single lug while the Americans used two.<sup>164</sup> Historian Peter Malone agrees with the US Bombing Survey total of 2,500 mines dropped, and assesses some **1,900 were US** mines and **600 were UK** mines (all being magnetic, apart from the 365 x Mk.13 1000lb acoustic mines that were initially used).<sup>165</sup> A 1944 RAAF memorandum on aerial mines stated: “There are at present five types of mines carried by RAAF aircraft. Two of these are British and three are American.”<sup>166</sup> These were British “A” series, and US Mk.12, Mk.13 and Mk.25 aerial mines.



[AWM NWA 0897]



[AWM NEA 0347]

43SQN Mk.25 mine MAY 1945

Cairns JAN 1944: stbd wing Brit ‘A’ Mk.9 (1800lb), port US Mk.25 2000lb mine

## CATALINA MARKINGS – SQUADRON CODES

Each of the four operational RAAF Catalina squadrons carried two-letter unit codes, and a single-letter aircraft identity. But these could be marked in different ways, and across the four units they were. RAAF DTS policy had allocated the two-letter codes by AFCO A.3/43 in JAN 1943, and unlike the delay to apply the codes to airframes of some units stationed in the north, Catalina codes appear to have been marked in either the first or second quarter of 1943. Several paragraphs of this order read:

2. The code for operational squadrons will take the form of two letters of the alphabet chosen by Air Force Headquarters to indicate the squadron, there being no sequence in the choice of the letters. Each aircraft in the squadron will also be identified by a single letter of the alphabet to be chosen by the squadron commander. Thus, No 14 Squadron has been allocated the code letters "PN". Aircraft in No 14 Squadron will therefore be marked -

PN - A    or    A - PN  
PN - B    or    B - PN  
PN - D    or    D - PN

and so on. THE LETTERS "C" AND "I" WILL NOT BE USED.

NOTE: The dash in between the letters indicates the fuselage roundel.

Such markings will be applicable to operational, transport, rescue and communication, and communication flight aircraft.

6. Normally code letters are to be placed, showing the squadron code letters immediately forward of the fuselage roundel with the single individual aircraft distinguishing letter immediately aft the roundel.

There may be cases, however, where there is insufficient room on certain aircraft for the two squadron code letters to be placed forward of the roundel, and in this case it is permissible to transpose the position of the letters..

8. Details of application, size and position of these letters is shown in Air Diagram 2001 already issued to units to which reference is to be made. Briefly summarised, each code letter is to be a maximum of 48" high, 24" across and strokes forming the letter are to be 6" wide. There is to be a space of 6" between each letter. These sizes to be correspondingly reduced if there is insufficient space on the fuselage. In all cases, however, the letters are to be the same height as the diameter of the fuselage roundel and the whole shall form a horizontal line of letters when the aircraft is in the flying position.

9. The colour of the code letters is to be Dope Camouflage *Sky Blue*, Ident No K3/195 for all aircraft.

10. It is to be the responsibility of the squadron receiving the aircraft to apply the relevant code letters as soon as possible after receipt of the aircraft.



**A24-75 with 11SQN FJ-D trigraph at East Arm, Darwin late 1944**

[adf-serials]



**A24-76 with 20SQN trigraph RB-V servicing at 1FBMU Bowen, MAY 1944**

[AWM NEA0462]

## CATALINA MARKINGS – SQUADRON CODES

As seen with these 11SQN and 20SQN examples (above), Catalinas often had the code letters marked as a three-letter trigraph aft of the roundel, with a hyphen to split the squadron and individual letters. As *Sky Blue* was found to fade quickly to an off-white, the revised AGI Pt 3(c), of 26 MAY 1944 standardised that codes should be in *Medium Sea Grey* (K3/183). Grey of course too would fade to an off-white. The curvature of the Catalina fuselage can be seen below, and can often give a distorted view of the roundel and letter proportions.

Variations in application of code letters of course did occur. There are examples of 11SQN and 20SQN aircraft later coded with the roundel splitting the code letters, in particular with the receipt of PB2B aircraft. 42SQN, however, was the exception - possibly as a function of forming later, as 42SQN did not form until JUN 1944. All 42SQN aircraft had letters either side of the roundel, in a format where they logically read in a 'proper' format, e.g. RK \* A, where RK was aft of the roundel on the starboard side (see below), and forward on the port side.



[Goodall Aviation site]

### 42SQN's A24-88 RK-A under restoration at the Australian National Aviation Museum at Moorabbin

This image shows the fuselage cross-section and the sloping and curving sides of the fuselage, which curved the application of the roundel and the code letters. 42SQN was the only unit to split the code like this – other squadrons primarily used a trigraph aft of the roundel. The roundel itself varied from type-A1 1:3:5:7 on delivery in 1941; to the 3:5 *Blue/White* only from SEP 1942; then 2:5 tone-down in 1943 and followed by the smaller 1:5 *White* disc in 1944. With this 2:5 36"-style roundel (with a *White* disc approximately 16"), the outer Blue ring on the sloping fuselage side would curve under the hull – this curvature gives the illusion when viewed straight on, that the roundel height is only ¾ of the width.

### 44 Squadron

The appendix to the AFCO A.3/43 provided a list of squadron code letters, not only for the units already in existence, but for those planned for future formation. Code letters "FJ" were allocated to 11SQN, "RB" to 20SQN, "RK" to 42SQN, and "OX" to 43SQN. Furthermore, "AA" was allocated to 44SQN.

In 1944 it was planned that a fifth Catalina squadron, 44SQN, was to be formed, but by SEP 1944 this was deferred until 1945.<sup>167</sup> The RAAF Organisation Memorandum No.746 in JUL 1945 noted that although 44SQN was to have formed from 107SQN in JUN 1945, because of manpower this plan was deferred indefinitely.<sup>168</sup>

## 11 SQUADRON

11SQN was formed at RAAF Richmond in SEP 1939, moving to Port Moresby with two Seagulls and two Empire flying boats. In MAR 1941, 11SQN received its first Catalina to enable reconnaissance tasking throughout the year, establishing a forward base at Rabaul. By JUN 1941, 11SQN had four Catalinas and four Empires, patrolling an area east of the Santa Cruz, the Loyalty groups to the north of New Ireland and the Admiralties. 20SQN then formed in AUG 1941 at Port Moresby and took control of all six Catalinas, leaving 11SQN to carry on with the Empires until augmented by more Catalinas – by 1 NOV 1941 Catalina strength was back up to four (A24-9, -10, -11 and -12).<sup>169</sup>

With Japan's entry into war, from the beginning of 1942 reconnaissance on an increased scale were conducted from Soraken, Tulagi, Noumea, Rabaul and Suva, and with the first long-range attacks on Truk.<sup>170</sup> The Japanese landed at Rabaul and Kavieng on 22 JAN 1942, and by the end of FEB 11SQN and 20SQN had lost eight Catalinas,<sup>171</sup> including three destroyed in a Zero raid moored at Port Moresby. Catalinas undertook a series of night bombing raids throughout 1942 – and in MAY, both 11 and 20SQNs moved to Bowen, from where during the **Battle of the Coral Sea** (4-8 MAY) the Catalinas provided valuable reconnaissance. In NOV 1942, 11SQN moved from Bowen to Cairns as an advanced operating base (remaining until mid-1944). 1943 remained an active period for the Catalinas. On 6 JAN 1943, 11SQN sighted an enemy convoy, sinking a 12,000-ton transport ship. On the night of 2 MAR, an enemy convoy steamed north of Vitiaz Strait towards Lae – an 11 SQN Catalina shadowed them during the night, and the following day, 3 MAR 1943, saw victory for Allied air power in the **Battle of the Bismarck Sea**. In APR 1943, 11SQN commenced operations in the North-Western Area (NWA), with an attack on a Japanese staging base at Babo.

APR 1943 also heralded the beginning of the largest task undertaken by the Catalinas, the **mining of enemy ports in the South-West Pacific Area (SWPA)**. The first mines were successfully dropped on the night of 22 APR 1943, and the last mines were dropped on 31 JUL 1945. Over APR-JUN 1943, mines were laid in the New Ireland and Admiralty Islands area, and then JUL 1943 saw the commencement of mining of harbours and shipping routes in the NEI. Under these "Courting" operations, Catalinas mined as far afield as China, and from DEC 1944 all four Catalina squadrons conducted mine-laying in Manila Harbour in support of the Philippines Allied landings (with 25 RAAF Catalinas involved). 11SQN then returned to Rathmines, and from SEP 1945 the main peacetime role became transporting personnel from Labuan. With demobilisation, 11SQN disbanded over early 1946, but in JUL 1948, the Search and Rescue Wing at Rathmines was renamed 11 (GR) SQN, with a total of nine PB2B-2s kept flying or in storage. One task was a stores and mail drop to the Macquarie Island Antarctic Expedition party in AUG 1948, and by 1950 the unit's responsibility for northern SAR at Townsville and Darwin ceased.

**11 Squadron Codes – from MAR 1943**

Code	Serial	Details and Name	Code	Serial	Details and Name
FJ-A	A24-52	A24-35; A24-69	FJ-N	A24-71	
FJ-B	A24-43	A24-53; -35; -72; A24-68	FJ-O	A24-	
FJ-C		not used	FJ-P	A24-69	
FJ-D	A24-14	A24-45; A24-75	FJ-Q	A24-	not used
FJ-E	A24-26	A24-50; A24-55	FJ-R	A24-	not used
FJ-F	A27-32	A24-74	FJ-S	A24-	not used
FJ-G	A24-36	A24-47; A24-42; A24-79	FJ-T	A24-	not used
FJ-H	A24-38	A24-57; A24-37	FJ-U	A24-	not used
FJ-I		not used	FJ-V	A24-	not used
FJ-J	A24-40	A24-55; -37; -78; -56	FJ-W	A24-	not used
FJ-K	A24-42	A24-51; A24-47	FJ-X	A24-	not used
FJ-L	A24-49	A24-38; A24-61	FJ-Y	A24-	not used
FJ-M	A24-		FJ-Z	A24-	not used

Codes were normally a trigraph **aft of roundel** on both sides, with the three-letter group separated by a hyphen, e.g. **FJ-A** both sides. However, occasionally roundel could separate letters, e.g. A24-47 FJ\*K port side in Darwin JUL 45. 11SQN appears to have carried FJ- codes from MAR 1943; when 11SQN was operating with 20SQN from Port Moresby in 1943 they used a joint system, whereby the individual codes split the alphabet – i.e. 11SQN were allotted letters from the beginning of the alphabet (**A to M**), and 20SQN were allotted letters backwards from the end of the alphabet (**Z to K**).

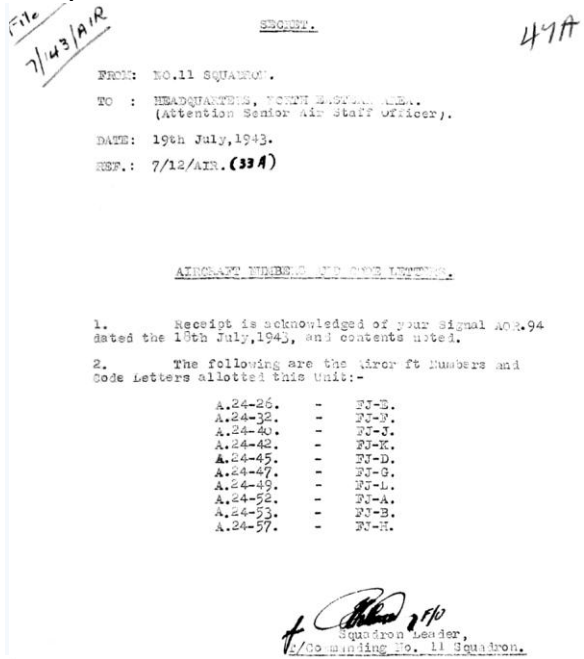
**11 Squadron Codes – initial single letter codes 1942**

Before the JAN 1943 AFCO A.3/43 directive for FJ- codes, 11SQN aircraft had carried single letter codes on the fin during 1942 and into 1943. This system was also adopted by 3OTU. Known 11SQN codes are:

- “A” A24-1; A24-25
- “D” A24-10 “Dagwood”
- “F” A24- 14 “Foo”
- “H” A24-17 “Donald Duck”
- “L” A24-22
- “M” A24-13

**11 Squadron Codes – documentation and style**

*Below: 11SQN signal 7/143/AIR (47A) of 19 JUL 1943 to Headquarters NEA*



The guidance of AFCO A.3/43 of JAN 1943 specifying code letters as a maximum of 48" x 36" in 6" strokes, was for the letters to be reduced correspondingly to adapt to the aircraft.

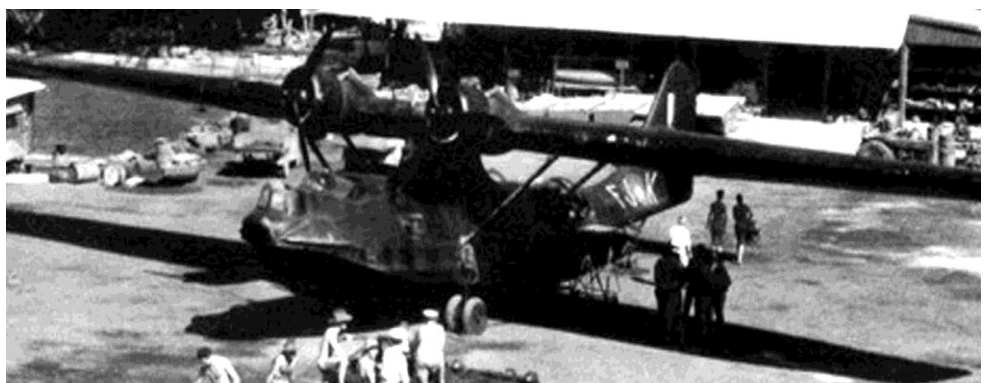
But proportions did not normally maintain this 4:3 ratio, and the standard adopted for the Catalina was generally 36" x 24" (3:2). The letters generally appear to maintain the policy by being the same height as the diameter of the fuselage roundel.

The 11SQN style of lettering was 36" high and 24" wide, in 4" strokes



[AWM NEA0455]

A24-78 with FJ-J trigraph at Bowen, MAY 1944



[adf-serials]

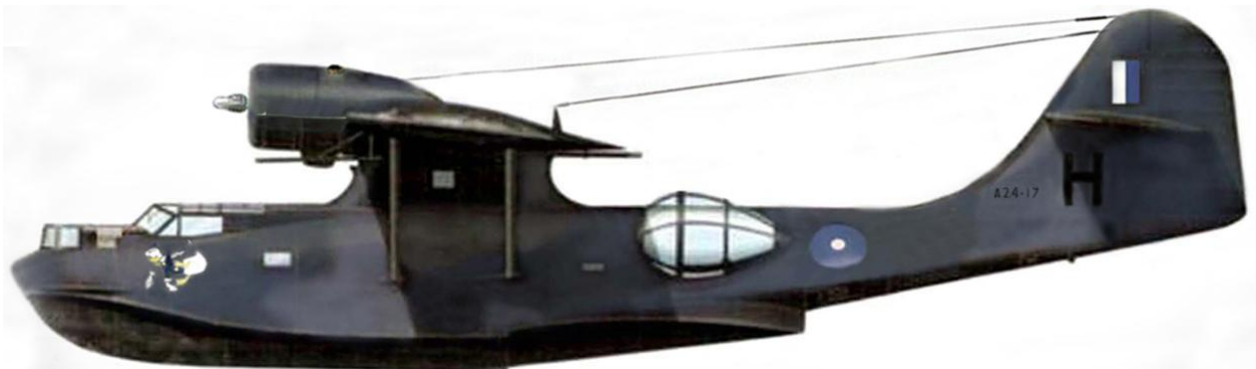
Unusually, A24-47 had a split code FJ\*K, at Doctor's Gully, Darwin JUL 1945



[colourised from adf-serials]

**A24-17 servicing at 1FBRD Lake Boga AUG 1942 still in delivery TSS camouflage**

A24-17 (attacked by a USN Wildcat in JUN 1942 prompting the eventual removal of *Red* from National Markings) here with *Red* centres remaining, until the policy change of SEP 1942. A24-17 was the first flying boat to complete an overhaul with 1FBRD.<sup>172</sup> Soon after this time the camouflage was darkened, a shade of dark blue overpainting *Slate Grey*. A24-17 may have been the first Catalina in the early 1943 Rathmines dark scheme trial, before the lighter *TSS* colours changed to *Dark Ocean Blue*/EDSG.



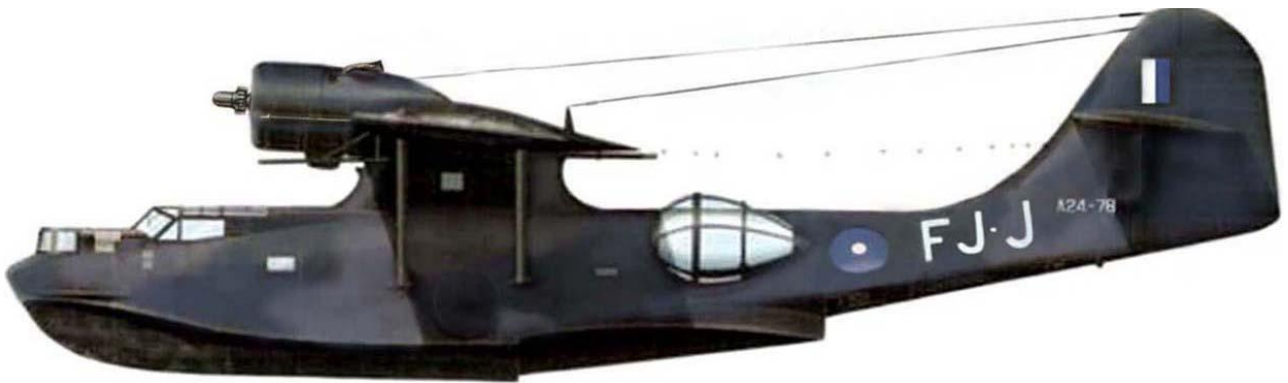
**A24-17/H Donald Duck with bomb, served with 11SQN JUL 1942 to MAR 1943, was one of the first aircraft to swap from *TSS* to a darker camouflage scheme developed from the beginning of 1943**



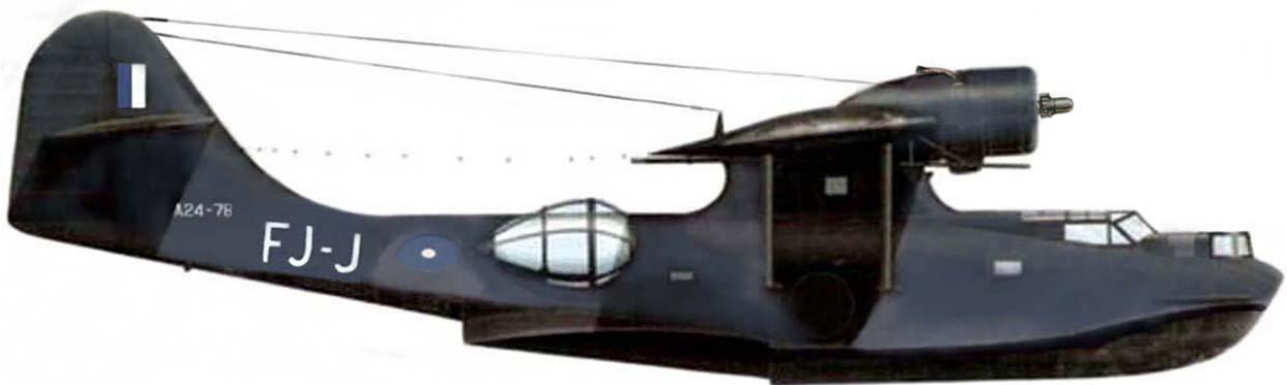
[AWM 152098]

**A24-17 11SQN in MAR 1943 immediately before issue to 30TU – at 30TU, A24-17 adopted “J” on the fin<sup>173</sup>**

PBY-5A(M) – A24-78 FJ-J Dark Blue/Dark Grey 111SQN 1944



*Dark Ocean Blue* (K3/318) and *Extra Dark Sea Grey* (K3/187) was painted on the upper mainplane with toned-down roundels. Beneath was *Night* (K3/179), with no roundels. The fuselage also incorporated a *Dark Ocean Blue* disruptive pattern with *Night*, and the roundels in 1:5 proportions and a narrow fin flash. Squadron codes were *Sky Blue* (K3/195) with serial in *Medium Sea Grey* (K3/183) – later fuselage was overall *Night*, and policy of MAY 1944 changed code letters to *Medium Sea Grey*. [These fuselage disruptive patterns referenced from AHCB #20 p.3, and AHCB #33 p.15.]



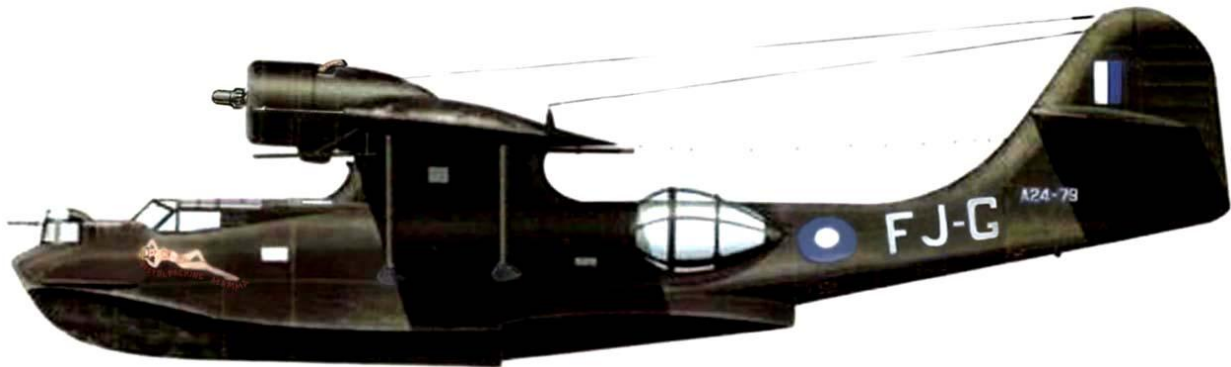
[adf-serials]

**A24-78 served with 111SQN in MAR 1944.** The 'FJ' codes were generally carried in a three-letter group aft of the roundel on both sides, e.g. always reading FJ-J. While the blue/grey disruptive pattern applied to the upper mainplane, some aircraft also had the fuselage disruptive blue/black, other were not disruptive but plain *Night*. This airborne A24-78 image of MAR 1944, still as a PBY-5A before modification to remove the undercarriage, shows the original bow turret and not the later "eye-ball" fitted to many by retrofit. Markings sizes by mensuration.<sup>174</sup>

PBY-5A(M) – A24-79 FJ-G 11SQN “PISTOL PACKING MAMMA” 1944



Catalina A24-79 FJ-G had disruptive mainplane upper surfaces and black *Night* fuselage [adf-serials]



A24-79 FJ-G in 1944, estimated *Red* bikini and titles. Fuselage roundel standard 2:5, codes in grey.



“Pistol Packing Mamma” nose art was popular (we have seen it already on a 31SQN Beaufighter), and this version on 11SQN A24-79 (left) was a reclining lady in a bikini, in a similar pose to a 1943 *Esquire* Varga model (centre). “Mama” or “Mamma” was particularly prevalent on US aircraft, here on a USN PBY (right) – spelling did vary.



[adf-serials]

A24-79 FJ-G served on 11SQN from JUN 1944, modified to PBY-5A(M) configuration, later eye-ball turret added

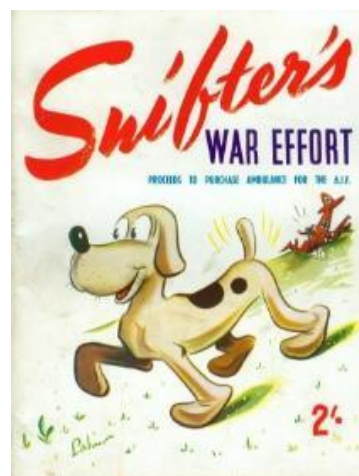


11SQN NOSE ART – 1943-1944



[Edward Titchener Collection via GRB]

A24-1 of 11SQN at Cairns, probably in early 1943. TSS scheme, with a 2:5 proportioned 30" diameter roundel, dating this as 1943. Fin flash is 24" high and 16" wide (8" per colour). Nose art features *Snifter*.



A24-1 *Snifter* leaving a 'Tokio' milepost, 11SQN Cairns [colourised from Pentland Vol.1 p.43] *Snifter's War Effort*



[colourised from AWM P02557.011]

A24-49 FJ-L "*Maggie*" in 1943 showing nose art wife of F/L Malcolm Brooks' wife painted by Paul Rigby who became a well-known artist.<sup>175</sup> Possibly at Port Moresby; a similar image is in *Catalina Chronicle*, pg.59.



[colourised from AWM NEA0326]

JAN 1944, aircraft not known 11SQN at Cairns, "*Popeye*" riding a bomb below the cockpit, colours estimated.

## 20 SQUADRON

The second unit, 20 (General Reconnaissance) Squadron, was formed at Port Moresby on 1 AUG 1941, taking over all six Catalinas from 11SQN's 'B' Flight.<sup>176</sup> 20SQN joined a comprehensive coast watching and reconnaissance operation, covering New Guinea, New Britain, New Ireland, the Solomon Islands and New Caledonia until the outbreak of war in DEC 1941. At the commencement of the war 20SQN had six Catalina and two Empire flying boats, and flew its first anti-submarine patrol on 17 DEC.

On 12 JAN 1942, six Catalinas began their first attack on the enemy, with both 11 and 20 SQNs making up the mission against the Japanese stronghold of Truk, on the Caroline Islands. Nightly raids continued against Japanese ships in Rabaul Harbour, intensifying during FEB, but this seemed to be having little effect on the enemy's advance. Over DEC-JAN 11SQN and 20SQN flew an incredible 427 sorties totalling 3,764 flying hours.<sup>177</sup> Port Moresby had been under attack since early FEB 1942, and on one surprise attack on Port Moresby in early MAR several Catalinas were destroyed with 11 and 20SQNs' records. Japanese air attacks continued on Australian bases, and as their naval activity increased around Rabaul and the surrounding seas, by MAY an invasion of Port Moresby seemed imminent. When enemy attacks made Port Moresby an unsafe base, both 11 and 20SQNs moved in MAY 1942 to Bowen, with Horn Island, Townsville and Cairns used as forward staging bases.

By early JUL 1942 20SQN was mainly devoted to anti-submarine patrols, enemy ship searches and searches for missing Allied aircraft, continuing these operations until JUN 1943, when mining operations commenced. In NOV 1942 the Squadron had moved to Cairns and commenced mining operations in JUN 1943, ranging through Manus Island, NEI and as far north as Manila. Although "*Courting*" mining became the major operational activity for 20SQN, and in SEP 1944 20SQN moved to East Arm in Darwin.<sup>178</sup> Raids were made on targets in Ambon, with supply drops on the Sepik River. During JAN 1945, the Squadron new "*Serenade*" operations, harassing the enemy at night, in addition to mining, standard search patrols and convoy escort duties. The last recorded wartime operation by 20SQN was a search patrol on 14 AUG 1945. In OCT 1945, 20SQN commenced the repatriation of POWs from areas such as Manila, continuing these operations after moving to Rathmines in NOV. The last recorded operation by 20SQN Catalina took place on 31 JAN 1946, when A24-307 flew to Balikpapan on transport duties; 20SQN was disbanded on 27 MAR 1946.<sup>179</sup> 20SQN had been the only wartime squadron equipped with the PB2B-1,<sup>180</sup> in addition to eleven PB2B-2s.<sup>181</sup>

### 20 Squadron Codes – from APR 1943

Code	Serial	Details and Name	Code	Serial	Details and Name
RB-A		not used	RB-N	A24-60	A24-71
RB-B		not used	RB-O	A24-63	A24-204
RB-C		not used	RB-P	A24-58	A24-82; A24-307
RB-D		not used	RB-Q	A24-48	A24-55; A24-372
RB-E		not used	RB-R	A24-46	A24-42; A24-43; A24-87
RB-F		not used	RB-S	A24-44	A24-33; A24-77; A24-306
RB-G		not used	RB-T	A24-34	A24-73; A24-86; A24-46; A24-301
RB-H		A24-300	RB-U	A24-41	A24-54; A24-303
RB-I		not used	RB-V	A24-35	A24-76; A24-203
RB-J	A24-76		RB-W	A24-27	A24-51; A24-37; A24-202
RB-K	A24-56	A24-77; A24-201	RB-X	A24-24	A24-23; -67; -77; A24-83; A24-205
RB-L	A24-59	A24-81; A24-304	RB-Y	A24-21	A24-84
RB-M	A24-61	A24-308	RB-Z	A24-50	A24-62; A24-85; A24-309

References for known 20SQN codes: adf-serials A24 database, signals, imagery. Codes were a trigraph aft of roundel on both sides. Like 11SQN, letters "C" and "I" were not allocated. As for 11SQN aircraft in 1942, single letter codes were marked on the fin. Then from 1943 there was a joint allocation system with 11SQN at Port Moresby, with the individual codes split the alphabet – i.e. 11SQN were allotted letters from the beginning of the alphabet (A to M), and 20SQN were allotted letters backwards from the end of the alphabet (Z to K). As more aircraft arrived however, this became impractical.

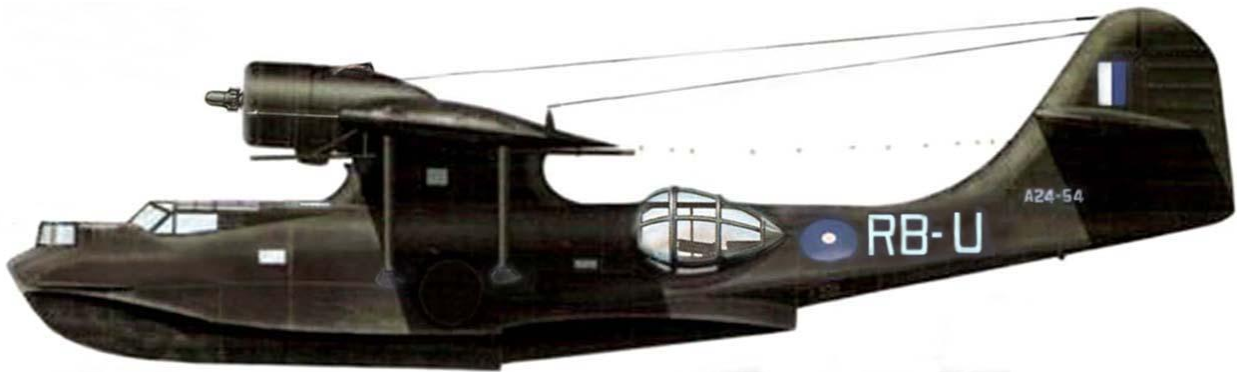
RB-LOPU

PBY-5 – A24-59/RB-L and A24-54/RB-U 20SQN 1944



[colourised from adf-serials]

**PBY-5 A24-59 RB-L with disruptive mainplane upper surfaces and fuselage, and black *Night* undersurfaces, c 1944**  
A24-59 with 20SQN from JUN 1943, then from JUN 1944 to 3OTU; 43SQN from AUG 1944.



**A24-54 RB-U, all-over *Night* 1944**

**A24-54** was received from the US in APR 1943 and served its whole career with 20SQN, until written off by enemy action in APR 1945. From MAY 1944 code letters were changed from *Sky Blue* to *Medium Sea Grey* – not a great priority as both faded to an off-*White*. Here the fuselage roundel has the smaller *White*, 1:5 ratio.

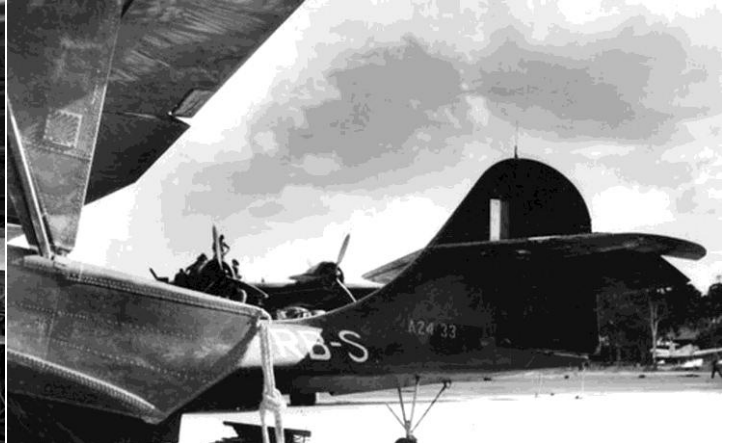
**OTHER 20SQN PBYs**

**Below left, PBY-5 A24-58 at 1FBRD in FEB 1945** – the 20SQN “RB” had been removed in MAY 1944 but is visible with paint stripped back (the individual “P” letter is not discernable); was 20SQN JUL 1943 to MAY 1944, prior to 3OTU and 43SQN (OX-U). In major servicing for air-sea rescue with 112ASRF in APR 1945, later to 111ASRF.

**Below right, PBY-5 A24-33 RB-S served with 20SQN until MAR 1944** – servicing at 1FBRD, before transfer to 3OTU.



**PBY-5 A24-58 “RB” at Lake Boga** [AWM VIC 0116]



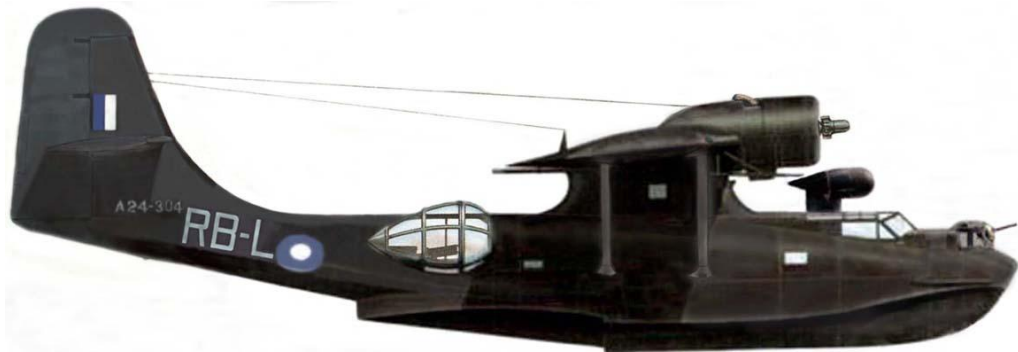
**PBY-5 A24-33 RB-S at Rathmines c1943-44** [adf-serials]

**PB2B-2 – A24-304 RB-L 20SQN 1945**



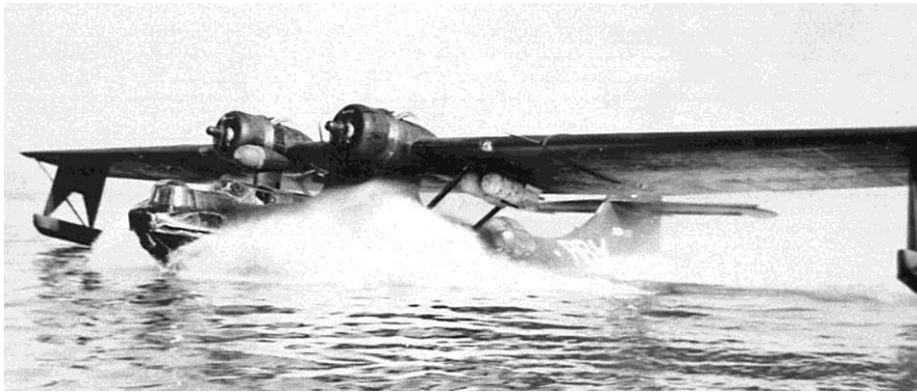
**RB-L A24-304 Labuan in 1945** *[adf-serials]*

A24-304 arrived from the US in JAN 1945, allocated serial A24-121 but changed immediately to A24-304, serving with 20SQN from FEB 1945 until JAN 1946. Like all PB2Bs, the nose turret was an eyeball, with the APS-3 radome above the cockpit.



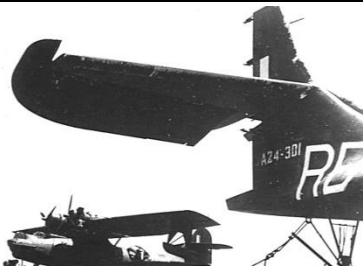
**OTHER 20SQN BOEING PB2Bs 1945**

20SQN was the only squadron to operate the PB2B-1, flying Catalinas A24-201 to A24-205



**A24-202 RB-W at Brunei Bay, JUN 1945** *[adf-serials]*

**PB2B-2s of 20SQN**



*[AWM 044473]*

**A24-301 RB-T served with 20SQN the first three months of 1945** (with A24-82 RB-P in background).



*[adf-serials]*

**A24-307 RB-P 20SQN from FEB 1945** (had originally been allocated A24-119), to 30TU beginning of 1946 then storage like many Cats at Rathmines until at least 1953.



*[adf-serials]*

**A24-372 RB-Q at Darwin, served with 20SQN over the last five months of 1945.** In 1948 loaned to QANTAS as VH-EAW, destroyed at mooring Rose Bay AUG 1949.

## 42 SQUADRON

42SQN formed with the Catalina at Darwin in JUN 1944, within NWA's 76 Wing with 20 and 43SQNs, as 11SQN was sent south to Rathmines and 20 and 43SQNs with the newly-formed 42SQN were consolidated in Darwin and assigned to full-time mining operations.<sup>182</sup> Beginning "Courting" operations from Melville Bay in AUG 1944, on 23 SEP on a mining mission on Tiworo Strait, A24-94 forced-landed with engine trouble near enemy-occupied territory and was subsequently destroyed, with the crew safely picked up safely by a 43SQN Catalina the following day.

On the night of 23 OCT 1944, A24-100 had its starboard engine damaged by a direct hit, but was able to complete its mining mission and made a forced landing south of the South-Western Celebes peninsula. The ensuing rescue operation by a 43SQN Catalina of 43 Squadron was one of the epic sea rescues of World War II, entailing a round trip of 1800 miles through mainly enemy-held territory. Accompanied by a B-24 Liberator, the 43SQN rescuer strafed the downed Catalina and transported. With the occupation of Morotai by Allied forces, a 42SQN detachment was based there during NOV 1944, making operations against North Borneo, with the mining of Brunei Bay, Tarakan, Sandakan and Balabac Straits. As the Allied advance continued into the Philippines, seven 42SQN Catalinas were based in Leyte, and on the night of 14 DEC 1944 conducted a successful mining operation in Manila Bay.

During JAN/FEB 1945, mining operations were concentrated in the area of the Surabaya and Laoet Straits. On the night of 14 JAN, Catalina A24-96, had a starboard engine failure enroute to mining the approaches to Surabaya, and after jettisoning the mines, landed south of Soemba. Another dramatic sea rescue was mounted again by a 43SQN Catalina and an accompanying Liberator, with A24-96's crew saved. Throughout the autumn of 1945, mining operations were extended to the Chinese coast and Formosa, with detachments operating from a USN seaplane tender at Jinamoc (Philippines) near Leyte and refuelling at Lingayen, north of Manila. After the cessation of hostilities, 42SQN evacuated POWs from Manila, and time-expired military personnel from Labuan. 42SQN disbanded on 30 NOV 1945.<sup>183</sup>

### 42 Squadron Codes – over 1944/1945

Code	Serial	Details and Name	Code	Serial	Details and Name
RK-A	A24-88	A24-373	RK-N	A24-	
RK-B	A24-90	A24-364	RK-O	A24-95	
RK-C		not used	RK-P	A24-96	A24-83
RK-D	A24-365		RK-Q	A24-	
RK-E	A24-96	A24-366	RK-R	A24-	
RK-F	A24-97		RK-S	A24-	
RK-G	A24-101	A24-368	RK-T	A24-	
RK-H	A24-102	A24-369	RK-U	A24-	
RK-I		not used	RK-V	A24-	
RK-J	A24-89	A24-370	RK-W	A24-	
RK-K	A24-94	A24-371	RK-X	A24-	
RK-L	A24-100		RK-Y	A24-	
RK-M	A24-78	A24-375	RK-Z	A24-	

References for known 42SQN codes: *adf-serials* database, imagery. Codes were 'split' by the roundel (which sat slightly below the code letters) so that A24-96 codes reading RK \* E starboard side, and RK \* E port side – i.e. the code always read logically. A24-88 RK \* A, as shown below during restoration at Moorabbin.



*[Goodall Aviation site]*

**The hull of A24-88, serving with 42SQN from AUG 1944, under restoration with the ANAM at Moorabbin**

## 42SQN PBYS 1944-1945

The initial issue of 42SQN PB5Y-5As from JUN 1944 primarily came from the batch numbered between A24-88 and A24-102. 42SQN PB5Ys were coded mainly with the letters either side of the fuselage roundel as shown here – but there are always exceptions to the rule, as shown by A24-95 RK-O with a rear fuselage trigraph. In 1945, 42SQN became a major user of the PB2B-2, with at least ten aircraft allotted.



*[adf-serials]*

**A24-88 RK-A at Bowen 2FBMU, with 42SQN AUG 1944 to AUG 1945, is now under restoration at Moorabbin**

A24-88 had survived in the intervening years as a houseboat on the Murray River; fortunately recovered and now in the care of the Australian National Air Museum.



*[AWM NWA0981]*

**A24-95 RK-O at Darwin SEP 1945, under maintenance by 2FBMU.** After initial service with 20SQN, A24-95 appears to have undergone Mod.60 at 1FBRD in SEP 1944, then to 42SQN.



*[Flying Cats, p.159]*

**A24-102 RK-H served on 42SQN AUG 1944 to JUL 1945,** then from SEP 1945 with 114ASRF.



*[adf-serials]*

**A24-94 RK-K in SEP 1944,** arrived from the US in APR 1944 and after several 1FBRD servicings, was received by 42SQN in SEP 1944, to be shortly lost in an accident in the Arafura Sea.



*[adf-serials]*

**A24-97 RK-F** was received in MAY 1944, and taken over by 42SQN in AUG 1944 serving until JUL 1945, for service with 11SQN.

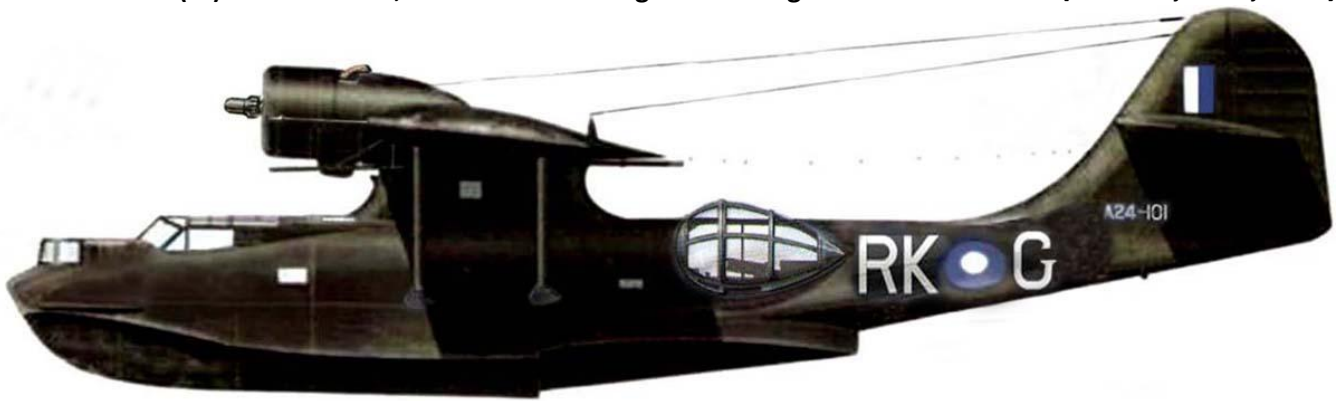
## PBY-5A(M) – A24-101 RK-G 42SQN 1945

A24-101 was received from the US in MAY 1944, and **operated by 42SQN from AUG 1944 until JUL 1945**. Undergoing PBY-5A(M) modification at 1FBRD in OCT 1944 and returning to 42SQN, it had a mishap on 3 JUL 1945 when “damaged alighting”, to be converted to components by 9RSU in AUG 1945. Codes show the 42SQN style of letters ‘split’ by the roundel (which always read in the logical manner); 42SQN PB2B codes were similarly marked.



A24-101 PBY-5A(M) Catalina RK-G, after forced landing and under guard JUL 1945

[colourised from adf-serials]



[AWM OG3094]

RK-G A24-101 Leyte, Philippines in JUN 45

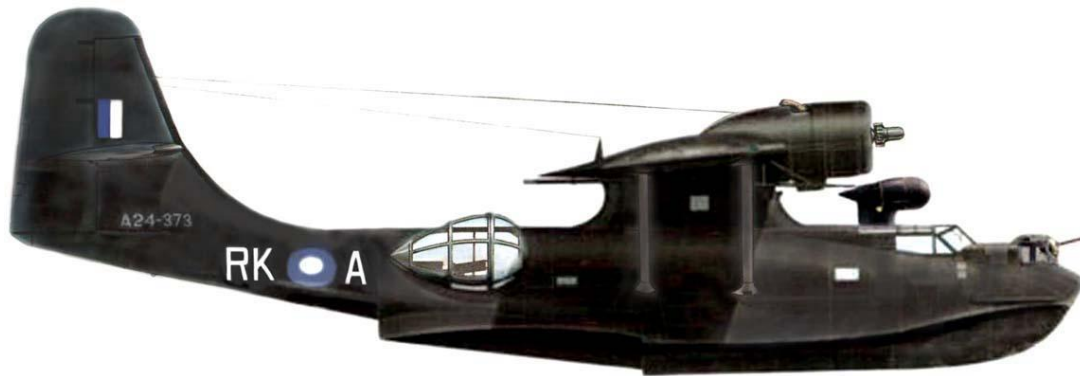


[AWM OG3095]

RK-G A24-101 Leyte JUN 45



**PB2B-2R Catalina VI A24-373 RK-A, 1945**, had 42SQN codes 'split' either side of the roundel - the code read logically RK\*A on both sides. Although suffixed "R" for transport, A24-373 was still armed like all PB2Bs with the eye-ball nose turret with twin guns. In addition to the tall tail, these aircraft had the ASD-1/APS-3 radome above the cockpit



*[adf-serials]*

**A24-370 RK-J was another 42SQN PB2B-2R**



## 43 SQUADRON

43SQN was formed at Bowen in MAY 1943, and began operations from Karumba on the Gulf of Carpentaria at the end of AUG 1943.<sup>184</sup> The first Cats were A24-56 and A24-64, and 43SQN maintained a detachment at Bowen on anti-submarine and convoy patrols. The first strikes from Karumba were conducted on the night of 8 SEP 1943 against targets at Amboina, and these continued against Babo, Langgoer, Ambon, Sarong, Toeal, Kaimana, Jefman and Taberfane. With 11 and 20SQNs, 43SQN began attacks on Kavieng, and on the night of 29 DEC 1943 a Catalina suffered a direct hit on its starboard engine and despite lightening the load was unable to cross New Britain on one engine. Waiting for dawn, near the Witu Island group, it was able to land at Finschhafen for repair.

43SQN transferred to Darwin, commencing its *"Courting"* mining operations from Doctor's Gully in APR 1944. Aircraft staged through USN tenders as far afield as Morotai to complete missions, with flights up to 25 hours on individual mining tasks. Areas blockaded areas included Hainan, Surabaya and Laoet Straits, and harbours at Hong Kong, Amoy, Seroea and Pascadores Islands. 43SQN also flew anti-shipping strikes, the most spectacular on 26 JUN 1944 being a torpedo attack by A24-45/OX-E on an enemy merchant ship anchored in Bima Bay. In the face of intense hostile fire, the torpedo was successfully dropped and despite the pilot being seriously injured, A24-45 was able to limp home. The last 43SQN mining mission was on the night of 29 JUL 1945, when mines were dropped in Bangka Strait. While mining had been the primary mission, other roles included air-sea rescue in support of long range bomber strikes on NEI targets, as well as harassing Japanese facilities throughout the NEI archipelago.

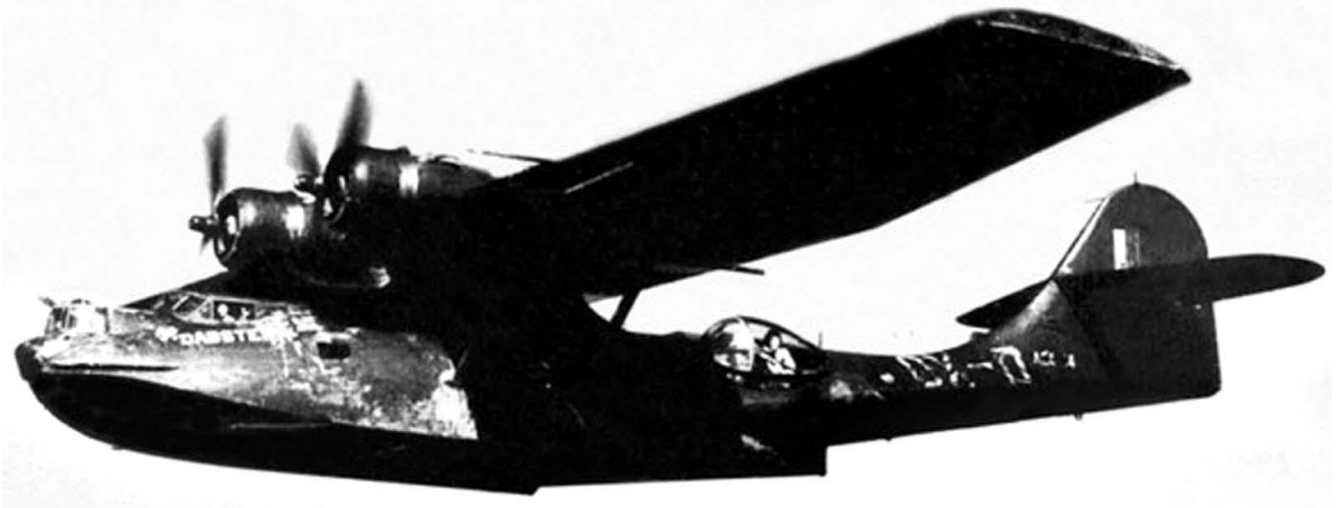
With the War ending in AUG 1945, 43SQN continued patrols over the NEI and the approaches to Darwin. Moving from Doctor's Gully to Rathmines in DEC 1945, notification was received from HQ Eastern Area that operations would soon cease. 43SQN had been the RAAF's main operator of PB2B-2R models, and was disbanded on 11 MAR 1946.<sup>185</sup>

### 43 Squadron Codes – from 1943

Code	Serial	Details and Name	Code	Serial	Details and Name
OX-A	A24-60	A24-40; A24-63	OX-N	A24-79	
OX-B	A24-56	A24-38	OX-O	A24-82	
OX-C		not used	OX-P	A24-63	A24-356
OX-D	A24-64	"The Dabster"	OX-Q	A24-47	A24-357
OX-E	A24-38	A24-68; A24-45	OX-R	A24-89	A24-358
OX-F	A24-66	A24-308	OX-S	A24-94	A24-359
OX-G	A24-68	A24-356	OX-T	A24-57	A24-100; A24-360
OX-H	A24-65	"Some Chicken"; -355; -359	OX-U	A24-58	A24-59; A24-361
OX-I		not used	OX-V	A24-57	A24-362
OX-J	A24-53	A24-354	OX-W	A24-	
OX-K	A24-44		OX-X	A24-60	
OX-L	A24-35		OX-Y	A24-65	
OX-M	A24-70	A24-353	OX-Z	A24-	

References for known 43SQN codes: signals, *adf-serials* A24 database, imagery, signals. Codes were normally trigraph style **aft of roundel** on both sides, e.g. A24-64, below, had OX-D on both sides. Later with PB2B-2Rs, codes were split so that the OX was normally forward of roundel, individual letter aft: A24-356 had OX\*P port side, P\*OX stbd side (similarly A24-353 OX\*M port, M\*OX stbd); but our image of A24-362 reads OX\*V on the stbd side. Unfortunately, many 43SQN PB2B-2 codes are not known.





Probably the most well-known 43SQN Catalina was 'The Dabster' – A24-64 OX-D, here in JAN 1944 above.

Appendix **SEC** R.A.A.F. Form A. 51  
(February, 1933.)

**OPERATIONS RECORD BOOK**  
DETAIL OF THE WORK CARRIED OUT.

From 0001 hrs. 1 / 4 / 44 to 2355 hrs. 30 / 4 / 44 By No. 43 Squadron, DARWIN. No. of Sheet 1

Aircraft Type and No.	Crew	Duty	Time Up	Time Down	Remarks	References
<u>CATALINA.</u>			<u>FLYING TIME.</u>			
OX - A (A.24-40)	W/C. THOMPSON. F/S. BERGMAN.	SPECIAL MISSION	19 hrs.	34 min.	Special Mission successfully carried out.	
OX - I (A.24-35)	F/L. GRAY. F/O. SEAGE.	"	21 hrs.	17 min.	OX - J did not return, possibly crashed over	
OX - D (A.24-64)	F/L. RIGHETTI. F/O. HARRIGAN.	"	19 hrs.	00 min.	target. OX - I badly hit by A/A and holed in	DAR 42.
OX - E (A.24-56)	F/L. MARR. F/L. BAKER.	"	20 hrs.	30 min.	hull near pilots compartment, injuring both	
OX - J (A.24-53)	F/S. ABBEY. F/O. ROBINSON.	"	20 hrs.	App.	Pilot and 2nd. Pilot. Aeroplane crash landed	
OX - E (A.24-45)	F/O. LONGMUIR. F/O. KING.	"	19 hrs.	15 min.	on beach.	
OX - E (A.24-45)	F/O. LONGMUIR. F/O. KING.	SPECIAL MISSION	18 hrs.	25 min.		
OX - E (A.24-56)	F/L. MARR. F/L. BAKER.	"	19 hrs.	45 min.		
OX - D (A.24-64)	F/L. RIGHETTI. F/O. HARRIGAN.	"	18 hrs.	56 min.	Special Mission successfully carried out.	DAR 43.
OX - A (A.24-40)	F/O. OLDMEADOW. F/L. MCKEAN.	SPECIAL MISSION	19 hrs.	20 min.		
OX - E (A.24-56)	F/O. VINEY. F/O. DONLON.	"	20 hrs.	32 min.	Special Mission successfully carried out.	DAR 44.
OX - D (A.24-64)	F/L. MILLER. F/L. CLARK.	"	21 hrs.	04 min.		
OX - A (A.24-40)	F/O. LAW. F/L. BAKER.	STRIKE	12 hrs.	05 min.	3 CATALINAS to carry out STRIKE against AIRCRAFT CARRIER reported in position 0055° S. 13110° E. Course 360, Speed unknown at 290400Z. Alternative Target JEPMAN. Due to insufficient time OX - A attacked AMBOINA from 8,500 ft. Bombs dropped near HIPOELAMA with unobserved results. Two aircraft did not take off due to insufficient time to bomb up and change of wind.	DAR 45.

8-43. GOVERNMENT PRINTER, BRISBANE

Editor: A not example of good adherence to RAAF Policy per Security in A50 History Sheets details: Serial and Captains., but adding BAKER Codes. OX-D was on several special missions on this entry out of Darwin: Sadly A24-53 and crew were lost also in this period. Source: RAAF 43 Sqn A50 History Sheet

## 43SQN PBYS 1944



[adf serials]

**A24-70 OX-M with 11SQN A24-69 FJ-P at 1FBRD Lake Boga for PBY-5A(M) modification AUG 1944**

This image shows that both 11SQN and 43SQN code letters were a similar height as the 1:5 roundel (36" diameter with a 7" White circle), with the code letters being 36" high, and 24" across in a 4" stroke.



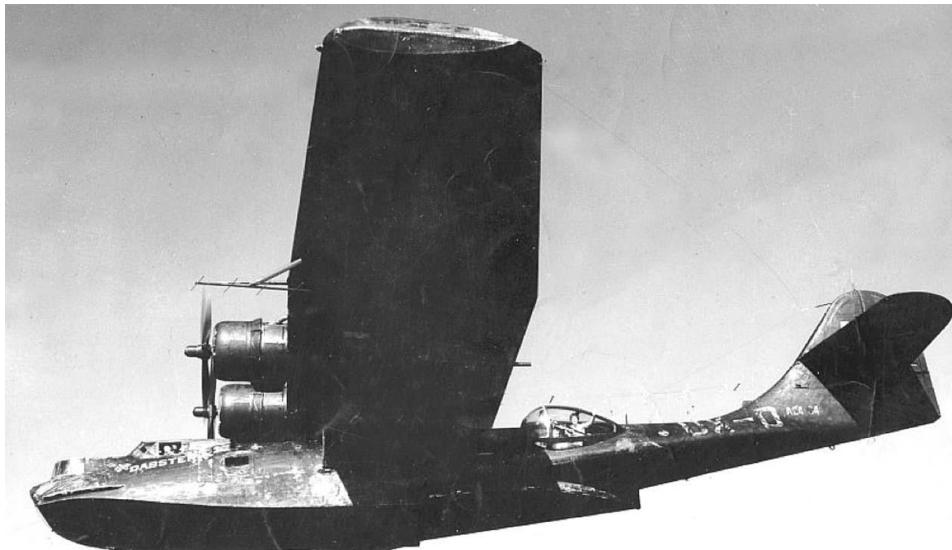
**A24-63 OX-P at Darwin JUN 1944** [AWM NWA 0876A]



[coloured from adf-serials]

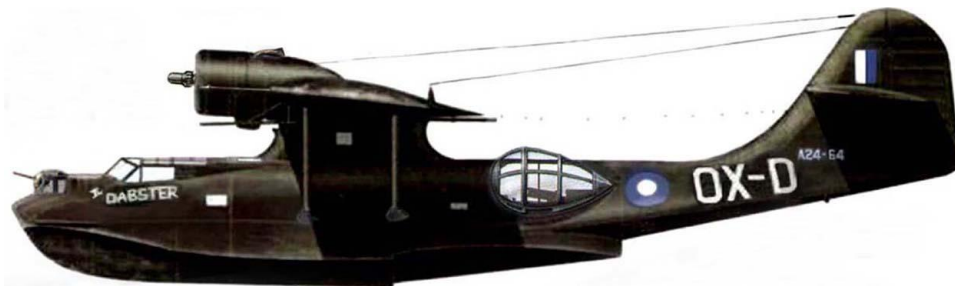
**A24-44 OX-K c1944 – disruptive cam upper, with 43SQN over SEP 1943-JUN 1945, before ASR duties with 111ASRF**

PBY-5 – A24-64 OX-D 43SQN “The Dabster”

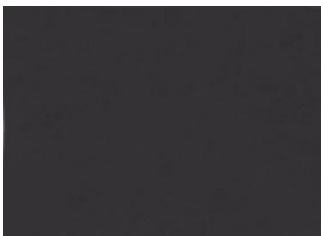


[adf-serials]

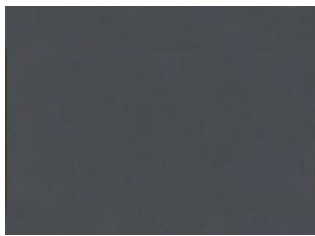
Catalina captain FLTLT Ivo Righetti related on arrival on 43SQN at Karumba: “I was allotted Catalina A24-64. During our first visit to Bowen for a major overhaul, I was asked if I would like a name on our aircraft. I said “That would be great, call her ‘The Dabster’. The Dabster was rather a favourite saying of mine, and to me it meant ‘a bobby dazzler’, ‘a beauty’ or ‘the best’.”  
186



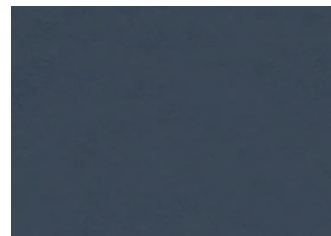
Later A24-64 OX-D The Dabster had an “eye ball” nose turret fitted



K3/179 Night



K3/187 Extra Dark Sea Grey



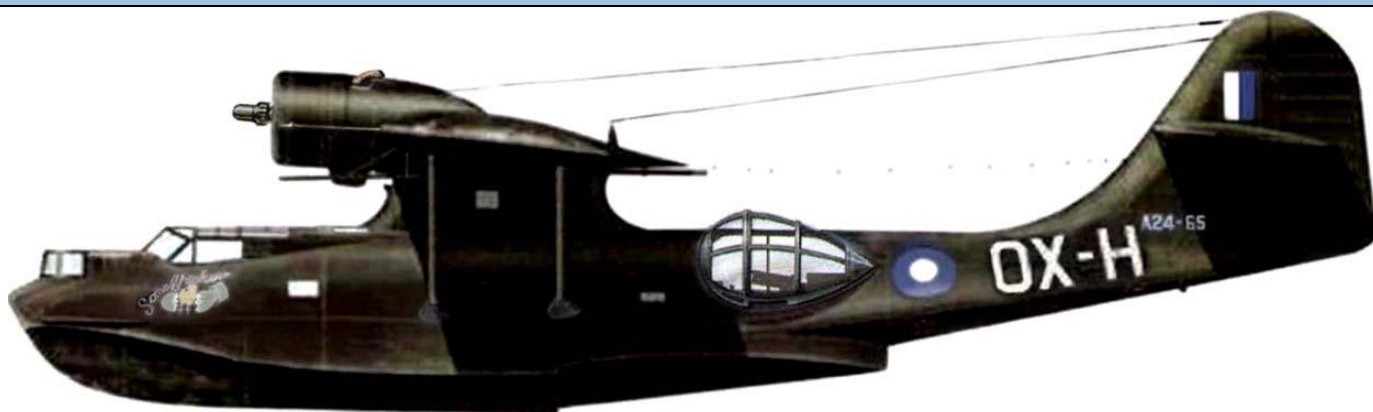
K3/318 Dark Ocean Blue

Wings uppersurfaces EDSG/Dark Ocean Blue; fuselage Night but very worn which gave this mottled appearance.

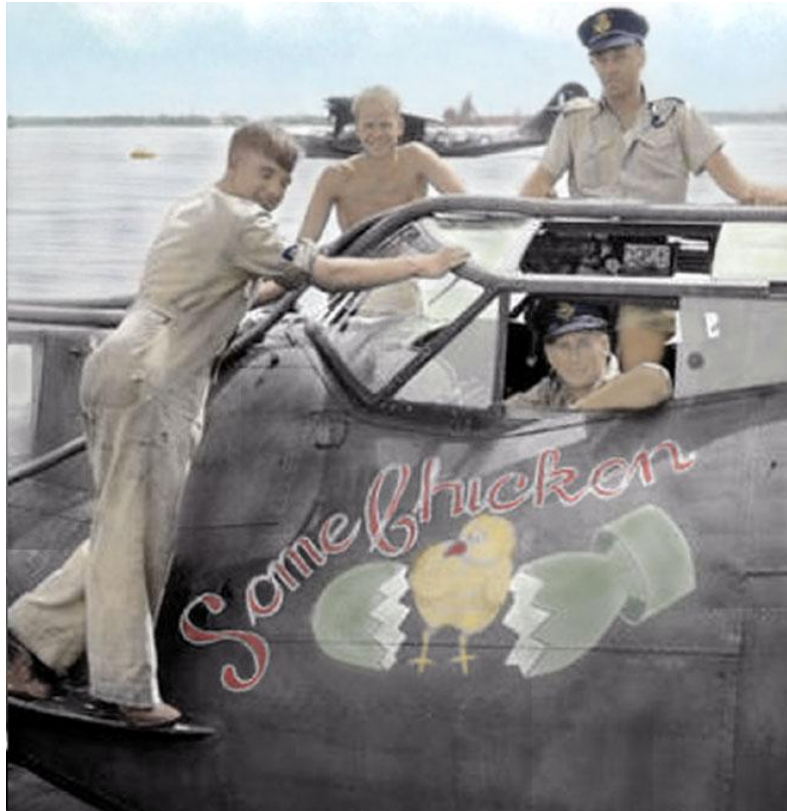


PBY-5 A24-64 OX-D c FEB 1944

Photos of ‘The Dabster’ clearly show that the codes, serial, markings are painted over the Black and are flaking off, but the Grey patches on the wing are in good condition and not flaking off. Perhaps the Black was painted over the Grey, not vice-versa.  
187



A24-65 OX-H *“Some Chicken”* served with 43SQN from SEP 1943



*“Some Chicken”* A24-65 OX-H

[colourised from AWM NEA0328]

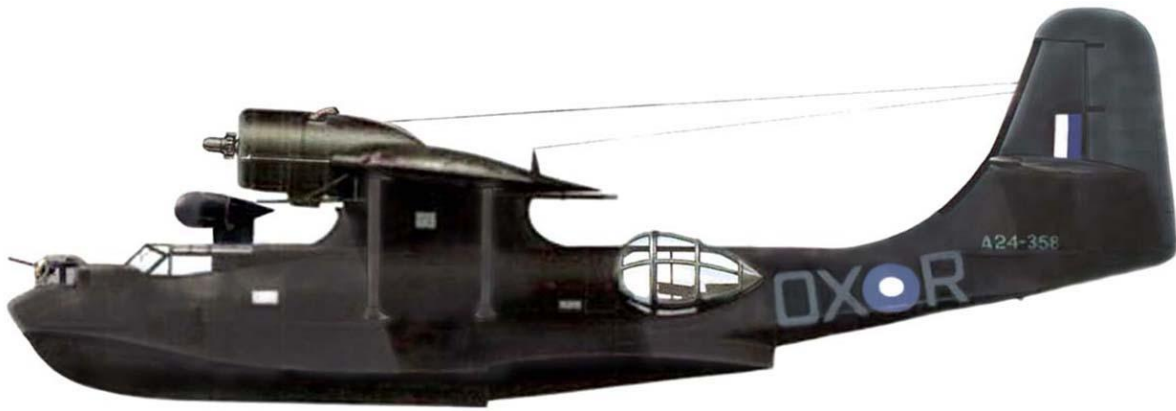
The hatching chicken is emerging from a bomb, so this is assessed as ‘bombshell green’ and not ‘eggshell pink’



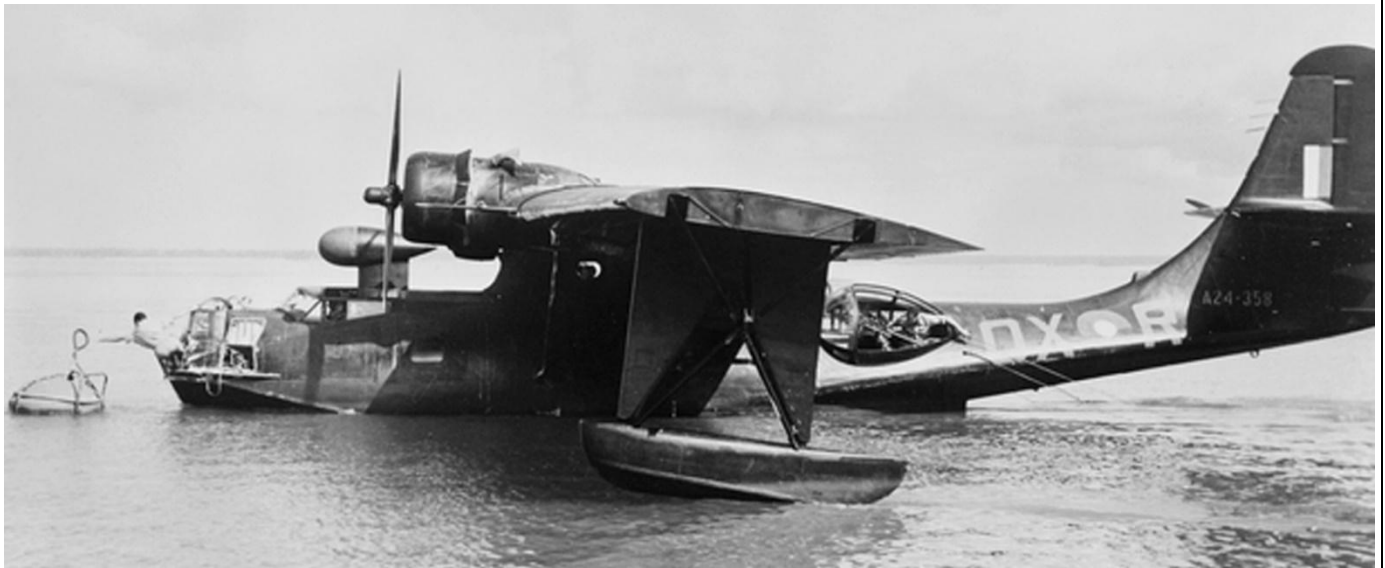
[adf-serials]

*“Some Chicken”* the egg has truly cracked – collision with marine craft on landing at Doctor’s Gully JAN 1944  
After this accident, A24-65 was returned to Lake Boga for reconstruction by 1FBRD, finally returning to 43SQN in JAN 1945.

PB2B-2R – A24-358 OX-R 43SQN 1945



PB2B-2R Catalina VI A24-358 OX-R had 43SQN codes either side of the roundel, not the previous three-letter trigraphs of 43's PBVs, with the code reading OX\*R on both sides. One of 19 PB2B-2R models allotted to 43SQN, A24-358 like all of this type, was the "tall tail" variant and had the eye-ball nose turret, and the AN/APS-3 radome above the cockpit.



[AWM 128024]



[AWM 128019]

A24-362 shows the starboard presentation of OX-V codes.<sup>188</sup> The roundel is 2:5, and codes for OX-R and OX-V are both unfaded *Medium Sea Grey*. A24-362 was operated by 43SQN from JUN 1945, until issue to 115ASRF in FEB 1946. Like many Catalinas, it went into storage from APR 1946.

## ASR FLIGHTS and COMMS UNITS

While the priority for Catalina deliveries had been flying boats for the strategic mining campaign, in late 1944 the responsibility for all ASR in the New Guinea area was passed from the USN to the RAAF.<sup>189</sup> Although the last eleven PBY-5As were delivered as flying boats, these were all eventually modified back to amphibians for the ASR role.

### 111 ASR Flight [KP]

Three RAAF air-sea rescue units were formed at the end of 1944 – 111, 112 and 113 ASR Flights,<sup>190</sup> taking over the ASR role from 6CU and 8CU. Forming at Madang on 13 DEC 1944, 111ASRF carried out ASR in support of strike operations. Strength of ASR Flights was typically four Catalinas: three were transferred from 8CU (A24-92, -98, -104), and in JAN 1945 a fourth was added (A24-91).<sup>191</sup> By JUN 1945, 111ASRF had only flying boats with four PBY-5s; some amphibians were returned by late 1945. In MAR 1946, 111ASRF moved to Port Moresby, disbanding in JAN 1947.<sup>192</sup>

### 112 ASR Flight [LJ]

112ASRF formed at Darwin on 23 DEC 1944, and in SEP 1945 supported the occupation convoy during the signing of the Japanese surrender at Koepang. From 1944 to 1947, 112ASRF conducted leaflet drops, search operations and the evacuation of POWs from Labuan, Morotai and Balikpapan, medical evacuation, and regular courier and supply runs.<sup>193</sup> 112 and 114 ASRFs were both disbanded in OCT 1947 to form 11SQN in JUL 1948.<sup>194</sup>



*[colourised by GRB image]*

**PBY-5 A24-47 was LJ-F with 112ASRF at Doctor's Gully Darwin**

### 113 ASR Flight [NR]

113 ASRF was formed at Cairns on 10 JAN 1945, and the unit relocated to Morotai in 11 MAR. Duties included the delivery of medical supplies for guerrillas, and collecting locals for debriefing by Australian Intelligence. A regular courier service from Morotai to Tarakan was commenced in MAY 1945, and for the OBOE 2 invasion of Balikpapan in JUN 1945 tasking involved ASR, and transported Australian Intelligence Bureau personnel with Japanese prisoners.<sup>195</sup> With peace in AUG 1945, the unit was moved to Labuan for recovery of POWs to Australia. The beginning of 1946 involved escorting the move of 81WG Mustangs to Japan, with the Catalinas then moving on to Iwakuni under command of the 1st TAF.<sup>196</sup> On return to HQ Eastern Area at Rathmines in APR 1946, 113ASRF disbanded.<sup>197</sup>

### 114 ASR Flight [ – ]

114ASRF was formed at Cairns on 18 JUL 1945 from the personnel of 41SQN, and continued to operate its Martin Mariner with Catalinas until APR 1946. From DEC 1945, limited route transport work to Brisbane and Sydney from the islands. Now with PBY-5A amphibians, 114ASRF was able to move to Garbutt/Townsville at the end of SEP 1946, but advice was received in SEP 1947 to disband and reform under Search and Rescue Wing at Rathmines.<sup>198</sup> 112 and 114 ASRFs were both disbanded in OCT 1947, and in the personnel and equipment was formed into 11SQN in JUL 1948.<sup>199</sup>

### 115 ASR Flight [ – ]

115ASRF was formed at Morotai on 16 JUL 1945, with personnel from 113ASRF with four Catalinas (PBY-5As and PB2B-2Rs).<sup>200</sup> With the Japanese surrender, ASR continued to support flying operations and movements, and a detachment was maintained at Balikpapan for regular courier services. A Biak detachment ensured ASR cover for fighters being ferried back to Australia until NOV 1945. JAN 1946 tasking involved Army surveillance flying, and carriage of Dutch personnel among the islands. Flying reduced and 115ASRF disbanded at Morotai in MAR 1946.<sup>201</sup>

**NR-A A24-92** With 113ASRF at Mindoro strip Philippines 1945, this aircraft served with 113ASRF from MAY 1945 to SEP 1945. The A24-92 E/E.88 card for **AUG 1944** records while serving with 8CU it was camouflaged by 1FBMU at Bowe General/34 Foliage Green".<sup>202</sup>



[colourised from RAAF image]

**NR-B A24-112** The serial A24-112 had originally been allocated to a PB2B-2, which was reallocated a "block" serial A24-303. A new PBY-5A A24-129 was renumbered A24-112, and served with 111ASRF in 1945. In FEB 1946 A24-112 joined 113ASRF, merging into the ASR Squadron at Rathmines: note Sunderland and Walrus in the image.



[colourised from SA Library PRG 1614/2/61]



A24-112 NR-B in ASR Squadron 1946 at Williamstown

[adj serials]



## 113 ASR FLT FOLIAGE GREEN PBY-5As 1945-1946

A24-91 was with 6CU from JUN 1944, the unit having been formed in the NT in DEC 1942 and commencing ASR missions in APR 1943 over the Arafura Sea with the Walrus.<sup>203</sup> This capability was further enhanced by the Catalina in JUN 1944; by early 1945 this rescue role had been transferred with the formation of the ASR Flights.<sup>204</sup> A24-91 joined 113ASRF in MAR 1945 – it is often illustrated as a flying boat in USN *Blue Gray*. The *Sea Hawk* jolly roger nose art may refer to a mission on 3 APR when on a clandestine extraction, attacked a Japanese lugger setting it on fire.



[colourised from Vincent, p.87

1945 – A24-91 PBY-5A 113ASRF “Sea Hawk” with a jolly roger



adf-serials]

A24-91 in FEB 1945 before 113ASRF service – recent refurb by 1FBRD, no nose art and serial marked in **Black**  
On 14 JUN 1945 A24-91 caught fire during engine repairs at Sanga Sanga, northern Borneo, and was written-off.

## 8 COMMS UNIT – “ZA” CODED PBY-5As 1945

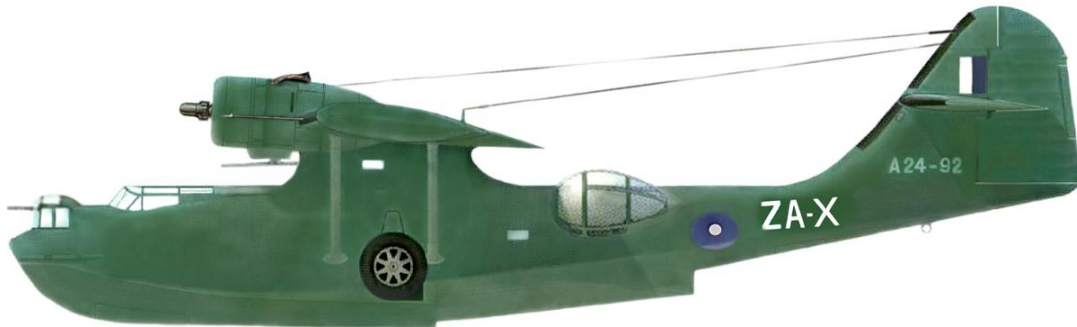
1 Rescue and Communications Squadron at Goodenough Island was reformed as 8CU in NOV 1943, to provide a rescue service between Kiriwina and New Britain, and communications duties. The Catalina enhanced the unit's capability, moving to Madang in NOV 1944. 8CU flew anti-malarial spray duties at Jacquinot Bay and Tadjji, and after the end of the War, flew courier missions all over Papua and New Guinea, before disbanding on 4 MAR 1946.<sup>205</sup> Before formation of the ASRFs, the ASR mission in 1944 was undertaken by 6CU and 8CU.



[colourised from AWM 77158 via vincent p.67]

### 1945 – 8CU PBY-5A A24-92 ZA-X at Jacquinot Bay

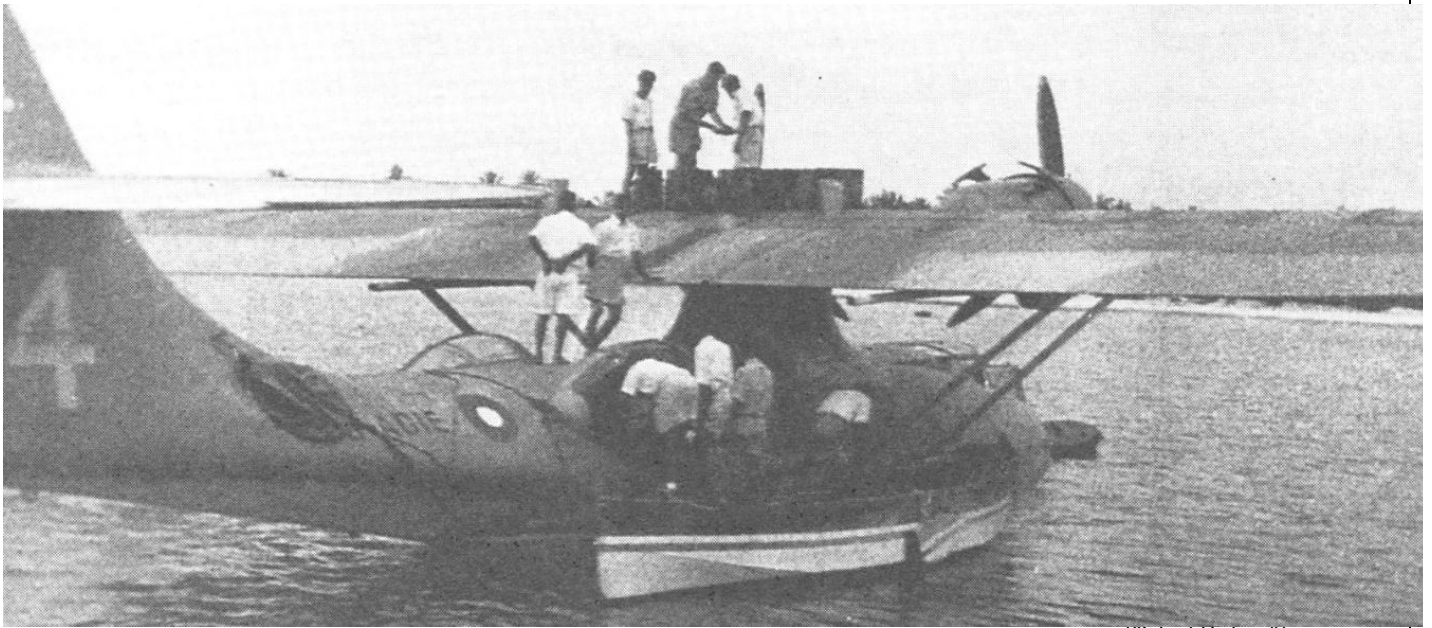
PBY-5As of the ASR Flights operated in *Foliage Green* (as per MAY 1944 policy AGI), and were amphibian for the added flexibility for ASR, typically with nose guns in the eye-ball turrets. 46491/A24-92 was earmarked for 8CU for ASR in APR 44.<sup>206</sup> Other 8CU PBY-5As in 1944 were A24-92 ZA-F, A24-98 ZA-Z, A24-104 ZA-T. By 1945, some units applied code letters in *White*, as *Medium Sea Grey* (*Sky Blue* before that) always faded to an off-white in the tropics. Postwar, A24-92 retained an ASR role with 11SQN.



[colourised from AWM UG1986]

**A24-104 still in the 8CU markings of ZA-T with FLTLT Wood's crew of 111ASRF who in DEC 1944 undertook a hazardous rescue from Madang.** A24-104 was transferred to 111ASRF in JAN 1945 and served at Rathmines until transfer to the Dutch in 1953 as 16-220. Ex-VH-EXG ('Super Cat' with 1700hp R-2600 engines) is displayed as A24-104 NR-H/113ASRF, at RAAFM.

## WARTIME "DOUBLE SUNRISE"



[*"Silent Victory"*]

**G-AGIE '4' Antares Star at Cocos, c 1945**

The five Catalina flying boats that comprised the QANTAS "Double Sunrise" flying boat fleet, that flew the Indian Ocean services from Perth to Ceylon, were RAF aircraft loaned to BOAC and leased to QANTAS.<sup>207</sup>

G-AGFM	'1'	PBY-5B Mk.IB	c/n 811	ex-FP244	<i>Altair Star</i>
G-AGFL	'2'	PBY-5B Mk.IB	808	ex-FP221	<i>Vega Star</i>
G-AGID	'3'	PBY-5 Mk.IVA	1109	ex-JX575/Bu08215	<i>Rigel Star</i>
G-AGIE	'4'	PBY-5 Mk.IVA	1111	ex-JX577/Bu08217	<i>Antares Star</i>
G-AGKS	'5'	PB2B-1 Mk.IVB	28022	ex-JX287	<i>Spica Star</i>



**G-AGFL PB2B-1 Mk.IVB '2' Vega Star on beaching gear to launch from base at Nedlands, Perth, 1943**



**Amphibian PBX-6A 46644 restored as '4' / G-AGIE Antares Star, at QANTAS Founders Museum, Longreach: Pictures GR & SG Birkett 's Tour de Qld/WA and Northern Territory @July-August 2019**

### 3 OPERATIONAL TRAINING UNIT

3OTU was formed at Rathmines from the Seaplane Training Squadron in DEC 1942. By JAN 1943 3OTU was equipped with three Catalinas and 17 OS2U-3 Kingfishers and over 400 personnel.<sup>208</sup> By the end of DEC 1943, Rathmines had become the point of entry of Catalinas being ferried from the US, its Catalina strength had increased to twelve Catalinas and two Seagulls.<sup>209</sup>

3OTU continued training crews for all RAAF seaplane types until FEB 1946, when it became Crew Training Unit (Flying Boat). On 1 APR 1946 the unit again changed names, to Crew Conversion Unit (Flying Boat), and absorbed 113ASRF, to disband in 1947. However, postwar Rathmines remained the seaplane hub of the RAAF. In JAN 1946 the wartime 11SQN had disbanded at Rathmines, reforming again in JUL 1948 when the SAR Wing was renamed 11(General Reconnaissance) SQN, with search and rescue detachments around Australian coastal bases. 11SQN Catalinas on strength included: PBY-5As A24-92, A24-104 and A24-110; and PB2B-2s A24-380, A24-381 and A24-385.<sup>210</sup> Postwar Catalina colours were bright *Aluminium*-pigmented cellulose enamel (K3/162) and dope (K3/168), silver Catalinas had a *Medium Sea Grey* (K3/183) hull.<sup>211</sup>



[colourised by 'RAAF Black Cats']

PBY-5 A24-66/R of 3OTU at Rathmines 1945

### Catalina Disposals

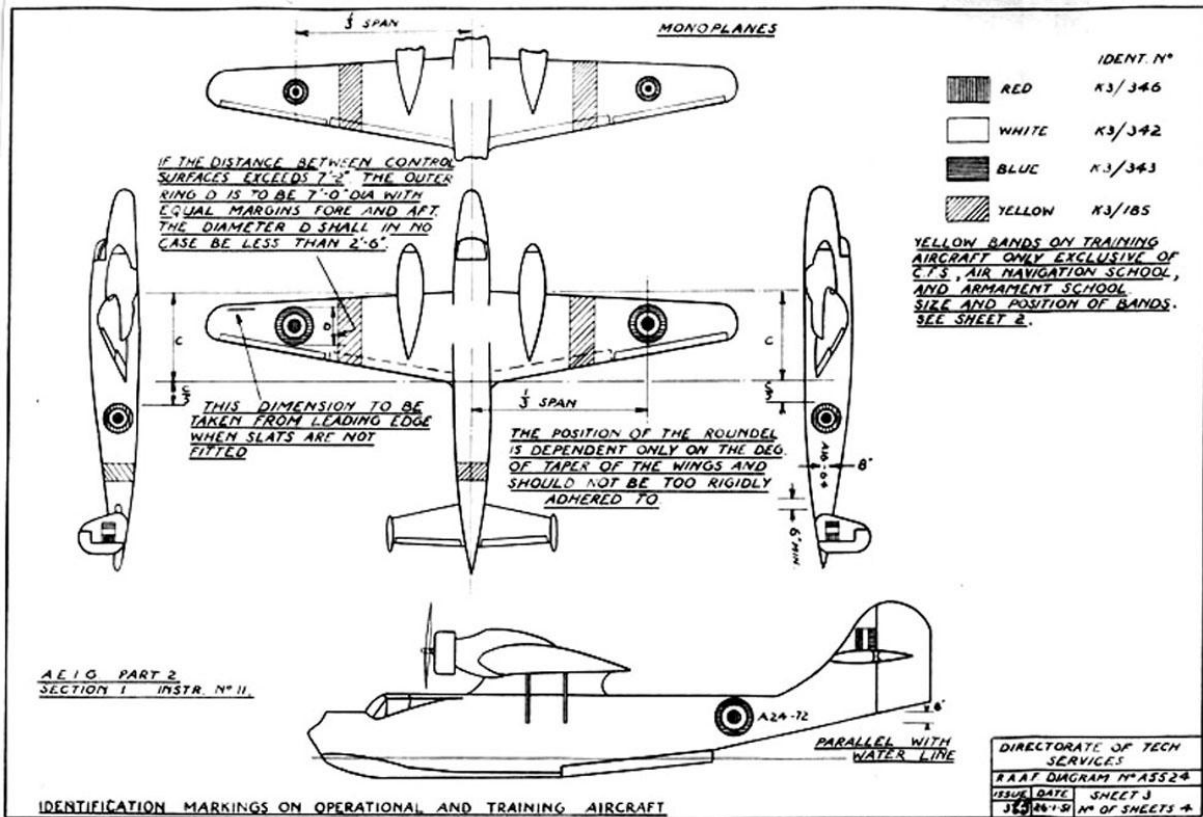
Rathmines and Lake Boga became the major seaplane disposal bases. On 12 NOV 1947 at the Care and Maintenance Unit at Lake Boga, 36 Catalinas were in storage,<sup>212</sup> these having been offered for tender in AUG 1946 by Disposal **List 2631**. Several were released over 1947-48 flying on the civil register with QANTAS and Barrier Reef Airways.<sup>213</sup> By 1952, the Catalina was made completely surplus to RAAF requirements, with the final survivors being offered for disposal, but most for scrap metal use only. On 29 SEP 1952, the final 23 Catalinas on RAAF strength were offered for sale by tender on **List AIR 7196** by the Department of Supply.<sup>214</sup> These were located at RAAF Rathmines and had been in open storage for some time, and not in airworthy condition.

The most famous surplus RAAF Catalina was **PB2B-2 A24-385** which was acquired free-of-charge from Rathmines in AUG 1950 by Capt P G Taylor as **VH-ASA *Frigate Bird II***, and is now held at Sydney's Powerhouse Museum.

VH-EXG, (ex-RCAF c/n CV-369) flew in Australia on mineral survey, until being acquired in 1989 by the RAAFM – the fuselage was restored at Amberley, and VH-EXG is now marked as "**A24-104/NR-H**" at Point Cook. In addition, HARS at Albion Park fly PBY-6A (ex-USN 46679) as **VH-PBZ**, marked as 43SQN's "**A24-362/OX-V**".

## CATALINA POSTWAR SERVICE AND DISPOSAL

Catalina markings in postwar RAAF service has been covered by our *adf-serials Newsletter* Vol 8 Issue 1 (Summer 2017-2018 Supplement).<sup>215</sup> In OCT 1945, RAAF Headquarters directed that camouflage could be removed from ASR Catalinas in lieu of the current *Foliage Green*,<sup>216</sup> then followed by RAAF directive DTS SIG/71 in NOV 1945 for all aircraft to have camouflage removed during major overhaul.<sup>217</sup> The SIG/71 directive of late 1945 would not immediately see all RAAF Catalinas stripped back to bare metal, as some Catalinas of 113 ASRF at Iwakuni still had camouflage over FEB-APR 1946. *Catalina Chronicle* provides some details of the RAAF ASR Flights.<sup>218</sup> One PBY-5A shown below was marked with 'NR' unit codes as NR-K, and once established at Iwakuni in early 1946 inherited the BCAIR red-white-blue 'Type-A' 1:3:5 markings. This was a PBY-5A, as amphibians were required for runway Iwakuni operation, and appears to have been A24-114.



**RAAF Drawing A5524 3/4 published by DTS Instruction No.11 Pt2 Sect1 of 27 JUL 1951**

Postwar several PB2B-2s were retained after flying with various ASRFs. These particularly included the last aircraft delivered: A24-352, A24-363, A24-368, A24-373, A24-380, A24-382, A24-383, A24-385 and A24-386.



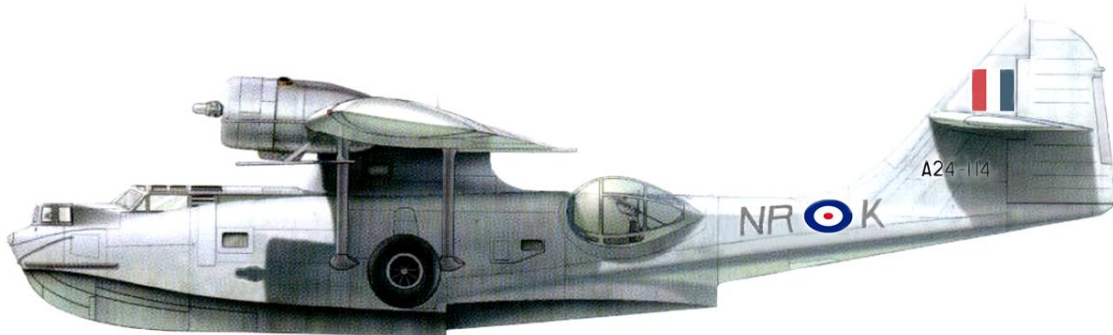
**11SQN PBY-5A Catalina A24-92 (ex-8CU ZA-F) at Nowra in 1951**

[RAN AMOF]

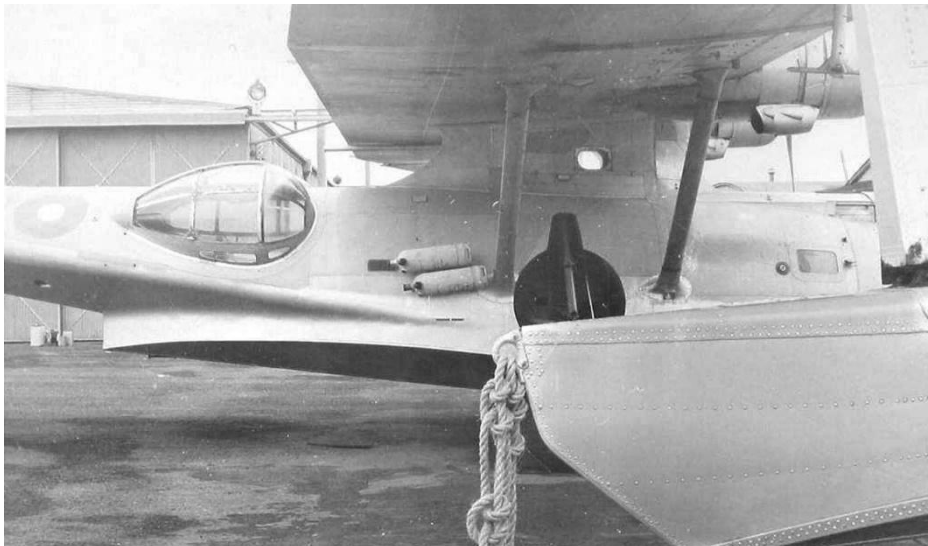
## A24-114 – PBY-5A CATALINA WITH BCAIR ROUNDELS



1946 – A24-114 PBY-5A NR-K of 113 ASR FLT at Iwakuni, BCAIR roundels, supporting 81WG cMAR 1946



An interesting silver PBY-5A Catalina was A24-104. This was used for jet-assisted JATO trials at ARDU over JAN-NOV 1948, and below is A24-104 in early 1948, still with *Pacific 2:5* roundels. This is before its markings were changed to the newly-introduced 'Type-D' 1:2:3 national markings (introduced by RAAF SIG/96 in JAN 1948), which in later wore from about AUG 1948 for the completion of the trial.



A24-104 with JATO bottles

Included in the A24-104 JATO trials was preparation for upcoming Antarctic Expeditions. In AUG 1948, A24-104 departed Hobart for Macquarie Island on "Operation SINBAD", with a landing at Macquarie Island in rough seas. These conditions necessitated a JATO take-off, and a return to Rathmines via RNZAF Base Wigram (Christchurch). In SEP 1948 A24-104 returned to ARDU for completion of the JATO trials program.<sup>219</sup> VH-EXG, not ex-RAAF but ex-RCAF, was acquired by the RAAF in 1989, the fuselage was restored at Amberley, and is now marked as **A24-104** at Point Cook.

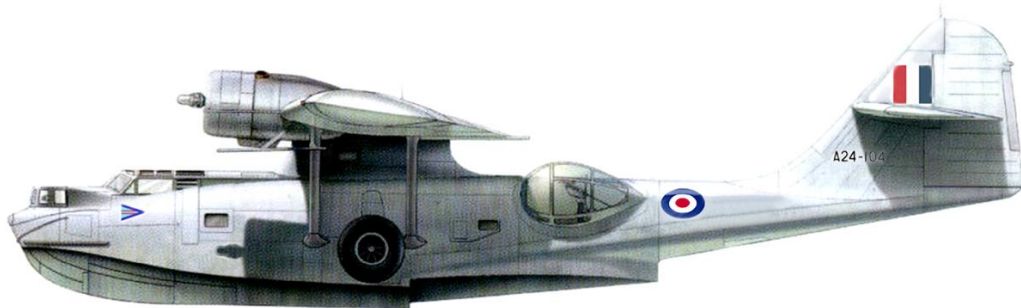
By 1949, a WGCDR's pennant had been added to A24-104, when with 11SQN at Rathmines, before the unit disbanded in MAY 1950. 11SQN then re-formed flying Lincolns in preparation for the arrival in 1951 of P2V-5 Neptunes at Pearce.

## A24-104 – A LONG-SERVING PBV-5A CATALINA

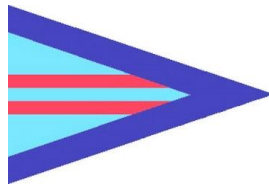


**1949 – 11SQN PBV-5A Catalina A24-104 at Rathmines**

Bu 46594 was our first New Orleans-made PBV-5A, serialled A24-104 by the RAAF Det at San Pedro on 13 SEP 1944, serving with 8CU as ZA-T, then 113 ASRF as NR-H, before the JATO trials in 1948. In AUG 1950 it was still serving for ASR at Rathmines with A24-110 and A24-112.<sup>220</sup> (VH-EXG is displayed at RAAF Museum Point Cook as an ASRF *Foliage Green* A24-104 NR-H.)



Type-D Roundel 1948-1953



WGCDR pennant for CO 11SQN



Hull K3/183 *Medium Sea Grey*

**Roundel sizes, diameter inches (cm): fuselage 36" (1xcm), mainplanes 36" (1xcm)**

**Fin flash: 24" wide (8" each colour) x 24" high**



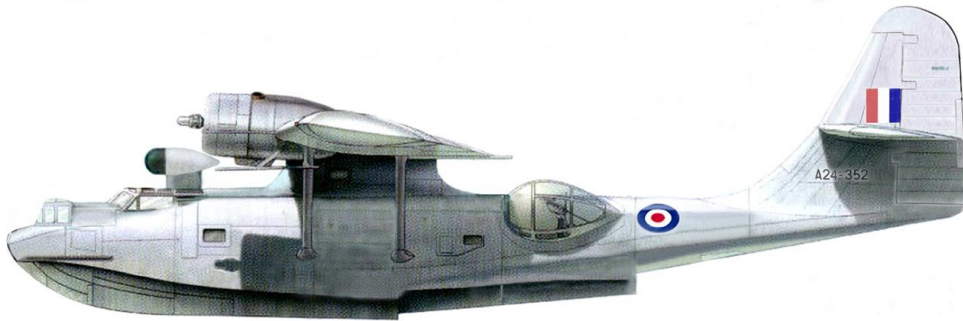
**A24-104 at Rathmines c1949**, in bright *Aluminium*-pigmented cellulose enamel (K3/162), except for *Medium Sea Grey* (K3/183) hull, and perhaps a little further up the sides.<sup>221</sup> A24-104 became **16-220** with the Dutch in FEB 1954.



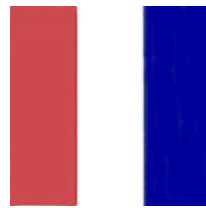
**A24-352 – A POSTWAR PB2B-2R CATALINA**



1949 – 11SQN PB2B-2R Catalina A24-352 over Sydney



Type-D Roundel 1948-1953



Rudder Flash  
24" wide x 24" high<sup>222</sup>

PB2B-2Rs A24-350, A24-367 and A24-386 retained RAF Coastal Command delivery colours of *Coastal White* with TSS uppers.<sup>223</sup>

TSS



K3/187 EDSG and K3/189 Dark Slate Grey

*Roundel sizes, diameter inches (cm): fuselage 36" (1x2cm), mainplanes 36" (1xcm)*

*Fin flash: 24" wide (8" each colour) x 24" high*



11SQN PB2B-5A A24-109 – c1950, different PB2B-5A markings with serial moved from the fin to beside roundel

## RAAF CATALINAS FOR NEI

**Four PB2B-2Rs** These flying boats were under Disposal List 2631 offered in AUG 1946.

(P-207 to P-210, later 16-207 to 16-210 1952) sold to the Dutch MLD (naval aviation) in NEI over 1947-48:

A24-351 (Bu 44286) to **P-208** 1947; A24-358 (Bu 44266) to **P-207** 1947; A24-366 (Bu 44264) to **P-210** 1948; and A24-384 (Bu 44293) to **P-209** 1947. The Dutch **P**-registrations were later changed to **16-** prefixes c 1952.

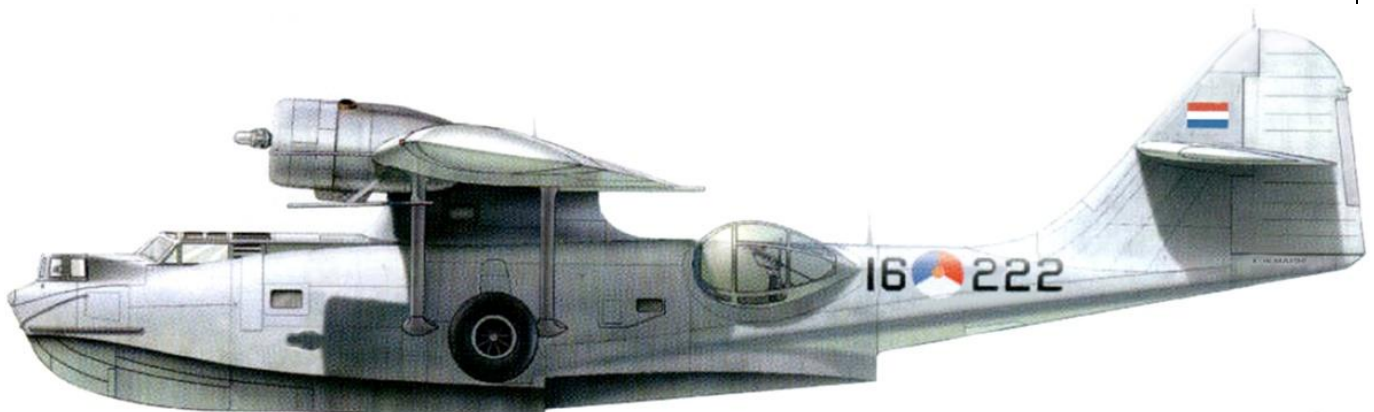


**A24-112 at Bankstown in 1953 in preparation for issue to the Dutch Navy as 16-225**

**Six PB2B-2Rs (16-220 to 16-225)** donated to the Dutch Navy in Indonesia over 1953-54, and were marked as 'Kon Marine' (Royal Navy): A24-92 transferred to Dutch Navy as **16-223** MAY 53; A24-99 as **16-224** 1953; A24-104 to **16-220** FEB 1954; A24-110 as **16-221** 1953, A24-111 in 1953 as **16-222**; A24-112 in 1953 as **P-225**



**A24-111 reconditioned for the Dutch as 16-222, 'KON MARINE' marked under rudder, at Bankstown 1954**





Creed, in *PBY: The Catalina Flying Boat*, provides a suitable epitaph:<sup>224</sup>

The PBY had its faults. Slow, prone to vibrate, and heavy on the controls, it was not the most manoeuvrable plane in the air. It was hot when the weather was hot, cold when the weather was cold. It was noisy.

But the plane had good points, too. Its galley provided hot food and coffee, and the Catalina had a head and bunks, all of which made long patrols more bearable. It was dependable; its Pratt & Whitney engines nearly always started, no matter whether in the steaming heat of the South Pacific or the freezing damp of the Aleutians, and they kept running until their switches were cut. It was tough; the airframe could take a beating from gunfire and heavy seas and nearly always come home, unless the odds were just too great.



[AWM ART22339]

## Sources:

- I K Baker, *Aviation History Colouring Book 20, Consolidated Catalina*, Melbourne Vic, 1995.
- I K Baker, *Aviation History Colouring Book 21, Dornier Do.24*, Melbourne Vic, 1995.
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There's more.....So read On

## In remembrance:

To their families, we express our sincere condolences for the Crew of the Coulson C-130 Fire Bomber



The three US firefighters have been remembered as heroes: (from left) First Officer Paul Hudson, flight engineer Rick DeMorgan jnr and Captain Ian McBeth.



A Repatriation Ceremony was held at RAAF Base Richmond on 8 February 2020 for Senior Master Sergeant Rick DeMorgan, an employee of Coulson Aviation and member of the United States Air Force who was tragically killed on 23 January 2020 whilst serving as a flight engineer on a C-130 Large Air Tanker combating bushfires near Cooma, New South Wales. RAAF Official.

## **Editor's Exit Comments, from my desk and heart : 02/03/2020**

It's been a lovely experience working, as usual, with John and our new Author, Shep, in producing this fine "rag".

Often it is easy to criticise the content after being read by those who are often not apprised with the amount of research that goes into this from researching Source Documents, Microfilms, or simple facts, before lampooning or offending "my boys".

Personally I've been contributing to our current and previous Newsletters since the first edition in, what, 2002.

Add a few larger ones in Flight Path over the last decade, and you'll understand why I get upset "a little" when there is a thoughtless complaint, based on naivety!

Where we going with this?

Well following the last Summer 2019 Edition, we had one "insignificant" complainer, so ignorant of actual history in fact, I was amused.

Such was the vitriol of his complaining that John and I, which despite being astounded by his anger, ensured that we provided a fair, balanced and pleasant counter reply.

Sticking to with facts, researched documents and Newspaper clippings of the era, he gave a shallow meaningless, "oh sorry", but not apologising for his reactionary insults, whereupon after, he then started complaining on the presentation of this Telegraph. Yes, he went on and on with emails, wasting precious hours of my remaining life span.

I accept that Page Numbering is required when you print this off, but when viewed in Acrobat Reader, there they were sitting there at the top. Our Basic Reason of not numbering pages in M/S Word? We have done this in this edition, and hope that this will pacify and put to sleep this creature of non-description. This Telegraph is an Electronic Media vessel thus page numbering was not needed.

**You see, we're not paid to do this, nor do we charge a single cent for you to read it, and that after we commit innumerable hours, days and weeks to research and produce the stories in this Telegraph.**

However, we do respect fair criticism based on fact, research and source documents tabled in an initial reply...not knee jerking emotional garbage.

**Gordy**

# End Notes:

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## <sup>1</sup> **How to Read RAAF Historical Records by Shep@2020**

Air Board Order N.16/1942 in RAAF War History Section "N" Orders Nos 1-1029, 1942; NAA: AA1966/5, 227.

<sup>2</sup> Air Board Order N.759/1942, *ibid*.

<sup>3</sup> Air Board Order N.718/1943 in RAAF War History Section "N" Orders Nos 1-952, 1943; NAA: AA1966/5, 228.

## <sup>4</sup> **RAAF Reconnaissance Development: Part 3 @Gordon R Birkett 2019**

These aircraft received nicknames: A8-126 'Cloud Dodger', A8-134 'Doubtful Dodger', A8-143 'Draught Dodger' and A8-146 'Artful Dodger'.....Ref: Page 141 per "From Controversy to Cutting Edge"

<sup>5</sup> The Ford Aerospace AN/AVQ-26 Pave Tack is an electro-optical targeting pod developed by the United States Air Force (USAF) for military attack aircraft. It uses a laser and a forward-looking infrared to find and designate targets for laser-guided bombs and other precision-guided weapons. Pave Tack's images are routed to a cockpit display

Good explanation Video available here: <https://au.video.search.yahoo.com/search/video?fr=yfp-t&p=AN%2FAVQ-26+Pave+Tack#id=1&vid=af77dee60dd972a6e6cde8bc5c11fd9a&action=click>

<sup>6</sup> The P-8A's AN/APY-10 Radar is able to provide high resolution radar images in both overland and water modes. Available modes include colour weather, synthetic aperture radar (SAR), inverse synthetic aperture radar (ISAR), periscope detection, and navigation. ISAR mode is capable of both detecting, imaging and classifying surface targets at long range using a variety of resolutions.

## <sup>7</sup> **RAAF WWII IN COLOUR: No.3 – RAAF Catalinas by John Bennett @2020**

D Vincent, *Catalina Chronicle*, Catalina National Committee, Adelaide, 1981.

<sup>8</sup> R Cleworth & J S Linton, *RAAF Black Cats*, Allen & Unwin, Sydney, 2019.

<sup>9</sup> The E/E.88 Aircraft Status Cards show that initially the PB2B deliveries were serialled in sequentially: between A24-106 and A24-116 were for PB2B-1s, re-serialled NOV 1944/JAN 1945 to a "block" from A24-200; A24-109 to A24-122 had been allocated over DEC 1944 and JAN 1945 to PB2B-2s which were subsequently renumbered from the A24-300 block; furthermore, from MAR 1945 the PB2B-2Rs were initially allocated serials from A24-310, but ultimately re-serialled in another block from A24-350.

<sup>10</sup> 'PB2B-2R' designation for this final batch mentioned only in few publications: R Francillon, *The RAAF and RNZAF in the Pacific, Aero Pictorials 3*, Aero Publishers, Fallbrook CA, 1970, p.6; also marked on E/E.88 Aircraft Status Cards. The 'R' is a USN suffix indicating modification for transport duties.

<sup>11</sup> Image of A24-7 arrival Rose Bay JUL 1941 – colours of the image appear to be "more greenish" than true "greyer" TSS shades.

<sup>12</sup> Vincent, p.10; R Creed, *PBY: The Catalina Flying Boat*, Naval Institute, Annapolis MD, 1985, p.262.

<sup>13</sup> The civil registrations VH-AFA to VH-AFS were used for the ferries. <http://www.adf-serials.com.au/2a24.htm>

<sup>14</sup> Vincent, p.12.

<sup>15</sup> <http://museum.wa.gov.au/mac-aviation-archaeology/fallenangels/a241.html>

<sup>16</sup> D Gillison, *RAAF 1939-1942*, AWM, Canberra, 1962, p.124.

<sup>17</sup> The 14 Canadian Vickers PBY-5A Catalina amphibians were to be given RCAF serials 9737 to 9750 (RAF VA737 to VA750), while the 55 Boeing-assembled Catalina amphibians were given RCAF serials 9751 to 9805 over 1942-43. In total, Canadian production was 731 aircraft – 362 by Boeing Canada and 369 by Canadian Vickers (which in 1944 became Canadair): <http://theflyingboatforum.forum> posts of MAR 2017.

<sup>18</sup> W Scarborough, *PBY Catalina in Action*, Squadron/Signal, Carrollton TX, 1983, p.23.

<sup>19</sup> A Percy, *Lend-Lease Aircraft in WWII*, Airline, Shrewsbury, 1996, pp.115-116.

<sup>20</sup> I K Baker, *Aviation Colouring Book 33, Catalina Collection*, Queenscliff Vic, 1997, p.10.

<sup>21</sup> J M Andrade, *US Military Aircraft Designations and Serials since 1909*, Midland Counties, Leicester, 1979, p.211.

<sup>22</sup> B Robertson, *British Military Aircraft Serials 1878-1987*, Midland Counties, Leicester, 1987, p.149. Official correspondence shows all PB2Bs for the RAAF were through Lend-Lease AIR Indent 2361 Contract BAC/N-1654, and as additional aircraft were added to this Contract, amendments were added as 'A2' and 'A3'. The first 17 aircraft comprised seven PB2B-1 Catalina IVBs, then ten PB2B-2 Catalina VIs – records have these aircraft mixed while 17 PB2B-1s had evidently been expected. RAF serials were JX611 to JX627, and this may go some way to explain the serialling mix-up from the A24-200 "block", requiring re-serials of some then from A24-300. Soon the RAAF obtained approval to take over a further 37 PB2B-2s which the RAF no longer required, and mission equipment was stripped out to provide a transport role as the PB2B-2R – first this comprised 17 aircraft (JX660-JX662, JZ828-JZ841), then a further 20 were added (JX628-JX643, JX645, 646, 648 and JX652). NAA A1695 282/209/EQ (108), c22 FEB 1945. These 37 PB2B-2Rs became A24-350 to A24-386.

<sup>23</sup> Gillison, p.484.

<sup>24</sup> AMO A.926/40 of 12 DEC 1940, cited in J Tanner, *British Aviation Colours of World War Two*, Arms and Armour Press, London, 1986, p.9.

<sup>25</sup> AMO A.30/41 of 9 JAN 1941, cited in Tanner p.13.

<sup>26</sup> For the TSS colours, *Sky* was generally not available in early 1940, and it was highly unlikely that the RAF members of BPC in New York were aware of *Sky* before mid-1940 when it came into widespread use in Britain. Therefore, *Sky Grey* was probably the specified undersurface colour for these initial Catalinas: research by Peter Malone, in *Aussie Modeller Intl*, 27 FEB 2015.

<sup>27</sup> The PBY-5B designation was for 225 RAF Catalina Mk.IB (FP100 to FP324) delivered over MAY-NOV 1942, with 60 held by the USN with RAF serials; Scarborough, *PBY Catalina*, p.50.

<sup>28</sup> Markings historian Dana Bell (in *Britmodeller*, 11 NOV 2019) gives the Du Pont approximations as *Extra Dark Sea Gray* duPont 71-19324, and *Dark Slate Gray* duPont 71-19323.

<sup>29</sup> I K Baker, *Aviation History Colouring Book 20, Consolidated Catalina*, Melbourne, 1995, p.4.

<sup>30</sup> Marking sizes confirmed by mensuration: upper mainplane type-B roundel 72" diameter, from wingspan 104ft; fuselage A1 roundel 1:3:5:7 proportions *Yellow 35"*, when overpainted outer *Blue 25"*; flash 24" x 24" standard RAF dimensions 1941-42 – RAF AMO.664 2 JUL 1942, in Tanner pp.20-21. Later in 1942 as *Red* was deleted from RAAF markings, flash became a standard 24" x 16", although with toned-down markings this was sometimes narrower with 6" width per colour as 24" x 12".

<sup>31</sup> NAA MP238/1 8/116/16(188) of 11 DEC 1940.

<sup>32</sup> RAAF HQ files 1/501/329; and 150/4/852 "Standard Finishes" AGI C.11 Issue 4, of 31 AUG 1942.

<sup>33</sup> Baker, No.20 p.2.

<sup>34</sup> These blue/black colours are analysed in Baker, *Aviation History Colouring Book 21, Dornier Do.24*, Melbourne Vic, 1995, p.2.

<sup>35</sup> A.D.1164 is described in I K Baker, *Aviation History Colouring Book 70, RAAF Colour Schemes & Markings Part 5A*, Queenscliff Vic, 2010, p.11.

<sup>36</sup> RAAF HQ file 1/501/329 (folio 156A) of c27 APR 1944; also repeated in Air Board letter SAS 7091 of 29 APR 1944.

<sup>37</sup> *adf-serials Newsletter* Vol.9 Issue 3, Spring 2019:

<http://adf-gallery.com.au/newsletter/ADF%20Telegraph%202019%20Spring.pdf>

<sup>38</sup> RAAF HQ Support Command file C3/8/Air Pt 2 (98) filed by RAAF Historical as 579/3/104 of 23 DEC 1966.

<sup>39</sup> Cited in J Tanner, *British Aviation Colours of WWII*, RAF Museum, Arms & Armour Press, London, 1986, p.9.

<sup>40</sup> P Malone & G Byk, *Understanding RAAF Aircraft Colours*, Red Roo, Melbourne, 1996, p. 27.

<sup>41</sup> Cited in Archer, p.42.

<sup>42</sup> Cited in Tanner, p.21.

<sup>43</sup> Cited in Archer, p.70.

<sup>44</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 repainted in a hurry, the type-C flash would be asymmetric with 13" *White*, 11" *Blue*.

<sup>45</sup> Cited in Archer p.153.

<sup>46</sup> RAAFHQ file 1/501/329(95A) of 18 AUG 1943 to Maintenance Groups: approval granted to retain US camouflage until repainting need; not to be re-camouflaged during erection; amended Instr No.1, AGI Part 3 Sect(c) to be issued in due course.

<sup>47</sup> Cited in Archer pp.163-172. Also covered in *adf-serials Newsletter Vol.8 No.1 Summer 2018 Supplement*, p.7:

<http://www.adf-serials.com.au/newsletter/ADF%20Telegraph%202017-18%20Summer.pdf>

<sup>48</sup> RAAFHQ file 1/501/329(103A) of 8 SEP 1943.

<sup>49</sup> In this signal, RAAFHQ pointed out to 1FBRD that "In the case of those Mariner aircraft where painting would prevent the extension of initial corrosion the hulls may be covered with *Seaplane Varnish* ident K3/74..."

<sup>50</sup> Cited Tanner, pp.32-56.

<sup>51</sup> J M Elliott, *The Official USN & USMC Aircraft Colour Guide Vol 2 1940-49*, Monogram, Sturbridge MA, 1998, pp.190-194.

<sup>52</sup> I K Baker, *Aviation History Colouring Book 33, Catalina Collection*, Queenscliff Vic, 1997, p.12.

<sup>53</sup> Messimer, p.xiv. Numbers were changed to simplifying the last digits: 101-P-27 became "27" but then changed to "4"; 22 became "2"; 13 became "7". The VP-22 aircraft were also integrated. When reconstructed with MLD Y-72, 22-P-12 became "46".

<sup>54</sup> Messimer, p.347. These five were MLD Y-41, Y-50, Y-43, Y-73 and Y-39; "Blackcat", *adf-serials* Catalina post, 13 APR 2014.

<sup>55</sup> Creed, p.52.

<sup>56</sup> Scarborough, p.20.

<sup>57</sup> D R Messimer, *In the Hands of Fate*, Naval Institute, Annapolis MD, 2012.

<sup>58</sup> Scarborough, p.44.

<sup>59</sup> Messimer, p.269.

<sup>60</sup> Peter Malone (as Magpie 22), *Britmodeller* site, 17 DEC 2016.

<sup>61</sup> Messimer, p.39.

<sup>62</sup> Scarborough, p.21. Modellers have subsequently run with these multi-tone blue/grey shades, with nothing positively definitive.

<sup>63</sup> Messimer, p.155.

<sup>64</sup> I K Baker, *Aviation Colouring Book 32, USN Aircraft Camouflage & Insignia 1941-47*, Queenscliff Vic, 1997, pp.2-3.

<sup>65</sup> J K Jonker's *Dutch Modelling and Aviation* site:

[https://kw.jonkerweb.net/index.php?option=com\\_content&view=article&id=713:consolidated-pby-55a-catalina](https://kw.jonkerweb.net/index.php?option=com_content&view=article&id=713:consolidated-pby-55a-catalina)

<sup>66</sup> Baker, No.21 p.1; also pp.3-4 notes that the orange triangle became smaller in APR 1941 at 28cm, with a 10cm black border, and then replaced in FEB 1942 by a 50cm x 30cm Dutch flag.

<sup>67</sup> Messimer, p.xiv. Numbers were changed to simplifying the last digits: 101-P-27 became "27" but then changed to "4"; 22 became "2"; 13 became "7". The VP-22 aircraft were also integrated. When reconstructed with MLD Y-72, 22-P-12 became "46".



- <sup>68</sup> Messimer, p.347. These five were MLD Y-41, Y-50, Y-43, Y-73 and Y-39; “Blackcat”, *adf-serials* Catalina post, 13 APR 2014.
- <sup>69</sup> <https://www.pacificwrecks.com/douglas/articles/nejaf.html>
- <sup>70</sup> I K Baker, *Aviation History Colouring Book 43, Updates & Oddities 2*, Queenscliff Vic, 2001, p.10.
- <sup>71</sup> <https://www.goodall.com.au/australian-aviation/dornier-24/dornierDo24.html> Also lost were two USN PBY-4s (101-P-13/“7” and 102-P-26/“6”), two RAF 205SQN Catalinas, five MLD Do-24Ks X-1, X-3, X-20, X-23, and X-28, and two Short Empires Qantas G-AEUC *Corinna* and RAAF A18-10. From Goodall: “As the Japanese invasion of the NEI commenced, five of the older Dorniers X-5, X-7, X-8, X-9 and X-10 were transferred to Australia on 19 Feb 1942 as part of a planned evacuation of the MLD training school to a safe location.” These became A49-1 to A49-5; later X-24 became A49-6.
- <sup>72</sup> For a history of MLD PBYS, including PBY-5 losses in NEI, see J K Jonker’s *Dutch Modelling and Aviation* site: [https://kw.jonkerweb.net/index.php?option=com\\_content&view=article&id=713:consolidated-pby-55a-catalina](https://kw.jonkerweb.net/index.php?option=com_content&view=article&id=713:consolidated-pby-55a-catalina)
- <sup>73</sup> According to the Operations Record Book for 321 (Dutch) SQN during the last days of MAY 1942 (from Nelson as “Blackcat” at *adf-serials*, on 13 APR 2014), five PBY-5 Catalinas Y-45, Y-49, Y-62, Y-69 and Y-71 arrived from Australia at Koggala, Ceylon (ref UK National Archives TNA: AIR 27/1715/1 p.3); these joined four Y-55, Y-56, Y-57 and Y-64 to form 321SQN, headquartered at China Bay, Ceylon (TNA: Air 27/1715/1 p.3). <http://www.adf-messageboard.com.au/invboard/index.php?showtopic=2398>
- <sup>74</sup> MLD PBY-5 Y-45 flew from Ceylon to Australia in MAR 1943 for the Dutch Det/Australia to join the Do-24K, X-24, for liaison duties for the Dutch intelligence services. It is interesting to note that the RAAF E/E.88 status card for A24-28 incorrectly makes reference to Y-45 (c/n 298), which was ex-USN “3”. Then to replace Do-24K X-24, in JUN 1943 two PBY-5As (Y-86 and Y-87) were added to Det/Australia. [https://kw.jonkerweb.net/index.php?option=com\\_content&view=article&id=713:consolidated-pby-55a-catalina-uk&catid=84&lang=en&showall=&limitstart=1&Itemid=546](https://kw.jonkerweb.net/index.php?option=com_content&view=article&id=713:consolidated-pby-55a-catalina-uk&catid=84&lang=en&showall=&limitstart=1&Itemid=546)
- <sup>75</sup> Messimer, p.307.
- <sup>76</sup> The four PatWing 10 PBYS were 101-P-3/“3”, 101-P-5 “5”, 101-P-10 “10”, and hybrid 22-P-12/“46”.
- <sup>77</sup> [http://www.joebaugher.com/navy\\_serials/secondseries1.html](http://www.joebaugher.com/navy_serials/secondseries1.html)
- <sup>78</sup> This may have been the Catalina that on 27 FEB 1942 USN Leut Hyland had set off in for Broome, but lost his starboard engine and landed at Tjilatjap, where it was abandoned; Creed, p.93.
- <sup>79</sup> Messimer, pp.307, 326.
- <sup>80</sup> Messimer, p.269.
- <sup>81</sup> *adf-serials* website gives the MLD airframe for the US “46” salvage as Y-72; Dutch K W Jonker site gives it as Y-42 (c/n 266).
- <sup>82</sup> Messimer, p.347.
- <sup>83</sup> USN “VP” patrol squadron designators were changed to “VPB” patrol bomber squadron on 1 OCT 1943 with the change in tactics from “search and report” to “search and attack”; Creed, p.165.
- <sup>84</sup> <http://www.adf-serials.com.au/research/catalinaA24-30.shtml>
- <sup>85</sup> J M Elliott, *The Official USN & USMC Aircraft Colour Guide Vol 2 1940-49*, Monogram, Sturbridge MA, 1998, pp.190-194.
- <sup>86</sup> I K Baker, *Aviation History Colouring Book 33, Catalina Collection*, Queenscliff Vic, 1997, p.12.
- <sup>87</sup> Gillison, p.484.
- <sup>88</sup> W Scarborough, *Walk Around PBY Catalina*, Squadron/Signal, Carrollton TX, 1995, p.69.
- <sup>89</sup> There was some re-serialling of the PB2B-1 and the PB2B-2 flying boats into -200 and -300 “blocks”, and PBY-5As being concurrently delivered had to be **re-serialled from A24-106**.
- <sup>90</sup> Percy, p.115.
- <sup>91</sup> B Pattinson, *The Kingfisher in the Antipodes*, Red Roo, Melbourne, 1998, pp.17-18.
- <sup>92</sup> I K Baker, *Aviation History Colouring Book 28, Those Eagles 1*, Queenscliff Vic, 1997, p.6.
- <sup>93</sup> 1FBRD Unit History A.50, JUL-AUG 1943.
- <sup>94</sup> Peter Malone e-mail to author, 23 JAN 2020.
- <sup>95</sup> G Pentland, *RAAF Camouflage & Markings 1939-45 Vol 1*, Kookaburra Melbourne, 1980, pp.121-122.
- <sup>96</sup> Creed, p.272, states that the port wheelwell space was able to be used for the auxiliary power unit (APU), which is substantiated by Mod.60 specs in JUN 1944; A705 9/30/203(65A) para.39(u) MAY 1944; and A705 9/30/203(74A) of 19 JUN 1944, which totals the weight reduction of the modification as 1766 pounds (800 kg).
- <sup>97</sup> E/E.88 A24 Aircraft Status Cards. The cards annotate those aircraft modified as “PBY-5A(M)”, and some of those not modified as “not fitted MOD.60”, or “reserved amphibian”, or “for ASR duties”. Although R Cleworth & J S Linton, *RAAF Black Cats*, Allen & Unwin, Sydney, 2019, p.43, claims 45 or 46 aircraft underwent conversion from DEC 1943, not all the PBY-5As were required as flying-boats with amphibians preferable for ASR, and in addition modifications were delayed until mid-1944.
- <sup>98</sup> RAAFHQ DTS signal T 160 of 10 MAY 1944, file 62/4/93(33A).
- <sup>99</sup> RAAFHQ T.O. AGI Pt 3(c), Instruction 1, Appendix D; file 150/4/5056 (1A), of 26 MAY 1944.
- <sup>100</sup> Adding to the different disruptive schemes, it is possible than in some cases that patches of the USN *Blue* were left when *Black* was added; Peter Malone, e-mail to author on 23 JAN 2020.
- <sup>101</sup> I K Baker, *Aviation History Colouring Book 34, Colour Chips*, Queenscliff Vic, 1998, p.3.
- <sup>102</sup> *Sea Blue* was either matt (i.e. in USN terminology ‘non-specular’) ANA 607, or semi-gloss ANA 606. Matt colours were recorded in the ANA 600-series, and gloss colours generally (but not always) as ANA 500-series numbers; Elliott, p.190.
- <sup>103</sup> NAA A705 9/30/203(M.48) of 26 JUL 44 by RAAFHQ DTS states fitting aux tanks and the wooden nose box, with the removal of landing gear only constituted 10 percent of Catalina Order No.60. Later aircraft from New Orleans had hydraulic systems removed on the production line.

<sup>104</sup> All aircraft, after transiting through 2FBRD at Rathmines, proceeded immediately to 1FBRD at Lake Boga for RAAF induction and servicing, which would have involved checking the integrity of the US flying boat “temporary modification”, which had included fitting auxiliary fuel tanks in the main wheelwells to prevent water ingress (but not connected to fuel), fitting of a plywood box structure inside the nosewheel cavity, and removal of some hydraulic equipment. It was not the “more permanent” configuration to be undertaken from mid-1944. In JAN 1944, RAAFHQ selected the 6th PBY-5A received (A24-74) as the prototype for the 1FBRD Mod.60 design, and in FEB determined that aircraft received from the US with the “temporary modification” could be released and operated by the squadrons; A705 9/30/203 (M.9) 11 JAN 1944, and (M.17) 26 FEB 1944. The following month, Alcoa aluminium extrusion sheets were shipped from the US, A705 9/30/203(41A) of 31 MAR 1944; aluminium had to be imported and the Dural sheets were used for the skin, extruded strips for building aircraft frame and stringers. In JUN 1944, RAAFHQ AMEM issued the finalised Catalina Order No.60 for the modification; A705 9/30/203(64A) of 19JUN 1944. At that stage, the designation of converted aircraft was introduced as “**PBY-5A(M)**”; A705 9/30/203(M.42) of 22 JUN 1944.

<sup>105</sup> RAAF HQ DTS Catalina Tech Order No.60 “*Amphibian Landing Gear Removal*” NAA A705 150/4/5213 (2A) of 7 JUL 1944, where para.4 specifies “for aircraft A24-69 and subsequent”.

<sup>106</sup> B Freeman, *Lake Boga at War*, Catalina Pubs, Swan Hill VIC, 1995, p.189.

<sup>107</sup> Consolidated Sales Order 3-1-7 of 11 AUG 1944 shows that seven PBY-5As from New Orleans had the “more substantial modification” to RAAF requirements as flying boats by the removal of the amphibious undercarriage and auxiliary fuel tanks fitted in the main wheelwells. These aircraft were Bu 46592 (A24-105), 46493 (written-off landing at San Pedro on 25 SEP 1944), 46594 (A24-104), 46605 (A24-123), 46606 (A24-124), 46607 (A24-125), and 46608 (A24-126); NAA A1695 270/209/EQ Pt.2 (267C) of 22 AUG 1944. RAAF E/E.88s on delivery in Australia for PBY-5As A24-106 through A24-109 are recorded “U/c not fitted”, similarly A24-114 is recorded on delivery as “without undercarriage”. The E/E.88 for **A24-82** is annotated “PBY-5A” – but states for 30 JAN 1945 “A/c not fitted with Catalina Order No.60”.

<sup>108</sup> E/E.88 A24 Aircraft Status Cards annotate those aircraft modified as “PBY-5A(M)”, and some of those not modified as “not fitted MOD.60”, or “reserved amphibian”, or “for ASR duties”. The 2FBRD Unit History A.50 for NOV 1944 reports the conversion of **A24-71** under Modification 60, but does not record any other amphibian being converted at Rathmines. Similarly, **A24-72** is recorded as the first Order No.60 aircraft modified at 1FBMU Bowen; A705 9/30/203(83A) of 10 JUL 1944.

<sup>109</sup> In APR 1944, before the formation of the ASR Flights, RAAFHQ determined that at least two PBY-5As retain their amphibious capability for ASR, with one aircraft allocated each to 6CU and 8CU, with a further two to follow before the formation of 44SQN, A705 9/30/203(M.36) of 13 APR 1944, and those first two would be Bu 46489 (**A24-94**) and Bu 46491 (**A24-92**). One PBY-5A(M) that was retrofitted back to amphibian configuration was **A24-76** (ex 20SQN) modified for use by 6CU, and written-off on the runway at Broome in DEC 1944. **A24-104** was ferried as a flying boat from the New Orleans factory in OCT 1944, and immediately at 1FBRD “was fitted with amphibious equipment for ASR”, going to 8CU in DEC 1944. E/E.88s A24-76, A24-104.

<sup>110</sup> NAA A705 9/30/203(M.48) 26 JUL 1944.

<sup>111</sup> NAA A1695 270/209/EQ Pt.2(271A) of 30 AUG 1944.

<sup>112</sup> NAA A1695 270/209/EQ Pt.3 (467A) of 22 DEC 1944. A further three PBY-5As had been allocated to the RAAF (Bu 46636 to 46638), but because of the reduced output of the New Orleans plant, these were completed as amphibians and redirected to the USN.

<sup>113</sup> This followed VP-11 operating in this scheme from OCT 1942 at Guadalcanal, and then aircraft in matt black paint, flame dampers and radio altimeters; Creed, pp.150-1. Later, from late 1944, VPB-50 in the Philippines; Baker No.32, p.14.

<sup>114</sup> Baker, No.20 p.2.

<sup>115</sup> Baker, No.33 p.16.

<sup>116</sup> RAAFHQ DTS signal QQ 457 of 2 MAY 1944, 1/501/329(162A).

<sup>117</sup> I K Baker, *Aviation History Colouring Book 29, Those Eagles 2*, Queenscliff Vic, 1997, p.17.

<sup>118</sup> Historian Mark Harbour (as “Sydhuey” on *Britmodeller* 15 Nov 2016) concurs that late PB2B-1 (200 series) and PB2B-2 (300 series) were all repainted all-over *Black (Night)* before delivery to squadrons.

<sup>119</sup> NAA A11093 452/A24 Pt.2 (19A) c JAN 1945, RAAF Command ‘*Replacement Pool – Catalinas Aeroplanes – NWA*’.

<sup>120</sup> Creed, p.273.

<sup>121</sup> Andrade, p.210: Boeing’s first PB design was the PBB Sea Ranger; PB2B was Boeing’s licensed production of the PBY-5. While the PB2B-1 was visually similar to the PBY-5; the PB2B-2 had the tall tail of the PBN-1 and PBY-6A designs. It is incorrect to imply the PB2B-2 as a copy of the “PBY-6” as there was no such design – the US model was only built as the amphibian PBY-6A. Basically the PB2B-2 was a tall tail PBY-5 with latest modifications of radome and eye ball turret, and British equipment; Scarborough, p.38.

<sup>122</sup> RAAF Washington advice to RAAF HQ Melbourne NAA A705 9/30/297 (3A) of 6 NOV 1944.

<sup>123</sup> NAA A705 9/30/182 *Catalina Radar Installations*, folio 45A of 14 FEB 1945. Catalina radar types were: ASE long-wave ASV search radar, and ASB medium-wave search radar, both with Yagi array aerials; ASD-1 (aka AN/APS-3) centimetric ASV radar in PB2B aircraft in a teardrop polifibre radome, which was found unsuitable in the tropics and was changed to a local A8702 plexiglass radome; these were all ASV (air-to-surface vessel) search radars. Later a SCR-729 IFF radar/transponder (Mod 58) was fitted.

<sup>124</sup> NAA A2761 War Cabinet Agendum 533/1944 p.1, 4 NOV 1944.

<sup>125</sup> NAA A1695 281/209/EQ, UK Requisition BAC/N-2026 AUS, Indent AIR 2417, of 19 JUL 1945. PBY-6A production was at New Orleans, with the first batch of 61 aircraft produced over JAN-MAY 1945 (Bu 46639/46698 and 46724); Scarborough, *PBY Catalina*, p.50.

<sup>126</sup> Baker, No.32 p.5.

<sup>127</sup> DTD Technical Service Circular 360, *Camouflage and Marking of Aircraft*, Appendix 5, of 23 FEB 1943:

[http://www.hrmtech.com/SIG/coastal\\_cam.asp](http://www.hrmtech.com/SIG/coastal_cam.asp)

<sup>128</sup> Baker, No.33 p.14.

<sup>129</sup> AP.2656A, Vol.1 Sect.6, para.33, of OCT 1944, cited in Tanner p.39.

<sup>130</sup> Dana Bell on *Britmodeller* site, 11 NOV 2019.

<sup>131</sup> RAAFHQ DASP file “Camouflage of AS Patrol Aircraft” 62/4/84 (M.121), of 19 NOV 1943.

<sup>132</sup> RAAF Command letter 4486 686.3H9 “Camouflage-Aircraft” of 27 NOV 1943, filed as 1/501/329(121A).

<sup>133</sup> NAA A1695 282/209/EQ (115A) of 2 MAR 1945.

<sup>134</sup> Andrade, p.11.

<sup>135</sup> Baker, No.43 p.16; and No.80 pp.5, 12.

<sup>136</sup> I K Baker, *Aviation History Colouring Book 80, RAAF Colour Schemes & Markings Part 13A*, Queenscliff Vic, 2014, p.12.

<sup>137</sup> RAAF HQ Air Member for Engineering & Maintenance letter of 18 OCT 1945, RAAF HQ file 1/501/329(31A), in response to No.4 (Maintenance) Group query of 10 OCT 45 (folio 30A).

<sup>138</sup> E/E.88 A24 Aircraft Status Cards.

<sup>139</sup> RAAF Ferry Det San Pedro, to 2FBRD Rathmines, 1/1/AIR (60A) of 7 MAY 1945.

<sup>140</sup> In addition to the PBY-5A renumbering A24-106 to A24-114, some PB2B-1 numbers were also allocated twice: A24-201 and A24-204. There are discrepancies between E/E.88 Aircraft Status Cards, and RAAF delivery files NAA A705 files 9/30/297, A1695 270/209/EQ, 279/209/EQ and 282/209/EQ, plus the RAAF Ferry Det at San Pedro LA also highlighted discrepancies stating “It appears that when the JX or JZ number is painted off the aircraft [*presumably at Rathmines*], no one keeps a record”; RAAF San Pedro file 1/1/AIR (60A) of 7 MAY 1945. The RAAF A24- serial was allocated sequentially on arrival at 2FBRD Rathmines up to A24-110 irrespective of model; this was not consecutive with either the Bu numbers or RAF serials, and in SEP 1944 this re-serialising responsibility passed from Rathmines to the RAAF Acceptance & Ferry Det at US Naval Air Station, Terminal Island, San Pedro. The ferrying still continued from San Diego to Kaneohe, Hawaii. (The RAAF serial date in the list records when these numbers from A24-106 were allotted by San Pedro, which differ from dates on the E/E.88.) The E/E.88s show that initially the PB2Bs too were numbered sequentially in this series: PB2B-1s between A24-106 to A24-116 were re-serialised between NOV 1944 to JAN 1945 to a **‘block’ from A24-200** (JX611-JX617); PB2B-2s between A24-109 to A24-122 were allocated over DEC 1944 and JAN 1945 which were subsequently renumbered from **the A24-300 block** (JX618-JX627); furthermore, from MAR 1945 the PB2B-2Rs were initially allocated serials from A24-310, then re-serialised in another **block from A24-350** (JX and JZ numbers). Inconsistencies between RAAFHQ Catalina delivery file A705 9/30/297(9A) and E/E.88s: A24-110 is listed as Bu **44235** on file (but as Bu 44234 on the E/E.88) – 44234 became A24-204 (‘204 the 1st’, before changing again to A24-301); the E/E.88 gives **44235** becoming A24-308 (which was ex A24-120). Examples of simple E/E.88 errors include subsequent the transcription of A24-303/44231 as JX618 (it should be JX621), and A24-305/44228 as JX621 (it was JX618) – the correct tie-ups of JX618/44228 to JX627/44237 are in Percy, p.116.

<sup>141</sup> These PBY-5As were manufactured by Consolidated in New Orleans, Louisiana, after PBY production swapped from San Diego in APR 1944; 59 PBY-5As would be produced at New Orleans over APR 1944–JAN 1945 (Bu 46580/46638); Scarborough, *PBY Catalina*, p.50. All 1944/1945 Catalinas (from Vancouver and New Orleans production) would be ferried to the RAAF Det at San Pedro, near Los Angeles, for modification, and then to San Diego to commence the trans-Pacific crossing to Kaneohe Bay on Oahu, Hawaii.

<sup>142</sup> While most of the RAAF PBY-5s/-5As were manufactured at San Diego, 12 PBY-5As were delivered in 1944 from the plant in New Orleans, but one (Bu 46593) crashed alighting at San Pedro, so only eleven were taken on charge with A24- serials. Most of these aircraft were annotated as “undercarriage not fitted”. The first three RAAF PBY-5As from New Orleans production (Bu 46592/46594) were earmarked in JUL for RAAF acceptance in SEP 1944; NAA A705 9/30/203(98A), *‘RAAF Visit to New Orleans Factory 27 JUL 1944’*. Over JUN-AUG 1944 there was much negotiation between the RAAF, USN and Consolidated on options for converting the PBY-5A amphibians into flying boats, and this included work being done at New Orleans factory, San Francisco civil contractor, Elizabeth City USN modification centre or San Pedro naval air station (home of the RAAF Ferry Det) – and the fitting of Canadian Vickers flying boats hulls was considered too. RAAF Washington signal WL115T of 13 AUG 1944 provided the breakdown of work: New Orleans remove undercarriage with hydraulic equipment, fuel cells, and the wing/empennage de-icing; San Pedro would install auxiliary wheel well tanks (which would remain empty) to prevent water ingress with a plywood box also installed in the nosewheel well, remove heat exchanger, and some radio installation; NAA A705 9/30/203(95A). Ultimately seven PBY-5As of the RAAF production were fitted with Canadian Vickers hulls (Bu46592/46594, 46605/46608), this could also have been the case for the last five; NAA A1695 27/209/EQ Pt.1 22 AUG 1944.

<sup>143</sup> NAA A1695 270/209/EQ Pt.3 (363A) of 12 OCT 1944.

<sup>144</sup> NAA A1695 282/209/EQ (108) and (179B) of c22 FEB 1945.

<sup>145</sup> Consolidated Sales Order 3-1-7 of 11 AUG 1944 shows that seven PBY-5As from New Orleans had been modified to RAAF requirements as flying-boats by the removal of the amphibious undercarriage. These aircraft were Bu 46592 (A24-105), 46593 (written-off landing at San Pedro on 25 SEP 1944), 46594 (A24-104), 46605 (A24-123), 46606 (A24-124), 46607 (A24-125), and 46608 (A24-126); NAA A1695 270/209/EQ Pt.2 (267C) of 22 AUG 1944. These seven were followed by a further five (Bu 46619/46623), serialised at San Pedro as A24-127 to A25-131, also with landing gear removed. The E/E.88s are not always clear on this: most PBY-5As on delivery from the US are annotated “undercarriage not fitted”, or “without undercarriage”. Later

amphibian references are “serviceable for strip landings” (A24-111), and “nosewheel collapsed after landing” (A24-110). Of this group, imagery shows that subsequently at least A24-104 to A24-114 operated as amphibians.

<sup>146</sup> There must have been confused messages (unsighted) passing between RAAFHQ Melbourne, RAAF Washington, RAAF Det San Pedro, and 2FBRD at Rathmines during this allocation of serials – no definitive explanation has come to light on why RAAFHQ entrusted San Pedro in allotting A24- serials.

<sup>147</sup> RAAFHQ DTS file A705 9/30/297(9A) has A24-113 listed as Bu 44218 and becoming A24-201, and A24-115 Bu 44219. But E/E.88 Aircraft Status Cards have Bu 44218 as A24-115 becoming A24-201, and Bu 44219 as A24-113 becoming A24-204. Aircraft arrived together at Rathmines and re-serialled on 27 DEC 1944 in the 200-series to fill the gaps of PB2B-2 aircraft “elevated” to the 300-series.

<sup>148</sup> RAAF Washington letter 2361 of 16 JAN 1945.

<sup>149</sup> NAA A1695 270/209/EQ Pt.2 (196A), 21 JUN 1944.

<sup>150</sup> J W Bennett, *Fighter Nights, 456 Squadron RAAF*, Banner Books, Canberra, 1995, p.97.

<sup>151</sup> Creed, p.48.

<sup>152</sup> NAA A1695 282/209/EQ (153A) p.2, of 5 APR 45.

<sup>153</sup> NAA A1695 270/209/EQ (406A) of 30 OCT 1944; 270/209/EQ Pt.2 (210A) 16 JUL 1944; 270/209/EQ Pt 2 (272B) AUG 1944; 270/209/EQ Pt 3 (381A) c20 OCT 1944. Other NAA references for Catalina radar installation include A705 9/30/141 *Catalina Tech Order No.55* (Yagi search aerials installation); 150/4/5207 *Catalina Tech Order No.58* (SCR-729 IFF); and 9/30/182 *Catalina Radar Installations*.

<sup>154</sup> MAJ J S Chilstrom, *Mines Away! The Significance of U.S. Army Air Forces Minelaying in World War II*, USAF Air University, Alabama, 1992, Chap 3, pp. 20-21:

[https://media.defense.gov/2017/Dec/28/2001861720/-1/-1/0/T\\_CHILSTROM\\_MINES\\_AWAY.PDF](https://media.defense.gov/2017/Dec/28/2001861720/-1/-1/0/T_CHILSTROM_MINES_AWAY.PDF)

<sup>155</sup> S W Roskili, *The War at Sea 1939-1945, Vol. III, Part II, History of the Second World War*, HMSO, London, 1961, p.371.

<sup>156</sup> With twin 50-cals in the PBY-5A nose turret, on an early morning attack on a Japanese camp in Borneo in JUL 1945, an 113ASRF gunner opened fire on the assembled Japanese ranks. “Then there was a mad scramble in all directions – utter pandemonium – with some men literally flung between the legs of others by the impact of our heavy point 5s. At the same time, seeing the tracers seeming to almost lazily ricochet away. I made a purely detached, mental observation as to the unsuitability of this ammunition for strafing. The more rapid firing, more anti-personnel, .303s, would have been much more effective.” Leach, p.137.

<sup>157</sup> Vincent, p.18.

<sup>158</sup> NAA A705 9/30/232 (3A) *Armament Installation on Catalina Aircraft*, c AUG 1944, para.C.

<sup>159</sup> Peter Malone (as “Magpie 22”) on *Britmodeller*, 24JUN 2018. Depth charges could be carried for ASW, not a normal role for RAAF Cats. British depth bombs were the 450lb Mk VII (standard for first years of the war), and 250lb Mk.VIII from 1942.

<sup>160</sup> NAA A11093 452/A24 Pt.1 (41A) of 25 Sep 1943. The USN Bomb Disposal manual “*Bombs and Fuzes*” provides details on the Mk.37 depth bomb: <https://bulletpicker.com/pdf/USNBD%20-%20US%20Bombs%20and%20Fuzes.%20Pyrotechnics.pdf>

<sup>161</sup> Vincent, p.24.

<sup>162</sup> NAA A11093 452/A24 Pt.1 (9A) and (13A) MAR/MAY 1943.

<sup>163</sup> NAA A705 15/18/33 *Aircraft Mines – Overhaul and Maintenance of Mines – Policy*, (72A) para.6 of 11 OCT 1946 gives the following weights of UK mines: ‘A’ Mk.8 500lb, ‘A’ Mk.9 1800lb, and ‘S’ 1000lb.

<sup>164</sup> Mark Harbour (as “SydHuey”) on *Britmodeller*, 23 JUN 2018.

<sup>165</sup> Peter Malone (as “Magpie 22”) on *Britmodeller*, 25 JUN 2018. Vincent p.64 gives these as 365 x Mk.13 Mod.5 acoustic mines.

<sup>166</sup> NAA A705 12/14/1 *Aircraft Naval Mine Type A – General Technical Details*, (10B) of 18 DEC 1944 lists the following: British ‘A’ Mk.IV 1500lb, and ‘A’ Mk.V 1000lb; US Mk.12 1660lb, Mk.13 1025lb, Mk.26 identical to Mk.13 except it is 6-inches longer being fitted with the parachute. Folio (14B) of 24 JUL 1945 generally confirms this data, giving the Mk.12 as 1800lb, Mk.13 as 1000lb, and adds the US Mk.25 as 2000lb (75 inches long).

<sup>167</sup> NAA A705 172/3/5701 (7A), of SEP 1944.

<sup>168</sup> NAA A1695 281/209/EQ, of 4 JUL 1945.

<sup>169</sup> 11SQN A.50 Unit History; Vincent, pp.11-12.

<sup>170</sup> *Units of the RAAF, A Concise History, Vol.4 Maritime and Transport Units*, AGPS, Canberra, 1995, pp.17-21.

<sup>171</sup> These eight comprised five 11SQN and three 20SQN: **A24-15** crashing on take-off at Port Moresby on 8 DEC 1941, **A24-11** crashing taking off at Kavieng on a strike for Truk on 15 JAN 1942, **A24-9** shot down by Zeros near Salamaua on 21 JAN 1942, **A24-8** shot down by Zeros when shadowing ships on 21 JAN 1942, **A24-13** FTR from raid on Rabaul on 24 FEB 1942, and three aircraft destroyed by Zeros on 28 FEB 1942 moored at Port Moresby, **A24-3**, **A24-6**, **A24-7**; M Claringbould & P Ingman, *South Pacific Air War Vol.1*, Avonmore, 2017, pp.199-200.

<sup>172</sup> 1FBRD Lake Boga Unit History A.50 – this overhaul took place over 5 AUG 1942 to 12 SEP 1942.

<sup>173</sup> Vincent, p.16.

<sup>174</sup> **Mensuration:** Digital imagery with large monitors now makes it easier to accurately measure aircraft markings. For calibration, known dimensions are used – for instance, aircraft serial numbers are generally 8” high and 5” wide (Imperial measures are used, as that was the standard of the day), and some Orders provide roundel and fin flash dimensions. Generally, squadron code letters vary as there was no laid down standard. Such mensuration is accurate enough if the camera lens is directly perpendicular and horizontal to a flat subject. But perspective is further affected by fuselage curvature, or other curved panels, and there can be camera lens imperfections. So this is an imperfect art but, in general, sizes of aircraft markings can be provided inside a 2” margin of error.

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- <sup>175</sup> Vincent, p.59.
- <sup>176</sup> Vincent, p.12; Creed, p.263.
- <sup>177</sup> Claringbould & Ingman, *Vol.1*, p.113.
- <sup>178</sup> Cleworth & Linton, p.77.
- <sup>179</sup> *Units of the RAAF, Vol.4*, p.29.
- <sup>180</sup> E/E.88 A24 Aircraft Status Cards: A24-200 was operated by 3OTU; A24-201 to A24-205 equipped 20SQN; the last PB2B-1 A24-206 was flown by 43SQN FEB/MAY 1945 before issue to 20SQN in JUN 1945, with whom it sank at its mooring on 20 JUN.
- <sup>181</sup> As related, PB2Bs were re-serialled from their initial RAAF serial allocation into “blocks”. A24-300 RB-H is a noteworthy example – originally allocated **A24-109** in NOV 1944, it was immediately re-allocated **A24-201** the following day, then two weeks later on 7 DEC allocated **A24-300**. Serving on 20SQN from the end of 1944, in JAN 1946 it was one of several allotted to 40SQN but this was cancelled, and went to 112ASRF. Sold via disposal list 2631, it went to QANTAS on 28 OCT 1946; E/E.88 A24-300.
- <sup>182</sup> Creed, p.271.
- <sup>183</sup> *Units of the RAAF, Vol.4*, pp.77-79.
- <sup>184</sup> Creed, p.268.
- <sup>185</sup> *Units of the RAAF, Vol.4*, pp.81-82.
- <sup>186</sup> Righetti quoted in Minty *Black Cats*, p.178.
- <sup>187</sup> Peter Malone e-mail to author, 23 JAN 2020.
- <sup>188</sup> Baker, No.20 p.3 1995, has a starboard side drawing of A24-362 showing code V\*OX, but this may be in error, no image seen.
- <sup>189</sup> NAA A1695 270/209/EQ pt.3 (472A) of 10 JAN 1945.
- <sup>190</sup> Creed, p.272.
- <sup>191</sup> 111ASRF A.50 Unit History, DEC 1944-JAN 1945.
- <sup>192</sup> *Units of the RAAF, Vol.4*, p.153.
- <sup>193</sup> *Units of the RAAF, Vol.4*, p.154.
- <sup>194</sup> Creed, p.284.
- <sup>195</sup> *Units of the RAAF, Vol.4*, pp.155-156.
- <sup>196</sup> J Leach, *RAAF Flying Boats at War*, Australian Military History Pubs, 1999, pp.145-142.
- <sup>197</sup> Creed, p.284.
- <sup>198</sup> *Units of the RAAF, Vol.4*, pp.157-158.
- <sup>199</sup> Creed, p.284.
- <sup>200</sup> 115ASRF A.50 Unit History, AUG 1945; Cats allocated were A24-105, -114, -380 and -381, and later A24-111 and -113.
- <sup>201</sup> *Units of the RAAF, Vol.4*, pp.159-160.
- <sup>202</sup> DTS Spec Instruction Gen/34 sent by RAAF HQ message T.20/PGM 62/4/93(13A) of 1 MAY 1944, precursor to AGI 3(c) No.1.
- <sup>203</sup> *Units of the RAAF, Vol.4*, pp.128-133.
- <sup>204</sup> In NOV 1943 the RAAF Comms Flts became Comms Units; 6CU Unit History A.50 NOV 1943.
- <sup>205</sup> *Units of the RAAF, Vol.4*, pp.137-140.
- <sup>206</sup> NAA A705 9/30/203(M.35) / (M.36) 13 APR 44 covers Bu 46491 (A24-92) being produced for 8CU and was therefore probably ferried as an amphibian, not the “temporary” flying boat modification. The same applies to Bu 46489 (A24-94) intended for 6CU.
- <sup>207</sup> Leebold p.28; previous identities have been added.
- <sup>208</sup> B Pattison, *Kingfisher in the Antipodes*, Red Roo, Melbourne, 1998, p.5.
- <sup>209</sup> *Units of the RAAF, A Concise History, Vol.8 Training Units*, AGPS, Canberra, 1995, pp.68-69.
- <sup>210</sup> 11SQN A.50 Unit History for JUL 1948. 11SQN disbanded 15 JAN 1946; 11(GR)SQN formed from SAR Wing 1 JUL 1948.
- <sup>211</sup> Baker, No.81 p.2.
- <sup>212</sup> 1FBRD Lake Boga Unit History A.50 NOV 1947 – other seaplanes in storage were 12 Mariners and six Kingfishers.
- <sup>213</sup> Geoff Goodall’s Aviation History Site, *Ex RAAF Catalinas*, 5 MAR 2017:  
<http://www.goodall.com.au/australian-aviation/civil-catalina-1/Civilcatalinas.html>
- <sup>214</sup> Disposal List AIR 7196 of 29 SEP 1952, A24 E/E.88 status cards.
- <sup>215</sup> <http://www.adf-serials.com.au/newsletter/ADF%20Telegraph%202017-18%20Summer.pdf>
- <sup>216</sup> RAAF HQ Air Member for Engineering & Maintenance letter of 18 OCT 1945, RAAF HQ file 1/501/329(31A), in response to No.4 (Maintenance) Group query of 10 OCT 45 (folio 30A).
- <sup>217</sup> RAAF HQ Director of Technical Services (DTS), *Special Instruction General/71 (SIG/71)*, of 13 NOV 1945, TS.1219/PGM, RAAF HQ file 1/501/329(folio 51A).
- <sup>218</sup> Vincent, pp.93-94.
- <sup>219</sup> 11SQN A.50 Unit History, AUG-SEP 1948. It was unfortunate over this period that 11SQN A24-381 crashed at Lord Howe Island on 28 SEP 1948, with the loss of seven lives.
- <sup>220</sup> NAA A705 9/30/232 (M.39) of 8 AUG 1950.
- <sup>221</sup> Baker, No.81 p.2.
- <sup>222</sup> While Tech Diagrams A5524 of 19 JAN 1951 had specified the fin flash as 24” high and 22” wide (an odd width which has to be divided by 3 for equal red, white and blue), contemporary images tend to suggest flashes were applied 24” x 24”.
- <sup>223</sup> Baker, No.43 p.16; and No.80 pp.5, 12.

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14 of these were the newer PB2B-2s, offered by Disposal List AIR 7196. Previously in AUG 1946, List 2631 had offered 23 of this model; A24 E/E.88 status cards.

<sup>224</sup> Creed, p.2.