

THE NAVY

The Magazine of the Navy of Australia

*The 2006
Creswell Oration*

*The Terminal
Decline of
the RN*

The X-Factor

*Autonomous
Unmanned Vehicles*

Australia's Leading Naval Magazine Since 1938





Anzac ship 157. NUSHIP PERTH is seen here on sea trials off Melbourne. PERTH is the tenth Anzac built by Tenix and the last of eight for the RAN. She is due to commission in the next few months. She has an older Mod 2 Mk-45 gun mount shielding as this gun was used as a training tool during the build of the Anzacs and is now no longer needed by the dockyard. (PHOTONET via Tenix)



The former civilian tanker *DELOS* nearing completion for her new role as the replenishment tanker HMAS SIRIUS at Henderson in WA. (Ian Johnson)

THE NAVY

Volume 68 No. 3

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Front cover: The RN Type 22 Batch 3 frigate
HMS CUMBERLAND. (RN)

The Navy

All letters and contributions to:

The Office of The Editor

THE NAVY

Navy League of Australia

GPO Box 1719

Sydney, NSW 2001

E-mail to: editorthenavy@hotmail.com

All Subscriptions, Membership and Advertising enquiries to:

The Hon Secretary,

Navy League of Australia, NSW Division

GPO Box 1719,

Sydney, NSW 2001

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FROM THE CROW'S NEST

Recently the Royal Navy said its final farewell to one of the best known aircraft types in history, the Sea Harrier. Many will recall the television images from April of 1982 of HMS INVINCIBLE steaming out of port with a blue and white painted Sea Harrier at the end of her ski jump heading for the Falklands in the South Atlantic. There the Sea Harrier had its 'finest hour' accounting for approximately 22 Argentine aircraft for no loss (to air-air combat). During the 1990s it underwent an upgrade in its air-air capability and was for a while the best air superiority fighter in Europe.

The decision to retire the Sea Harrier was taken due to cost considerations. The required upgrade to her engine and avionics was deemed too great when the fighter role she was designed for hadn't been used since 1982. The UK's main carrier borne effort since has been in the strike role. So there is some basis to the decision.

The Sea Harrier will be replaced with a RAF GR-9 ground attack/strike Harrier II until the arrival of the F-35 JSF. While having a considerable range and payload increase over the Sea Harrier it has no radar. This makes it less useful in the air-air or fleet air defence role and somewhat difficult to find a moving aircraft carrier at night or in fog in conditions of fleet electronic blackout.

Although the RN rightly see this as a risk, and some in the UK calling it a stupid decision, there is some scope for the GR-9 to provide a backstop air defence capability. During the Falklands conflict the Sea Harrier's Blue Fox radar was found to be rather ineffectual in the look-down- shoot-down mode, particularly over land. In essence, like the current GR-9, the Sea Harriers were without eyes. But, a lot of the air-air successes of the Sea Harrier came as a result of cueing provided by ship's radars such as the Type 42 destroyers and Type 22 frigates.



Crew members on deck of one of the RN's Invincible class carriers to see the last launch and flyby of the Sea Harrier as it passes into history.

The GR-9 uses the same air-air missile as the Sea Harrier of 1982, that being the AIM-9L Sidewinder. While the GR-9 could thus produce a similar capability, but with far greater range and loiter time, it should be remembered that the RN now uses the Mk-7 Sea King Airborne Early Warning (AEW) radar helicopter. Something found to be lacking in the 1982 conflict. So with this added capability the GR-9 should provide a better measure of defence against a similar sized and technological advanced air force as the Argentines of 1982 (and today).

While not wishing this to sound like a criticism, the RN could go further. The addition of Link 16 in the GR-9 could give it a greater level of situation awareness than most of the first world's fighters with live data streams from ships and AEW Sea Kings merged into a common air picture. Fitting of the ASRAAM (Advanced Short Ranged Air- Air Missile, as used on other RAF aircraft) with its extended range, high manoeuvrability and accuracy would represent a better air defence capability than anything that could have been fielded by the UK in 1982, and by many air forces today.

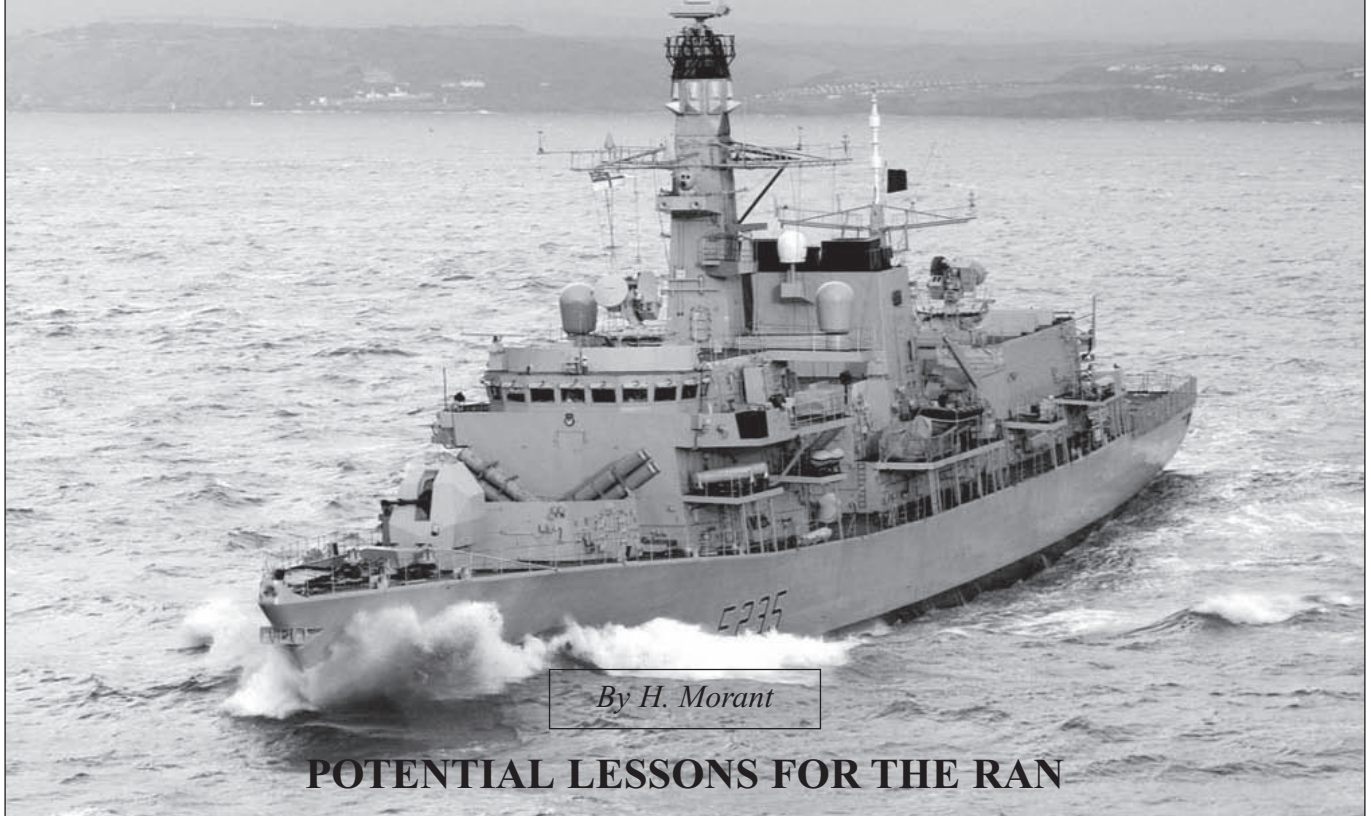
What this indicates is that modern networking combined with a small measure of new weaponry can provide a significant capability to legacy equipment. Time is starting to show that networking battlefield platforms is as important as the weapons they can employ. While the RAN has been networking warships for some time it is now time to network the ADF to realise better economies and gain greater battlefield effectiveness through jointness.

By Themistocles



A new GR-9 Harrier II. Despite the criticism of its lack of air-air capability, with Link 16 and ASRAAM the GR-9 could be quite a formidable fighter. The networking ability provided by Link 16 is the key. The RAN has been using Link for some time and has thus amassed a working corporate knowledge of its benefits. It is now the turn of the ADF to link its Service arms to provide more capability to face the future.

THE TERMINAL DECLINE OF THE ROYAL NAVY



By H. Morant

POTENTIAL LESSONS FOR THE RAN

The Type 23 frigate HMS MONMOUTH. Despite being relatively new and quite capable the RN is selling off or decommissioning the Type 23s to make room for the new Type 45 Daring class destroyers and CVFs.

Despite appearances to the contrary and the recent, almost-but-not-yet-certain, decision by Gordon Brown, the British Chancellor, to build two large carriers, CVFs, the decline of the RN from the 'Nott Review' shortly before the Falklands War has been constant if not dramatic – from well over a 100 capital ships, submarines and aircraft carriers and 75,000 RN personnel in 1980, supported by 8-10,000 Royal Marines¹(RMs), to fewer than 6,000 RMs in 2006, supported by about 35 major platforms and 33,000 RN personnel². Reducing at a rate of 50% of its personnel and 65% of its force every generation, given another twenty five years like the previous the RN will be a force equivalent or smaller than the RAN now, established around a similar number of hulls.

Once Mighty

The once mighty RN, upon whom it might more truly be said 'the sun never set' and that, from the glory days of General at Sea Blake in the 17th Century, bestrode the international sea-lanes, will have been reduced to a shadow upon which the sun rarely rises. Its once proud ensign, that defined the flags of the USA, Canada, Australia, and New Zealand to name but a few, and whose 'white' derivative still flies historically over the navies of the Commonwealth, will be seen increasingly only in old films and in the naval backwaters of northern Europe. Historians will no doubt look back and ask how it was possible that a once-mighty nation and fierce, liberally-minded, innovative, free-trading people gave away and sold-off in half a century one of its most precious assets: an asset that it had taken 300 years to build? I doubt if historians will be forgiving of the short-sighted politicians and grasping senior staff officers who then played leapfrog over the carcase of the RN. They will not care – as they wander off the mortal coil with their inflation-proofed pensions and

archaic decorations – but history just might. And history may just yet record these same politicians – as it recognises Drake, Elizabeth I, Blake, Nelson, Pepys, Charles II and William to be the founders of the RN – to be its destroyers. Quite an epitaph for the budding politician to be able to say to their grandchildren that they – unlike the Dutch, the Spanish, the French, the Germans, the Americans, the Japanese, the Chinese, the Russians, the Soviet Union or even the Argentineans – destroyed the RN: '*UK Chancellor lies here – reaper of the Queens' Navy*', RIP.

If there is a time for Drake's drum to beat it is now – but maybe, just as the United Kingdom no longer appears to believe in the RN, it no longer believes in ghosts or the ghosts no longer believe in it? So what are the lessons in this now terminal decline of the RN for the RAN as it begins slowly to grow in terms of manpower, ships and capability? Can the two navies continue to work from different sides of the same song-sheet; do they need to consider working more closely together again and what exactly can they learn from each other?

If you know of a better ‘ole, go to it³

The RN is faced with the same conundrum it always has: too few ships; too many tasks; too few sympathetic masters; too few people; too many ‘wrong’ and too few right ships. Put simply, it is configured rightly for a Navy still fighting the Cold War but wrongly for one fighting the wars of the 21st Century. The RN built to fight the Cold War took two generations to build when the requirement of having a Navy was taken as a given and the lessons of WW I and WW II were not lost as the UK peered east towards the massed ranks of the Soviet Union. Yet even in 1980 the ‘givens’ were being eroded – the Royal Marines could define their role in Northern Ireland in support of the British Army more than they could their affinities to the RN. After the Falklands, they were more than happy to return to the foothills of Armagh and Tyrone leaving the Navy isolated in the Greenland-Iceland-UK gap.

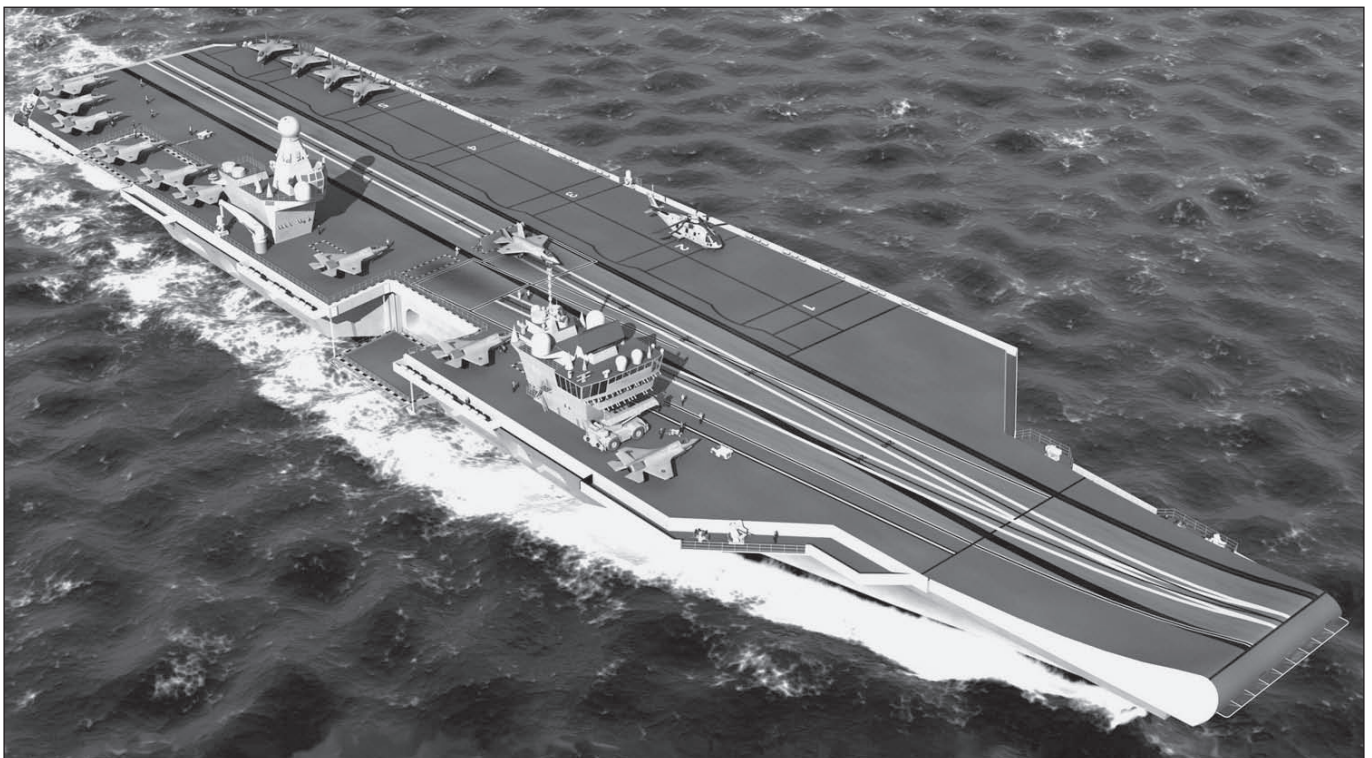
Little heard of now, in the late 1980s the RN had its last real technological success – using its mastery of surface Towed Array to track and follow Soviet submarines as they transited into the North Atlantic – even patrolling on behalf of the USA in the early days. The RN also deployed forward to the Gulf in the late 1980s, where its minehunters, designed typically only for temperate climes, actively engaged in clearing the sea-routes during the mine-war, 1987-89. In 1991 one of its Type 42 Destroyers became the first warship to successfully shoot down an anti-ship missile using the ageing Sea Dart system; in 1994 the RN deployed forward to defend Kuwait during *Operation Piper*; between 1992-1995 it provided air-cover over the Balkans; in 2000, the RN returned to Freetown, Sierra Leone, to turn back the rebel tide; in 2002 it supported Afghanistan Land operations from the Amphibious Readiness Group deployed in the Gulf and in 2003 it undertook the largest amphibious assault since Suez in 1956, enabling the Army to sweep across the Al Faw peninsular. To what avail? Any other organisation might have expected to be rewarded for its successes from 1982 onwards. The reverse has in fact applied. For every success the RN has

had it has been cut a little more – ‘if it can do this and more for that’ the politicians have concluded, then ‘it can do the same again for less’. So it goes on.

Naval Gazing

Ships

Following SDR (Strategic Defence Review) and SDR New Chapter, the RN has pinned its future to the CV(F) programme. Everything has been mortgaged to achieve this aim – be it operationally, financially or intellectually – and no one has been allowed to question this intent. Arguably this has been the right thing to do – but the sacrifices involved have been enormous and are only just really beginning to appear. The Fleet of today is moribund, obsolete if not obsolescent and starved of resources, financial and people. Look at it, Type 23 frigates being decommissioned early to give head-room to the Type 45s and CVFs. The Type 42s are increasingly unreliable and just about keeping in the fight through the excellent Sea Dart missile and its less than well engineered system; the Type 45, its replacement, 20 years overdue and looking more and more like an under-armed white elephant (a Type 82 Bristol repeat perhaps) with its outdated systems, radars and missiles systems even including the ancient 4.5-inch Mk-8 gun; the new Astute class nuclear powered submarine which offered so much but is now just a bridge from the past to the now and fails to address nuclear ownership or the submarine’s future purpose (Land Attack?); and the Trident Fleet that, without providing some form of dual role, appear more and more an expensive gold-plated money monster, consuming operational capability for strategic ‘MAD’ness and to allow UK politicians to continue playing at being one of the five permanent members of the UN Security Council. The cost for all these mistakes and grandiose political-military gestures falling, as ever, to the poor bloody surface fleet to pick up in terms of under-resourcing and badly engineered ships and systems.



A computer-generated image of the RN's planned CVF.



The Type 42 Batch 3 destroyer HMS EDINBURGH. The Type 42's Sea Dart system is the only thing keeping the ships in service as maintenance costs to keep them in service start to soar.

The one success story the RN had in the last ten years was the creation of the Amphibious Readiness/Task Group (AR/TG) around the LPH, the new LPDs and the ALSs. This though came about more by accident than design and as a profound cultural shock to the rest of the RN, more used to small ship private commands than getting their feet dirty. When HMS OCEAN entered its Base Port for the first time it had not one call-round by any of the assembled Frigates and Submarines. The cultural shock between 'Royal' and Navy as they met for the first time on board the LPH, in any significant capacity since the Falklands, was equally as profound. In effect two cultures met – the one used to controlling its environment with super-sonic speeds of reaction; the other used to commanding its people and resources over time. This cultural shock continues to run deep within the Naval Service but exposed, perhaps, the RN's greatest weakness: its inability to command in the joint environment.

Technically, though, the introduction of the LPH was not so much a revolution as a fudge. Built supposedly to commercial standards, she ended up getting the worst of both – the lowest of the commercial standards (to a minimum of Lloyds requirements) and the worst of the Naval Engineering Standards (for example accommodation). The LPH's greatest contributions were its presence in the Fleet at the right time and the degree of space that it brought with it to allow for 'experimentation' and the modern systems it actually needed to be fitted. The LPH was there – whereas the RN intellectually and culturally was left many years behind, for example initially the LPH was always seen in the support carrier role; never the reverse! The RN is still behind the curve when it comes to the 'big ship Fleet' that is emerging – its senior officers hearken back either to the comfort of small-ship-private-commands or a Cold War that they would like to think they could control, and that in actuality lost them the ability to command. The RN, its ships, submarines and its senior officers today are a moribund relic of the Cold War, clinging to its future by the skin of its teeth.

Finally, there is the RFA – a Fleet in both tonnage and numbers terms that is beginning to eclipse the RN itself. Amongst the RFA there are the true professional seaman officers who have won their spurs over the years. Yet these officers, with the exception of the AR/TG, are very often treated as 'second-raters' by the RN's operational and warfare branches drawn from the surface combatant elites. The submariners see them only as targets. Clearly this state of affairs cannot be allowed to continue – neither the ignorant way in which the RN applies its RFA capabilities (its ships and people); nor the distinction between teeth and support; RN and RFA. Probably long overdue, like the USN and the RAN, the RN needs to bring the RFA into the White Ensign Fleet but in doing so have the humility to learn from the RFA, rather than impose authoritarian misjudgement and misconception upon them. In this it is the culture of the RFA that the RN needs to learn from; not the other way around.

People

A Navy is its people – it used to be said in the RN in its Divisional Handbook, 'its greatest single factor'. I am not sure if in reality the RN has ever treated its people this way. I am sure, though, that it cannot continue making use of this all important resource so poorly. The rot as is so often the case starts at the top. Professor Norman Dixon, in his analysis 'On the Psychology of Military Incompetence', identifies two types of officers which he calls 'authoritarian' and 'autocratic':

According to Nixon, the *'authoritarian officer joins the armed forces to make a virtue out of various personality disorders which make him particularly adaptable to military life... a need for the peer-group approval and promotion with which the peacetime armed services reward conformity. He draws self-esteem from the status imparted by his rank and uniform. He defers naturally to authority and obeys orders to*

the letter, loves order and ceremony....' By contrast, 'the autocratic officer is approximately the obverse of the above. He tends to think laterally, rather than serially, and his convictions often follow his instincts. He uses his initiative as a matter of habit. He is receptive to the possibility that his juniors might be right or his seniors might be wrong, and takes his career into his hands when he believes the latter to be the case. His attitude to hierarchy and military "bull" is casual or even overtly ironical; and he tends to be individualistic, or negligent, about dress. His peacetime career ascent is often difficult because he lacks the docility convenient to his immediate seniors and he is typically considered disruptive....'

This division into two is probably overly simplistic but serves to make the point that there are fundamental differences in the way in which Command and Control is exercised. In fairness to the military, there is a third category between the autocrat and the authoritarian which has been provided by the 'technocrats and meritocrats'. In the RN, this essential grouping of officers – predominantly drawn from 'upper yardies', engineers and let us call them supply officers – has in the past provided the glue between those seeking 'peer-group approval...promotion...[and] conformity with those 'who think laterally...[and] use their initiative as a matter of habit'.

Into the 'third type' of technocrats and meritocrats one can often include RN warfare specialists such as Aircrew and Submariners and from the Royal Marines the Amphibious specialists. This technomeritocrat grouping exists on its own merit and its understanding and application of the technologies of their trades. As a group, it is distinct from the 'autocrats', because it tends to follow facts rather than 'instinct' and, by being informed by rules and orders, rather than simply 'conforming' to them, different again to the authoritarian.

The RN, whilst it had some size and therefore depth to its officer caste, provided for all three groupings. It was implicitly recognised by both the authoritarians and the autocrats that they needed the meritocrats/technocrats in order

to provide for the innovation and stability both sides strove for. As long as all three groupings needed each other there was a measure of stability – swings between the two bi-polar styles of command could be managed.

The Cold War changed this balance, in the RN at least. Both the authoritarian and autocrats began to have at the middle grouping of specialists – denying them their purpose or requirements and constraining their access to senior appointments based upon perverse notions of command. This would have been bad enough but the attack also came from within. From a group of engineering and supply officers more authoritarian in nature and who saw their advancement tied to this camp and that denied the importance – the strategic agility – of what the technomeritocrats brought to command; they saw themselves more as caretakers than as specialist systems engineers. This has had enormous and debilitating impact upon the way in which the RN is commanded. Essentially, it has removed the professionals from the service giving rise to a new amateur class – neither one thing nor the other. This is seen in many ways by the way in which the RN is now flip-flopping ridiculously between autocratic and authoritarian forms of leadership with no 'capacitor' between the two. For example the recent changes of 1st Sea Lord, CINCFLEET and 2nd Sea Lord.

Superimposed upon all of this have also been outdated notions of leadership and command as expressed in the RN through its so-called 'warfare' branch. In reality these are notions of control, more suited to tackling hi-speed targets, than command suited to prevailing over time. The net outcome is that the RN has lost its command over the seas just as it has lost the respect of the other services. The British Army and the Royal Marines see Command in ways almost diametrically opposed to the way the RN understands and applies it. As a result of all of this, the RN and its non-specialist warfare officers are increasingly pushed to the supporting rather than supported tasks within with strategic HQ constructs. And of course this favours the authoritarian even more over the autocratic and the technocrats/meritocrats.



A computer generated image of two Type 45 Daring class air warfare destroyers. The Type 45s are well over due and may actually become a repeat of the Type 82 Bristol class project (which saw only one ship produced).

CVF

This might all not be a problem if the RN was still managing the status quo as epitomised by the Cold War. It is not, and the difficulty it faces is that in securing its future it needs the technocrats/meritocrats led by autocrats as never before. But these same groups have been unmercifully attacked, derided and removed over the previous two decades to a point at which it is uncertain whether or not the RN retains the will, determination or skills to succeed. CVF is a case in point. To deliver CVF will require technical and operational leadership of the first order. This to a great extent needs to be delivered from within – not simply by stating and restating the need for super-carriers in the 21st Century to a largely uncaring and un-listening audience. The CVF needs to be fought for and yet, when one looks around the higher echelons of the UK Defence Procurement Agency and the MoD and to those responsible for leading this change one sees only defeatism: “only one if we are lucky” or “I am only in a waiting appointment for my next great advancement”. These are not the men who will deliver CVF – they have neither the will nor the vision to do so. They are yesterday’s authoritarian men – an inner mafia used to complying and deferring to those in authority. To deliver CVF, the RN needs a ‘Jackie Fisher’ and a supporting depth of technocrats and meritocrats, led by autocrats – to lead change and challenge orthodoxy. It is uncertain if they are there or can be found in time.

In his book ‘Lions, Donkeys and Dinosaurs’, Lewis Page argues broadly that UK Armed Forces have been sold down the river by poor senior leadership and in selling out to BAe. Nowhere is this more obvious than in terms of shipbuilding and maritime support. BAe have pretty much bought out all the shipbuilding yards; they have their eyes on VT and now even for Babcock-International that runs Rosyth. In doing so they have raised questions regarding the future of Devonport Management Ltd (DML) owned by Halliburton with Weir Group and Balfour Beatty as two minority shareholders. The much trumpeted UK / MoD Defence Industrial Strategy (DIS) could be seen more accurately as a thinly veiled restructuring of UK’s maritime support infrastructure (about much reduced capacity) and the promotion of BAe. If this is all placed together, we are going to end up with a CVF that is a ‘pig-in-a-poke’ – it will deliver what the treasury and BAe both want but not what the RN and the country need. It will be built therefore in British yards to the lowest possible specification and will never deliver anything like its full potential.

The RAN

This returns in a roundabout sort of way to THE RAN. The RN has not suffered a HMAS VOYAGER type disaster nevertheless, over the last two decades, it has suffered an increasing number of groundings – the NOTTINGHAM, SOUTHAMPTON and BRAZEN – any of which could have led to the loss of a ship. The RN has been lucky in one regard and unlucky in another for it has not learnt from its mistakes. The RAN was slow to learn from the mistakes of the



The Australian Major General Tubby Allen posing for a portrait. MAJ GEN Allen commanded those “ragged bloody heroes” fighting the Japanese Imperial Forces’ advance along the Kokoda track. He was later sidelined by General Macarthur and the Australian Field Marshall Blamely when his popularity started to rise.

VOYAGER disaster as shown in Peter Cabban and David Salters’ book ‘Breaking Ranks’. It is uncertain to me that the lessons have been learned by either Navy – the key one being that this is about command and leadership and what happens when we get it wrong. The RN has been doing Command wrong for years now and, tragically, beyond a disaster of its own may not be in a position to learn. I sense the RAN is similarly divided between its autocratic and its authoritarian officers with a small body of technomeritocrats holding it all together. It is this group the RAN will need to develop if it is to successfully lead its own emergence as a big-ship, amphibious Navy.

These observations also link back to an older period in Australian history, to the militia and digger mentality that did so much to put Australia and its fighting man on the military map. If one considers what happened to ‘Tubby Allen’ as an example of the authoritarian social elites of Melbourne riding roughshod over meritocratic talent and autocratic command then we should have our concerns. For it is these social elites that have officered the ADF since the end of the Second World War; they are instinctively authoritarian in nature – as bad as the old British Imperial Officer caste – averse to change and implacably opposed to the autocrats and technocrats. It is they who rise to the top in a peace-time service – the hidden enemy within that will need to be tackled if the RN and RAN are ever to deliver a successful future.

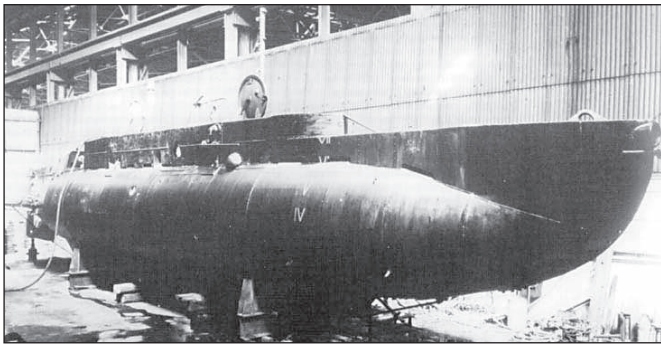
- 1 Over the same time the British Army reduced from about 250,000 personnel to about 110,000 in 2006 and the RAF from around 90,000 to around 50,000. In personnel terms, the RN and Royal Marines have reduced from 20% of UKAF in 1980 (RAF 21% and British Army to 59%) to about 19% in 2006 (RAF 25% and British Army 54%).
- 2 The Royal Marines have increased as a proportion of the Naval Service from about 1 in 8 in 1980 to 1 in 5 in 2006 and as a proportion of Land Forces from about 1 in 25 in 1980 to 1 in 18 in 2006. As a key ‘teeth arm’ equivalent to the Army’s 16 Air Assault Brigade, the 3rd Commando Brigade makes up a significant proportion – as much as 25% – of the UK’s operationally deployable Land fighting assets.
- 3 A comment from Bill sitting in a shell hole to another soldier in the famous ‘Old Bill’ Cartoons by Captain Bruce Bairnsfather.

THE X FACTOR

By Ian Johnson

Like a predator ready to strike, the 42,000 ton WW II German battleship TIRPITZ waited for nearly two years in the Norwegian Altanfiörd for her moment of glory. However, her mere presence was enough to disrupt vital supply convoys bound for Russia. The threat of the Kriegsmarine's last battleship forced the Royal Navy to conduct a most daring mission. An attack by midget submarines known as X-craft.

TIRPITZ was the sister ship of the battleship BISMARCK and was commissioned 25 February 1941. With a speed of 29 knots and armed with eight 15-inch guns, she was the last battleship completed by the German Navy (Kriegsmarine) and had a crew of nearly 3,000 sailors. In 1941, it was planned that she would sail with BISMARCK and several heavy cruisers into the North Atlantic as a large and powerful surface raiding group. Such a force would pose a grave threat to convoys bound for Britain.



A British X-Craft midget submarine out of the water in dry-dock. This same craft was used to successfully attack the German battleship TIRPITZ.

Delays in the battleship's workup and crew training, equipment breakdowns, as well as RAF bombing raids ensured TIRPITZ was many months behind schedule. She was forced to remain behind when BISMARCK and PRINZ EUGEN sailed on their ill-fated *Operation Rheinübung*; the raiding of UK bound convoys, on 18 May 1941.

After the sinking of BISMARCK, plans for TIRPITZ changed. She remained in the Baltic Sea until January 1942, after which she sailed for Trondheim in Norway, with orders to disrupt convoys bound for Russia.

On 5 March, TIRPITZ left Trondheim with a destroyer escort after U-boats located Convoy PQ-12 heading for Russia. Escorting the convoy were units of the Royal Navy's Home Fleet including the aircraft carrier HMS VICTORIOUS. Albacore biplanes from the VICTORIOUS were launched after TIRPITZ was spotted at 0842hrs on the morning of 9 March. TIRPITZ fired more than 4,200 rounds of anti-aircraft ammunition as well as two broadsides from her 15-inch guns against the attacking aircraft. Despite this effort two torpedos hit but failed to detonate. Two aircraft were lost in the attack which forced TIRPITZ to return to Norway without sighting the convoy.

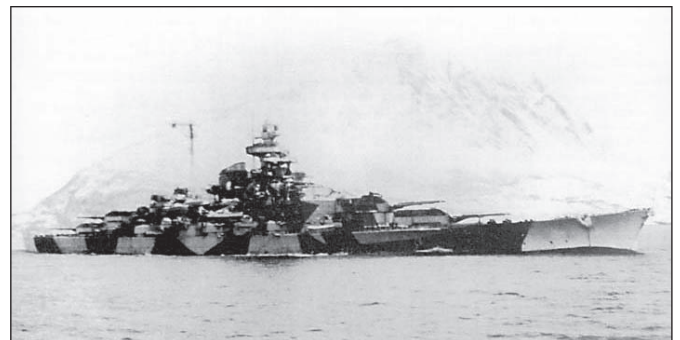
Even the rumour of TIRPITZ sailing had an adverse effect on the convoy system. Indeed, Convoy PQ-17, made up of 33 merchant vessels, was ordered to scatter on 4 July 1942 after TIRPITZ and the heavy cruiser HIPPER had been detected moving from Trondheim to Altanfiörd. With a belief that the

German ships were heading towards the convoy, the Royal Navy withdrew the convoy's cruiser escort, leaving PQ-17 helpless. Although TIRPITZ and HIPPER had passed Altanfiörd, they did not approach the convoy and returned to port shortly afterward. Amazingly, this brief appearance almost resulted in the destruction of TIRPITZ. The Russian submarine K.2, being in the area, claimed a torpedo hit on the battleship. Meanwhile, PQ-17 was left to fend for itself and was 'mauled' by German U-Boats and the Luftwaffe. Twenty-three ships and well over 100,000 tons of cargo, desperately needed for the Russian, front were lost. Without firing a shot TIRPITZ was responsible for a very successful operation against a convoy. Indeed, Churchill temporarily suspended the convoys to Russia, much to the irritation of Stalin.

After the last of the surviving ships of PQ-17 arrived at Archangel on 10 July, the Admiralty began planning to sink the TIRPITZ at her anchorage in Altanfiörd. Other attempts to sink the battleship by the Russian Air Force, the Royal Air Force, and the Royal Navy's Fleet Air Arm had been unsuccessful. Poor weather or the inability to find the target due to smokescreens over the battleship at the time of attack had hampered their efforts.

In mid July 1942 an 'A' series signal was sent to all Royal Navy ships and shore establishments requesting volunteers for 'Special and Hazardous duties'. Many applied, including several sailors from the RAN on loan to the Royal Navy, only to discover once they were accepted that they had signed up as submariners. After a week of submarine escape training, those volunteers that were left were told of the mission. To their shock and surprise, they were told that their target was the mighty German battleship TIRPITZ.

Operation Source, as it became known, would involve the RN's newest submarines, the X-craft. These 40-ton mini submarines were built at Vickers Shipbuilding at Barrow-in-Furness. They were 15 metres long, had a top speed of over 6



The powerful WW II German battleship TIRPITZ. She was to have joined her sister ship BISMARCK in raiding surface convoys in the Atlantic but delays in her construction and acceptance meant she missed BISMARCK's fatal mission.



TIRPITZ was so hunted by the RN that she spent most of her life in a Norwegian fiord. It was felt back in Berlin that the propaganda fallout of her demise was more risk than engaging in combat.

knots and were designed to carry 2 two-ton amotal charges on either side of the hull. Each mini submarine carried four men. It was hoped that their size would allow the X-craft to manoeuvre through both navigational and military hazards such as minefields, torpedo nets and patrol craft to arrive at the target area undetected.

Training for the operation took place in Scotland at HMS VARBEL on the Island of Bute. The attack was planned for April 1943 when weather conditions were good and the length of night provided cover for the X-craft on the surface. Over the next six months the crews trained in two of the prototype midget submarines, HMS X3 and HMS X4. They learned skills such as penetrating hostile harbours and cutting torpedo nets. But as the time of the attack grew near, it became apparent that the crews, as well as the X-craft themselves, would not be ready. More X-craft arrived from the builders and all the boats were assigned to the 12th Submarine Flotilla. Important lessons on handling the midget submarines forced modifications to the boats, while the crews pressed on with training for the mission, learning new techniques along the way.

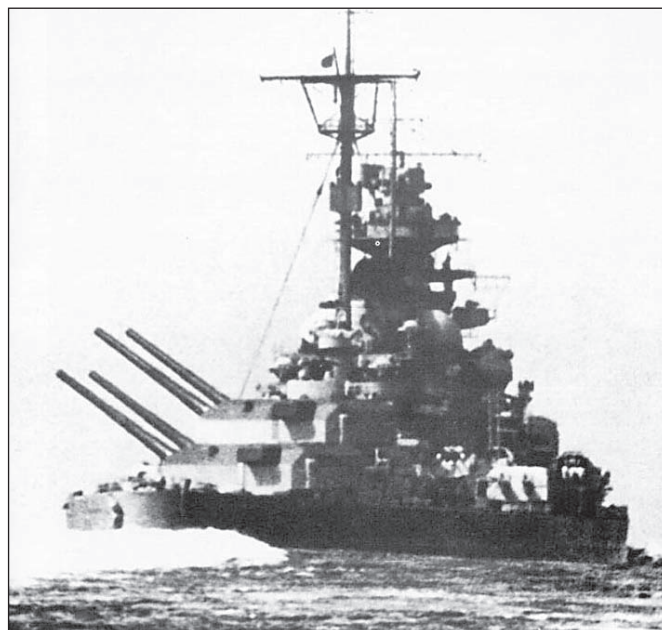
While training continued, another mission to strike TIRPITZ was underway. This involved manned torpedos or 'Chariots'. *Operation Title*, as it was known, was a disaster. The Norwegian fishing boat towing the two-man Chariots first developed engine trouble, before running into a German patrol boat. After leaving the patrol boat, and in increasing bad weather, both Chariots were lost when their towing lines snapped. Three of the four members of the Chariot crews made it to safety, while one was wounded and captured. Able Seaman Robert Evans was handed to the Gestapo, nursed back to health and then shot on the orders of the German leader, Adolf Hitler.

Meanwhile Grand Admiral Erich Raeder, Commander in Chief of the Kriegsmarine, had his own troubles. With the failure of TIRPITZ to intercept the convoy, Hitler told Admiral Raeder that TIRPITZ was not to sail unless the Royal Navy's aircraft carriers were dealt with. Hitler had begun to lose faith in the Kriegsmarine's battleships and threatened to disband them, with their guns to be used in coastal defences and their crews employed elsewhere. Another problem was the lack of fuel available to the fleet in Norway, which in April led to the order that all units were to stop operations due to low fuel stores.

In Scotland, the training and planning for *Operation Source* was coming to an end. The period of September 20-25 was set as the time to launch the attack, with that period expecting acceptable weather conditions. After conducting workups in the Lochs of northern Scotland, the X-craft of 12th Submarine

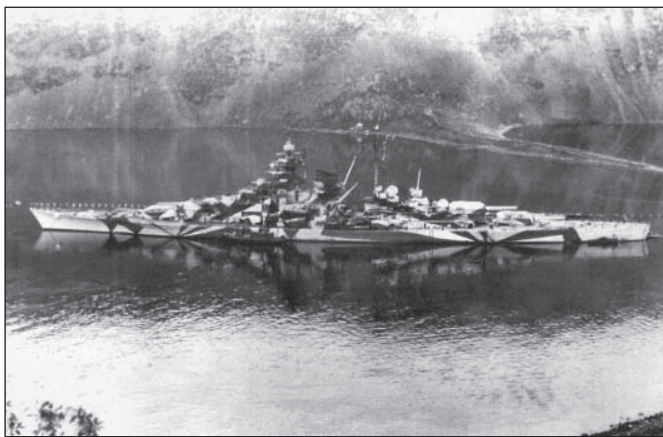
Flotilla were based alongside their mother ship HMS BONAVENTURE. Exercises with the larger submarines which would be towing the X-craft to the Norwegian coast, and the vital torpedo net penetration techniques were practiced. The plan was for the midget submarines to enter the guarded anchorage at Altanfiörd and slowly make their way through the heavy defences. If all went well, they would place their two-ton amotal charges underneath TIRPITZ, after which they were to escape as best they could. Six Royal Navy midget submarines, HMS X-5 to HMS X-10 were finally ready and crewed for the mission.

On the other side of the North Sea, the TIRPITZ, under the command of Captain Hans Meyer, along with the heavy cruiser SCHARNHORST and a ten destroyer escort departed Altanfiörd on 6 September. Their mission was to destroy the Allied weather observation station at Spitzbergen. On the morning of 8 September 600 troops were landed from the destroyers to raid the weather observation station while TIRPITZ's 15-inch guns bombarded the towns of Longyearbyen and Barentsburg. This was the first and last time the battleship's main armament was used in the shore bombardment role. The immense firepower flattened nearly every building on Spitzbergen. The raid also saw the island's storehouses looted. TIRPITZ and her escorts returned to Altanfiörd before the Royal Navy's Home Fleet could intercept them.



TIRPITZ from the stern with two of her gun turrets trained to port. Each turret housed two 15-inch guns. Just the mere presence of TIRPITZ forced the RN to expend considerable effort to keep her bottled up. News of her movements around Norwegian waters would also spread panic amongst convoys passing Norway bound for Russia.

In Scotland, all was ready for *Operation Source*. On 11 September 1943 the six X-craft began their mission, with each midget submarine towed out to sea by a conventional submarine. HMS X8 was the first to experience problems when her tow line was severed from the submarine HMS SEANYMPH. X8 managed to return to SEANYMPH, only to discover that her charges were leaking. The order came to dump them, but as this was done one exploded, and X8 was destroyed. X9 was towed by HMS SYRTIS, but at 0900hrs on 16 September at a scheduled surfacing for ventilation, the SYRTIS crew discovered to their horror that X9 was not on the end of the tow line. Several fruitless hours were spent searching for the boat, which was eventually declared lost with all hands.

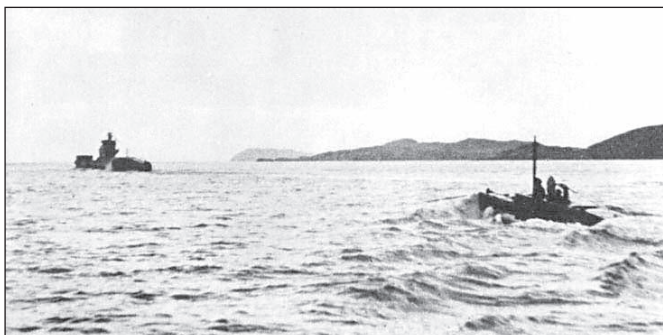


TIRPITZ in a Norwegian fiord with high cliff mountains either side to protect her from aerial bombing.

On the evening of 20 September, the signal 'All X-craft attack TIRPITZ' saw the four remaining X-craft, HMS X5, HMS X6, HMS X7 and HMS X10 disengage their tow ropes and proceed towards Altanfiörd. X10, commanded by Lieutenant Kenneth Hudspeth RANVR, managed to get as far as the island of Brattholm before persistent electrical problems forced him to abort the mission. But this was only after spending fourteen hours at the bottom of Altanfiörd trying to find and fix the problem.

X5, X6, and X7 continued deeper into Altanfiörd, not knowing of the loss of their sister submarines. Lieutenant Donald Cameron RNR, commanded X6 and like X10 was having equipment problems, which included a partially effective periscope. Despite these problems, X6 became the first of the X-craft to breach the anti-torpedo net that protected TIRPITZ, on the morning of 21 September. Lieutenant Cameron followed a supply boat through the only gap in the net. At 0707hrs, X6 raised her periscope while manoeuvring into position to deploy her charges. This was seen by a member of the battleship's crew, who dismissed it as a diving seal. Minutes later X6 ran into a submerged rock, which drove her almost clear of the water.

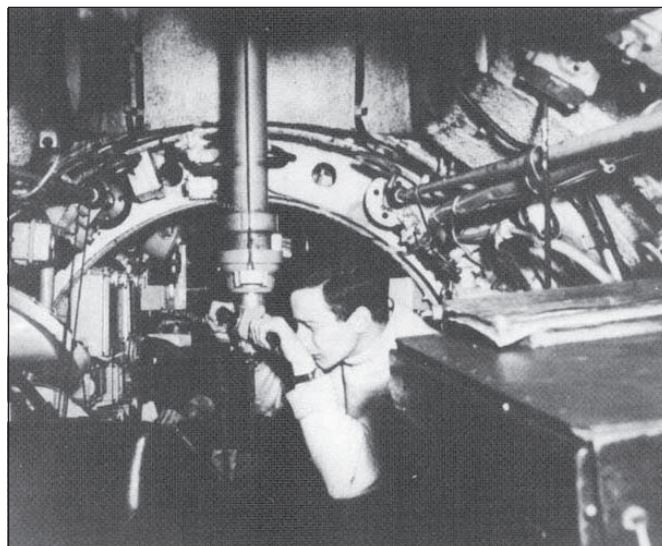
On TIRPITZ, the ship's watch sighted the X-craft breaking the surface of their sanctuary in the early dawn light and sounded the alarm. Captain Meyer, knowing there was a threat, ordered the crew to prepare the battleship for sea and sent divers over the side to check for limpet mines. Lieutenant Cameron and his crew regained control of X6 and, knowing the TIRPITZ had discovered them, continued towards the battleship, only to run into more problems. This time the boat became entangled in wires hanging from TIRPITZ, trapping her for a short time before she broke free. Shortly after, Lt Cameron took X6 into a deep dive under the hull of TIRPITZ, where he placed his charges at 0740hrs.



An RN ocean going submarine towing an X-Craft midget sub. Due to the X-Craft's small size, short range, low endurance and no 'hotel' services they needed the support of other vessels to get to the target area.

Realising that TIRPITZ was alerted to his presence, and knowing that his boat was damaged, Cameron made the decision to surface and abandon X6, before scuttling her. The X6 reached the surface long enough to be seen by the battleship's crew, before the midget submarine sank. The four crewmen were pulled from the water and brought onboard TIRPITZ, while time ticked down on the charges Lieutenant Cameron and his crew had laid on the hull below them.

X7 was commanded by Lieutenant Godfrey Place, RN, and was the second X-craft to close on the TIRPITZ. Place tried to take X7 under the anti-submarine nets, but at a depth of 75 feet she became trapped for a short period of time. She managed to break free and proceed quietly onward. As they approached TIRPITZ, X7 went deep under the battleship and, like X6, the charges were placed under the hull. X7 was spotted by TIRPITZ crewmembers as she was making off. Once again the boat got caught up in torpedo nets, and Lieutenant Place and his crew struggled to free her before the charges detonated. Captain Meyer, believing he was safer behind the anti-submarine nets, cancelled an order to get underway. He believed his ship was under another attack by Chariots and ordered TIRPITZ to be veered to starboard in an attempt to reduce her target area.



Looking through the periscope inside a very cramped X-Craft midget sub.

Lieutenant Cameron and the X6 crew were still onboard TIRPITZ when, at 0812hrs, two massive explosions ripped through the battleship. Water and steam flew high in the air as the sound of two simultaneous explosions thundered down Altanfiörd. TIRPITZ suffered major damage, with a hole below the waterline, causing her to list. The force of the explosions was such that her forward 15-inch turret was lifted off its turntable mountings, buckling her armoured deck. All three propellers were jammed, the rudder wrecked and the range finders and fire control were put out of action. Many other systems throughout the ship were damaged. The TIRPITZ crew were stunned, and after several moments of chaos they began damage control, while many of the crew opened fire on anything that resembled a submarine.

The force of the amotal charges exploding freed X7 from the entangling nets and forced her to the surface, only to have the enraged crew of TIRPITZ open fire on her with small arms and grenades. The damage to her was bad enough without the Germans help and Lieutenant Place ordered the submarine be scuttled. Only Place escaped from the boat before it sank. Another of his crew managed to escape by using his Davis

escape apparatus. Both were quickly caught by the TIRPITZ crew and brought aboard the damaged battleship.

The third X-craft to enter Altanfiörd was the X5, commanded by Lieutenant Henty-Creer RNVR. X5 entered the fray just after the explosions. This time the Germans were ready and X5 was quickly spotted near the damaged ship. The gunners on TIRPITZ opened up, scoring hits on the submarine. X5 and her crew were sent to the bottom of Altanfiörd before they had the chance to attack.

After the experience of the captured Chariot crewman at the hands of the Gestapo, Captain Meyer ordered the six captured crewmen from X6 and X7 to be transferred to the naval hospital at Tromsø. From there they were sent to POW Camps in Germany, where they remained until the end of the war.

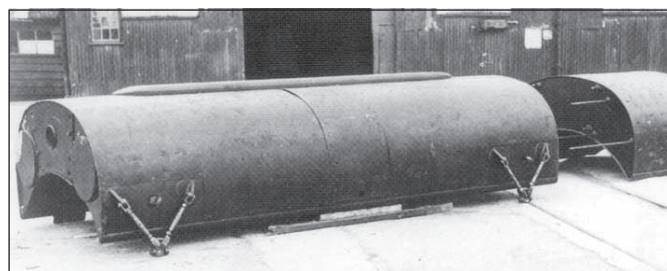
The SEANYMPH and SYRTIS, along with the other towing submarines, waited at the rendezvous for the X-craft, but only X10 returned, and she had not been able to make it to the target. After waiting for several hours, the rendezvous group and X10 (under tow) started for home. Problems with this tow, and deteriorating weather meant that X10 had to be scuttled.

With the return of the towing submarines to Scotland and HMS BONAVENTURE, the cost of *Operation Source* became apparent. Six X-craft and ten crewmen were lost, with another six becoming prisoners of war. RAF reconnaissance photographs showed TIRPITZ, still at Altanfiörd, and from the air the battleship looked largely intact. Time would show that TIRPITZ was not only badly damaged, but after *Operation Source*, she was not the battleship she once was, and would never again be a threat to the Russian convoys.

For the Kriegsmarine, the pressure was on to repair TIRPITZ. But in most cases the damage could not be repaired to a high standard without time in a drydock. Yet the German repair crews did the best job they could. TIRPITZ's speed was cut to 27 knots, which was less than the Royal Navy's KING GEORGE V class battleships. Ultimately though, TIRPITZ would fall victim to airpower in November 1944 when RAF bombers finally sank the battleship at Tromsø.

For the X-craft and their crews, they would continue the war with new midget submarines. One, HMS X24, commanded by Lieutenant Max Sheean RANVR, sank the German merchant ship *BARENFELS* near Bergen, Norway in April 1944. X-craft were also used along the Normandy beaches prior to D-Day. After the war in Europe ended, the X-craft deployed to the Pacific where they took part in several operations.

Two years after the end of the Second World War, the world learned of the X-craft and the missions they conducted. Most attention was focused on the men involved in *Operation Source*, and in 1947 King George VI at Buckingham Palace decorated the surviving crews for their actions on that September morning. In the words of an Admiralty report on the operation, "this daring attack will surely go down in history as one of the most courageous acts of all time".



One of the two two-ton amotal charges carried by each X-Craft.



A 12,000lb Tall Boy bomb being dropped by a Mk-1 Lancaster bomber. The bomb was so big only one could be carried.

TIRPITZ's end

In mid-1944 the British realised that traditional weapons (torpedoes, mines and current bomb types) were not going to permanently put the TIRPITZ out of commission. About this time a new bomb was put into RAF service, the 'Tall Boy'. This weapon was developed under the direction of the famous Professor Barnes Wallis, who developed the dam busting bouncing bomb used with great success in the spring of 1943 on reservoir dams in Germany. RAF Bomber Command eventually received orders to attack TIRPITZ with the new 'Tall Boy'. With a weight of 5,443 kg (12,000 lb) it was the heaviest bomb built up to that time. The Tall Boy belonged to the category of thick-walled, teardrop-shaped GP bombs (General Purpose) and was 6.35 metres (21 feet) long with a diameter of 0.95 metres (38 inch). The warhead consisted of 2,358 kg (5,200 lb) of Torpex, a new and highly explosive substance with a detonation speed of 7,600 meters (8,350



A crater left by a Tall Boy bomb. In the background is the wreck of the TIRPITZ which was ironically stripped for scrap by the Norwegians who lived under the threat of her guns. In fact, some of her gun turrets were pressed into Norwegian service as shore batteries after the war.

yards) per second (the detonation speed of TNT is only 6,900 meters (7,580 yards) per second). A fuse delay could be set to a maximum of 11 seconds. Such was the weight and size of the bomb that only four engined bombers of the Lancaster Mark I type could use it, and then only one per aircraft, which had to be rebuilt to employ the weapon. By war's end a total of 854 Tall Boy bombs had been dropped, of which 77 were dropped in three attacks on TIRPITZ in September, October and November of 1944. In the first attack, a direct hit on the bow was achieved, in the second only a near miss. In the decisive third attack there were two direct hits and one near miss; these finally achieved the hoped-for success: TIRPITZ foundered and was declared a total loss. After the war the Norwegians pulled her apart for scrap metal. One of her main gun turrets was also salvaged and put into Norwegian military service as a shore battery gun.

Flash Traffic

Settlement signed for FFG Upgrade

ADI Limited has signed a Deed of Settlement and Release with the Government formalising the government's decision to reduce the FFG Upgrade Project from six ships to four and resolving all outstanding commercial and contractual issues on the A\$1 billion project.

The deed, signed by vice president Thales Naval Australia and ADI director of naval Ali Baghaei, and Defence Materiel Organisation deputy CEO Kim Gillis on Monday May 29, is the result of several months of detailed negotiations. The signing comes one month after the first upgraded frigate HMAS SYDNEY achieved 'handback' to the Royal Australian Navy (RAN).



HMAS SYDNEY post modernisation sailing up Sydney Harbour. ADI Limited has signed a Deed of Settlement and Release with the Government reducing the FFG Upgrade from six to four ships and resolving all issues. (John Mortimer)

The Australian Government announced its decision to retire the RAN's two oldest guided missile frigates to provide offsets to support the acquisition of three air warfare destroyers in its Defence Capability Review Statement of November 2003.

As well as reducing the scope of the original FFG Upgrade Project contract from six ships to four, the deed revises the project schedule, clarifies test and trial procedures and formalises the process of delivering upgraded frigates back to the RAN.

The FFG Upgrade Project is the most sophisticated naval systems integration task ever undertaken by an Australian company involving both new technologies and legacy equipment. Central to the upgrade is the new command and control system known as the Australian Distributed Architecture Combat System (ADACS), developed by ADI.

New guns for RAN

Selected RAN ships are being fitted with an Israeli made remote gun system known as mini-typhoon. This .50-cal (12.7mm) machine gun mount is controlled by a small console from the operations room inside the ship and can provide very accurate stabilised heavy calibre machine gun fire to any approaching surface target. Each FFG and Anzac being sent to the Persian Gulf has been given two mounts covering each flank.

The light weight mini-typhoon mount can be used in bad weather, day and night time conditions through its on mount TV camera, has a built in auto tracker and carries 230 rounds of ammunition. It can also be 'slaved' to a radar tracker or any other form of target acquisition sensor. The .50-cal gun can also be replaced with a 7.62mm machine gun or Mk-19 40mm grenade machine gun. It is known to be a very reliable and accurate weapon system.

In conjunction with the mini-Typhoon is a Rafael TopLite electro-optical targeting sensor and tracking system which is used to locate targets for the mini-typhoon operator.

The RAN has purchased an undisclosed number of mini-typhoons under Project 'SEA 1874 Surface Combatant Force Protection Upgrade'. Classified as a minor project it is funded at less than \$20 million.



An Israeli made mini-typhoon mount with .50-cal machine gun on an RAN FFG. Each FFG has two installed above and either side of the bridge. The mount is controlled by a small console from the operations room inside the ship and can provide very accurate stabilised heavy calibre machine gun fire to any approaching surface target. (RAN)

New Aussie minesweeping equipment revealed

The Parliamentary Secretary to the Minister for Defence, Senator the Hon. Sandy Macdonald, has unveiled a new class of highly advanced sea mine sweeping technology being developed by Australia's Defence Science and Technology Organisation (DSTO).

The new system is based around high temperature superconducting magnet technology and represents a leap forward in magnetic mine sweeping. Australia is believed to be the only country in the world currently investigating the application of high temperature superconductors to sea mine warfare.



Two mini-typhoon mounts without machine guns above the hanger corners of the Anzac Frigate HMAS STUART. Also visible is a small black ball on a pole. This is the Rafael TopLite electro-optical targeting sensor and tracking device used to locate targets for the mini-typhoon operator. (RAN)

Minesweepers are vital for keeping sea-lanes safe for naval and commercial shipping.

Australia is already a leading exporter of mine sweeping equipment. This new technology is designed to complement current systems but has the added benefit of being smaller, lighter and more portable.

This makes it a flexible device that can be transported by air, allowing the Australian Defence Force to deploy the system to any area of operation and tow it from almost any available vessel.

LHD RFT issued

In a step closer to acquisition a Request for Tender (RFT) for the \$2 billion large amphibious ships project have been released by Canberra. The two ships, to be named HMAS CANBERRA and ADELAIDE, are scheduled to enter service with the Royal Australian Navy from 2012.

The RFT is a major milestone in the process that will lead to final project approval and ship builder and design selection early next year. It comes after an intensive design development effort by Defence and the two competing designers, in which the designs have been adapted to meet specific Australian legislative and regulatory requirements.

Two Australian companies - ADI and Tenix - will team with the designers to compete for the contract to supply the

ships. ADI will team with the French designer Armaris, and Tenix with the Spanish designer Navantia.

The Tenix-Navantia team will propose a variation of the Navantia 27,000 tonne design, while ADI-Armaris will propose a variation of the Armaris 22,000-tonne Mistral class.

Both prospective designs offer a quantum leap over our current capability and satisfy Government's strategic guidance. Selection of the preferred consortium to construct the ships will be determined on value for money grounds.

The tender documentation will allow bidding companies to:

- Submit fixed price bids;
- Bid through life support solutions; and
- Provide innovative solutions to improve price and schedule.

Australian industry stands to benefit considerably from this project of national significance.

Each ship will have the ability to transport up to 1,000 personnel, have six helicopter landing spots and a provision for a mix of troop lift and armed reconnaissance helicopters. It will also be able to transport up to 150 vehicles including the new M-1A1 Abrams tank and other elements of the Hardened and Networked Army.

Each ship will also be equipped with medical facilities, including two operating theatres and a hospital ward.

The project will allow the Australian Defence Force to perform a range of tasks, including regional disaster relief, delivering humanitarian aid, support for peace operations, and assistance to policing or military operations.

Last *Pong Su* conspirator gaoled for 24 years



The North Korean merchant ship *Pong Su* in flames after being hit by two 2,000lb laser guided bombs from two RAAF F-111s 140 miles off the NSW south coast. (Aust DoD)

The last of the men responsible for Victoria's biggest heroin bust has been sentenced to 24 years in gaol, the highest penalty of the group.

The shipment of 150 kilograms of heroin from the North Korean freighter *Pong Su* was worth \$165 million. Wee Quay Tan, 35, was one of three members of an onshore party waiting to meet the drugs when they were ferried in a rubber dingy from the freighter to Boggaley Creek beach near Lorne in April 2003.

One man died in rough seas on the way.

Justice Kellam said traffickers and dealers who exploit Australia's vast and unprotected coastline will suffer heavy penalties for their greed.

Tan has been sentenced to 24 years, and must serve a minimum of 16.

Tan's three co-conspirators have already been sentenced to 23 and 22 years in gaol.

In March, the *Pong Su*'s captain, political secretary, chief mate and chief engineer were found not guilty of involvement in the shipment.



The Spanish aircraft carrier PRINCIPE DE ASTURIAS (left) with a computer generated image of the 27,000 tonne LHD (right) being proposed to Australia by Navantia of Spain with the Australian company Tenix. (Navantia)

The fate of the *Pong Su* was sealed some 140 miles off the NSW coast when two RAAF F-111 strike bombers each dropped a 2,000lb laser guided bomb on the ship. She had been held in Sydney Harbour since her capture on the high seas in a joint Federal Police, Customs, NSW Police and Navy operation. She had been used by security forces as a training platform for counter terrorist exercises.

Huons reactivated

Two Huon class coastal mine hunters, HMAS HUON and HMAS HAWKESBURY, will be given new leases on life in order to bolster the fight against the armada of Foreign Fishing Vessels (FFVs) plundering Australia's maritime resources.

Maritime Commander Australia, RADM Davyd Thomas, told *Navy News* that cancelling the deactivation of HAWKESBURY and reactivating HUON is one of several initiatives designed to protect the Australian Economic Exclusion Zone from the growing threat posed by FFVs.

"Reactivating HUON and keeping HAWKESBURY operational is one of several initiatives to provide an increased surface response capability for the Commander Joint Offshore Protection Command," RADM Thomas said.

RADM Thomas said the recent Budget announcement included an increase in funding of \$95.6 million over four years to enable Defence to operate two Huon Class mine hunters that will periodically operate in Australia's northern waters, ensuring increased surveillance and patrolling of Australia's high threat maritime approaches.

"Illegal fishing is a serious threat to our sovereignty and this funding recognises the crucial and very important work of all those involved in maritime security," he said.

The decision to reactivate HUON comes just two months after she was deactivated in late March as part of the force structure changes announced in the Defence Capability Review in 2003.

Since HUON's deactivation she has been kept by DMO in a preserved state at HMAS WATERHEN, so that she could be brought back into operation at short notice if required.

Under the current initiative, HUON and HAWKESBURY would eventually replace HMAS GASCOYNE, which has been deployed to Australia's north to support

Armidade and Fremantle class patrol boats conduct Operation Cranberry patrols.

In the near term, the Huon class mine hunters will operate from HMAS WATERHEN, using HMAS CAIRNS as a forward operating base.

From Navy News

US offers minehunters to Egypt

The United States has offered Egypt two surplus US Navy minehunters as part of a plan to replace aging Soviet-origin vessels. The Pentagon has already briefed the Egyptian Navy on the Osprey-class coastal minehunter.

The US vessels would help Egypt ensure the safety of its territorial waters with their main focus being the Suez Canal, a leading route of US Navy ships destined for the Red Sea and Persian Gulf.

Under the US offer, Egypt would be given one minehunter at no cost. Officials said the second surplus Osprey-class vessel would be sold to Cairo and financed by US military aid to Egypt.

RSN launches final frigate

The Republic of Singapore Navy's (RSN) sixth frigate, RSS SUPREME was launched on 9 May 2006 by Dr Ivy Ng, wife of Minister for Manpower and Second Minister for Defence, Dr Ng Eng Hen, at the Singapore Technologies Marine shipyard. Dr Ng officiated at the launching ceremony.

The launch of RSS SUPREME marks another significant milestone for the frigate program. It is the final frigate to be built locally. In the next phase of construction, RSS SUPREME will undergo harbour and sea trials.

In March 2000, the Singaporean Ministry of Defence (MINDEF) signed a contract with Direction des Constructions Navales (DCN) of France for the construction of six frigates for the RSN. DCN designed and built the French Navy's low signature La Fayette-class frigates. Under the technology transfer arrangement, DCN designed and built the first ship while the remaining five were built locally by Singapore Technologies Marine. The six new frigates will replace the RSN's missile gunboats, which have been in service for more than 25 years.

The new frigates are highly capable warships designed to be stealthy and are

equipped with advanced combat systems. They also have greater endurance and are able to stay at sea for longer periods. Each frigate is designed to carry a Sikorsky S-70B Naval Helicopter capable of complementing the ship in Anti-surface and Anti-submarine warfare. By leveraging on a high level of automation and enhanced work processes, each frigate will only require a crew of 71.

The frigates will be equipped with state-of-the-art combat capabilities allowing them to perform a wide spectrum of missions and to deal with various threats in all dimensions of naval warfare – surface, air and underwater. These systems include the Thales Herakles Multi-function Radar (MFR), the MBDA Aster SAM System, the EDO Active Low Frequency Towed Sonar (ALOFTS) system, the Eurotorp A244S torpedo and the Boeing Harpoon missile system. Command and control of the various sensor and weapon systems onboard each frigate is achieved via an indigenously developed Combat Management System (CMS).

AEW&C Merlin?

Lockheed Martin UK has been awarded a contract by the Ministry of Defence (MoD) to study the potential of using Merlin helicopters as a platform for both maritime airborne early warning and command and control.

Under the 15-month program, Lockheed Martin will lead a three-way team, which will include Thales UK and Agusta/Westland. The overall study, with a total value of £3.4 million, includes two more contracts, which will see Agusta/Westland and Thales UK each leading similar teams looking at other airframe and mission system options.



A RN ASW Merlin helicopter on the flight deck of HMS ILLUSTRIOUS. The UK is looking to turn the new helicopter into an AEW&C platform as it did with the Sea King post the 1982 Falklands Conflict.

All three contracts are part of the Maritime Airborne Surveillance and Control (MASC) program. MASC is the third component of the UK's future carrier strike capability and will work with the future aircraft carrier (CVF) and the Joint Strike Fighter to provide airborne early warning and command and control capabilities.

MASC will replace the current Sea King Airborne Surveillance and Control capability, with increased emphasis on command and control functions as the Royal Navy develops its Network Enabled Capability.

Pakistan to acquire four frigates from Greece

Greece will provide four frigates for the Pakistan Navy, two of which will be delivered this year, Greek Prime Minister Shaukat Aziz said recently.

The two countries are looking forward to stronger ties in defence and security related matters.

Without giving details of the deal, the Greek PM said Pakistan was acquiring used frigates. He said two frigates would be delivered this year and the other two in 2007.

The Hellenic Navy uses Elli class frigates and the same would be provided to Pakistan.

The Elli are former Dutch Kortenaar class frigates armed with a 76mm OTO Melara gun, Sea Sparrow missiles, Harpoon, Phalanx and a helicopter.

Pakistan has been acquiring defence equipment from various countries to meet its defence needs.

SPY-3 conducts at-sea testing

The US Navy's first shipboard active phased array multifunction radar, Raytheon's AN/SPY-3, has successfully participated in a series of at-sea tests to confirm its unique capabilities – including the first time the radar has acquired and tracked a live controlled aircraft while at sea.

"The multifunction SPY-3 is unprecedented in the field of naval radar technology," said Mike Hoeffler, Raytheon vice president, Future Naval Capabilities. "Here we have one exceedingly robust X-band system that can effectively meet the Navy's requirements for the 21st century fleet by simultaneously sustaining anti-air warfare, anti-surface warfare, anti-submarine warfare, land attack, naval gun fire support and navigation missions.

"Moreover, SPY-3 embraces new ship-design requirements for reduced radar cross-section, significantly reduced maintenance and manning requirements, and total-ownership cost reduction. No other naval radar delivers such an astounding array of capabilities and benefits in a single package."

Raytheon will integrate the SPY-3 radar with S-band volume search radar arrays to comprise a unique dual band radar system that will be employed on the Navy's new Zumwalt-class (DDG-1000) multi-mission destroyers and the transformational CVN-21 aircraft carrier.

Under the DDG-1000 detail design and integration contract awarded by the US Navy in May 2005, Raytheon Integrated Defense Systems continues its role as the prime mission systems equipment integrator for all electronic and combat systems.

Upgraded SM-2 Block IV successfully tested

A Raytheon Standard Missile-2 (SM-2) Block IV with control systems upgrades was successfully flight tested against a subsonic target at White Sands Missile Range, N.M., Feb. 16. The upgrades will provide the SM-2 users with improved performance at a lower cost.

The SM-2 Block IV upgrade includes a new steering control section, new thrust vector actuator assembly for the boost rocket motor and a new primary missile battery as well as upgrades to the guidance and control software. The upgrade was completed as part of a value engineering project at Raytheon Missile Systems in Tucson, Ariz. The improvement will result in a significant cost reduction of the missile.

"We see these upgrades as a good investment for the company. The result is a more producible Standard Missile-2 with better performance and improved reliability at a reduced cost," said Ed Miyashiro, Raytheon vice president of Naval Weapon Systems.

SM-2 is launched from cruisers and destroyers. The missile has enhanced precision and kinematics throughout the threat envelope as well as improved countermeasures performance.

The SM-2 Block IV upgrades are applicable to all extended-range Standard Missile variants, including SM-3 and SM-6.

"These enhancements will be used to rocket SM-3 into space to protect against the threat of ballistic missiles and on SM-6 to help protect navies around the world," said Miyashiro.



A Greek Elli class frigate firing a Sea Sparrow anti-aircraft missile. Greece will sell four of this ships to Pakistan.



Armaris

STRENGTH AT SEA



Photograph Copyright: French Navy / Pascal Fournier.



**MISTRAL CLASS:
BUILT, TESTED
AND PROVEN.**



**THE INNOVATIVE,
LOW RISK CHOICE
FOR AUSTRALIA'S
AMPHIBIOUS SHIPS.**

SeaRAM for Littoral Combat Ship

Raytheon will install the SeaRAM anti-ship missile defence weapon system on General Dynamics' Littoral Combat Ship (LCS). SeaRAM is the latest addition to Raytheon's world-class ship self-defence suite combining the Phalanx Block 1B close in weapon system and the Rolling Airframe Missile (RAM) guided missile weapon system.



A Raytheon SeaRAM anti-ship missile defence weapon system. SeaRAM is a combination of the Phalanx Block 1B close in weapon system and the Rolling Airframe Missile (RAM) guided missile weapon system.

SeaRAM is a low-cost spiral development of the proven Phalanx Block 1B and RAM, the latter produced jointly by Raytheon and RAMSYS of Germany. Intended to enlarge Phalanx's 'keep-out' range against sea-skimming anti-ship missiles, SeaRAM utilises enhanced Phalanx sensors and replaces the M-61A1 20 mm gun with an 11-round RAM missile 'cassette'. In addition, SeaRAM will likely bring the first US Navy implementation of the RAM Block 1A Helicopter, Aircraft, and Surface (HAS) attack capability to the fleet.

Aegis Ballistic Missile Defence upgraded

Lockheed Martin announced the successful completion of land-based testing for the next enhancement to the Aegis Ballistic Missile Defence (BMD) Weapon System. Completion of this testing is a key milestone to provide tactically certified capability to engage short and medium range ballistic missiles on all Aegis BMD ships.

The upgraded Weapon System enhances the ballistic missile defence capabilities of the current Aegis BMD fleet, adds capability in other warfare areas and brings the BMD mission to additional destroyers and cruisers. Aegis BMD has been operational since September 2004 providing Long Range Surveillance & Tracking (LRS&T) for the initial Limited Defensive Capability of the US Ballistic Missile Defence System (BMDS), and providing an initial emergency capability to engage short and medium range ballistic missiles since early 2005.

The testing was conducted in late February at the Navy's Combat System Engineering Development Site in Moorestown with Navy personnel operating the system. Testing verified that the system met all engagement, LRS&T, and multi-warfare mission requirements, using simulated interfaces with ground-based midcourse and other elements of the BMDS.

"The ability to continually enhance and field capabilities for Aegis BMD is a hallmark of the Aegis program: it always paces the threat," said Orlando Carvalho, vice president and general manager of Lockheed Martin Surface-SBMD line of business. "As this test demonstrated through the participation of our local US Navy Aegis technical representative, the sailors who will operate the Aegis Combat System play a key part in its assessment before the systems are fielded."

The Missile Defense Agency and the US Navy are jointly developing Aegis BMD as part of the BMDS. Lockheed Martin is the prime contractor and combat system engineering agent for the Aegis Combat System and Aegis BMD Weapon System.

Ultimately 15 US Navy Aegis destroyers and three Aegis cruisers will be outfitted with the capability to engage short to medium range ballistic missile threats and to conduct LRS&T.

The Aegis Weapon System is the world's premier naval surface defence system and is the foundation for Aegis BMD, the primary component of the sea-based element of the BMDS. Aegis BMD seamlessly integrates the capabilities of the SPY-1 radar, the MK-41 Vertical Launching System and adds the SM-3 missile into the existing Aegis Weapon System's command and control system. Aegis BMD also is integrated with BMDS, receiving cues from and providing cueing information to other BMDS elements.

MINSK sold for \$16m

A former Soviet aircraft carrier was auctioned off on 31 May in the Chinese town of Shenzhen for 128 million yuan (US\$16m).

The aircraft carrier MINSK was sold to the Chinese company Citic Shenzhen, which pledged not to take it outside the limits of the province and expressed the hope that the investment would be profitable.

MINSK, designed to engage in anti-submarine and surface warfare, was decommissioned from the Russian Navy in 1993 and sold to a South Korean company for scrap. In 1994, the aircraft carrier was resold to China as a military museum piece and amusement park.

The company Minsk World Industries, which operated the aircraft carrier in the town of Shenzhen, was declared bankrupt after failing to repay a loan, following which the ship was put up for auction.



The former French aircraft carrier CLEMENCEAU (now known as Hull Q790) arriving back in Breast, France. The ship was destined for the breakers yard in India but European Green Groups mounted a legal challenge based on the Basel Convention to which France is a signatory. The convention relates to exporting hazardous waste to the developing world. As Q790 is fitted with Asbestos this was seen as posing a serious health risk to ship breaking workers in India where hazardous waste handling standards are below that of the EU. The French Government will now have to pay to have the Asbestos removed before it can leave France for breaking.



HALT! SHUTDOWN. The last US Navy F-14D Tomcat to have flown a combat mission, from VF213 'The Black Lions', arriving at the US Navy's Museum of Aviation. (USN)

Observations

By Geoff Evans OBE VRD

US Defense Review

The writer often refers to articles in the United States Naval Institute's journal *PROCEEDINGS*, he does so because of the frankness with which the journal's contributors, including senior serving and retired officers, express their opinions on all manner of maritime events. Australia's serving (and with some exceptions retired) officers, must wince at times.

One article in particular in the March issue of the journal attracted the writer's attention – comments by the editor of *DEFENSE NEWS* and author Bradley Peniston, on the just-released *Quadrennial Defense Review* – The Pentagon's survey of the near future, a document not unlike Australia's periodical Defence White Paper. These comments related in the main to the maritime aspects of the Review.

The Review makes it quite clear that the USA has no intention of retreating into isolation, quite the reverse in fact. The emphasis is to be on forces "capable of projecting power in the brown and green waters of coastal areas". USN and Coast Guard capabilities will be integrated and much attention given to the Marines, where a Marine Special Operation Command has been created. It is recommended the tentatively planned Maritime Pre-positioning Force (Future) should go ahead, with eight new ships. Special forces would operate from a new type of vessel to be called the Afloat Forward Staging Base.

Personnel will be highly trained, not only in weaponry but also in cultural understanding. Reinvigoration of the Foreign Area Officer Program which provides language and cultural training is recommended. "Special operations" is a term often used in the Review.

These comments express surprise that the "blue water" Navy receives very little attention so far as new construction is concerned and "nary a word about the DDX destroyer, the only capital ship on the Navy's drawing board". However, it appears that 11 carrier strike groups will be maintained, so it could be assumed American predominance at sea will continue for some time to come.

Given the anticipated type of warfare in the coming years – 'irregular and unconventional' – the ever increasing cost of highly sophisticated ships, aircraft and army materiel appears to be causing concern; in this respect America is not alone.

The only country to be mentioned by name in the commentary is China. Quoting the Review Peniston writes "...of the major and emerging powers, China has the greatest potential to compete militarily with the United States" and "...Chinese military modernisation has accelerated since the mid-to-late 1990s in response to central leadership demands to develop military options against Taiwan scenarios...China is likely to continue making large investments in high-end, asymmetric military capabilities".

At least so far as China is concerned, one can only hope the Pentagon, is being unduly pessimistic.

Ship Names etc...

In the April-June 2006 issue of *THE NAVY*, Themistocles notes from *The Crow's Nest* the use of the term "capital ship" when referring to the name PERTH given to the last of the ten Anzac-class frigates.

Not so long ago only battleships and aircraft carriers were called capital ships – not even cruisers and much less destroyers and frigates were so classified; nowadays even the latter are referred to as capital ships – probably because of their large cost!

Themistocles also commented on names to be given to the two yet-to-be-acquired amphibious operations ships (LHDs), CANBERRA and ADELAIDE, which he suggested might have been given names more appropriate to their purpose of joint Service operations. There have been many such operations in the past and even a third TOBRUK would not go amiss if continuity is desired.

The writer recalled that he had expressed views on RAN ship names some years ago and in due course found the article concerned in the October-December 1992 issue of *THE NAVY* under the heading "New Warship Names Upset Veterans". The article was prompted by a decision to name two of the Anzac ships on order after two WW II Tribal-class destroyers, ARUNTA and WARRAMUNGA; however, the spelling was changed to ARRERNTTE and WARUMUNGU, causing consternation among the many serving and former naval personnel who had served in the two Tribals.

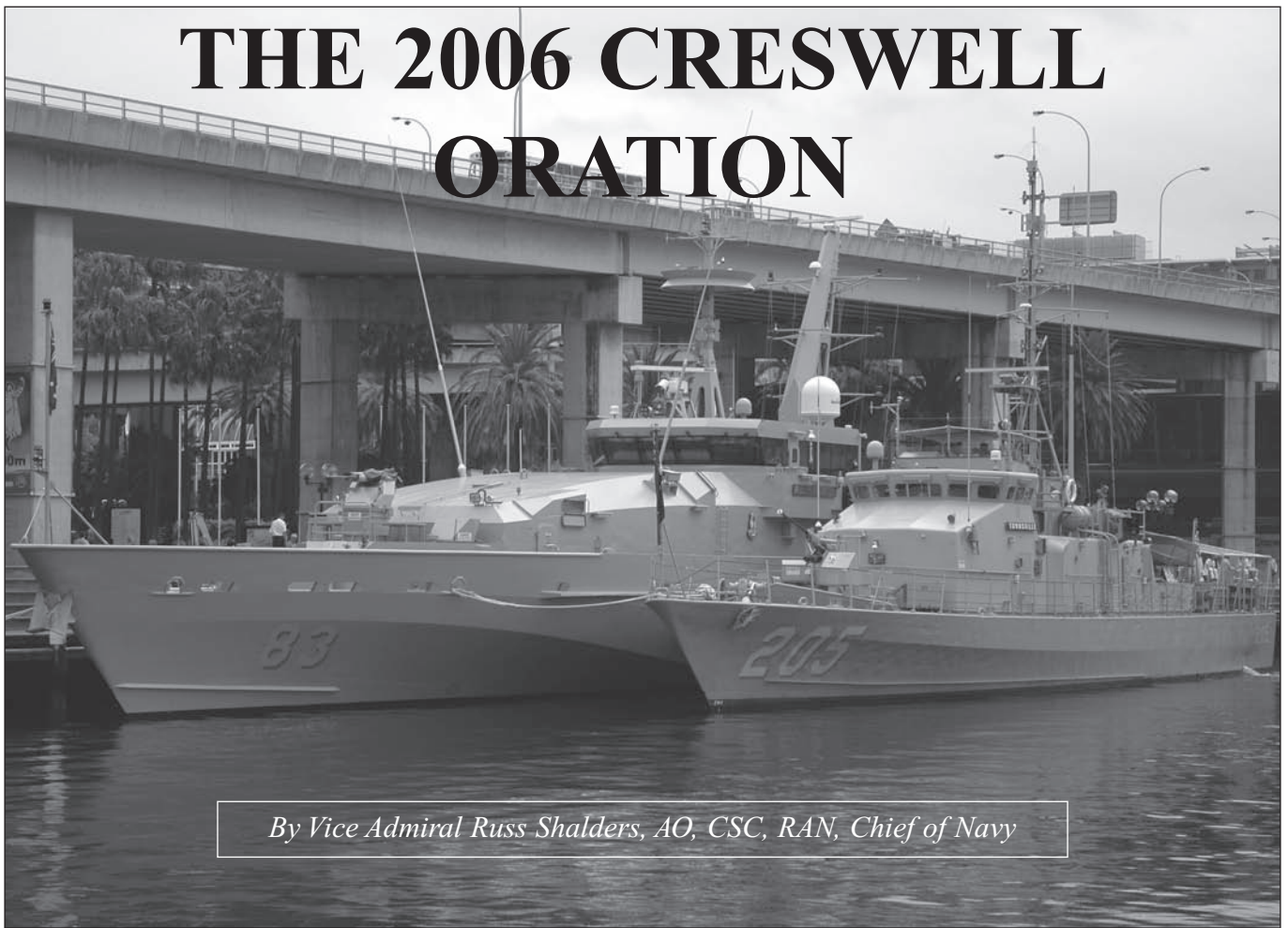
In the event, after much discussion involving senior Defence officers and officials, former Tribal officers and sailors, ship associations and not least elders of the aboriginal communities concerned who were consulted on their home ground, the decision to change the spelling was revoked and the original names retained. The writer was among those who 'stood by' and formed because he was part of WARRAMUNGA's commissioning crew under Commander (later Captain) E.F.V Dechaineux, DSC, who, after leaving WARRAMUNGA to take command of the cruiser AUSTRALIA, was mortally wounded when the ship was struck by an enemy aircraft piloted by a kamikaze pilot at Leyte Gulf in October 1944.

Among other things, the 1992 article listed the guidelines for naming new RAN ships:

- Submarines: After famous Australians or heroic sailors.
- Offshore patrol vessels or patrol boats: After cities and towns or past patrol boats.
- Hydrographic ships: After past hydrographic ships and explorers and scientists who have contributed to knowledge of our maritime environment
- Amphibious ships: After Australian amphibious or combined operations.
- Minewarfare vessels: After past minewarfare vessels and Australian rivers, bays, straits and coastal features.
- Support ships: After former support ships.
- Tugs and other auxiliaries: After Australian flora and fauna.
- Work craft: After colonial vessels related to the operating locality.

With the exceptions of the planned LHDs, the guidelines appear to have been followed but it is now virtually impossible to classify a ship by its name. Warship names may generally be unimaginative but at least avoid the extraordinary names given to some merchant ships, especially cruise ships – *SONG OF FLOWER*, for instance!

THE 2006 CRESWELL ORATION



By Vice Admiral Russ Shalders, AO, CSC, RAN, Chief of Navy

(From right to left) HMA Ships TOWNSVILLE and ARMIDALE.
The Armidales represent a significant capability boost to the RAN's patrol boat capabilities. (David Karonidis)



The Navy League's annual Creswell Oration was given by Vice Admiral Russ Shalders, Chief of Navy, on 1 March 2006 at the RSL's ANZAC House, Collins St, Melbourne. About 70 attended this 6th Annual Creswell Oration to celebrate the 105th Anniversary of the foundation of the Australian Navy. The following is Vice Admiral Shalders' speech to the assembled guests.



"I have no doubt that there are amongst you, many who would know the history and unique contributions of Rear Admiral Sir William Creswell far better than I. Notwithstanding, I would like to try to provide some background on Creswell's fight to form an Australian navy before I attempt to draw some parallels between the challenges he confronted, and those which face me a century on.

Creswell began agitating for the need for adequate Australian naval forces to supplement the Royal Navy Squadron based at Sydney in 1886. He argued that it would be better to develop local forces, instead of subsidising the British squadron. While such views had been raised earlier, Creswell's articles stimulated much debate. His recommendations for enlisting Australians in the Royal Navy, and to establish a Royal Naval Reserve in Australia for British squadrons east of Suez, were rejected and Creswell later abandoned them. In 1899, at a conference of Australian naval officers here in Melbourne, he recommended instead the raising of an Australian force.

With the formation of the Commonwealth of Australia on 01 January 1901, the Constitution gave Parliament the power to make laws for the naval and military defence of the Commonwealth. The States transferred their 'naval forces and

everyone employed in their connection' to the Federal Government on 01 March 1901. It is that anniversary we celebrate today (1 March 2006). The Army claims today as their birthday. I had great pleasure in signalling the Chief of Army this morning to offer my congratulations, but to also remind him that the Senior Service is also one year older today.

Parliamentary debate in the ensuing years showed that Creswell was not alone in advocating an Australian navy. He came to be regarded as the nation's chief spokesman on naval matters, and in December 1904, he became Director of Naval Forces. Through frequent changes of Defence Ministers, Creswell consistently pressured and preached for new ships and increased manpower for the Commonwealth Naval Forces. He ardently believed that adequate Australian naval forces were needed to open careers in which Australians could render that personal service necessary for the country to contribute to Empire naval strategy. His advocacy was persistent and obviously successful. Creswell was promoted to Rear Admiral and became the first naval member of the Australian Naval Board on 01 March 1911. Some see this as the Birthday of the RAN but not me! I continue to debate that point with the Chief of Army.



(From left to right) Chief of Navy, Vice-Admiral Russ Shalders, AO, CSC; Mr John Wilkins, President of the Navy League's Victorian Division; and Captain David Garnock, Senior Naval Officer Victoria. (RAN)

I am aware that the original intent of the Creswell orations has been to examine the effects of our early Navy heritage. I intend to do the same, with particular emphasis on manning the Fleet in those early years. But, like the presenters of the past two years, VADM Chris Ritchie and RADM Raydon Gates, I will use also use this opportunity to compare and contrast between Creswell's navy and mine. I have always felt that we ignore the lessons of our past at our peril and I want to highlight the similarities of the challenges faced and overcome by Creswell, with those I deal with 100 years later.

Now, if I may move back to the early 1900's...

The Australian Naval Defence Act passed on 25 November 1910 provided the clear legislative authority necessary for the Navy. The key provisions included the creation of a new Board of Administration, the establishment of colleges and instructional institutions, the division of the Naval Forces into

the Permanent Naval Forces and the Citizen Naval Forces; and provisions relating to service conditions, such as pay, allowances, and discipline. In large part, that early legislation remains intact and is the source of my authority as today's Chief of Navy.

Sir Reginald Henderson, RN was invited by the Government to visit Australia and provide advice on naval infrastructure. His subsequent report advocated a progressive expansion of the RAN extending over a generation. By 1933 he estimated a Fleet comprising eight battle cruisers, 10 light cruisers, 18 destroyers, 12 submarines and 15,000 personnel. This Fleet was based upon the expected population growth rate, and lacked strategic and financial rationale. Henderson's report covered both policy and administration, and many of his recommendations were initially accepted. It's interesting to draw a comparison between Henderson's vision and what we now have. I'd submit that, ignoring technological changes, he was seeking about the level of capability that I am now pursuing.



The assembled guests at the RSL's ANZAC House, Collins St, Melbourne. About 70 attended the 6th Annual Creswell Oration. (RAN)

The acquisition of ships of course is a relatively simple matter – the far greater difficulty, then and now, is to recruit and organise the personnel to man them. At the end of 1911, there were just 400 men in the RAN. To man the new fleet, the number had to expand rapidly to at least 3,400. The Naval Depot at Williamstown was designated the interim training depot for general entry recruits. Initial enlistment was for five or seven years, and those who wished to join as normal entry had to be ‘Smart active youths and young men, between the ages of 17 and 25 years, of very good character’. Entrance examinations applied to most categories, and particular attention was paid to volunteers with trades – at least 20% of the Navy needed to have technical skills. Soon, recruits were coming in so fast the Navy could not cope. I would certainly wish to be confronting that problem now!

By March 1913, the RAN had 1,004 men under training, and to restrict further applications, the Naval Board raised the age of entry. Admission to the Seaman categories was restricted to those recruited under the Boy Seaman entry scheme. The Commonwealth purchased an old sailing hulk ‘*Sobroan*’ and converted it into a boys’ training ship – it was commissioned in April 1912 as the *TINGIRA* and two months later accepted the first entry of 37 ‘smart active’ boys ranging in age from 14 to 16. In June 1913, the RAN’s strength reached 2,500. Imagine that, doubling the size of the Navy in less than six months.

RAN personnel were wholly interchangeable with those of the Royal Navy. While it would have been cheaper to send Australian cadet midshipmen to England, there remained concerns that they might lose their ‘unique Australian character’. So, in March 1913, the Royal Australian Naval College was founded, to ensure the Australian spirit would be fostered and Australian traditions built up. The original College was temporarily housed in Geelong and moved to its current site at Jervis Bay in 1915.

Officer training began at a young age – applications were accepted from boys born in 1899, making them 14 years old on entry. The first entry arrived at Osbourne House, Geelong on 13 Feb 1913 to begin a planned 4-year course followed by six months sea training. Engagement was for a period of 12 years after attaining the age of 18.

Things really haven’t changed that much. We are today in the same position as that new emerging Navy of Admiral Creswell’s – building for the future, and not really sure if, and how we are to man it. I’ll draw some comparisons in terms of the manpower issues confronted by Creswell in a moment.

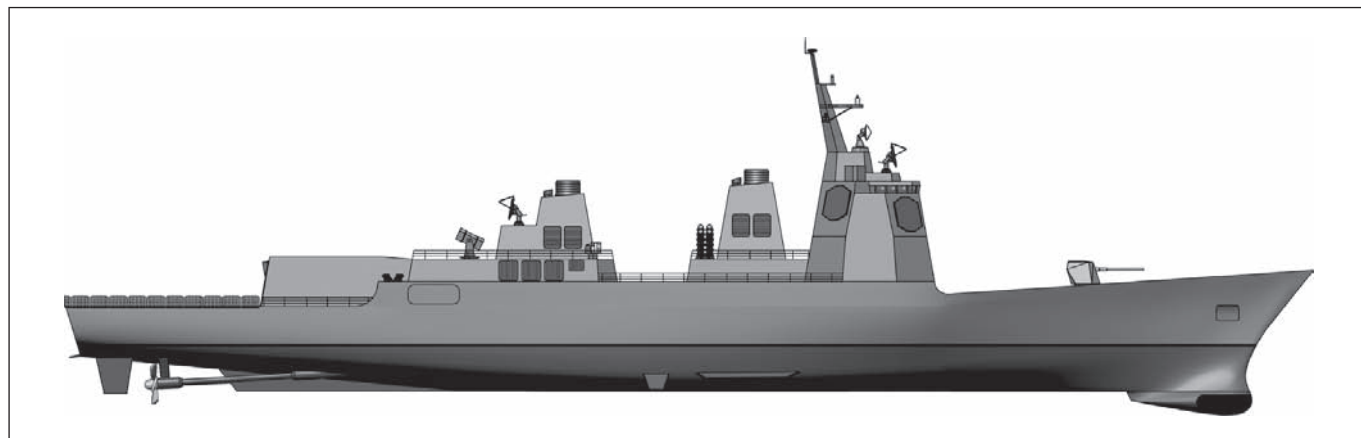
Like Creswell, as he embarked on the birth of our Navy with the building of his new Fleet, we too are also looking at a new and exciting capital acquisition program. Let me briefly address some parts of that program now in order to highlight that, while things change, many elements stay the same.

For example, the new Armidale class patrol boats coming on line will be used to better patrol and protect Australia’s coastline. I note here that this was as much an issue in Creswell’s day as it is in ours! Henderson had proposed 18 destroyers – these days the patrol boat fleet perform a similar task to that envisaged for those long ago ‘destroyers’. The Armidales are bigger, faster and far more capable than the Fremantles they are replacing. We currently have the lead ship of the class in service and the next two, *BATHURST* and *LARRAKIA* were commissioned in Darwin recently. It may be of interest to this audience to note that the 6th ship of the Class, the *ARARAT*, is scheduled to be ‘named’ in WA on the 6th of May. As a native of that pretty country Victorian town, I’ll take great pride at being present for that ceremony.

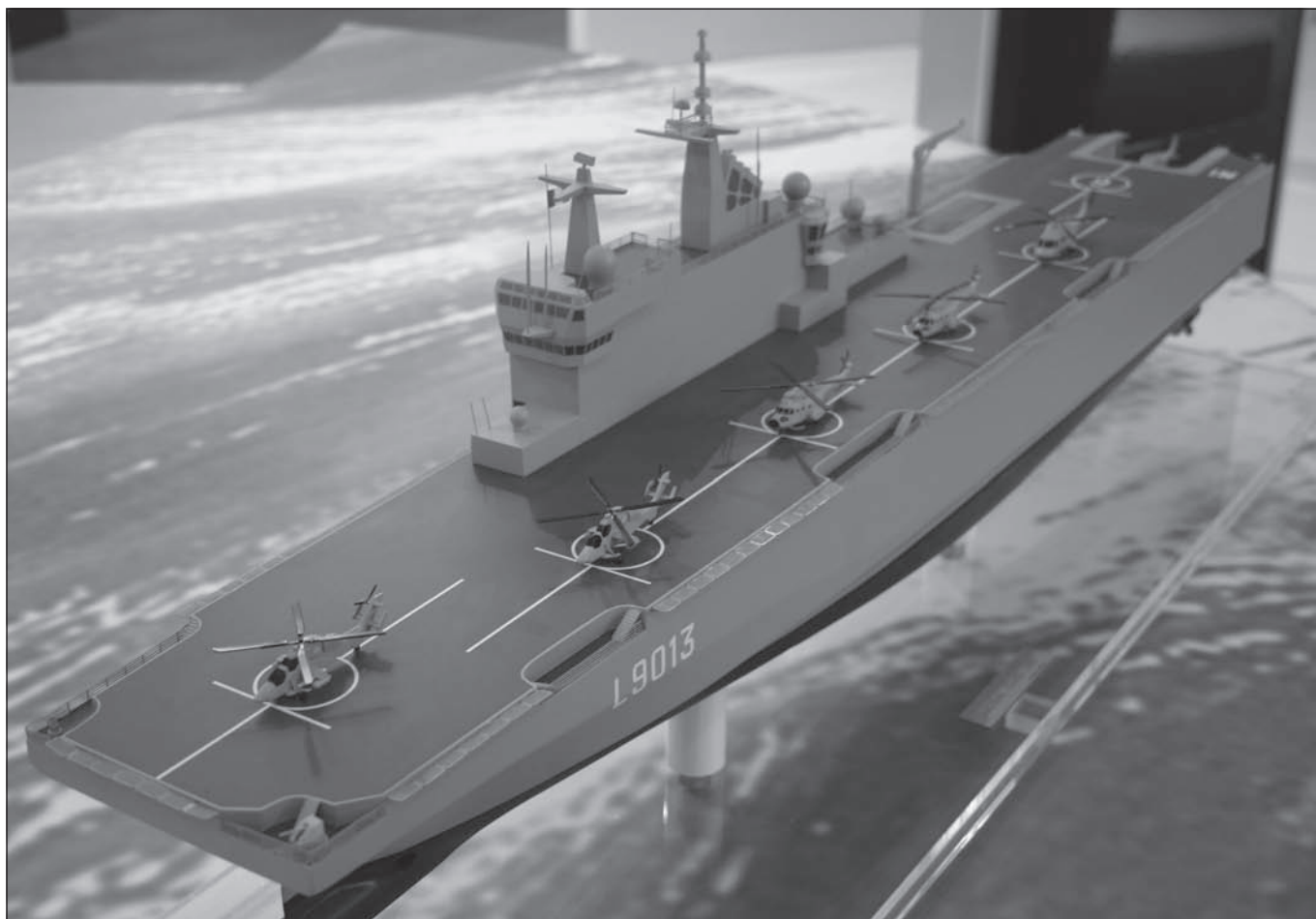
A more significant change to that confronting Creswell, is occurring in the area of Amphibious Ops, arguably the most complex of all military activities. Our two new LHDs, to be called *CANBERRA* and *ADELAIDE*, will have the ability to embark, sustain and deliver in good order by sea, a combined arms battle group comprising a landing force of approximately 1,200 and a support group of 800. *CANBERRA* and *ADELAIDE* will significantly increase our reach, and our ability to operate as a very effective joint force in the littoral environment. All of Creswell’s Navy of March 1913 could be embarked in just one of these two ships!

Our new Air Warfare Destroyer is the second major acquisition project occupying much effort and a lot of my time at present. They will be our primary surface combatants, giving the RAN an ability to succeed in low level, high level, conventional and asymmetric conflicts. The capabilities of these new ships will give us better, or more options than we have previously enjoyed. These ships of the *HOBART* class will be named *HOBART*, *BRISBANE* and *SYDNEY*. Sir Reginald Henderson’s eight battle cruisers were envisaged to be the capital ships of the line in 1911. We believe *HOBART*, *BRISBANE* and *SYDNEY* will fill the same role by 2017.

As I mentioned earlier, we face a similar dilemma to that which Admiral Creswell faced at the birth of our Navy. We are in the process of acquiring all this new capability, building our Future Fleet, and yet, we face problems in being able to recruit and retain enough people to man this future fleet. Recall that I



A computer generated image of the potential final design by Gibbs & Cox for the new Hobart class AWD.



Chief of Navy, VADM Shalders, said that one of the challenges facing Navy in the future was the introduction of the new LHD capability. Depicted is a model of ADI's proposal based on the French Mistral LHD.

mentioned earlier the RAN in 1913 had to raise the age of entry because they had too many applicants. Conversely, some years ago we extended the age limits for applicants to 51, allowing us greater access to the recruiting pool.

I make no bones about it – Recruiting has been difficult. Less than 70% achievement four or five years ago – in the 80's now – that is 80% of our target. Demographic trends will work against us in the next 10 to 20 years, with less people in the recruiting pool. Even now, a buoyant economy and low unemployment rate makes the recruiting market extremely competitive. I wish that I had the same challenges as to network and multi-task to an extent not seen before in the Australian workforce. These attributes match well with what Navy has to offer. The challenge of course is to attract and retain them!

So, what are we doing about these issues today and for the future? Navy's current focus is concentrated on what we call the *Sea Change* program, a complex and wide-ranging set of over 240 initiatives that address concerns expressed by our people. *Sea Change* focuses on improving individual choice, and on providing better leadership and management of our people and their careers to provide increased stability, certainty and satisfaction. They've told us that they want these things – stability, certainty and satisfaction, and *Sea Change* aims to provide exactly that when we can.

However, large and ambitious as the *Sea Change* programme is, it is not a universal panacea for all our workforce challenges. One reason for this is, that addressing current issues does not itself include all of the changes we need, to satisfactorily address the personnel environment of the Future Navy.

Key to future success in recruiting and retention will be meeting the satisfaction priorities of new generations. Recruiting and retention are two sides to the same coin. As important as recruiting is, this battle for people or the 'war for talent' as it is known, will be won in the retention arena. For every person we keep; that's two or three we don't have to recruit.

To return from whence I began, there is no doubting that Sir William Creswell deserves the title often given him, that of the 'Father of the Royal Australian Navy'. He undoubtedly played a major role in developing Australian naval policy. From the 1880s, he had begun to press for Australia to take her naval defence seriously and to contribute adequately to it. He strenuously advocated the principle that Australia needed her own navy. His accomplishments as professional head, in organising and administering the new navy from 1909 to 1919, with all that this responsibility involved, was no less outstanding.

The parallels I discern between the challenges faced by Admiral Creswell, and those that face me and the Navy today are very similar. As I hope you can now understand, addressing people issues is very high on my to do list. My enduring priorities include a requirement to lead our people and manage our resources to deliver efficient and effective capability. It is with these priorities in mind that I look back in proud admiration at the work of Creswell and his small team of advisers. He set the agenda and we who follow can learn and prosper by taking heed of the aspirations and guidelines he so constructively put in place."

PACIFIC 2006

AUV SYMPOSIUM

By CDRE Merv Youl, AM, RAN (Rtd)
Vice-President Navy League NSW Division

The Pacific 2006 Autonomous Unmanned Vehicles (AUV) Symposium was held at Darling Harbour on 2-3 February 2006 in conjunction with Pacific 2006 Symposium and International Maritime Exposition (see *THE NAVY* Vol 68, No.2). It presented an eye-opening look at the current state and future of Autonomous Unmanned Vehicles.

Merv Youll takes up the story.

The major impression which attendees gained from the symposium was that the growth in the number of applications of unmanned technology seems to be almost exponential. Whether the environment be air, sea or underwater many more companies are becoming involved in AUV developments and many more countries are procuring the capabilities afforded by the technology.

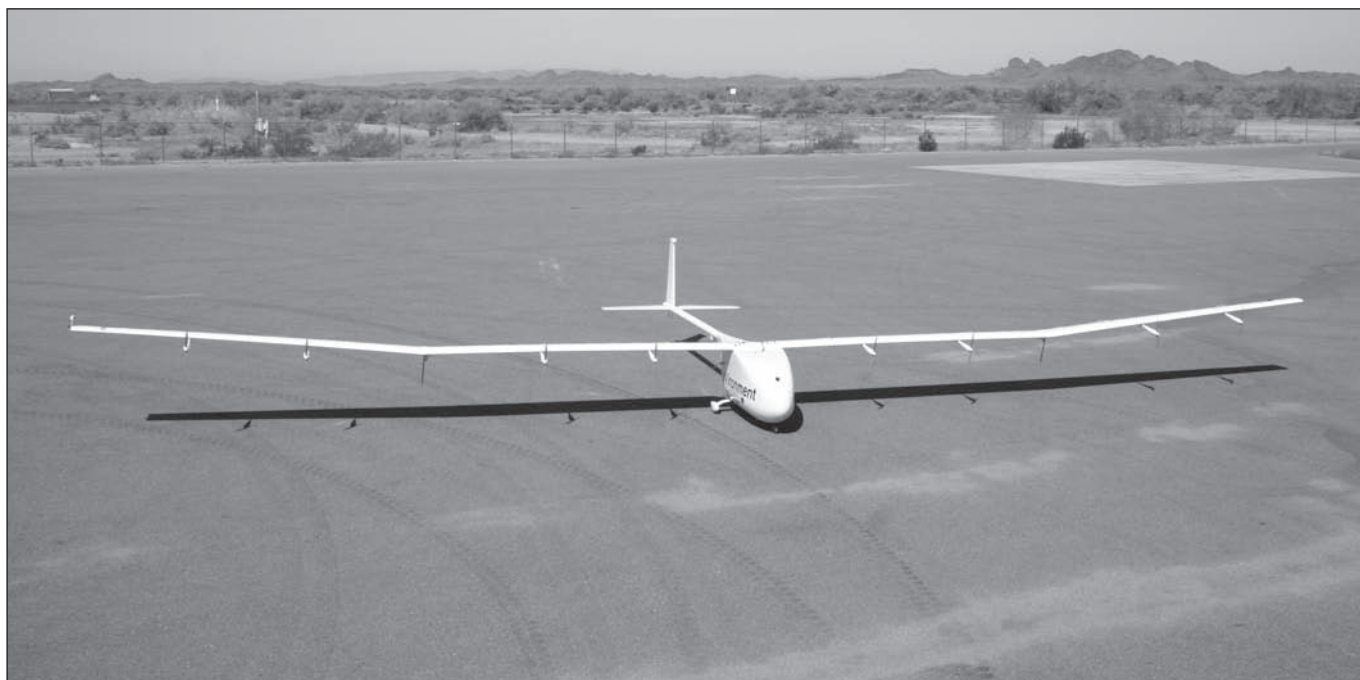
The symposium had a range of speakers who covered the development and use of AUVs in all the maritime environments as well as the land environment, and speakers who covered issues relating to command and control, communications, sensors and propulsion technologies.

The other impression gained by attendees was that the world of AUVs has a jargon all of its own and a whole new set of acronyms.

The AUVs covered in the symposium ranged from unmanned aerial vehicles (UAVs), large, small, fixed-wing, rotary wing, fast, slow, short endurance and long endurance. There were presentations on unmanned underwater vehicles



The 'Predator B' UAV has an operating altitude of 500-15,000 feet and an endurance of 26-49 hours. The RAN may be undertaking a trial of this UAV on the NW Shelf in the not to distant future. It can carry approx 4,000lbs of weapons on six pylons including smart bombs, rockets and sidewinder air-air missiles.



The hydrogen fuelled High Altitude Long Endurance (HALE) Global Observer. This aircraft is designed to operate in the stratosphere (65,000 feet) and has operated up to 85,000 feet and has an endurance of 14 days.

(UUVs) and a most interesting presentation, including a video, of the Rafael unmanned surface vehicle (USV) 'Protector'.

UAVs

The first UAV presentation was given by a speaker from Aerovironment who spoke about their hydrogen fuelled High Altitude Long Endurance (HALE) Global Observer. This aircraft is designed to operate in the stratosphere (65,000 feet) and has operated up to 85,000 feet. This aircraft operates on Hydrogen and has an endurance of 14 days.

The aircraft has a variety of payloads covering defence/security surveillance, disaster recovery, fire detection, environmental monitoring, pipeline monitoring, crop optimisation, aerial mapping etc. By flying in a circle of radius 2000 feet at its operating altitude it provides a capability similar to a satellite but with the advantages that there is virtually no time-delay on voice services, it has a 1000 times larger bandwidth density and it can be brought back to earth to change the payload.

The company claimed that with two aircraft a 24 hour 365 day per year coverage can be obtained.

The next speaker (Anthony Patterson – National Air Support, which has a subsidiary Surveillance Australia) spoke from the viewpoint of an operator of surveillance systems. He indicated that they saw UAVs as not replacing manned aircraft but complementing them.

They are looking at a range of UAVs for use in surveillance of the Australian coastline and are seeking greater safety; better operational outcomes; more cost-effectiveness; and more capability.

They are currently looking at the General Atomics Aeronautical Services aircraft 'Predator B' which has an operating altitude of 500-15,000 feet and an endurance of 26-



An armed 'Predator A' UAV fitted with four laser guided Hellfire missiles. The US CIA has had great success using this version as a long range high altitude long endurance 'sniper' against Al Queda groups in the hills of Afghanistan.

49 hours. He indicated that RAN would be undertaking a trial on the NW Shelf.

The Boeing corporation has developed a ship launched/recovered UAV the 'ScanEagle'. This UAV which is launched from a catapult, has a 10 foot wingspan, weighs 112 pounds and has an endurance of 16 hours. It is recovered by flying into a wire which captures it can be folded down into a pack about the size of a set of golf clubs. It carries an electro-optical camera with 25 times optical zoom and sophisticated image stabilization software. Control is very flexible and can be transferred to a Sea King helicopter.

These aircraft are currently operating in the Persian Gulf and are used in the surveillance of oil rigs. The system is being installed in HMS SUTHERLAND for a trial in the Hebrides.



The UAV 'Camcopter S-100'. The makers claim that it could be used from the Armidale class patrol boats with the builder, Austal, having drawn up a design for a small platform which could accommodate it. Its endurance is up to six hours with a 25 kg payload.



The Bell helicopter Eagle-Eye tilt-rotor UAV. Three of these UAVs can fit into the same hanger space as one Seahawk helicopter.

An interesting presentation was given by Scheibel Electronics on their small rotary-winged UAV the 'Camcopter S-100' which they indicated could be fitted to the Armidale Class patrol boats. The Armidale Class builder Austal has drawn up a design for a small platform which could accommodate such a UAV. The UAV is just over three metres long and weighs 100 kgs. It can carry a payload of 50 kgs. Its endurance is up to six hours with a 25 kg payload. Such UAVs can also be used for port security.

The aspect which left some doubts in the minds of the audience was that of recovery to the ship of the UAV in anything but calm waters.

SUAVs

The Advanced Ceramics Research Company has a number of small UAVs (SUAVs) in service (the Silver Fox) used for such diverse tasks as air-sampling in the Maldives and lava observations at the Mount St. Helens volcano. Their latest development for maritime surveillance is a SUAV "Coyote" which is designed to be launched by ejection through the sonobuoy tube of a P-3 aircraft. The aircraft, which is expendable, weighs 12.5 pounds; it folds into a cylinder three feet by 15 inches and can be launched in air speeds up to 250 knots from as high as 30,000 feet.

After ejection the aircraft descends under parachute; it acquires orientation within 10 seconds, unfolds itself and begins flight to its target within 20 seconds. It has an endurance of one hour at 50 knots or 30 minutes at 75 knots. It is fitted with a stabilized Electro-Optical/Infra-red camera.

The Coyote SUAV is still in the development stage – its currently reliability in achieving successful flight is about 80%. The target for reliability is 100%.

Another SUAV which is well into the production stage is the Aqua Puma produced by Aerovironment. The company is currently producing 275 aircraft a month in both the Aqua Puma version and its land equivalent the Land Puma. The speaker indicated that the aircraft was so simple to operate that it could be operated by a "potato peeler".

The aircraft and its control system pack into two back packs and can be easily carried by two men who can assemble the 6 foot long 8 foot wingspan SUAV and deploy it within 10 minutes. It is hand launched. It has an operating range of 15 kilometers, an endurance of 4 hours, can operate up to 10,000 feet and is capable of tracking both stationary and moving targets.

The speaker claimed that it takes up to 1500 bullet shots to hit one of these SUAVs and on average four bullets to bring one down.

Hyper-Spectral Imaging

A major development in the capability of UAVs and SUAVs is the development of the Hyper-Spectral Sensor. This sensor captures images from the low infra-red to high ultra-violet spectrum which provides 300 spectral channels for each pixel of data. This sensor is monitoring reflectance and it can be calibrated (in the land environment) to strip away foliage to see what is underneath.

In the maritime environment it would enable you to pick out a man in the water. From 1,000 feet the sensor has a swath width of 140 feet and a resolution of six inches.

UUVs

There are a number of Underwater Unmanned Vehicle (UUV) developments taking place and some systems are already deployed for sea trials. The UUVs are, in general, equipped for mine-hunting missions as they have the advantage that they can enable personnel to remain out of a minefield.

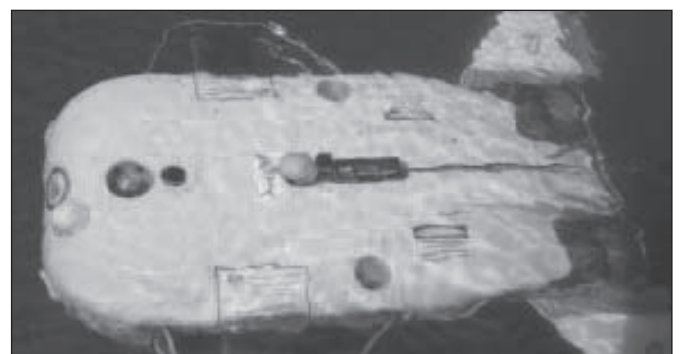
Lockheed Martin has a system named 'Sea Talon' which is a remote minehunting system. The vehicle is currently deployed in USS PINCKNEY and USS MOMSER. It is seven metres in length and operates seven feet below the surface with its air inlet, the exhaust for the air breathing engine, its GPS and communications sitting above the surface.

'Sea Talon' tows a variable depth sonar (VDS) and can operate for up to 24 hours with the sonar fully deployed (three days without the VDS deployed) in sea states up to 4-5. The Sea Talon is able to undertake a planned mine-hunting survey and it feeds positioning and sonar information back to its controlling vessel continuously for onboard classification.

Launch and recovery of the vehicle is a tricky operation and it needs to be closely controlled to avoid collision.

It is expected that the system, which is to be fitted to the Littoral Combat Ship, will be deployed in 2007.

QinetiQ is another company which is undertaking a considerable amount of development of UUVs and made a presentation on two of their UUVs 'Marlin' and 'Gambit 21' which are both MCM (Mine Counter Measures) UUVs designed to operate in littoral waters at various depths.



The Australian Wyambra. Wyambra is a "power down the wire" UUV which is utilising a MCM vessel to control it. Wyambra has GPS and acoustic control sensors in the fin and carries both camera and sonar sensors.

With the Gambit UUV fitted with its modular MCM payload, it is capable of planning its own mission given the area which it has to cover. These vehicles present a number of navigational challenges as they need to minimize their reliance upon GPS and they do not have an external acoustic positioning system. They do use an inertial navigation system, Doppler velocity log and a depth sensor to achieve their navigation, giving them a claimed accuracy of +/-9 metres.

As part of its Automation of the Battlespace initiative, the Australian Defence Science and Technology Organization (DSTO) is undertaking a number of trials with its UUVs 'Wyambra' and 'Mullaya'.

'Wyambra' is a "power down the wire" UUV currently participating in *Operation Dugong* which is utilizing a MCM vessel to control the UUV using a UAV (Aerosonde UAV) as a communications link. Wyambra has GPS and acoustic control sensors in the fin and it carries both camera and sonar sensors.

DSTO will be continuing its trials to demonstrate different concepts of operation, such as multiple vehicle cooperation in integrated air and undersea operations and multiple undersea vehicle operations.

DSTO is tackling the problem of underwater navigation by UUVs using the NETSONG and NAVSONG systems, developed in conjunction with Nautronix. The systems use buoys with GPS antennae and employ acoustic signals to enable the UUV to update its position. This provides a horizontal accuracy of less than 10 metres.

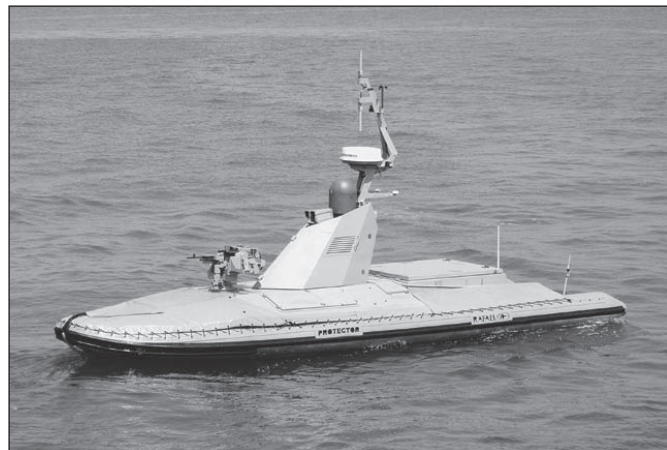
DSTO has a number of Australian companies involved in its trials.

USVs

One of the most interesting presentations was given by the Israeli Rafael company representative who talked about their development of the unmanned patrol craft Protector.

This USV has been developed to protect against incidents such as the suicide attack on USS COLE, the attack on an Israeli patrol boat and the recent suicide attack on the Sri Lankan patrol boat.

This USV is a diesel water-jet propelled rigid inflatable boat which is fitted with a Topflite EO (Electro Optic) sensor



The unmanned patrol craft 'Protector'. This USV has been developed to protect against incidents such as the suicide attack on USS COLE. This USV is a diesel water-jet propelled rigid inflatable boat which is fitted with a Topflite EO (Electro Optic) sensor and a stabilised 12.7mm (.50-cal) or 7.62mm gun. It can travel at high speed in sea state 3.

and a stabilised 12.7mm (.50-cal) or 7.62mm gun. It can travel at high speed in sea state 3 and operate up to sea state 5 with degraded performance. Alternatively it can be fitted with a grenade launcher.

It possesses non line of sight communications which receive command and control information and feed back video and audio to the controller who can be 20 kms away. The control system has full redundancy to ensure continuous operation.

The presenter stressed that USVs such as Protector eliminate the risks to personnel and capital assets; they can perform dull, dirty and dangerous missions; they reduce the costs of operations; and they can be re-configured. They can be used for protecting merchant ships, oil rigs, coastal sites and ports.

USVs such as Protector have been used in the North Arabian Sea for 3 months.

These USVs can also be fitted with a light projector, a PA system and a microphone which can enable a controller to challenge a boat by voice and instruct passengers to show their identity cards.

The launch and recovery from a surface vessel is still under development.

Other Developments

There are many other developments taking place in areas such as unmanned targets, lightweight propulsion, operational simulation and training, command and control systems, electro-optical sensors, sonar and communications which are all assisting in the rapid progress which is being made in the area of AUV technology. A number of speakers addressed the developments taking place in these aspects.

There are a very large number of Australian companies involved in many aspects of these developments often in conjunction with overseas partners.

The Federal Department of Industry, Tourism and Resources has developed an extensive data-base of Australian companies which are involved in the production of AUV products.

Summary

The pace with which AUV technology is moving is extremely impressive. In virtually all the presentations made at this symposium speakers repeatedly stressed the very large savings which can be made because of the reduced capital costs; the ability to attain long endurance without the need for onboard manpower; the increased flexibility in using AUVs; and the vastly reduced training times required for the operators of these vehicles compared with training pilots etc for manned vehicles.

In some services overseas AUV control is developing a career path of its own as the use of AUVs continues to expand.

While the bulk of the developments to date appear to be in the UAV and SUAV area more attention is being paid to developments in the USV and UUV areas and it is expected that these areas will see major growth in the use of UAV technology in the future.

HATCH, MATCH & DISPATCH

HATCH MAITLAND and ARARAT

The Naming Ceremony for the sixth and seventh Armidale Class Patrol Boats to be launched was held on 8 May 2006 at the Austal shipyard in Henderson, Western Australia. Fourteen patrol boats in total are to be delivered to the Royal Australian Navy.

The 56 metre, all-aluminium monohull vessels were named MAITLAND by Mrs Jacqueline Rice, daughter of ex crew member Mr Jack Breddin, and ARARAT by Mrs Jennifer O'Malley, daughter of Lieutenant Commander Norman Muzzell, Commanding Officer, HMAS ARARAT.

The ceremony was attended by senior figures from the Royal Australian Navy, Department of Defence, Government and industry including Senator David Johnston, as representative of the Minister for Defence and Chief of the Royal Australian Navy, Vice Admiral Russ Shalders.

Speaking at the ceremony, Austal's Executive Chairman, John Rothwell, marked the significant halfway point in the delivery of the new patrol boats:

"With a further seven patrol boats still to deliver it is pleasing to see that the on-time delivery of these vessels is already making an impact in active service. The first, HMAS ARMIDALE, has already been involved in frontline search, rescue and interdiction operations in Australia's northern waters reinforcing the benefits of the Government's decision to invest in the upgraded design and enhanced capabilities of the new Armidale Class patrol boat fleet."

Austal teamed with Defence Maritime Services (DMS), the Prime Contractor, to win in 2003 the A\$553 million "output specified" contract to provide and support through their service lives a fleet of patrol boats to replace the aging Fremantle class, which have patrolled Australia's maritime zones for the past quarter century. Austal is responsible for the design and construction of the Armidale class vessels. DMS is managing the overall project requirements, including establishment of a fleet management organisation that will

provide integrated maintenance, logistic and crew-training support to the vessels throughout their operational lives.

The Chairman of Defence Maritime Services, Adrian Kloeden reinforced the successful partnership forged between customer and contractor:

"I am happy to report the Armidale program is on track, delivering six Armidales this year, including the two we name today, with the remaining boats scheduled for on-time delivery in 2007. The success of the program so far, can be attributed largely to the innovative 'performance-based contract' developed by the Defence Materiel organisation. The concurrent naming of the two boats MAITLAND and ARARAT, demonstrates the speed of delivery being achieved by the shipbuilder Austal as part of this progressive Defence-Industry contract."

To be based in the ports of Darwin and Cairns, the Armidale class fleet will primarily operate within Australia's Marine Jurisdictional Zones carrying out surveillance, interception, investigation, apprehension and the escort to port of vessels suspected of illegal fisheries, quarantine, customs or immigration offenses. The ships will also be utilised to protect our valuable offshore oil and gas installations.

The patrol boat MAITLAND is the first to take the name of the New South Wales town that provided war time Navy support as a transit depot, port war signal station, port examination service, general security and convoy support.

The original HMAS ARARAT was named after the Victorian regional centre and was one of sixty Australian Minesweepers (commonly known as Corvettes). Commissioned on 16 June 1943, she became known by her crew as "the Ark" because of Mount Ararat's association with Noah's Ark which was displayed on her crest. HMAS ARARAT served mainly on patrol and escort duties in New Guinea, with occasional bombardments on enemy held positions and post war she cleared minefields. She steamed a total of 109,000 miles before eventually being sold. In 1961 HMAS ARARAT towed a floating crane to Japan and was later broken up in that country.



Two more new Armidale class patrol boats (from L to R) NUSHPs MAITLAND and ARARAT at their official naming ceremony in WA on 8 May 2006. (Austal)

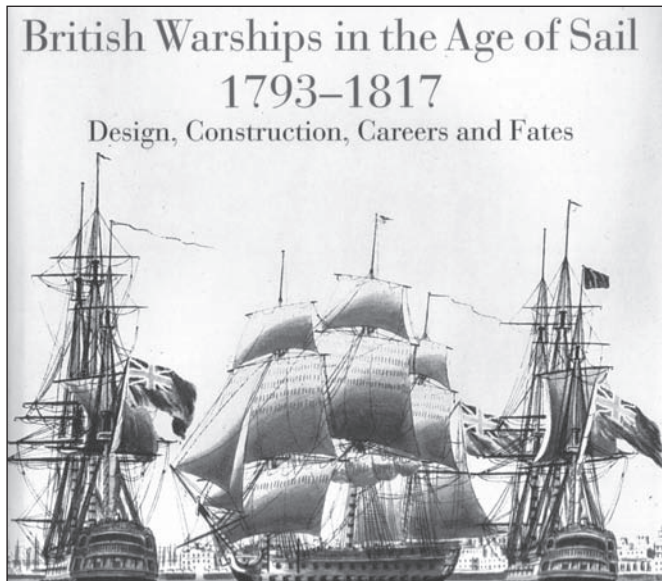
PRODUCT REVIEW

Age of Fighting Sail – Books From Chatham Publishers

BRITISH WARSHIPS IN THE AGE OF SAIL 1793 – 1817: DESIGN, CONSTRUCTION, CAREERS AND FATES

By: Rif Winfield

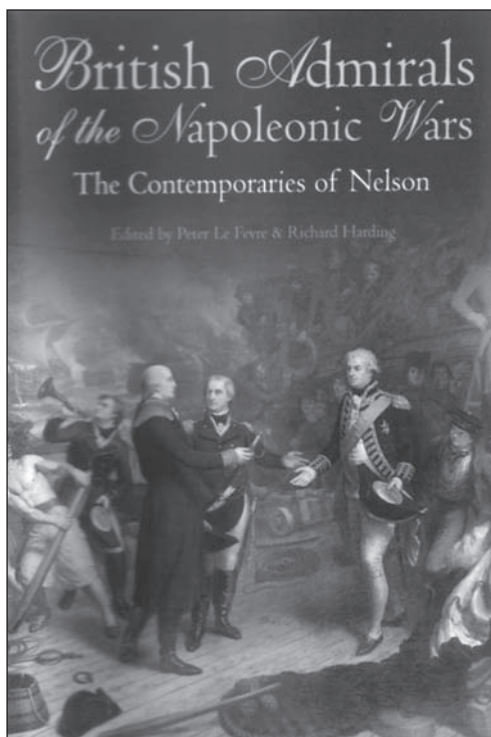
432 pages, 200 illustrations, Ship index



BRITISH ADMIRALS OF THE NAPOLEONIC WARS: THE CONTEMPORARIES OF NELSON

Edited By: Peter Le Fevre and Richard Harding

352 pages, 14 illustrations, Notes, Bibliography, Index

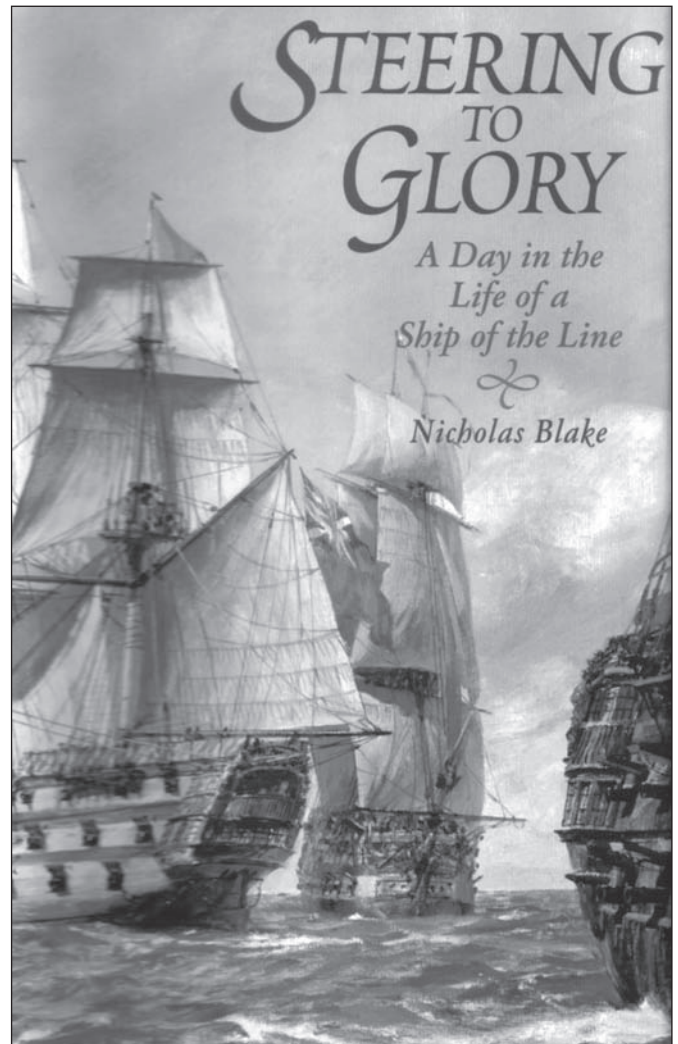


STEERING TO GLORY: A DAY IN THE LIFE OF A SHIP OF THE LINE

By: Nicholas Blake

304 pages, 60 illustrations, Appendices, Notes Bibliography, Index

Books reviewed by Joe Straczek



The Napoleonic Wars tend to be remembered for the great land campaigns and battles undertaken by Napoleon Bonaparte and his enemies. This period was also though the golden age of fighting sail. When three decked ships of the line engaged in fleet actions, such as Trafalgar and the Nile, and smaller frigates operated independently on the seven seas.

This period has held a fascination for historian and fiction writer alike. These three titles are the latest to be published by Chatham Publishers in the United Kingdom. Chatham Publishers has achieved a well deserved international reputation for the publishing of well researched and high quality books dealing with the period in question. *British Warships in the Age of Sail 1793 – 1817: Design, Construction, Careers and Fates*, *British Admirals of the*

Napoleonic Wars: The Contemporaries of Nelson and *Steering to Glory: A Day in the Life of a Ship of the Line* continue this fine tradition of quality and informative historical publications.

British Warships in the Age of Sail 1793 – 1817: Design, Construction, Careers and Fates compiled and researched by Rif Winfield details the histories of the many British sailing warships which served during the period 1793 to 1817. This extensive listing provides details of British built and captured warships. Entries for each ship generally include details as the vessels armament, dimensions, building dates and a short chronological history. As would be expected the more obscure ships the data is no as extensive as the better known ships. Having said that however, it is the information on these more obscure ships that makes this book such a worthwhile reference work. Amongst the interesting facts revealed in *British Warships in the Age of Sail* is that the largest, up to 1800, was named *Ville de Paris*. An interesting choice of names.

Supporting the technical and historical data in this book is a large number of ship drawings and copies of paintings. The drawings highlight hull forms and decorative nature of the various types of sailing ships. Whilst the paintings serve to illustrate what these ships looked like in service and battle.

Whilst *British Warships in the Age of Sail* provides much technical and historical detail on these magnificent ships it provides no information on what life was like onboard them. This is done by Nicholas Blake's *Steering to Glory: A Day in the Life of a Ship of the Line*.

Steering to Glory provides the reader with a detailed account of life onboard a ship of the line. The vessel in question is a 74 gun ship named *SPLENDID*. A quick check of the index to *British Warships in the Age of Sail* fails to identify the ship. Not surprising since this vessel is a fictitious ship.

Nicholas Blake has created the fictitious *SPLENDID* in order to illustrate what life in the sailing navy was like. He has drawn extensively on published and unpublished correspondence, reports, logs and other contemporary records in order to piece together an informative historical work. What the author has produced is an historical account of life at sea that reads like a Jack Aubrey novel. In it he describes minute details such as the consumption of candles as well as victuals. The changing sizes of hammocks is describes as is the accompanying bedding. To say that the author describes life

onboard these ships in intimate detail is not far from the fact. Some illustrative examples of the seedier side of naval life are also provided.

The story woven around the fictitious *SPLENDID* is an interesting and well told one. It tells of the daily life and hardships of the crews and of a Navy trying, on occasions, to balance the comfort and welfare of the sailors against the efficiency and cleanliness of the fighting ship.

Whilst providing a very good description of life on a sailing man of war *Steering to Glory* does not provide any details of those who manned and fought the ship. They remain largely unknown.

In part this anonymity is, in the case of the Admirals at least, lifted by Peter Le Fevre and Richard Harding's *British Admirals of the Napoleonic Wars: The Contemporaries of Nelson*. This complements a similar volume by the author titled, *Precursors of Nelson: British Admirals of the Eighteenth Century* (Chatham, 2000). Both books describe the lives and career of British Admirals. In the more recent volume those selected include Sir Samuel Hood, Lord William Hotham, Lord Cuthbert Collingwood, Viscount Exmouth and Peter Rainier. Of those mentioned Rainier is the one who immediately attracts a reader's attention. The reason for this is three fold. Firstly because he is literally unknown, secondly he apparently has no Knighthood or other honours. The third interesting aspect about Peter Rainier is that his portrait shows him as a bespectacled officer.

Rainier had command of the India Station for almost the entire period of the Napoleonic Wars, a period of almost 10 years. On his return to England Rainier entered Parliament. When he died he left half his fortune to the State to help alleviate the national debt. A truly interesting person.

All the biographies in this volume have been written by eminent historians. When read as a whole they provide an insightful view of the Royal Navy and in particular unique view of naval strategic command during the course of the Napoleonic Wars.

In publishing these books Chatham Publishers have made available to the historian, and history buff alike, a wealth on important knowledge on an era that helped shape the world and the subsequent century.

STATEMENT of POLICY

Navy League of Australia

The strategic background to Australia's security has changed in recent decades and in some respects become more uncertain. The League believes it is essential that Australia develops the capability to defend itself, paying particular attention to maritime defence. Australia is, of geographical necessity, a maritime nation whose prosperity strength and safety depend to a great extent on the security of the surrounding ocean and island areas, and on seaborne trade.

The Navy League:

- Believes Australia can be defended against attack by other than a super or major maritime power and that the prime requirement of our defence is an evident ability to control the sea and air space around us and to contribute to defending essential lines of sea and air communication to our allies.
- Supports the ANZUS Treaty and the future reintegration of New Zealand as a full partner.
- Urges a close relationship with the nearer ASEAN countries, PNG and the Island States of the South Pacific.
- Advocates the acquisition of the most modern armaments, surveillance systems and sensors to ensure that the ADF maintains some technological advantages over forces in our general area.
- Supports the acquisition of unmanned aircraft such as the GLOBAL HAWK and UCAVs.
- Believes there must be a significant deterrent element in the ADF capable of powerful retaliation at considerable distances from Australia.
- Believes the ADF must have the capability to protect essential shipping at considerable distances from Australia, as well as in coastal waters.
- Supports the concept of a strong modern Air Force and highly mobile Army, capable of island and jungle warfare as well as the defence of Northern Australia and with the requisite skills and equipment to play its part in combating terrorism.
- Advocates that a proportion of the projected new fighters for the ADF be of the STOVL version to enable operation from suitable ships and minor airfields to support overseas deployments.
- Supports the development of amphibious forces to ensure the security of our offshore territories and to enable assistance to be provided by sea as well as by air to friendly island states in our area and to allies.
- Endorses the control of Coastal Surveillance by the defence force and the development of the capability for patrol and surveillance of the ocean areas all around the Australian coast and island territories, including the Southern Ocean.
- Advocates measures to foster a build-up of Australian-owned shipping to ensure the carriage of essential cargoes in war.

As to the RAN, the League:

- Supports the concept of a Navy capable of effective action off both East and West coasts simultaneously and advocates a gradual build up of the Fleet and its afloat support ships to ensure that, in conjunction

with the RAAF, this can be achieved against any force which could be deployed in our general area.

- Is concerned that the offensive and defensive capability of the RAN has decreased markedly in recent decades and that with the paying-off of the DDGs, the Fleet lacks area air defence and has a reduced capability for support of ground forces.
- Advocates the very early acquisition of the projected Air Warfare Destroyers.
- Advocates the acquisition of long-range precision weapons and the capability of applying long-range precision fire to increase the present limited power projection, support and deterrent capability of the RAN.
- Advocates the acquisition at an early date of integrated air power in the fleet to ensure that ADF deployments can be fully defended and supported from the sea.
- Advocates that all Australian warships should be equipped with some form of defence against missiles.
- Advocates the future build up of submarine strength to at least 8 vessels.
- Advocates that in any future submarine construction program all forms of propulsion be examined with a view to selecting the most advantageous operationally.
- Supports the maintenance and continuing development of a balanced fleet including a mine-countermeasures force, a hydrographic/oceanographic element, a patrol boat force capable of operating in severe sea states, and adequate afloat support vessels.
- Supports the development of defence industry supported by strong research and design organisations capable of constructing and supporting all needed types of warships and support vessels.
- Advocates the retention in a Reserve Fleet of Naval vessels of potential value in defence emergency.
- Supports the maintenance of a strong Naval Reserve to help crew vessels and aircraft in reserve, or taken up for service, and for specialised tasks in time of defence emergency.
- Supports the maintenance of a strong Australian Navy Cadets organisation.

The League:

Calls for a bipartisan political approach to national defence with a commitment to a steady long-term build-up in our national defence capability including the required industrial infrastructure.

While recognising budgetary constraints, believes that, given leadership by successive governments, Australia can defend itself in the longer term within acceptable financial, economic and manpower parameters.

HMAS ADELAIDE at sea. Commissioned in 1980 she is the first of the RAN's FFG class of ships. ADELAIDE is due to be decommissioned in September 2006. (RAN)



The newest of US nuclear powered aircraft carriers USS RONALD REAGAN refuelling the RAN Anzac class frigate HMAS BALLARAT on her starboard side in the Persian Gulf. (USN)





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