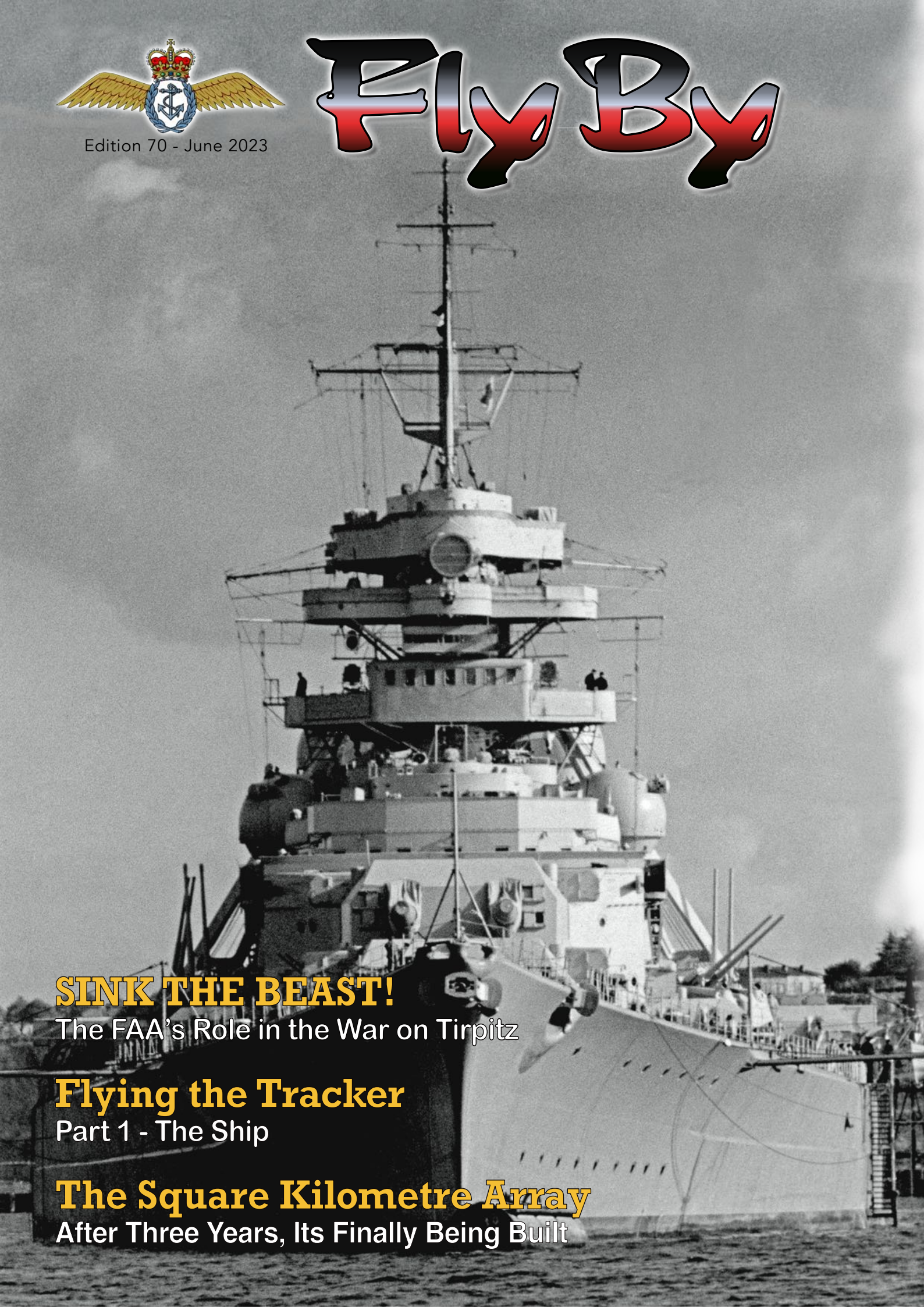
Edition 70 - June 2023

Fly By



SINK THE BEAST!
The FAA's Role in the War on Tirpitz

Flying the Tracker
Part 1 - The Ship

The Square Kilometre Array
After Three Years, Its Finally Being Built

EDITORIAL

BY M.C. PEAKE - EDITOR, 'FLYBY' MAGAZINE

Whoo Hoo! The Coronation is done and dusted and we are all set for another 70 years. Well, perhaps not quite that much.

Those who watched it on television couldn't deny the spectacle, I'm sure. Only the Brits know how to put on an event like that - but then, they've been doing it for a very long time and, let's be candid, they've also had a fair spell to think about this one.

Now fasten your seat belt as I'm sure the Republican movement is all geared up to start the next debate. If only they could get their act together to combine it with "The Voice" referendum scheduled for later this year, we could save millions.

In case anyone thinks all this Coronation material in '*FlyBy*' is a measure of my allegiance, I'll share with you that I'm gusting towards Republicanism. But I also think that before anyone casts their vote for a new system they should be convinced whatever they are voting for is at least as good as what we have. Watching the Coronation reaffirmed for me, at least, that tradition isn't a bad thing, and our democracy is framed in a thousand years of it. So let's tread carefully before we sever the old ties - lest any dodgy foundations lead us to become a banana republic.

In putting together this magazine I try to find something for every one, and this month is no exception. The cover photo shows the German Battleship *Tirpitz* and I'm pleased to bring you the story of the role the Fleet Air Arm played in tying up "The Beast" (as Churchill called it) in Norwegian fjords for much of her life. How she was eventually destroyed by the RAF is also a fascinating story and I'll bring that to a later edition of "FlyBy".

Owen Nicholls has been kind enough to allow us to print his story on Flying The Tracker. Part 1, which is about the aircraft, features from page 24. Part 2 - operating from Melbourne - will be next month. He's thinking of writing a part three, so we look forward to that in the fullness of time.

The SKA (Square Kilometre Array) has broken ground both here and in South Africa. It's taken 30 years of planning so that's a pretty important milestone. In this edition we remind readers what it is and what it will do.

Aside from that, there's the usual bits and pieces, snippets and updates.

Finally, another appeal! Both "*Slipstream*" (our flagship magazine) and '*FlyBy*' are powerful ways to capture our stories in a colourful way, that will last. They are both great resources for future readers and historians - but to be useful they must contain the information in the first place. Even a simple 'Letter to the Editor' can provide an insight to something that, in a generation or so, people will have forgotten. So please, don't be complacent! Get your typing fingers out and tap out a story, letter or even just a paragraph for the **Editor** to sort out.

And on that note, I'll shut up! Sit back in your chair and enjoy this edition.

Until next time,

MP ✈

THIS MONTH'S COVER PHOTO

A striking image of the German battleship Tirpitz in her prime, shortly after commissioning in 1942. Her glory was to be short lived, however, as relentless attacks by the British kept her bottled up in Northern Norway for much of her four-year life. ✈

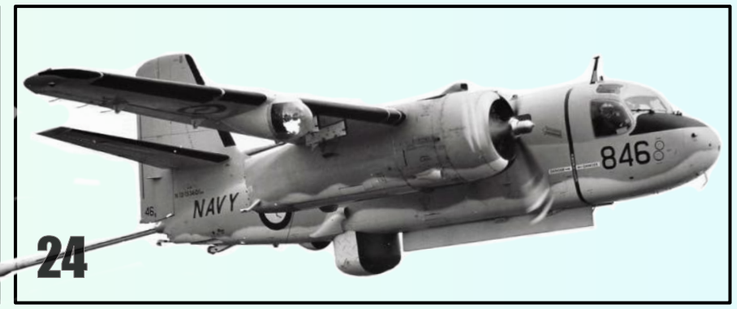
REST IN PEACE

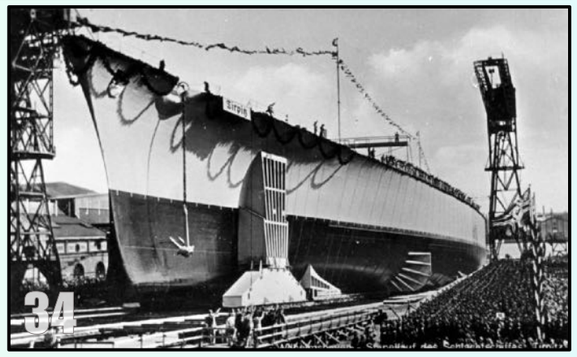
Since the last edition of FlyBy we have been advised that the following people have Crossed the Bar:

Ronald McKenzie, Errol Shelley, Peter Barnes, Ronald Dempster, Roy Matheson.

You can find further details by clicking on the image of the candle. ✈

THIS MONTH





REGULARS

FEATURES

Dear Editor,

Talk about a ghost from aircraft past! The article on the T28B in your last edition (FlyBy May 23) had me remembering back to the time I was one of the USN Trained RAN pilots, so (not expecting much) I checked my log book.

Sure enough there was 138218 - the subject of your article. For reasons I can't explain (or remember) the first 2 months at VT3 (Training Squadron 3) at Whiting Field, flights - 30 hours, including 12 hours solo - were all in the T28C (tail hook and smaller diameter prop - used for carrier work), then from April '67 all flights were in the "B" model. Records for the 10th April '67 show 138218 being flown for 2 sorties on that day.

I don't know why the plan seemed to be placing students in one model for a long time before switching to the other. The handling of the "C" was the same as the "B", except for a ground engine RPM restriction due to resonance which could damage the engine.

The last month at VT3 has me flying 12 sorties - 6 in "B"s and 6 in "C"s. Maybe they thought we could be trusted by then?

Of course when we went to VT5 it was all "C" models leading up to the ultimate goal of qualifying aboard the USS *Lexington*.

By the way, if I had the money I'd be more than happy to make an offer for the "Beast" in the article.

Cheers, **John "Bomber" Brown.** ✈

Flying out of Duxford.

Dear Editor,

Middle of April, my daughter and son in law bought me a 30-minute flight in an 80-year-old Tiger Moth. I believe **Gerry Dowling** has one and I also believe a lot of you out there have trained in one at some time in your flying career. Anyway, chatting to the pilot who looked older than the aircraft, I found out that I would be expected to fly the aircraft at regular times during the flight. “You have control” sort of thing. Having flying lessons out of Aldinga, I thought this should be a doddle. Squeezing into the cockpit with my heavy flying jacket, leather helmet and goggles, I realised how little forward vision I had and hoped the chap behind me could see more. Connected the radio link, cleared chocks, and away we went, rattling along the grass strip and lifted off at a ridiculously low speed over the Imperial War Museum hangers. First thoughts apart from the poor vision, was how noisy and chilly it all became. Trying hard not to fiddle with the switches and knobs around me in the cramped cockpit which could see us on the six o’clock news, I tried to get my bearings over unfamiliar county-side.

Next moment “You have control” over the intercom and I hastily shuffled my feet up onto the rudder pedals and grabbed the joy-stick shouting “I have control” which on reflection, was a bit of wishful thinking. “Maintain 1300 feet, heading 135 degrees”. I looked for the altimeter fluctuating 100 feet either side of the prescribed 1300-foot mark, then looked around for the magnetic compass for the heading. Bloody thing was down low by my knees and ridiculously small. Certainly not in your eye-line. Getting these two tasks under control I was instructed to bank left and follow the old Roman road to Royston Village for 10 minutes. I banked but had no time piece on me, so it was wait for the next instruction. “Bank right and steer 310 degrees” which I did successfully but dropping the nose slightly. I could feel the QFI in the back seat pull up on the stick to maintain height. A black mark for me! The Air speed dial was telling me I was travelling at 110 knots which I wondered was a bit high for an 80-year-old canvas and wood flying machine.

The rich, green, and lush county-side was a delight to fly over even without the prospect of forward vision and I imagined those WW2 pilots skimming low over the verdant fields and classic villages as they sort out wayward German raiders. “Maintain heading and height Harrison” came a strong command from behind, which broke the daydream and made me scan the cockpit panel where I would normally see an Artificial Horizon in colour, so head over the side again. Checked the small magnetic compass, two fingers holding the joystick where I

wanted to white knuckle that control stick, shift the feet on the pedals, check speed, height and attitude, all while being whipped by the slipstream and engine noise. I had to remind myself that I was having fun but when I get back to South Australia, I will quiz Gerry on how much fun he gains from his Moth. After 20 minutes of my flying the Tiger, my QFI grew bored and took over for an approach onto the grass 06/24 runway which I was told is 880 metres long which seemed short when you do not have brakes and a skid for a tail wheel.

Final radio call and an approach speed of 48 knots, for crying out loud, and we settled onto the grass and bumped and bounced to the hangar. Dropping the side panel, I clambered down rather carefully as we had lessons on where we could walk and what we could touch. Thoughts of putting a size 10 through the canvas alarmed me. The QFI was a pleasant chap my own age, and he was complementary on my flying skills. Very kind of him.

We chatted as we strode back to the hangar and asked where I do my flying, and he knew the Aldinga area and said it reminded him of parts of England. Not sure where, didn’t say. He told me they had a hidden camera on the top wing recording my flying with radio chatter so of course I had to buy the USB video stick and the still photo of me sitting in the cockpit fully rigged out in leather jacket, helmet, and goggles. Looking very gormless I thought.

Over all, an excellent experience which one must do in one’s lifetime, but whether I would do it again will depend on the advice from Gerry or any of you Tiger Moth followers out there, who wish to inform me on the exaggerated joys of flying the Tiger Moth DH 82.

Cheers,

Roger Harrison, Whipping Boy SA.

By Ed. *Nice contribution, Roger. Thank you. For some explicable reason I’m reminded of a Biggles quote:*

Jim Ferguson [Biggles’ associate]: ‘You can’t fly this - you don’t know how’.

Biggles: ‘If you can fly a Camel, you can fly anything.’ ✈

Coming Clean

Dear Editor,

My renditions on page 7 of last month's *FlyBy* of HMAS *Sydney* with the island to port instead of starboard upset the equilibrium of a few people.

I had numerous photographs sent to me from various phases of *Sydney's* life, explaining that they all showed the island on the starboard side and demanding to know when the port-island trial took place. Some people/organisations also asked me if I understood the engineering difficulties of re-routing funnel uptakes from the machinery spaces and re-laying electrical cables etc., and suggested the photographs were, in fact, reversed. They were not.

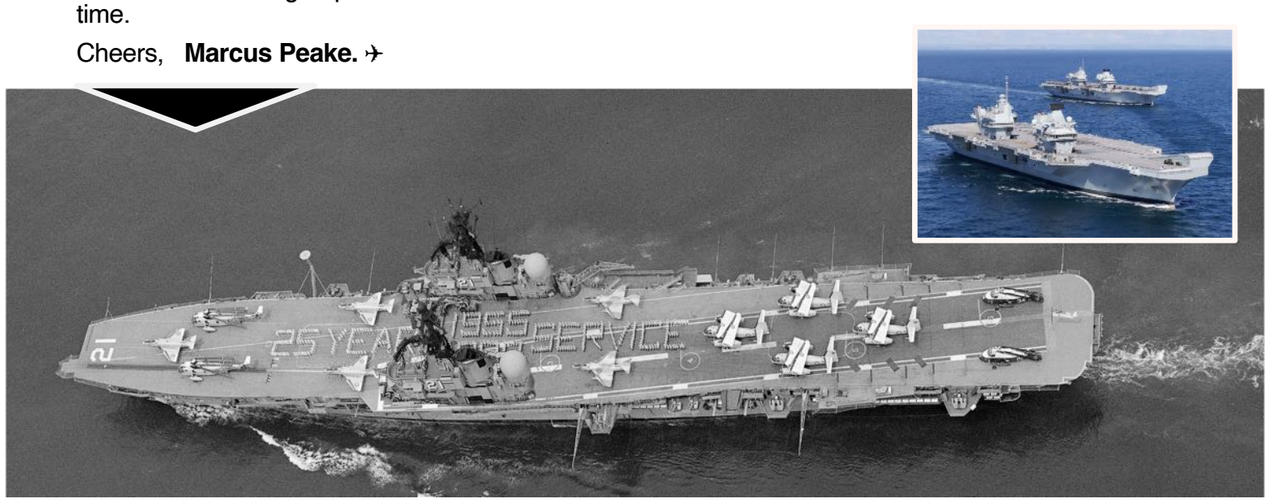
So, it's time to come clean. The only re-routing in the case of *Sydney's* island was by me, using my dubious photo-editing skills to carefully reposition that part of her image from one side to the other. In these days of digital manipulation nothing is sacred!

So, lest there is any doubt, let me assure readers that HMAS *Sydney's* island was indeed built to starboard, and remained so throughout her life.

HMAS *Melbourne*, on the other hand, featured two islands for a while, as shown in the main image below. It set the precedent for later vessels, such as the new Brit carriers HMS *Prince of Wales* and *Queen Elizabeth* (inset). Sensibly, those ships were built with their islands fore and aft on one side, unlike *Melbourne* who had hers both to port and to starboard. It was great for docking manoeuvres and as a redundancy measure.

Naval architects realised their error, however, when the first deck landing trials occurred. The dockyard was then tasked to remove the port island, blank off the funnel trunkings and tie off the electrical conduits. Due to funding constraints this didn't occur until after her 25th anniversary, to the consternation of the various air groups embarked from time to time.

Cheers, **Marcus Peake.** ✈



AUSTRALIAN VETERANS' CHILDREN ASSISTANCE TRUST
CELEBRATING 20 YEARS

Dear Editor,

AVCAT scholarships, including the Long Tan Bursary, are tertiary scholarships for the children and grandchildren of Australian ex-serving veterans. Scholarships are $4000–$6000 per year, for up to three years.

Applications open on 18 August 2023, Vietnam Veterans' Day, and close at midnight AEDT on 31 October 2023.

Apply online at **avcat.org.au**

Applicants must be:

- Enrolled or planning to enrol in a full-time course for one or more academic year's duration at a university, TAFE, or RTO in 2024;
- The child, stepchild, foster child, or grandchild of an Australian ex-serving veteran;
- An Australian citizen or permanent resident;
- In receipt of, or eligible to receive, a means-tested Commonwealth educational payment – Youth Allowance, ABSTUDY, Austudy or Veterans' Children Education Scheme (VCES) in 2024.

The Long Tan Bursary is sponsored by the Australian Government Department of Veterans' Affairs.

Find information about scholarships, the application process or scholarship eligibility at the link above.

Kind Regards, **Len Russell.** CEO AVCAT . ✈

Dear Editor,

In reading Clive Blennerhassett's article on Sea Venoms in the latest FlyBy I noticed that I rated a small mention in the piece about his Sea Venom OFS.

Although I was actually on that OFS, it was only briefly. I had not gone there, as BH writes, from already being a Wessex Observer, as had Max Speedy and Dave Cronin. I had in fact gone there straight from my course at the RN Observer School.

My stay on the OFS was fairly brief for two reasons; the sad loss of Gerrit Geerlings in a crash on r/way 26 and the extensive delays in the arrival of the "long nose" Dak which was to be used for air intercept training.

Having come straight from Observers Course, I had not yet gained my Wings or my first stripe, as Observers had to complete an OFS before gaining those. Given the imbalance that had now arisen in Pilot and Observer numbers on the course, and uncertainty when intercept training might begin, it looked as though it might be some time before I could finally qualify as an Observer and get promoted to ASLT. As luck would have it, there was a Wessex OFS about to commence fairly soon so the "powers that be" decided to switch me to that.

So, my time on Sea Venoms was a short one. I would have to say that I was not unduly disappointed in the switch to Wessex, as my few flights in Venoms had shown me that my constitution was more suited to comfort rather than speed. One landing with my bone-dome outer carefully balanced in my lap after a 2 v 1 trip was enough!

Cheers, **Guy Cooper**. ✈

Dear Editor,

I am currently putting together a paper on the remarkable life of **Adam Howie 'Curly' Brydon** DFC and Bar.

I have owned one of Curly Brydon's MG race cars for more than 20 years. You can see more information about it **here**.

On reading the excellent article, *"The Two Dozen, The 24 who kick started the FAA"* in the April 2023 edition of FLYBY I would like to ask the Association and the writer, **Graeme Lunn**, if he could provide any further information on this paragraph from the article:

"Curley Brydon, who had stalled and crashed his Seafire on New Years Day 1946, started Brydon Motors and raced MGs, winning the Bathurst 500 in 1955. He set up Diners Club in Australia and later became a long-serving Director of News Limited under his friend Rupert Murdoch."

I would like to include as much as possible about CB's time in the FAA in my paper, including the serial number of the crashed Seafire, and I would appreciate if you could help me with this.

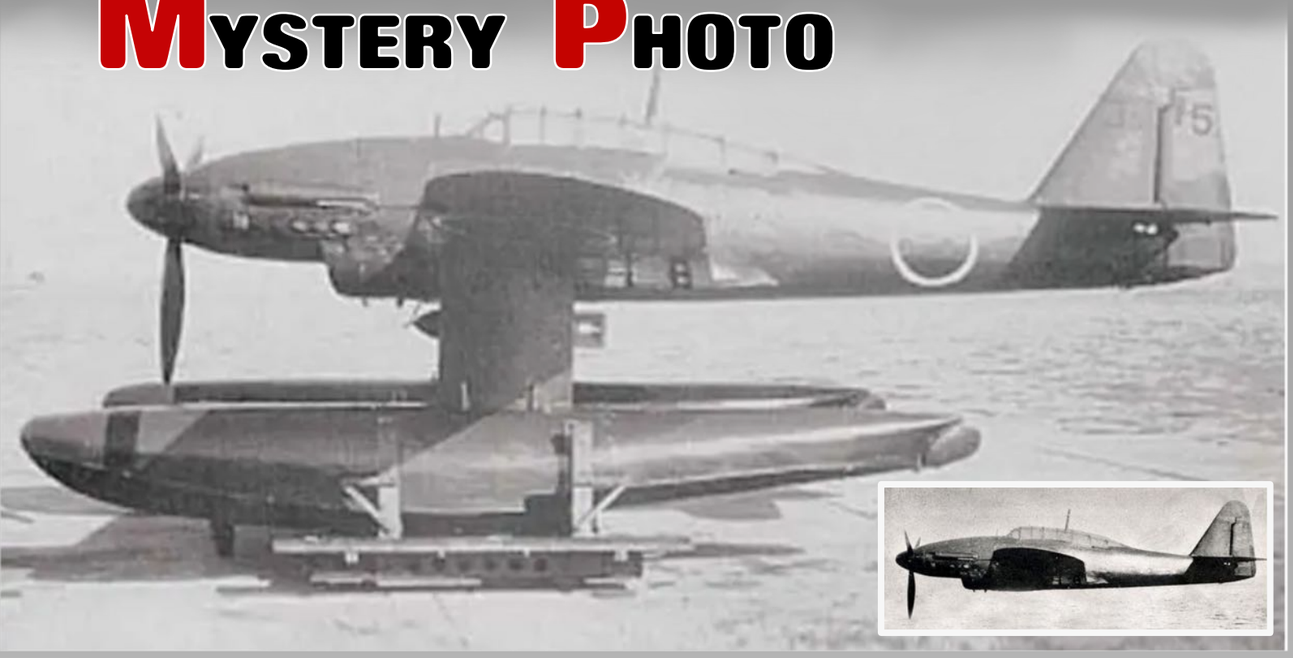
Thanks again,

Richard Townley. ✈

***Above**. 'Curly' Brydon in the Australian Grand Prix at Albert Park in 1953. **Below**. Richard Townley driving Curley's car 70 years later, at the Australian Grand Prix Historic Demonstration 2023.* ✈

ANSWER TO LAST MONTH'S

MYSTERY PHOTO



We cheated a bit on last month's Mystery Photo by editing out the floats (see inset), which were a bit of a give-away. The rouse seems to have worked as only a few very diligent folk correctly identified the image.

On 28 August 1945 two USN destroyers intercepted a massive Japanese submarine not far from the coast of Honshu, Japan's biggest island. The vessel was huge - bigger than either US ship, with a displacement twice that of any American submarine of the time. A third such vessel was captured the next day.

Examination of the submarines' hulls revealed a huge chamber at their centre, suggesting they were to carry clandestine cargo - perhaps to some of the islands still occupied by Japanese forces. It took a little while to learn the truth, however: the chambers were actually hangars, designed to carry the **Aichi M6A1 Seiran**, which is the subject of our Mystery Photo. The subs were purpose designed aircraft carriers.

The submarines were a marvel of engineering. Double hulled to support their great weight and provide battle protection, they featured a compressed air catapult on their casing, a crane to lift returning aircraft from the water, and a heating system to ensure the aviation fuel was not too cold to be used. They were also heavily armed with eight torpedo tubes, one 140mm gun and various anti-aircraft weapons.

Astonishingly, the submarines could travel over 37,000 nautical miles at 14 knots (surfaced) without refuelling, which is equivalent to 1½ times around the world. This gave them tremendous reach.

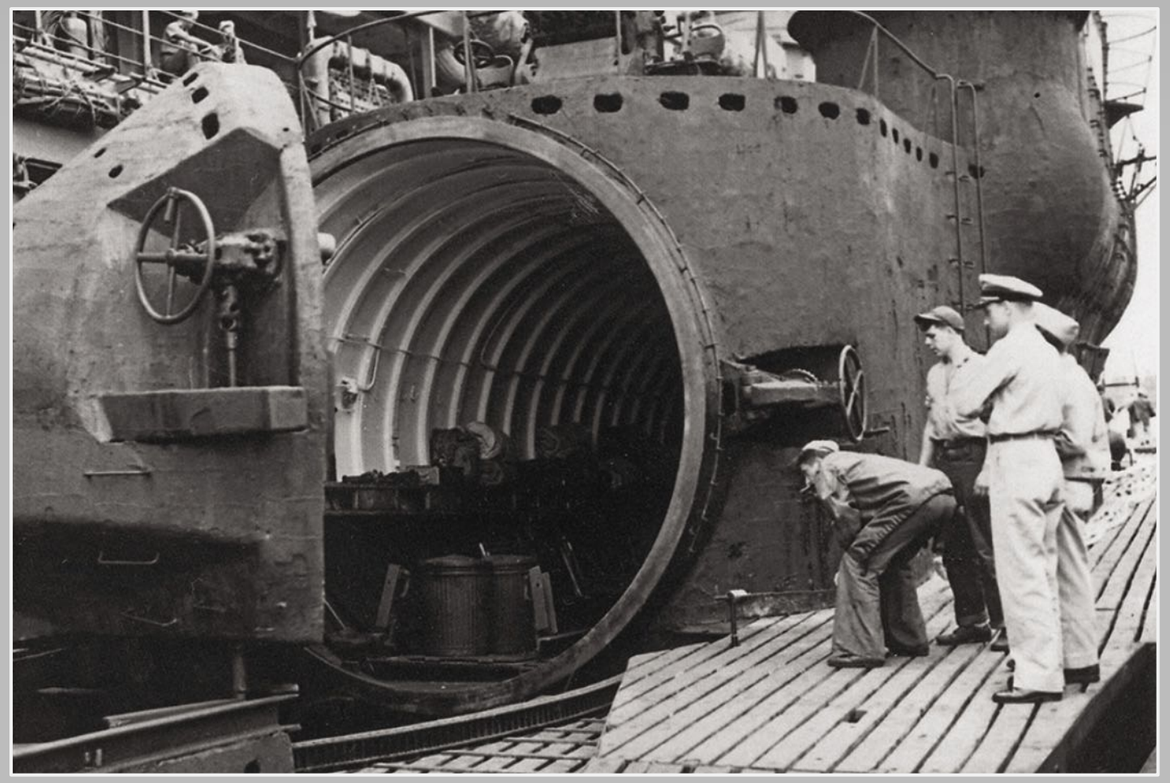
Folded like pieces of origami, three Seirans could be squeezed into the hangar. They were armed with a torpedo or two 500 lb bombs.

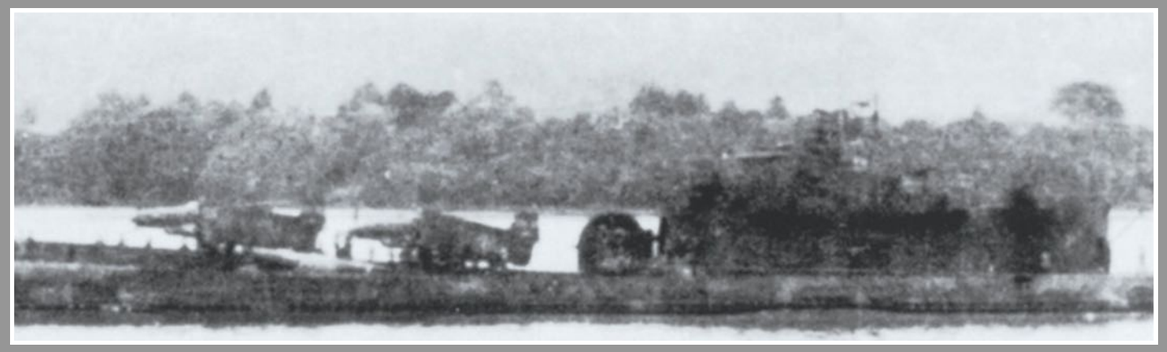
The original intent was to build eighteen I-400 class submarines and use them to launch a fleet of Seirans to strike the coast of the United States in a kind of retaliatory 'Doolittle Raid', but as Japan became increasingly damaged by the war, steel production became an issue and the number dwindled. Only three were ever completed.

As the war reached its final few months, the focus of potential targets shifted towards vital infrastructure in an effort to impede the American war machine. The Panama Canal became the primary focus, with a plan to use Seirans to strike the locks of the canal to disable it.. By then, most of the US Fleets were in the Pacific, but the canal was a crucial logistics element.

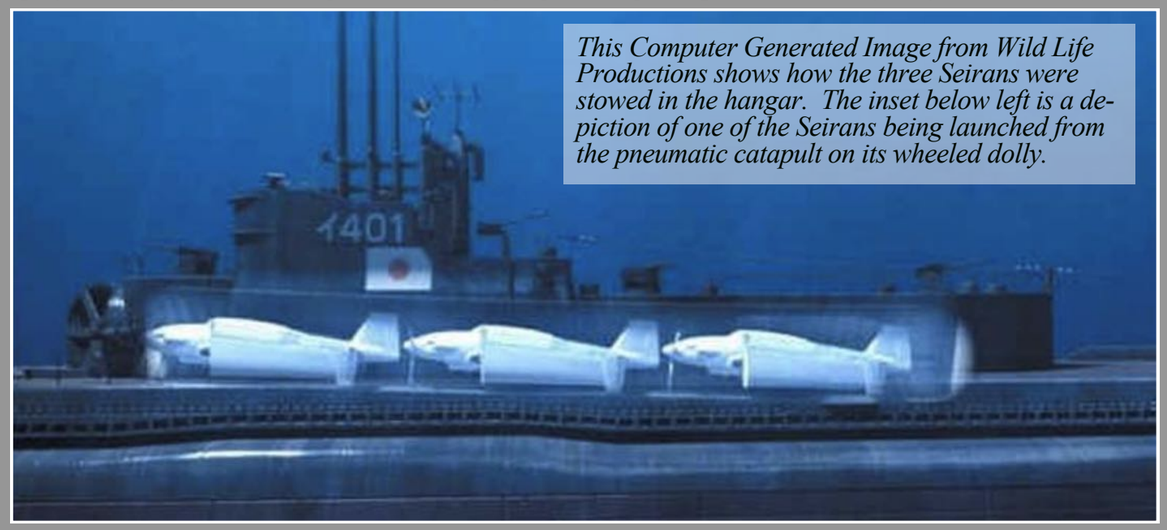
In the event, the raid never took place, and the three submarines were subsequently sunk by the US to prevent them from being inspected by the Soviets, who were interested in how they had been constructed. ✈

***Above**. Japanese submarines I-400, I-401 and I-402 moored next to the USS Proteus at Yokosuka in Tokyo Bay on 7 September 1945. Only two carried aircraft. One was subsequently scuttled in local waters whilst the other two were taken to Pearl Harbor for detailed examination before being destroyed. The open hangar and the recovery crane can be seen on the RH vessel, as can the raised launching catapult. **Below**. The hangar was sealed by a cone-shaped door which opened outwards, allowing the three aircraft to be unpacked. They were stored with the floats detached and wings and tail folded hydraulically. Once outside they were prepared for flight before being launched by the 120 ft pneumatic catapult, whose rails can be seen just below the door.* ✈





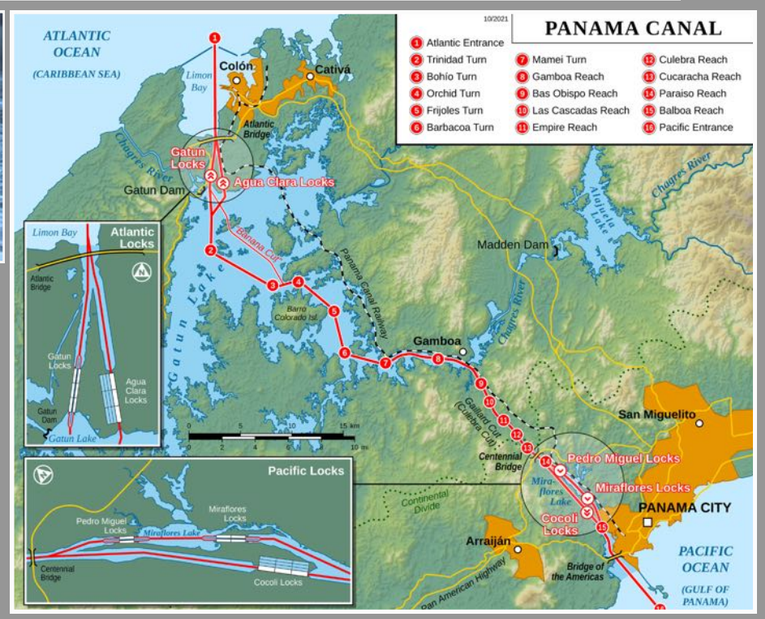
***Above**. The only known photo of a 1-400 class submarine with two of its three Seiran floatplanes deployed on the forward casing. It was undergoing training in Japanese waters. (Crecy Publications).* ✈



This Computer Generated Image from Wild Life Productions shows how the three Seirans were stowed in the hangar. The inset below left is a depiction of one of the Seirans being launched from the pneumatic catapult on its wheeled dolly.

***Right**. The Panama canal, joining the Atlantic and Pacific Oceans, was a vital piece of Allied infrastructure which allowed the US to ship huge amounts of material from the manufacturing powerhouse of the east coast to the Pacific theatre.*

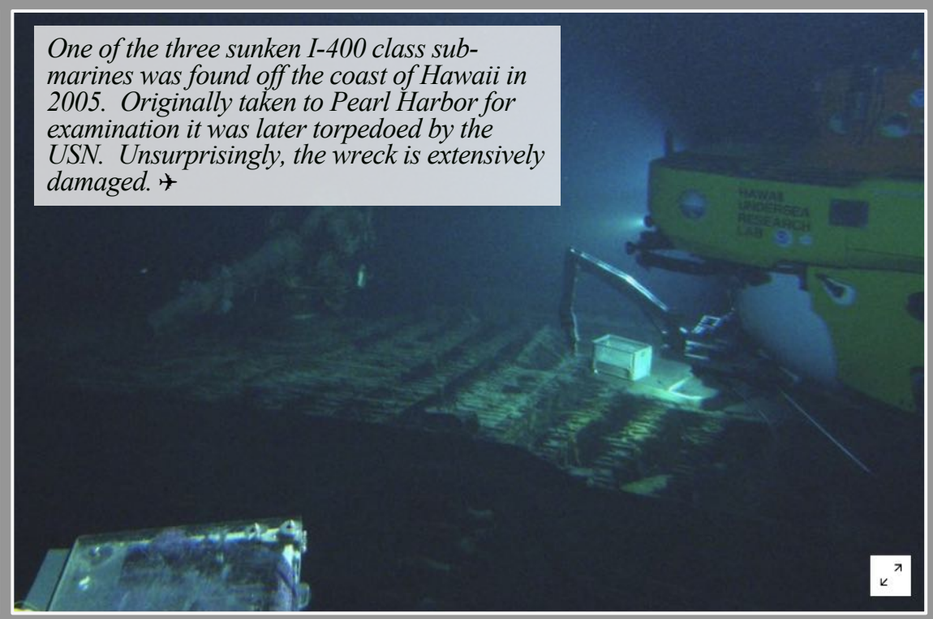
Had the canal been disabled by destroying its docks or dams, it would have added a month to the shipping time and perhaps bought Japan time to pause and regroup. ✈



***Below**. Just one Seiran survived the war and is now on display at the Smithsonian Institute in Washington DC. It was surrendered to the Americans by Lt. Akatsuka of the Imperial Japanese Navy, who flew it from Fukuyama to Yokosuka. Restoration was completed in 2000. (Wikipedia).* ✈

Aichi M6A1 Seiran

Former Lieutenant Atsushi Asamura, the leader of Squadron Number 1, remembers the Seiran. "They were were custom built and initially of good quality, but as they scaled back production the quality became poorer due to material shortages and difficult manufacturing conditions." he said. He confirmed its reputation as streamlined and responsive aircraft, with excellent attack power. "It was a versatile plane since it was both an attack bomber and had long distance range."✈



One of the three sunken I-400 class submarines was found off the coast of Hawaii in 2005. Originally taken to Pearl Harbor for examination it was later torpedoed by the USN. Unsurprisingly, the wreck is extensively damaged. ✈

THIS MONTH'S MYSTERY PHOTO

This piece of machinery has obviously seen better days, but it has an aviation connection. Any ideas? Click **here** to submit your thoughts.✈

Order No. 52 is now open for applications, with the following applications currently in the queue:

M. Cowley O112461 LEUT Jul72 - Oct93.

J. O'Regan R107494 POATWL Apr70 - Apr82

A.R. Milsom O120392 CMDR GLEX (AvWI) Jul76-Oct14

B.J. White R94352 CPO ATWO Jan64 - Jan91

D.M. Prest 325198 FLTLT Jan 66- Jan 99

K. J. Skomba W139951 ABATC May 86 - Mar 87

Now is the time for you to order a plaque for yourself if you have not already.

For those who don't know, the Wall of Service is a way to preserve your name and details of your Fleet Air Arm Service in perpetuity, by means of a bronze plaque mounted on a custom-built wall just outside the FAA museum. The plaque has your name and brief details on it (see background to photo above).

There are over 1000 names on the Wall to date and, as far as we know, it is a unique facility unmatched anywhere else in the world. It is a really great way to have your service to Australia recorded.

It is easy to apply for a plaque and the cost is reasonable. Simply click **here** for all details, and for the application form. ✈

WALL OF SERVICE LAST TWO WEEKS!

Order No. 52 will be submitted to the Foundry for manufacture in mid June, which is just two weeks away.

So, if you want to avoid the usual long wait, put your application in for a plaque **NOW**. Click **here** for for all information, pricing, application form, etc.

Any questions, please contact the webmaster **here**. ✈

HOW'S YOUR MEMORY?

TAS Browning is asking if anyone can remember the names of the Flight Deck Officer and Flight Deck Chief on HMAS *Melbourne's* 1963 Deployment. Can anyone help? Contact TAS directly **here**. ✈

Did You Know?

Some of our Readers may have watched the recent Coronation of King Charles III and noticed the beautiful Jubilee Carriage in which he and Camilla were transported to Westminster Abbey. This was different to the State Carriage which took them home again, which looks like something out of a Christmas Cracker.

But did you know the Jubilee Carriage was designed and built in Australia as gift to the late Queen?

Not only that, but it is a little time capsule containing artefacts both significant and rare. These include:

- The crown atop the roof is carved from timber from Lord Nelson's flagship, HMS Victory.
- Timber segments from The Tower of London, Westminster Abbey, St Paul's Cathedral, Edinburgh Castle, Henry VIII's flagship the Mary Rose, the Mayflower, Balmoral Castle, Blenheim Palace, Caernarfon Castle, Canterbury Cathedral, Carlisle Cathedral, Chichester Cathedral, Durham Cathedral, Ely Cathedral, Hampton Court Palace, Holyrood Palace, Kensington Palace, Lincoln Cathedral, Liverpool Anglican Cathedral, Osborne House, Salisbury Cathedral, St George's Chapel, Stirling Castle, The Palace of Westminster, the Royal Pavilion, the White House at Kew, Wells Cathedral, Westminster Cathedral, Winchester Cathedral, Windsor Castle, York Minster & others are inlaid into the interior lining of the coach.
- Also included is material donated by the Scottish Government from the Stone of Scone, wood from the Ferriby Boats (~1800BC), a segment of material donated by the Canadian Government from the Franklin expedition 1845 & others from the former Royal Yacht HMY Britannia, HMS Endeavour, The Battle of Hastings, RMS Queen Mary, RMS Olympic, SS Great Britain, RSS Discovery, an original counterweight from Big Ben, a Battle of Britain Spitfire & Hawker Hurricane, a Dambusters Lancaster, part of a musket ball from the Battle of Waterloo.
- Segments related to Shakespeare, Sir Isaac Newton, Charles Darwin, Edward Jenner, John Harrison, Joseph Banks, Florence Nightingale & other famous figures are also included as well as digital copies of the Magna Carta & Domesday Book.
- The two door handles, made by a New Zealand jeweller, are individually decorated with 24 diamonds & 130 sapphires.✈
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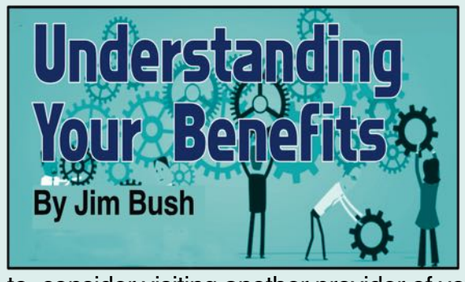


Dental Services.

DVA may cover the cost for a range of dental health treatment services for eligible beneficiaries. Gold card holder are eligible for treatment for all dental services based on an assessed clinical need, and White card holders are eligible for dental services for accepted service related conditions.

It is important to contact your dental provider and ask if they will accept your Gold Card or White card for the cost of treatment to be paid at DVA expense . If they don't you may need to consider visiting another provider of your choice to avoid incurring out of pocket costs at your expense. The eligibility and guidelines for dental treatment services are set out in the DVA web information page; Dental Services and maybe read **here**.

Scrapbook Update

'Spaz Sinbad,' aka Phil Thompson, has over the years amassed an extraordinary collection of over 20,000 pages of photographs and documents regarding the RAN Fleet Air Arm and its activities over the years, together with other pages of interest. The collection is a unique historical record of the Fleet Air Arm and the PDF file is certainly worth a long look. It is about 3.5 GB in size and is stored on Microsoft 'One Drive' (and 'Google Drive), from which you can download it to your computer.

Click **here** to access the latest version (as of May23). NOTE: ONLY the 64 bit Adobe Acrobat Reader will open this large PDF. The 32 bit Adobe Reader does not have the internal software resources to view this PDF after it is downloaded.

The above link will open the Microsoft 'One Drive' site. You don't need to register to access it.

There will be just a line of text at top of the page with a small download link to click on, then a download dialog. It is a very large file so be patient!

The PDF file is too big to browse directly through OneDrive, so always download it before opening, and then browse off your computer. To browse you can use the latest version of Acrobat Reader DC which you can get here for free.

Depending upon which web browser you use it may not be obvious that the PDF is downloading. Use combination of keys Control CTRL + J together to see the download happening. In EDGE and SAFARI the download just starts. Don't try to use Internet Explorer 11 as the URL will not work.

In Firefox it is not so obvious that after clicking on the download text that the PDF will start to download (to where ever the download folder is located on computer).

An alternative is to try the Google Drive Link **here**.

The FAAAA, along with every other organisation or individual with an interest in the FAA and its history, is indebted to Phil for the extraordinary work he has done and his willingness to freely share it. ✈

Reunions

FAA REUNION

Old Bar 16-18 August 2023

You are invited to join us for a FAA reunion which will include a Vietnam Veterans' Day commemorative service hosted by the Old Bar Public School to mark 50 years since Australia withdrawal from Vietnam.

Our base will be Club Old Bar where we have been invited to play barefoot bowls and/or mini-golf for $10 per person. Come along and enjoy the company of old mates as well as meeting some new ones.

A flyer containing all necessary information including registration form can be downloaded **here**. ✈

PHOT BRANCH REUNION

There will be a grand gathering of the PHOT/ IMAGERY Specialist Branch in October of this year, as follows:

Friday 27th October. 1430-1700 "Meet &Greet" at the FAA Museum, Nowra, followed by dinner at the "Postman's Tavern", Nowra @ 1800.

Saturday 28th October. Trip to view HARS aircraft. Lunch at Shell Cove. Dinner Worrigee Sports Club.

Sunday 29th October. Recovery lunch at home of Brian Warnest, in Berry.

Click **here** for more details and to register your interest in attending. ✈

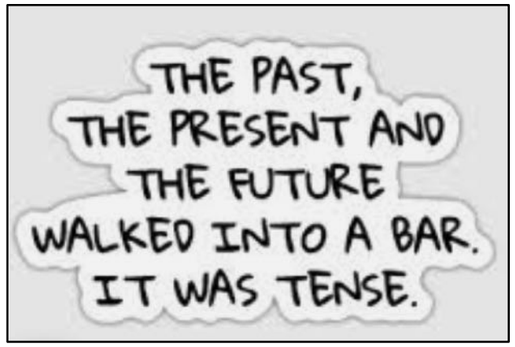
Readers who missed out on ordering a few **'Fly Navy" stickers** last year can still do so, and it's easy!

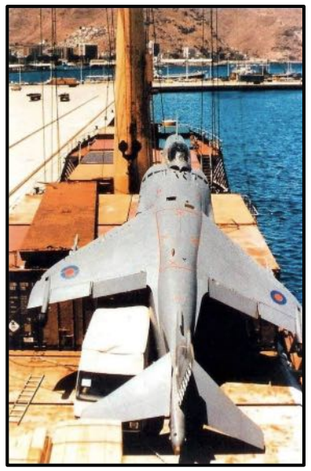
Simply fill out the little form **here**, click on the 'submit' button, and wait for the webmaster to send you payment details. Once paid, your stickers will arrive in the post shortly afterwards.

They are made of good quality self-adhesive vinyl and are 200x60mm in size.

The prices are: $1.50 per sticker for orders up to five, or $1.30 per sticker for six or more. Minimum order is five. Post and packing is included in these prices.

So, for example, if you order 5 the total price is $7.50, or $13.00 for ten. ✈





Imagine trying to write that A25! This is the result of Sub-Lieutenant Ian Watson's attempt to save his aircraft on 6th June 1983.

Watson was flying from HMS *Illustrious* off the coast of Portugal and had been tasked to locate a French aircraft carrier under combat conditions - ie in radio silence and low level. After completing the search he could not locate Mother and, running low on fuel and with his radio not working, he found a nearby shipping lane.

Initially intending to ditch next to the Spanish merchant ship *Alraigo*, he noticed that the deck cargo - some containers and a van - provided a flattish landing area so he went for it.

The ship docked four days later where the salvageable Harrier was craned off. The ship's owners were apparently awarded £570K in compensation.

Watson, on the other hand, was reprimanded for displaying poor airmanship, despite being sent out with only three quarters of his training complete. He was assigned to a desk job but was subsequently reassigned and completed three thousand further hours without any repeat performance. ✈

Here's another old photo, this time showing a Grumman Wildcat off HMS *Searcher*, probably in late 1944. The pilot, Lt. Hugh Morrison from New Zealand, was rescued safely, but was later killed in action on 4th May 1945 in Operation Judgement. He was reportedly the last Fleet Air Arm pilot to lose his life in the European Theatre. Operation Judgement was an attack on a German U-boat base in northern Norway, Ironically, the local Germans believed the war was over as Grand Admiral Dönitz, who had succeeded Hitler by then, had ordered the immediate surrender of all naval forces a few hours before the British attack occurred. ✈

We've all seen pictures of Carriers with 'people art' on their flight deck: lines of sailors spelling out "Aloha" or "10,000" (landings). Most of us give them a cursory glance.

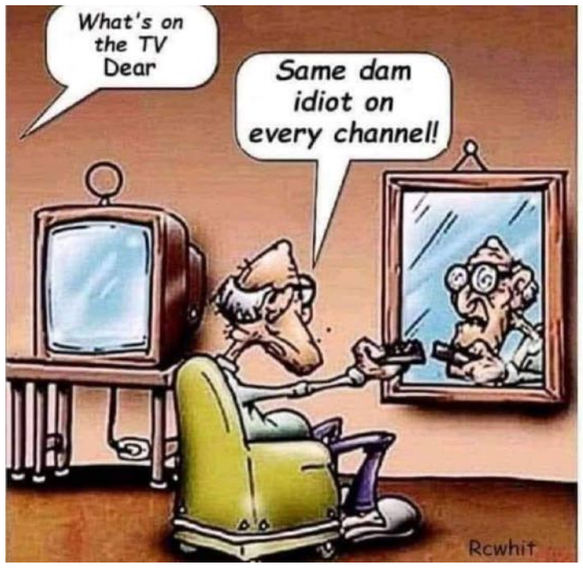
But there's an Art behind it which we'd like to explore. Firstly, how is it done? Are chalk marks put on the Flight Deck? Is an aircraft used to spot, and radio back corrections?

Or is it all done by the FDO (or someone) shouting a lot? We'd love to hear your story of the time you were in the letter 'C' in 'Coronation'...or any other letter, for that matter, and how it all happened. Photos would be great, too.

And what about small ships? Here's a couple of rather half-hearted attempts on small decks of another Navy - on this occasion the births of Prince George and then his sister. Nobody we know remembers the RAN spelling out any message, however, which is hard to believe.

So, drop us an email **here** and tell us your story about 'ship art'...where you were, what you were doing and how it was done.

We'll bring you the stories in a future edition of 'FlyBy'. ✈



Around The Traps

Former RAN SH-2G() Seasprite performing at the Omaka airshow last month. Serial NZ3614, formerly N29-161656 with 805 Sqn. (ADF Serials). NZ has just started a program to look at replacement of these airframes in the next few years. ✈

Last month we asked if anybody knew the story behind the 'tag' on this Mirage at Williamtown in May of 1986 (ADF Serials). Phil Thompson kindly advised that VC724 "Hangar Rats" were a group of Handlers at that time who liked tagging aircraft. Their badge was, unsurprisingly, a Rat wearing flight deck clothing and the stencil 'tag' was of the same creature, but from the back. We don't have names for the Rats in the photo, but would welcome contributions ✈

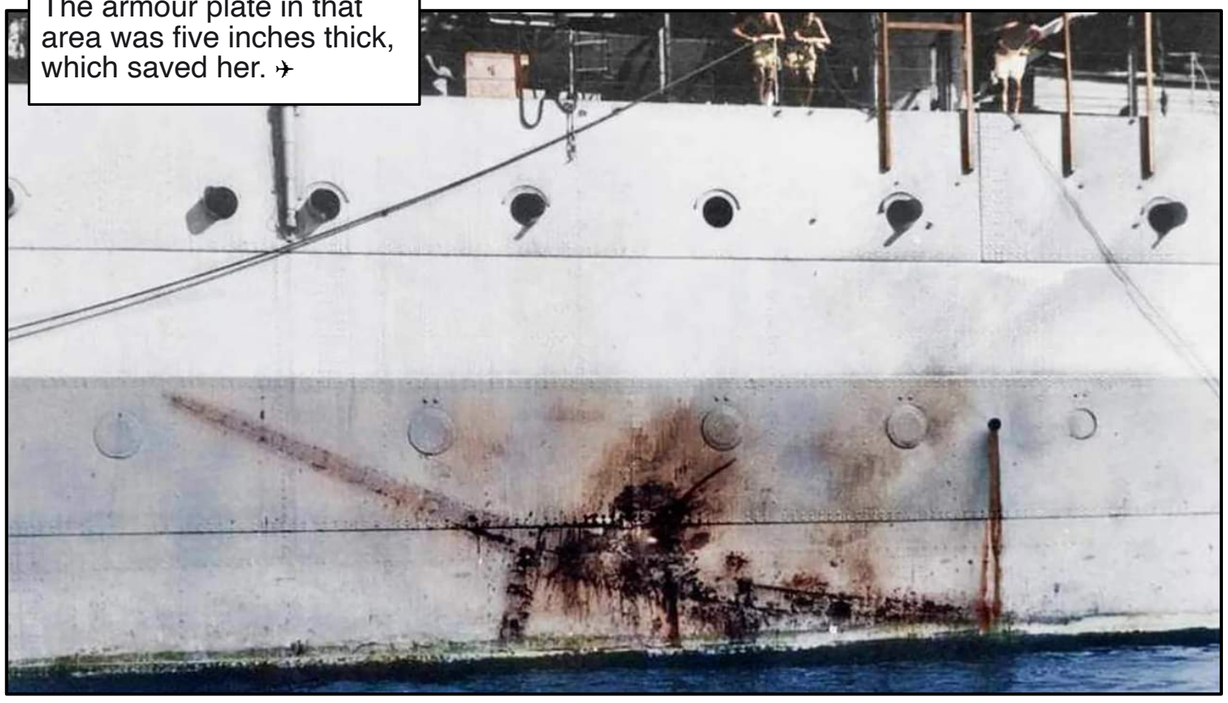
The ATSB's preliminary report into the crash of Coulson Aviation's B737 has been released. Readers may remember that it was lost whilst firefighting in the Fitzgerald River National Park in WA in February this year. It was the first 737 to crash in Australia. Remarkably, both pilots were able to escape with minor injuries.

It is reported that investigators from the ATSB found the aircraft struck a Ridge Line whilst dropping fire retardant. The Flight Data Recorder showed that the throttles were advanced and the engines had accelerated just before the aircraft struck a ridge line with the stick shaker activating", an ATSB spokesperson said. "The aircraft then cleared a small line of foliage, before impacting the ground a second time and sliding to rest.

Both pilots were able to scramble to safety before the 737 was consumed by fire.

The ATSB found the aircraft's operator had since changed its procedures to increase minimum drop heights and airspeeds. The final report is still being prepared. (ABC News).✈

On 26 July 1945 the Task Force of which HMS *Sussex* was attacked by two attack bombers acting as *kamikaze* suicide weapons. One made an imprint on the side of *Sussex*, from which it could be identified as a Mitsubishi Ki-51 "Sonia". The armour plate in that area was five inches thick, which saved her. ✈



Well, we all know who would have got an invitation to the Coronation!

None other than **Graham 'Squeak' Abraham** (circled, left) who is seen here rubbing shoulders with HRH the Prince of Wales, back in the day.

Clearly his Windsor connections worked as Graham went on to become personal pilot to **Sir Richard Branson**, flying out of the Virgin Islands.

Charles went on to become, well, the King.

Graham now lives in Surrey in the UK, so its easy for him to pop over to the Palace for the odd cocktail and canapé with his old mate. ✈

Our resident Facebook Sleuth, **Ron Marsh**, sent in this photo of WD828, on its arrival at Moorabbin airport in early 1967, having just been bought from Pussers by the Australian Aircraft Recreation Group for (reportedly) the princely sum of £400. It became that group's prize exhibit, displayed outside in their compound in Melbourne.

Like most surviving vintage aircraft it then had a very chequered life. In July 1973 it was sold to Mr Mike Wansey for restoration to fly at Essendon, Vic. Civil registration VH-HMW but marked as 'WD828 271/K' 'Mickey Mouse'

In December 1987 it suffered an engine failure shortly after taking off from Camden and made a forced landing into a cabbage field near by. The pilot, George Markey and his engineer, Bill Spence, were sued for $400,000.00 on the grounds of negligence and a court battle carried on until 2001. The court found in favour of Michael Wansey.

Eighteen months later it was acquired by Bruce Simpson of Classic Aviation for $100.00 and removed to the company's premises at Bankstown Airport for restoration using the forward fuselage and centre section of WB518 from a pole outside the RSL in Griffith, NSW. The forward fuselage and centre section of WD828 was restored to static display standard and incorporated in WB518 which was restored to display in Griffith.

In 1994 the partially restored aircraft was purchased by Captain Eddie Kurdziel of Fort Collins, Colorado, USA and airfreighted to Fort Collins, Colorado, USA where it was restored to flying condition by Ray Middleton's QA Aviation of North America. It made its first flight in April 2002 registered as N518WB but marked initially as 'WB377' '201/K' then later as 'WB518' '201/K' but with Royal Navy titles. A somewhat conflicting identity! ✈

Deep Sea Water specialists Magellan has captured digital photographs of the wreck of the Titanic, which have been compiled into a 3D representation of the sunken vessel in extraordinary detail.

Using two submersibles at depths of around 8,000 metres, Magellan took over 700,000 images amounting to 16 Terabytes of data. They are of such high resolution that minute items such as serial numbers, single rivets or even identification of who owed the personal items still scattered on the ocean floor can be defined. The images have been combined into an exact 3D replication of the wreck.

The main image above shows the complete bow section, which is largely complete, unlike the collapsed stern section (top small image) lying about 600 metres away.

To show the immense size of the rendered model, the BBC superimposed it into London Stadium (Bottom left).

Atlantic Productions is producing a documentary of the event, which should screen in a few months.

All images Magellan/Atlantic. ✈

First Woman To Command Aircraft Carrier Completes Her Tour

The first woman to lead a Navy aircraft carrier successfully completed her command tour May 18. Capt. Amy Bauernschmidt was relieved by Capt. Pete Riebe as commanding officer of the nuclear powered USS Abraham Lincoln during a change of command ceremony held on the flight deck.

Under Bauernschmidt's command, the sailors of Abraham Lincoln completed a seven-month deployment to the 7th and 3rd Fleet area of operations in the Pacific, culminating in the Lincoln serving as the flagship for the largest Rim of the Pacific exercise to date with 32 coalition partners.

Bauernschmidt, who took command of Abraham Lincoln in August 2021, has been nominated for the rank of rear admiral. She received the Legion of Merit during the change-over ceremony and will report to the commander of 7th Fleet, Vice Adm. Karl Thomas, for her next tour of duty, a Navy news release said.

This year marks the 50th anniversary of women flying in the United States Navy. Bauernschmidt was one of the first women to be assigned to a combat squadron after the combat exclusion policy for women was lifted in 1993.

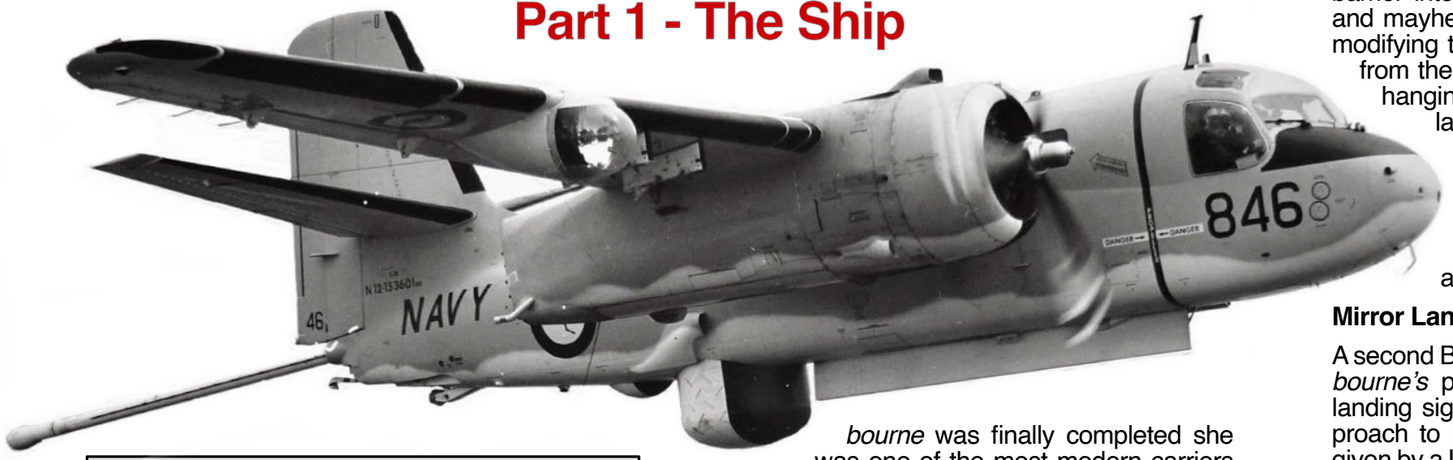
"Over the course of her CVN command tour, Capt. Bauernschmidt has shown herself to be an immensely impactful leader," said Rear Adm. Kevin Lenox, commander of Carrier Strike Group 3, who presided over the ceremony. "She did this job as well I as I have ever seen it done, by anyone." Source: Stars & Stripes.✈

No. 269 Course Navy Pilots Graduate from RAAF Pearce.

Left to right: Jim Bush (WA Division); Mike Keogh (WA Division); LCDR Brad Eaton (SNO Pearce); LEUT Jure Plestina (Parade Commander & Graduate), LEUT Ben Leece and LEUT Marc Ledwidge (Graduates) LCDR Al Clark Ret'd (Graduate '69 Course), CDRE Brett Dowsing Ret'd (101 Course); and Bill Atthowe (WA Division). Graduates were given minature wings pins by the FAAAA to mark the occasion. (Photo via Brett Dowsing). ✈

FLYING THE TRACKER

Part 1 - The Ship



The following article, by ***Owen Nicholls,*** *was written for the HARS magazine "Phoenix." It was therefore targeted at an audience who weren't familiar with the basics of deck operations - but it also contains a wealth of detail for more Navy-oriented readers. It is reprinted here with the author's kind permission.* ✈

The Ship

A question I am often asked is "what was it like flying the Tracker from HMAS *Melbourne*?". The answer I give is: "very demanding, immensely satisfying and fun (by daytime), but a deadly serious business on a dark night". I have never met a fixed wing navy pilot who thinks night carrier operations are fun, and that includes pilots I have spoken with from the Australian, British, American, Canadian, Dutch and French Navies.

Before going on to talk about flying the aircraft off and back onto the carrier, it is important to have some understanding of the ship itself and how things worked to make these operations possible.

HMAS *Melbourne* was not a big ship; displacing 20,000 tons fully loaded with an overall length of 214 metres (702 feet) when built. Contemporary American carriers are about 100,000 tons. *Melbourne* was the lead ship of six Majestic class light carriers; laid down in April 1943 and launched in February 1945, too late for World War II. With the end of the war construction ceased until 1946 when it resumed in a stop start manner before being completed in 1955. During this period many major changes from the original design were incorporated including an angled flight deck, mirror landing sight and steam catapult. When *Melbourne* was finally completed she was one of the most modern carriers in the world, although the Majestic class were still amongst the smallest.

When originally designed she would have been expected to operate single engine aircraft around the size of the Fairey Firefly and Hawker Sea Fury. These had wingspans of around 12.5 metres (41 feet). When delivered she had an air group of Sea Venom all weather jet fighters and Fairey Gannet anti submarine warfare (ASW) aircraft. The latter had a wingspan of 16.5 metres (a little over 54 feet. When you compare these with the Tracker's 22 metre (72 ft 7 inch) wingspan you can see we were operating a much bigger aircraft than was ever envisaged in the ship's design. Other Navies (Argentina, Brazil, Canada and the Netherlands) also operated Trackers from similar sized carriers, although many of these had angled decks with a bigger landing area offset than *Melbourne's* 5.5 degree angled deck, which moved their landing centreline further away from the ship's island superstructure. The United States Navy of course operated Trackers from carriers, the "smallest" typically being the 37,000 (full load) ton Essex class ASW carriers.

The Angled Flight Deck

So why is there an angled flight deck? Before the British invention of the angled flight deck after World War II, all take-offs and landings were carried out along the longitudinal axis of the ship from stern to bow. This meant that when an aircraft had landed it created an obstruction on the flight deck for following landings. This problem was solved by taxying the aircraft to a parking area on the forward end of the flight deck. To protect parked aircraft from landing aircraft a barrier was raised between the parking area and arrestor wires. This worked reasonably well providing landing aircraft always caught an arrester wire. Failure to do so meant the landing aircraft would plough into the barrier with inevitable damage, or worse still bounce over the barrier into parked aircraft with resulting carnage and mayhem. Sadly, this was not uncommon. By modifying the ship to have a landing area angled from the starboard side at the stern to an overhanging angle on the port side, aircraft could land and then taxy to park on the starboard side at the forward end of the flight deck, leaving the angled deck clear. Then, in the event of not engaging the arrester wires the pilot of a landing aircraft could add power and go around for another approach.

Mirror Landing Sight

A second British invention incorporated during *Melbourne's* prolonged construction was the mirror landing sight. Guidance for pilots during their approach to land on carriers had in the past been given by a Landing Signals Officer (LSO) to use the American term, or Batsman (British term) who signalled corrections to the pilot by hand signals with table tennis like bats in his hands. This was not precise enough or fast enough with the higher approach speeds of modern aircraft.

The mirror landing sight as fitted to *Melbourne* consisted of a number of orange lights (source lights) that shone into a curved mirror that had a horizontal line of green lights (known as datum lights) fitted each side of the mirror. The pilot receives very accurate glide slope (ie the aircraft is high, low or on the correct flight path) by viewing the reflection of the orange source lights in the curved mirror. The lights appear as a circular orange dot (nicknamed the "meatball" or "ball" for short) in the mirror. If the ball is exactly in line with the green datum lights the aircraft is on the correct glide slope, if above the aircraft is high, and if below the aircraft is low. The mirror sight is visually acquired about half way around the base turn and it is used all the way to touchdown. It is very sensitive, and fine corrections in descent path are required. Additional lights are two large red "wave off" lights that can be activated by the LSO or Flying Control position ("FLYCO" – the equivalent of a control tower); and "cut" lights, a vertical set of three green lights on the right side of the mirror that can be activated by the LSO to signal a Tracker pilot to close the throttles just prior to landing. The green datum lights and centred meatball can be seen on the port or left side of HMAS *Melbourne* in the angled flight deck photograph above. The various lights I have described are shown in the photograph on the next page.

Steam Catapult

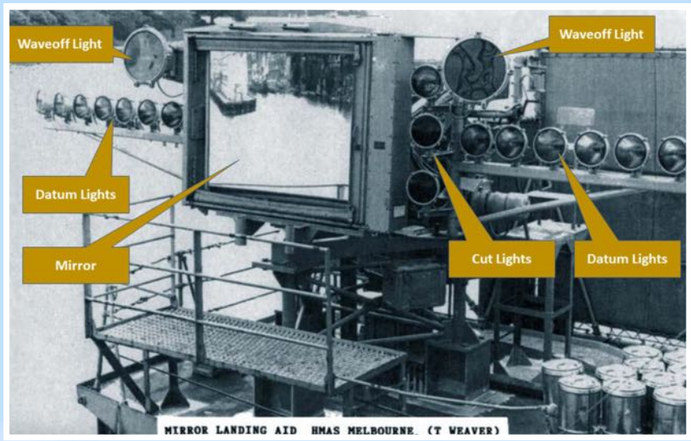
Melbourne had a single steam catapult on the port (left) side of the flight deck (viewed looking towards the bow). It extended back down the flight deck from the bow for around 30 metres (100 feet) but had a stroke of 27.5 metres (90 feet). This meant that from a stationary start the launched aircraft is airborne in slightly less than the 95 foot wingspan of one of the HARS Dakotas. Contemporary American carriers have 250 to 325 ft long catapults.

Steam catapults provide a smoother acceleration and can launch heavier and faster aircraft than their hydraulic predecessors. They work by harnessing the energy produced by the ship's boilers.

Steam is stored under pressure in a large reservoir. Beneath the flight deck are two long cylinders side by side. Each cylinder has a slot along its length at the top of the cylinder. Pistons in each cylinder are connected crosswise to a forward facing hook ("the shuttle") that runs along a track embedded in the flight deck. The slots in the cylinders have flexible sealing strips on each side of the slot that come together to minimise steam loss but permit the shuttle to move forward under steam pressure during aircraft launch.

When an aircraft is to

Right*. This stern shot of HMAS Melbourne gives a good idea how small the deck was compared to the aircraft that operated from it.* ✈



be launched it taxies forward to the catapult and a holdback cable is attached to the aircraft at one end and the flight deck at the other. The fitting on the aircraft end of the holdback incorporates a weak link that will break under load.

The shuttle is then retracted by a hydraulic system from the bow end of the catapult to a position under or slightly in front of the aircraft. With the aircraft connected to the shuttle by a launch strop (also called a bridle), the shuttle is tensioned forward by the hydraulic system and the aircraft runs up to full power with the brakes off. The only thing stopping it moving is the holdback. The catapult launch valve is then opened admitting steam pressure from the reservoir into the cylinders. The holdback weak link breaks and the aircraft accelerates down the flight deck to flying speed. The catapult pistons are brought to a rapid stop by a water brake system and the catapult readied for the next launch if required. ✈

Top Row. Left. *A pilot's eye view of an approach to HMAS Melbourne clearly shows the angled Flight Deck.* ***Middle****. The Mirror Landing Sight fitted to Melbourne. The parabolic mirror can be seen in the centre of the device, with the row of datum lights either side of it. The device gave the pilot a very accurate indication of whether he was correctly established on the glideslope, or was high or low.* ***Right****. HMAS Melbourne with the USS aircraft carrier Enterprise. The diminutive size of the Australian ship can be easily judged, especially when perspective is taken into account. .*

Main Photo. *With all checks complete and engines at full power, this Tracker is poised ready for launching. All that is required is for the catapult launch valve to be opened. ✈*

Next Month: Flying Trackers from HMAS Melbourne.

BUILDING THE SKA

The Square Kilometre Array has been decades in conception and planning, but construction has finally started. Marcus Peake takes a snapshot of what it is, how it will work and what it may tell us.

There's no limit to the size of dreams. They can be as broad as your imagination and as tall as you can envisage. That must have been the watchword of the group of extraordinary people who conceived the concept of the world's biggest radio telescope and, even more extraordinarily, convinced many governments to sign up to a treaty organisation known as the Square Kilometre Treaty Organisation (SKAO).

Thirty years in the making, the last full stop was placed in the treaty last year, and, after suitable ceremonial events on the land to be used, the bulldozers moved in.

What is the SQA?

The SKA is basically a big radio telescope, a bit like Tidbinbilla near Canberra or the Dish near Parkes. But is it, as its name suggests, BIG. Instead of having just one dish or a few antenna, it has thousands, located in different parts of the world. They will work together to collect information from outer space.

How Will It Work?

The concept is to have two telescope sites and one Global HQ, each on a separate continent. The telescopes will be in Australia and South Africa, and the HQ in England.

The South African Array will have 197 dishes, each 15m in diameter, with a 150km maximum separation between the most distant dishes.

Australia's Array will comprise 131,072 smaller antennas grouped in 512 stations, with up to 74km maximum separation between the most distant stations.

The two locations have been chosen due to their radio quietness. These sites enjoy the national regulatory status of radio quiet zones that protect them from ground-based interference, making them ideal for radio astronomy observations. This concept has already been proven by the SKA precursor telescopes "MeerKAT" and "HERA" in South Africa, and "ASKAP" and "MWA" in Australia. ✈

Far Left. *Assembly of the German funded SKA-MPG prototype dish on site in South Africa (Photo SARAO).* ***Under****. Low frequency antennas in Western Australia, which will number more than 130,000.* ***Bottom****: Local Aboriginal people provide a 'welcome to land' ceremony at the SKAO site in WA. ✈*

The Ultimate Data Handling Challenge

An average of 8 Terabits per second of data will be transferred over hundreds of kilometres from the SKA-Low telescope in the Murchison outback in Australia to the processing facility in Perth. For the SKA-Mid telescope in South Africa, the design is similar, but the data rates are higher - the transfer rate from the telescope in the Karoo desert to the processing facility in Cape Town is around 20 Terabits per second. This is approximately 100,000 times faster than the projected global average home broadband speed for 2022! (Source: CISCO).

Because signals from space reach each antenna at a slightly different time, the signals must first be aligned. This is done thanks to highly precise atomic clocks that timestamp the time each signal arrived.

Data is then transferred to two high-performance supercomputers called Science Data Processors (SDPs), To process this enormous volume of data, the two SDP supercomputers will each have a processing speed of ~135 PFlops, which would have placed them in the top three of the fastest supercomputers on Earth in 2020 (Source: Top500; June 2020).

In total, the SKAO will archive 300 petabytes of data per year. This would fill the data storage capacity of about half a million typical laptops every year by today's standard!

From the SDP supercomputers, data will be distributed via intercontinental telecommunications networks to SKA Regional Centres in the SKAO Member States where science products will be stored for access by the end users, the astronomers, to conduct their science and improve our knowledge of the Universe. ✈

The telescopes in Australia and South Africa will, in their first iteration, work seamlessly as a basic telescope, to provide a proof-of-concept. This will then trigger the SKA's full roll out. Construction of the first phase is scheduled to finish in 2024.

By 2028, the SKA will have an effective collection area of about half a million square metres, with the capacity to grow - perhaps up to the desired one million square metres (one square kilometre).

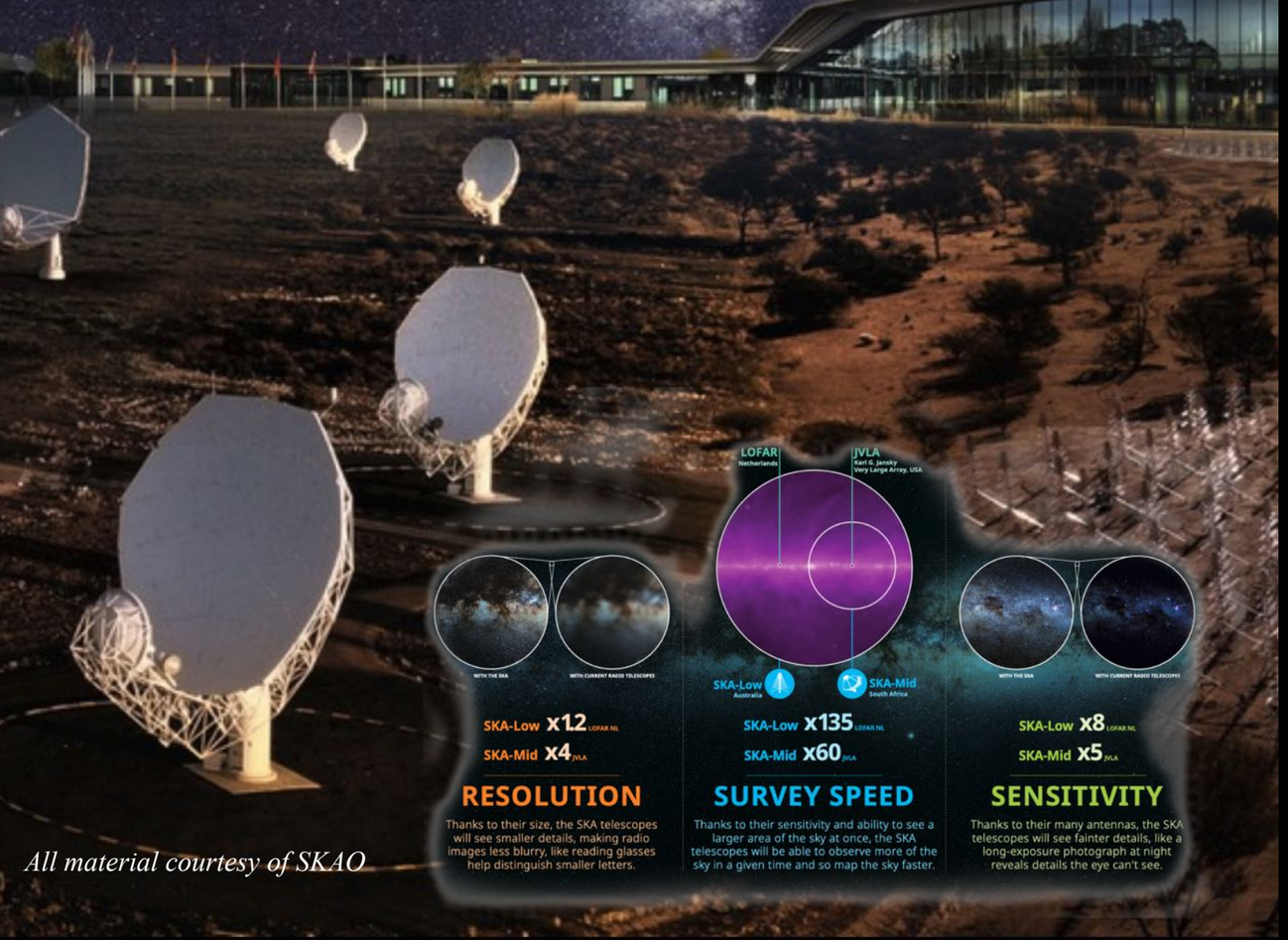
The members of SKAO at present are South Africa, the UK, Australia, China, Italy, the Netherlands, Portugal and Switzerland.

France, Spain and Germany are on the waiting list, to see how the initial trial works out. Canada, India, Sweden, Japan and South Korea have also expressed interest. ✈

Comparative performance

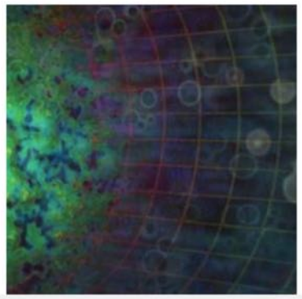
The SKA telescopes' sheer size and large number of antennas means they will, in comparison to existing state-of-the-art telescopes, provide a significant leap in sensitivity, resolution and survey speed, the three principal measures by which astronomers assess performance.

While higher resolution makes images less blurry, akin to putting on reading glasses, the SKA telescopes' exceptional sensitivity will allow them to see far deeper into the Universe than current telescopes, revealing far fainter details than ever observed before. They will also see more of the sky at once, providing vastly improved survey speeds.



All material courtesy of SKAO

Yes, But What Will it Do?



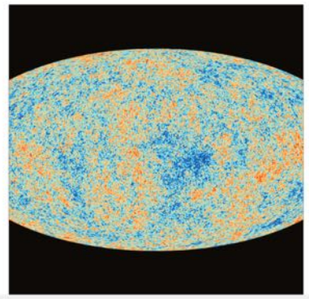
Cosmic Dawn and the epoch of reionisation

WHERE DID IT ALL BEGIN?

HOW AND WHEN DID THE FIRST STARS, GALAXIES AND BLACK HOLES FORM?

The SKA telescopes will uniquely enable the measurement of a complete time sequence of images from the onset of Cosmic Dawn to the end of reionisation, using the faint radio light coming directly from the hydrogen itself.

The resulting movie of the Universe's first 700 million years will answer a multitude of questions about this vital chapter in the history of the Universe.



Cosmology and dark energy

CAN WE UNCOVER THE MYSTERIOUS NATURE OF DARK ENERGY?

HOW AND WHY HAS IT BECOME THE MAJOR PLAYER IN OUR UNIVERSE?

The SKA telescopes will fundamentally advance our understanding of the mysterious dark components by measuring the equation of state of dark energy with percent-level precision; constraining possible deviations from general relativity on cosmological scales; and mapping the structure of the Universe on the largest accessible scales, thus constraining fundamental properties such as isotropy and homogeneity.

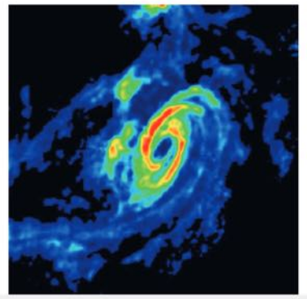
Forming stars through cosmic time

HOW AND WHEN WERE THE FIRST STARS BORN?

HOW HAS THE RATE OF STAR FORMATION CHANGED OVER TIME, AND WHY?

There is evidence that star formation was fundamentally different in the early Universe, often occurring within intense concentrations of super star clusters that have few, if any, counterparts today.

The SKA telescopes will play a key role in learning more about this mode of star formation.



Galaxy evolution

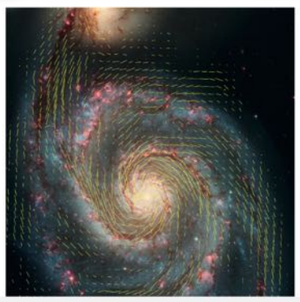
WHAT IS THE LIFE-CYCLE OF A GALAXY?

WHERE DO THEY COME FROM, WHERE DO THEY GO?

WHAT ARE THE PROPERTIES OF THE MYSTERIOUS DARK ENERGY?

The SKA telescopes will, for the first time, allow galaxy evolution, as traced by the accumulation and utilisation of atomic hydrogen, to be observed throughout cosmic time.

It will have the raw sensitivity to study the hydrogen concentrations that are associated with galaxies even in the distant, early Universe.



Cosmic magnetism

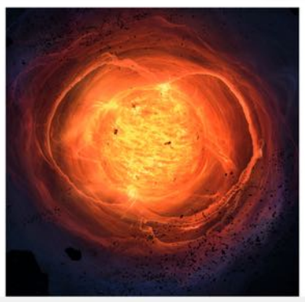
HOW DID THE UNIVERSE BECOME MAGNETIC?

WHERE AND WHEN DID MAGNETISM ORIGINATE?

HOW HAS IT EVOLVED?

The SKA telescopes will enable the creation of the first three-dimensional magnetic map of the Universe.

This will be done by measuring the individual magnetic components along the sightline toward extremely large samples of sources distributed in all directions on the sky and extending these measurements to sources at varying distances.



The bursting sky

WHAT ARE THE COUNTERPARTS OF THE FAST AND FURIOUS BURSTS OF RADIO WAVES?

WHAT CAN THEY TELL US ABOUT THE CONSTITUENTS OF THE UNIVERSE?

The SKA telescopes will enable us to associate thousands of individual fast radio bursts with the objects that host them, allowing us to map out the plasma content of the Universe.

This will allow us to study the so-called "missing baryons", determine the ionisation history of the Universe, and give us new and independent measures of the main drivers of cosmic expansion – the mass of the Universe and dark energy.

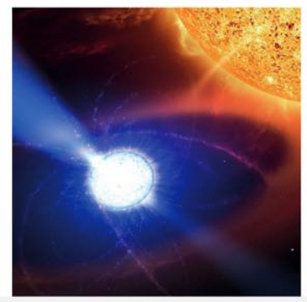
The cradle of life

HOW DO YOU MAKE A PLANET FROM SPACE PEBBLES?

ARE WE ALONE IN THE UNIVERSE?

The SKA telescopes will have sufficient resolution to watch the assembly of planets in Earth-like orbits about their parent stars.

The telescopes will also make it possible, for the first time, to detect emissions from planets associated with nearby stars that are comparable to those generated by human activity on Earth, opening the possibility of detecting technologically-active civilisations elsewhere in our galaxy.



Challenging Einstein: gravitational waves

WAS EINSTEIN RIGHT ABOUT GRAVITY?

CAN WE FIND AND UNDERSTAND WHERE GRAVITATIONAL WAVES COME FROM?

The SKA telescopes will use our entire galaxy to detect and measure gravitational waves from the merger of super-massive black holes at the centres of galaxies that are impossible to detect with Earth-based detectors.

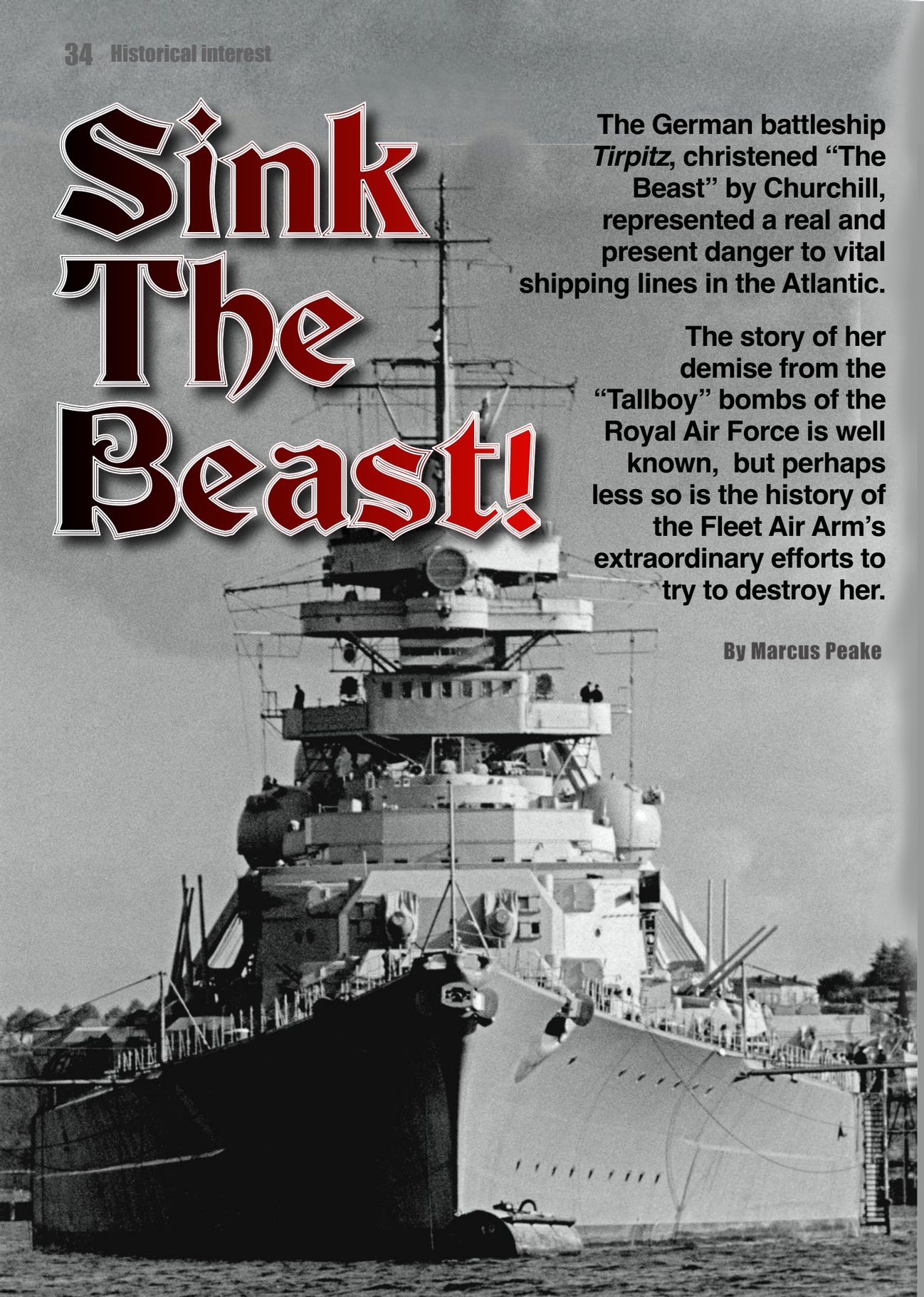
The detection method involves using very rapidly spinning neutron stars with radio beams emanating from their poles, known as millisecond pulsars, as a system of high precision clocks located throughout our galaxy.

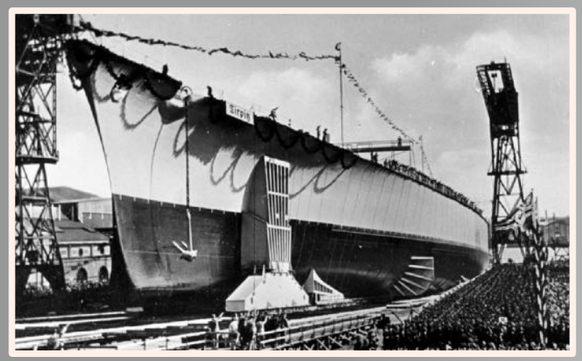
Sink The Beast!

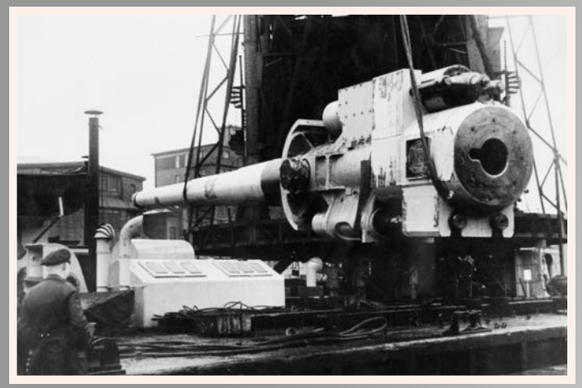
The German battleship *Tirpitz*, christened "The Beast" by Churchill, represented a real and present danger to vital shipping lines in the Atlantic.

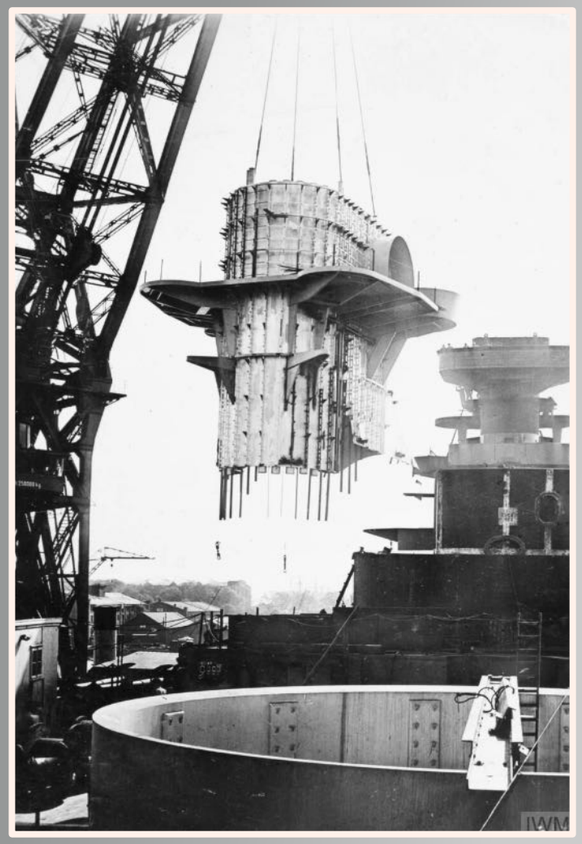
The story of her demise from the "Tallboy" bombs of the Royal Air Force is well known, but perhaps less so is the history of the Fleet Air Arm's extraordinary efforts to try to destroy her.

By Marcus Peake









'Our *Tirpitz* sunk.' This intercepted German signal tersly acknowledged the success of RAF Lancaster bombers on 12 November 1944.

The heavily armed German warship, which was capable of 34 knots and whose 15-inch guns could reach over 20 miles, had been under attack since 10 July 1940. Almost 400 bombers, torpedo-bombers, fighters, and reconnaissance aircraft had been involved over all those years, not to mention the fleets of British ships: including two audacious raids by Royal Navy charioteers (commando frogmen) and submariners.

Dubbed 'the beast' by Winston Churchill, and priority for her destruction elevated to 'utmost importance', *Tirpitz* had posed a continuous threat to Allied shipping on the Atlantic and Arctic convoys to the Soviet Union.

The Royal Air Force eventually left her upside down in near Tromsø, her hull a tomb to over 900 of her crew. But perhaps less well known is that the Fleet Air Arm had pressed home a number of attacks in the preceding years; and, whilst they never sank her, they did inflict severe damage which kept her under almost continuous repair.

The Beginning

The contract to build a sister ship to *Bismarck* was placed on 14 June 1936, with the vessel to be named *Tirpitz* after Admiral Alfred von Tirpitz, the architect of the Imperial German Fleet. He had given Germany a big-ship Navy to fight on the oceans, so it was ironic that the only vessel named after him should spend its life skulking in coastal waters.

At 53,000 tons Tirpitz was in blatant violation of the Anglo-German agreement of 1935, which limited Germany to a navy equivalent in size to 35% of the British surface fleet, and battleships to be limited to no more than 35,000 tons. Hitler had unilaterally rescinded its restrictions, however, as his ambitions grew.

The British were under no illusions about the threat the two *Bismarck* class ships of the Kriegsmarine presented. The vessels were the most powerful warships ever built in Germany, and their capability was graphically illustrated by *Bismarck* when she dispatched HMS *Hood* in a brief encounter in May of 1941.

Far left. *Regarded as one of the most powerful warships in the world, Tirpitz inspired awe just by looking at her.*

Left top. *At her launching on 01April 1939.* ***Middle****: One of the massive 15 inch guns being loaded aboard during construction.* ***Bottom****: her prefabricated funnel is set in place. In the foreground is a turret mounting.* ✈

Tirpitz at Fættenfjord (near Tromsø) in May of 1942, recovering an Arado float plane. She had not long deployed to Norway to threaten the Arctic convoys, but was to spend most of her life lurking in fjords further north, under almost constant attack from the Royal Navy and RAF. ✈

Bismarck was sunk three days later by ships of the Home Fleet. Crippled by a torpedo from a Fleet Air Arm Swordfish from *Ark Royal*, she was hunted down by the Royal Navy in dreadful retribution for the loss of *Hood* and all but three of her crew. The sinking of *Bismarck* was a blow to Hitler, who lost faith in the Kriegsmarine and forbade *Tirpitz* to venture into the wider Atlantic.

After completing sea trials in early 1941, *Tirpitz* briefly served in Kiel as the centrepiece of the Baltic Fleet. Several attempts had been made by RAF bombers to sink her, but all had been unsuccessful and in early 1942 she moved to Norway where she could more easily intercept Allied convoys to the Soviet Union.

The First FAA Action

In early March of 1942 Admiral Tovey, who commanded the British Home Fleet, received good information that *Tirpitz* had left the Arctic and was steaming south to threaten the Soviet-bound convoy PQ12. He set off in pursuit, aiming to launch an air attack from *Victorious* at dawn. With the enemy located by reconnaissance aircraft, he launched 12 Albacores, each carrying a Mark XII torpedo.

At 0842, the aircraft sighted the target and noted she had altered course eastwards, steaming towards the Lofoten Islands, behind which lay the port of Narvik.

Flying into a strong headwind, the bombers could only slowly gain on the battleship and were unable to position themselves for the planned head-on assault. Instead, the Albacores dropped their torpedoes from port and starboard, but all passed harmlessly behind the target.

The warship's manoeuvring to avoid these torpedoes allowed 817 Squadron to optimise their position, but *Tirpitz* foiled that attack too. Lieutenant-Commander J H Stenning reported:

'As we dived from our low height into a 30-knot wind, she [Tirpitz] altered course to starboard, so we had to chase her and with shots from her coming all round us I dropped my torpedo almost at extreme range.'

The Germans subsequently described the attack as 'most courageous' and revealed that one torpedo had missed *Tirpitz* by a mere 30 feet. On board, Vice-Admiral Otto Ciliax credited '*the good God's intervention between the Tirpitz and the deadly British weapons'.*

Back at Trondheim, three further attacks were carried out by RAF Lancaster and Halifax bombers, but each was thwarted by thick cloud and mist over the target.

In July 1942 the warship again headed north to attack the convoys. Warned that she was at sea, the escorts of PQ17 were withdrawn to intercept her, leaving the convoy exposed to U-boats and enemy aircraft. Only 11 of the 35 merchant ships of survived. By then, *Tirpitz* was back in Trondheim, having never fired a shot at the convoy.

September 1943 - Operation Source

By now the ship was in need of a refit, which occurred in Trondheim for five months before she returned to Altafjord. Various plans to sink her had been considered, including the use of Flying Fortresses using Soviet bases, and Mosquitoes using a smaller form of Barnes Wallis's 'bouncing bomb' which had breached dams in the Rhur so successfully.

None came to fruition, and the seeming impenetrability of air defences persuaded the British to resort to midget submarines on Operation Source. In an extraordinarily courageous attack, two of the three craft managed to place two-ton mines under her keel whilst she anchored at Kååfjord. They caused severe damage when they detonated, and although she did not sink, *Tirpitz* was under repair for four months.

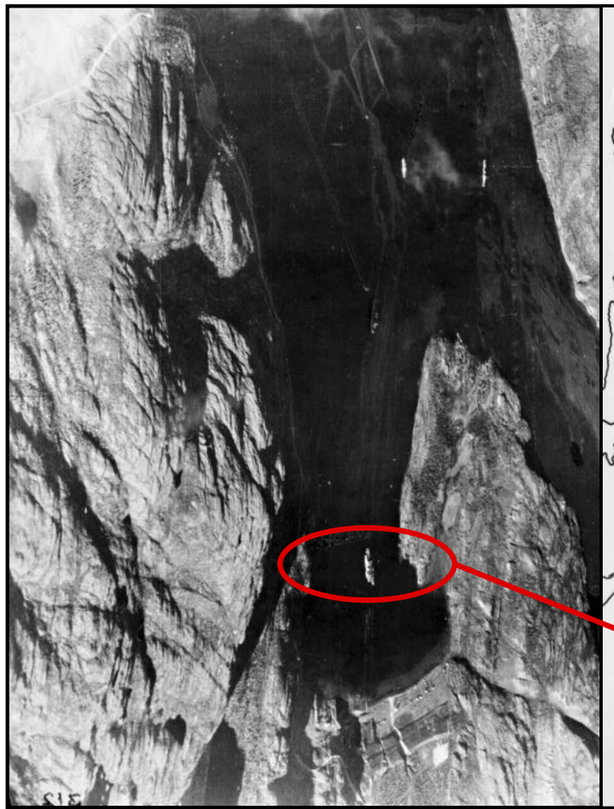
By March of 1944 she had been repaired, however, and commenced trials to confirm her seaworthiness. The British determined that no time should be lost in a further attempt to sink her.

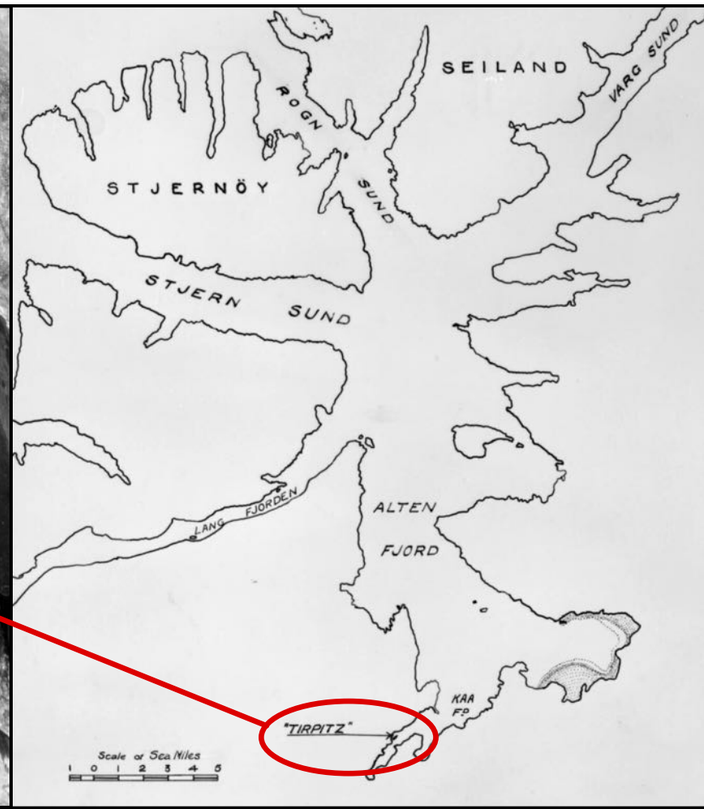
April 1944 - Operation Tungsten - Kååfjord.

Intelligence reported that *Tirpitz* remained at anchor in Kååfjord, under a steep cliff. The British constructed a mock up in Loch Eriboll, near Caithness, which attempted to recreate the actual anchorage including defences such as dummy AA batteries and smoke pots. The FAA used this site for rehearsals before setting off at the end of March 1994 on Operation Tungsten.

While at sea, aircrew further studied models showing *Tirpitz's* anchorage under the cliff on the western side of the fjord and the surrounding terrain, including Altafjord and Langfjord, in the course of ten hours of concentrated briefings.

Left. *A British Midget Submarine, of the type used in Operation Source.* ***Below:*** *An aerial photograph of Tirpitz in Altafjord, where the submarine attack took place, with a British sketch map showing her position. (IWM).*✈





Two fleet carriers, *Victorious* and *Furious*, together with four escort carriers (*Emperor, Fencer, Pursuer and Searcher*), rendezvoused 120 miles off Norway and, on 3 April 1944, launched the operation. They were accompanied by a veritable fleet of warships including the battleships *King George V* and *Anson*.

The plan for the raid called for two dive-bombing attacks, each by 21 Fairey Barracudas escorted by 40 Hellcats and Wildcat fighters. Aside from providing air cover, the fighters were also to attack *Tirpitz's* defences, shore batteries, and adjacent flak ships. Corsairs flew top cover.

While Seafires and Swordfish guarded the fleet, the first wave of took off *'It was a grand sight, with the sun just risen, to see this well-balanced striking force departing,'* recorded Rear-Admiral A. W. Bisset.

Previous raids had lacked bombs sufficient to penetrate Tirpitz's armour, but it was hoped that the recently developed 1600 lb armour-piercing bombs would achieve this, if dropped from sufficient altitude.

Tirpitz was caught moving out of her secure anchorage for trials. As the fighters crested the ridge shielding the warship, the smokescreen cloak had not become fully effective. Although 'various missiles appeared to be whizzing in all directions,' one pilot wrote, 'really the attack was a piece of cake.'

The second wave of 19 Barracudas set course from the carriers at 0538 to encounter the smokescreen 'halfway up the mountains on each side' without fully masking the target's superstructure.

Photos: [1] *HMS Emperor. Five New Zealanders who took part in the attack. Left to right: Sub Lieutenants, Scanes, of Christchurch; Cranwell, of Auckland; McLennan, of Thames; Jellie, of Auckland; and Lieut Hill of Wellington.(IWM)* ***[2]*** *A Fleet Air Arm Armourer writes a message on a 500lb bomb loaded on a Fairey Barracuda of HMS Furious. (Wikipedia)* ***[3]*** *Map of Norway, showing the locations of Tirpitz from when she arrived in March 1942 until her sinking in November 1944.* ***[4]****. Aircrew aboard Victorious celebrating after Operation Tungsten, April 1944. (IWM)* ***[5]****. A British reconnaissance photo of Tirpitz in Kåafjord in July of 1944. Smoke from the many generators is starting to fill the fjord, although the ship is still visible.* ✈

The Flight Deck of HMS Warrior during her operations against Tirpitz. The weather made flying very hazardous. (IWM) ✈

Corsairs and Barracudas ranged on the flight deck of HMS Formidable July 1944, in preparation for Operation Mascot. ✈

Although there was 'a substantial umbrella of bursting shells', bomber crews observed that 'fighters had shot up the target very well and undoubtedly spoilt *Tirpitz's* gunnery', before they dived steeply to attack 'from stern to stem'. Lieutenant Commander V. Rance concluded:

'Unquestionably, strafing attacks by fighters and the use of powerful blast bombs by the first few aircraft are of the utmost importance in ensuring the arrival of the armour-piercing bombs carried by the latter half of the attacking force'.

To the attackers' relief, no enemy fighters appeared. Nevertheless, three Barracudas and one fighter were lost. The Admiralty claimed eight certain (including three 1,600lb AP bombs) and five probable hits. *Victorious* declared *Tirpitz* 'now to be useless as a warship', and The Times assured its readers '*Tirpitz* Crippled by Dawn Raiders'.

In reality, the ship had been damaged but not severely. The strikes did not penetrate the ship's main armour but caused significant damage to her superstructure. Two of her 15cm turrets and both of her aircraft were destroyed, serious fires started and some flooding was caused by splinters from near misses. The salt water used to fight the fires reached her boilers and contaminated the feed water, and concussive shock disabled the starboard turbine.

One hundred and twenty-two of her company were killed, and a further 316 wounded – but she was to be repaired within a month and continued to represent a real threat to Britain's sea lanes.

July 1944 - Operation Mascot - Kååfjord

Repairs to *Tirpitz* following Operation Tungsten progressed quickly. Work began in late April, and 157 shipyard workers and special equipment were transported from Germany to Kååfjord to accelerate the project. Assisted by the long hours of daylight at that latitude during summer, three shifts of personnel worked on *Tirpitz* each day.

The battleship was capable of moving under her own power by 2 June, and ready to begin gunnery exercises by the end of that month. The repair works concluded in mid-July, though the battleship's starboard propeller shaft could only be used to drive her forwards. Captain Wolf Junge assumed command in May 1944, replacing Captain Hans Meyer who had been wounded during Operation Tungsten.

During this period three follow-up operations were planned – Planet (24 April), Brawn (15 May), and Tiger Claw (28 May) – but they were all were frustrated at the last moment by adverse weather conditions in the target area. Urgency, though, was heightened at the beginning of July by reports of *Tirpitz* achieving 15-20 knots in renewed trials. Plans for another attack were complicated by evidence that the battleship was now anchored on the eastern side of the fjord.

A reconnaissance flight on 12 July confirmed 'no visible signs of damage except that one aircraft crane and a boat to starboard are missing', the flak mountings were 'intact', and the upper deck 'mottled' in an attempt at camouflage. Two days later, 'in fog and drizzle', ships involved in Operation Mascot left port.

As *Victorious* had been redeployed to the Indian Ocean in June, the carriers selected for the operation were the recently commissioned HMS *Indefatigable* as well as the veterans *Formidable* and *Furious*. The carriers were escorted by the battleship HMS *Duke of York*, four cruisers and twelve destroyers. Vice Admiral Sir Henry Moore commanded the force from *Duke of York*, and the carrier group was led by Rear Admiral Rhoderick McGrigor on board *Indefatigable*.

The defences of Kååfjord had been improved following Operation Tungsten. Previously comprising eleven batteries of anti-aircraft guns, several anti-aircraft warships and a system of smoke generators capable of hiding *Tirpitz* from aircraft, they now included additional radar stations and observation posts, and the number of smoke generators located around the battleship had been increased.

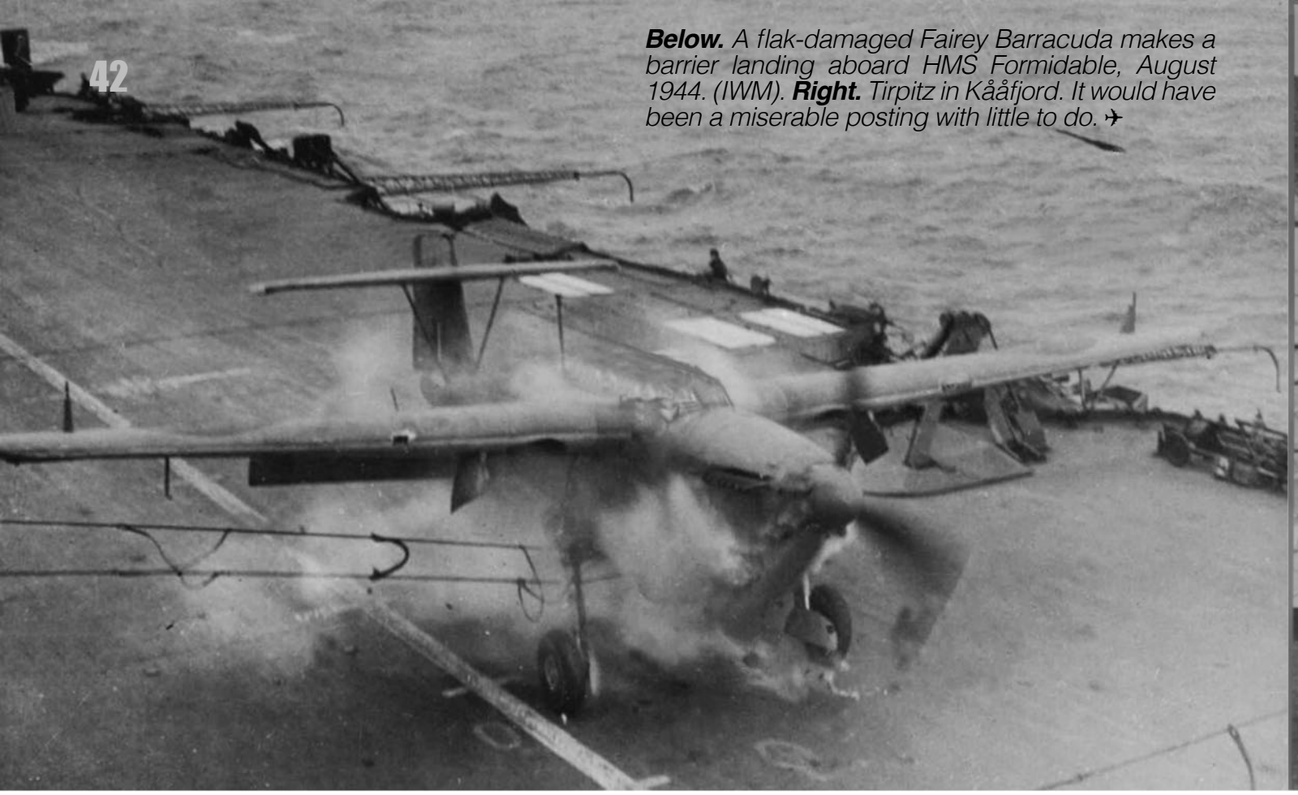
Tirpitz's own air defences were also strengthened whilst she was under repair, by adding more 20-millimetre cannons, modifying the 150 mm guns to include an anti-aircraft capability, and by supplying aerial-fused shells for her 380-millimetre (15 in) main guns.

The German also established a patrol line of twelve submarines around the island of Jan Mayen, with the task of intercepting any British carrier forces that ventured into the Norwegian Sea.

For the ten previous days, bomber and fighter squadrons had practised together 'both from shore bases and from their ships', again making use of the dummy set-up on Loch Eriboll. Further detailed briefings occurred at sea, and on 16 July the undetected force was in position to launch the attack in a 'light easterly wind and clear conditions'.

The carriers began launching their aircraft shortly after midnight on 17 July. The main striking force comprised 44 Barracudas, all but two of which carried the powerful 1,600-pound armour-piercing bombs. Eighteen Corsairs were assigned to provide protection against German fighters, and the 20 Hellcats and 12 Fireflies were given the task of suppressing anti-aircraft guns.

A Corsair pilot recalled of Monday 17 July: 'At mid-



Below. *A flak-damaged Fairey Barracuda makes a barrier landing aboard HMS Formidable, August 1944. (IWM).* ***Right.*** *Tirpitz in Kååfjord. It would have been a miserable posting with little to do.* ✈

night, with the sun still shining, we all boarded our cabs and started up for the "big do".'

After 'an excellent form up', the aircraft flew at 50 feet above the sea to evade German radar until they were ten minutes' flying time from the coast, where they climbed to 9000 feet.

The British strike force was detected by German radar stations 43 miles from Kååfjord at 02:00. It took four minutes to pass a warning to *Tirpitz,* and her protective smoke generators were quickly in action to cover the vessel in an artificial cloud. The battleship and anti-aircraft batteries located on the shore began firing a barrage towards the British aircraft at 02:19. German forces also began jamming the British aircrafts' radios once they came within 10 miles of the Norwegian coastline. The smokescreen frustrated the British attack, as the crews of only two of the Barracudas and a pair of fighters managed to sight *Tirpitz* during the raid.

The Hellcats and Fireflies were first to attack, and strafed anti-aircraft positions and smaller vessels, as best they could in the poor visibility. The Barracudas gained no clear sight of *Tirpitz* and bombed on the flashes of her flak guns.

A second British raid, which had been scheduled to take off on the morning of 17 July, was cancelled two minutes before the aircraft were to begin launching when fog began to build up near the carriers, and the British fleet turned south to return to Scapa Flow.

One Corsair was lost in the target area, no damage was even claimed, and officially 'strike considered unsuccessful… a disappointing show'.

German reports showed no hits and only a few near misses. The gunners claimed to have shot down 12 attackers.

August 1944 - Operation Goodwood I

Analysis of Mascot photos, reports, and other data confirmed the greater strength of the defences on and around the warship, and a proposal was advanced for continuous operations over 48 hours to wear the defenders down and, in particular, exhaust the smoke generators.

Priority was raised by reports that *Tirpitz* was now regularly achieving 20 knots during daily excursions to Altafjord and her guns were fully operational. On 1 August she exercised at sea with the 4th Destroyer Flotilla, raising fears of an impending, aggressive sortie.

Operation Goodwood, comprising a series of strikes in pursuit of the plan to erode the defences, was scheduled for mid-August. Once more rehearsals were carried out at Loch Eriboll and 'splendid models of the fjord [Kååfjord] and its surrounding terrain and excellent photographic cover of the area' used in detailed pre-operational briefings.

On 18 August, the fleet carriers *Indefatigable*, *Formidable*, and *Furious*, with escort carriers *Trumpeter* and *Nabob,* protected by an impressive array of cruisers and destroyers led by the battleship *Duke of York*, left Scottish waters.

Two days later, the ships rendezvoused off the Norwegian coast, where poor flying conditions disrupted the planned programme.

However, the ships' fuel situation would not allow indefinite delay, so despite dreadful weather and two postponements during the morning of 22 August, Goodwood I was launched. While Seafires defended the fleet, Barracudas, protected by Corsairs, Fireflies, and Hellcats, would carry out a similar attack to that executed by the Tungsten force. This time, Avengers were to drop mines beside the enemy warship and across the entrance to the fjord in case *Tirpitz* raised steam. But low cloud conditions precluded that phase of the operation. More frustration followed. Thick cloud at 1,500ft caused the Barracudas and Corsair escorts to turn back short of the coast. Eleven Fireflies pressed on to attack flak positions in Kååfjord at 1249. Two minutes later, nine Hellcats each released a 500lb semi-armour-piercing (SAP) bomb on *Tirpitz*, as eight Seafires hit Luftwaffe bases elsewhere at Banak and Kolvik.

One Hellcat and one Corsair were lost, and a Barracuda ditched close to the fleet. More significantly, the escort carrier *Nabob* was torpedoed at 1725. She survived, to be escorted back to harbour by a protective flotilla including *Trumpeter*. The two escort carriers had the Avengers on board, thus narrowing the scope of a repeat operation.

August 1944 [Operation Goodwood II and III

Meanwhile, in keeping with the 'teasing tactics' of a succession of sequential strikes, Goodwood II took place on the evening of 22 August 'in very good conditions' Fireflies attacked the flak positions as seven Hellcats dived from 8,000ft to release their 500lb bombs.

Surprise caused by the speed of approach of this small force meant that the smokescreen proved ineffective, so no aircraft were lost. *Tirpitz* recorded no hits, but did acknowledge the vast amount of 380mm, 150mm, 105mm, 37mm, and 20mm ammunition that had been expended during the two attacks.

After a respite for bad weather, Goodwood III was launched during the afternoon of 24 August. Thirty-three Barracudas each carrying a 1,600lb armour piercing bomb, 24 Corsairs (five with a 1,000lb AP bomb) and ten Hellcats (each carrying a 500lb MC bomb), together with ten Fireflies set off for Kååfjord.

The Barracudas arrived to find the flak had 'lightened considerably' due to the 'sheer cold-blooded gallantry' of the fighter crews. After a steep dive from 10,000ft to 4,000ft, the bombers released their load on the anticipated location of *Tirpitz*, which was completely obscured by an effective smokescreen. One observer reflected: 'To pull out of the dive in the smoke, with the mountains around us and many other aircraft above was a feature of the occasion which has stuck in my memory.'

Two Hellcats and three Corsairs were lost, but two hits on the ship were recorded - one 500 lb bomb

which caused superficial damage, and another by a 1600 lb bomb which penetrated the upper and lower armoured decks and came to rest in the No.4 switchboard room - but failed to detonate.

The Germans acknowledged that had the 1600 bomb exploded the effect 'would have been immeasurable'. They paid tribute to 'the great skill and dexterity in flying during undoubtedly the heaviest and most determined [attack] so far'. Heavy losses were also suffered by batteries on shore, where an ammunition dump was blown up.

August 1944 - Operation Goodwood IV

In the early hours of 29 August the force gathering for Goodwood IV moved into position. Conditions improved during the morning and at 1430 the last combined strike was flown off *Indefatigable* and *Formidable*.

Twenty-six Barracudas, two Corsairs and three Hellcats were protected by 15 Corsairs and ten Fireflies, tasked to deal with flak positions.

An inaccurate wind forecast meant that the attackers flew a 'roundabout approach from south-west, not north-west, as planned. The added delay allowed the smokescreen to thicken, so 52 tons of explosive were dropped blindly.

One Firefly and one Corsair were shot down, but all the Barracudas survived, even though some were badly damaged by flak. The absence of enemy fighters again proved welcome, if somewhat surprising. Back in Britain the national press enthused: *'They Struck from the Sea', 'Six Times Attacked', 'How We Hit Tirpitz'…*

The operation on the 29 August would be the last flown by the FAA against the German battleship.

Vice-Admiral Sir Henry Moore concluded that further seaborne attacks were a waste of time and resources. The slow Barracudas, he reasoned, allowed the Germans ample time to form an effective smokescreen, and their weapon load was not sufficient to inflict fatal damage even if they did strike the ship. As to the policy of 'teasing', Moore was dismissive: *'The weather only gives periodical and fleeting chances; [and] periods of darkness give respite to the defenders',* he said.

But although FAA operations during 1944 had not finished off *Tirpitz*, they had certainly caused damage to the ship which had prevented further excursions.

They constituted a fitting prelude to the RAF Bomber Command operations which, within a few months, would finally kill the Beast.

But that's a story for another edition. ✈

When the first of the RAN's Seahawk S-70Bs arrived in February of 1989 it was the most advanced anti-submarine helicopter money could buy. They remained in service in peace and in war for over thirty years, without the loss of a single airframe - the only operational aircraft in our history to do so.

The story of the Seahawk from project inception, though its years in the Gulf War and to eventual retirement, is told in a new 'Heritage' Article now available on our website.

Read the Seahawk Story

STOP PRESS

Mal Smith, the Secretary of the Victorian Division of the FAAAA, has asked that this notice be included in this Edition of 'FlyBy' as it missed the deadline for 'Slipstream' (which is being posted out on 31May22.

Two of the most important events on our calendar are the Annual Dinner to be held at the Waverley RSL on Saturday 26th August and our Commemoration Service at HMAS Cerberus on Sunday 27th August. By the time you are reading this, I expect we will be not far off these two events.

I like to give plenty of notice as there is a substantial amount of organising to do, particularly for the Commemoration service. Most of the approvals required to enter Cerberus and hold the service have now been obtained and the CO, Captain Morthorpe has advised that he will be attending and participate in the wreath laying at our memorial plaque.

It isn't always possible but we try each year to have a class of recruits join us. I am delighted to advise that the recruits from Shipp Division will be joining us this year. I'm sure most of you are aware of Leading Aircraftsman Noel Shipp who was tragically killed in Vietnam. Noel was a heroic figure of the Fleet Air Arm and I couldn't think of a more appropriate person to be associated with our service.

Should any interstate members be in Melbourne at the end of August and wish to join us you would be more than welcome. Just send me an email here.