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VOLUME 70 NO. 4

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THE NAVY

The Magazine of the Navy League of Australia

SEA 1000
Replacing Collins

Japanese Submarine Operations in Australian Waters During WW II

Brought to Justice
French Navy Snatches Pirates

Nearly Too Little
Nearly Too Late

ISSN 1322-6231

Australia's Leading Naval Magazine Since 1938

LCS-1 FREEDOM on sea trials in Lake Michigan. The Lockheed Martin Littoral Combat Ship is armed with a rapid fire 57mm gun, the RAM anti-air/ missile missile system, Mk-50 ASW torpedoes and a new surface-surface missile. She also embarks two Seahawk sized helicopters and a number of Special Forces rigid hull inflatable boats. She is designed to have a top speed of 45 kts and can also carry out mine countermeasures tasks while networking with all other forces in the area of operations. (USN)

NOTICE IS HEREBY GIVEN THAT THE

ANNUAL GENERAL MEETING

of

THE NAVY LEAGUE OF AUSTRALIA

will be held at
the Brassey Hotel, Belmore Gardens, Barton ACT

FRIDAY 31 OCTOBER 2008 AT 8.00PM

BUSINESS

1. To confirm the Minutes of the Annual General Meeting held in Canberra on Friday 19 October 2007
2. To receive the report of the Federal Council, and to consider matters arising
3. To receive the financial statements of the year ended 30 June 2008
4. To elect Office Bearers for the 2008-2009 years as follows:
   - Federal President
   - Federal Vice-President
   - Additional Vice-Presidents (3)

   Nominations for these positions are to be lodged with the Honorary Secretary prior to the commencement of the meeting.
5. General Business:
   - To deal with any matter notified in writing to the Honorary Secretary by 21 October 2008

ALL MEMBERS ARE WELCOME TO ATTEND

By order of the Federal Council

Philip Corboy, Honorary Federal Secretary, PO Box 128 Clayfield QLD 4011
Telephone 1300 739 681 Fax 1300 739 682

THE NAVY

Volume 70 No.4

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Front cover: HMAS WALLER in Sydney Harbour for a rest stop while on her way to the RIMPAC 08 exercise where she fired the first Mk-7 version of the Mk-48 torpedo. The test shoot was a success with the torpedo sinking a large Spruance class destroyer hulk. (RAN)

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The Navy League of Australia

Beware the Persians

Last month a leading UK defence magazine, WARSHIPS IFR, revealed details of a harassment incident involving the Anzac class frigate HMAS STUART and naval units of the Iranian Revolutionary Guard (IRG). HMS CHATHAM, a Type 22 Batch 3 frigate also in the same area of the Gulf at the same time, came in for similar harassment. The IRG has been responsible for the kidnapping at gun point of British Sailors and Royal Marines on two separate occasions in the past. A few years ago they also tried to kidnap Australian sailors.

While the IRG was unsuccessful on these two most recent occasions to create an international incident and embarrass the West, again, it does set a worrying trend and possibly indicates Iran's future intentions.

Many international affairs and security think-tanks are predicting Israel will strike Iran's growing nuclear facilities during the life of this edition of *THE NAVY*. Part of urgency for this strike is the upcoming deployment of the latest and most sophisticated Russian anti-aircraft missile system, which has not been seen by the West and to which no counter has been developed. Thus, the Israeli air force will need to conduct its strike before the missile system becomes fully operational at the end of this year, or risk unacceptable losses.

Israel recently 'rattled the sabre' by carrying out a very public dress rehearsal exercise of an air strike on Iran. In the exercise, an air armada of strike and fighter aircraft flew from Israel to a point in the Mediterranean Sea off Greece (coincidently the exact distance from Israel to Iran's nuclear facilities). The strike package was said to have had over 100 aircraft with AEW&C and air-air refueller support.

If Israel strikes Iran what will that mean for our frigate in the Persian Gulf? With Iran's belief that an Israeli strike would have needed Western approval, her first act will be to attack the nearest Western military assets. The coalition warships in the Persian Gulf. Given their proximity to Iran's maritime borders just after an attack, it could be argued by anti-Western countries in the UN Security Council that these ships represented a legitimate threat to Iran's security. Thus justifying their attack.

THE NAVY has in the past warned of Iran's growing antagonism and boldness towards the West. We have also warned of her growing anti-ship missile arsenal, sophistication and tactics and questioned if our Anzac frigates are able to adequately meet the threat. Taking a hard look at our Anzacs not much has changed since the "Tier 2 fitted for but not with" philosophy first appeared in the 1980s as their 'raison d'être'. Strategist Paul Dibb, in his *Dibb Review* of 1986, who came up with the idea and coined the term, never anticipated that these ships would be placed in such proximity to a non-regional player with an extensive anti-ship missile arsenal, which also includes the underwater rocket torpedo Shkval.

HMAS PARRAMATTA leaving Sydney Harbour recently for a tour of duty of the Persian Gulf. During her time in the Gulf she could come in for attention from Iranian naval units if Israel strikes Iran's nuclear facilities. (RAN).

An IRG high speed missile boat fitted with two Chinese made C-701 anti-ship missiles. The C-701 is unique as it has a millimetre wave radar which is undetectable to many warships such as the Anzac class.

If one casts their mind back to the 86 Dibb Review, which turned into the *1987 Defence White Paper*, you will remember that the Anzacs were intended to be high endurance brown water patrol boats operating under the air umbrella of the RAAF off Australia's bare bases in the North. The Persian Gulf in 2008 couldn't be further from their intended area of operations. One prominent UK naval expert, Iain Ballantyne, recently described Iran and the area of the Persian Gulf patrolled by our Anzac frigates as a "latter day equivalent to the NATO – Warsaw Pact face-off at the Berlin Wall".

With the FFG upgrade programme in permanent hold the only thing the RAN can send to meet its international security obligations is the "Tier 2 patrol frigate". Here's hoping there are no on-going 'deficiencies' in the already small war fighting capability of the Anzacs. If there are, we may need to prepare for the loss a warship. The lives and careers of many Australians depend on Israel's next move.

Themistocles

F-35

The last edition of *THE NAVY* featured an article on the F-35 Joint Strike Fighter. It argued the case for Australia to acquire a number of the short take off and vertical landing (STOVL) version of this aircraft. The Navy League strongly supports the view that some 12 to 20 STOVL aircraft should be included in the RAAF`s proposed buy of 100 F-35s.

At the same time as the article appeared in *THE NAVY* the Navy League took steps to promote the issue in the broader media. This resulted in a number of excellent reports that gave good coverage to the League's position. Unfortunately, one news agency reported that the League was seeking aircraft carriers. Not true!

What the League has at all times argued is that the STOVL aircraft should be purchased for the RAAF. In its press release the League urged "the Australian Government to seize the opportunity presented by the acquisition of two large amphibious ships and the Joint Strike Fighter to greatly enhance the operational flexibility of the RAAF."

The inclusion in the Joint Strike Fighter purchase of the STOVL version, at present being built for the Royal Navy and the United States Marine Corps, would provide the RAAF and the Australian Defence Force (ADF) with much needed options. STOVL aircraft can be available on call when and where the ADF may need them.

The new amphibious ships and the new F-35s will be in the service of Australia for at least 30 years. It is impossible to forecast the contingencies the ADF may face between now and 2050. It is highly desirable that the ADF is equipped to handle all possible situations.

Great White Fleet and Ballarat

In August 1908 Australia received the visit of the United States "Great White Fleet". This event has this year been commemorated at various places around Australia. There have been a number of functions to commemorate the visit, including a Ball in Sydney and a Luncheon in Melbourne.

The visit in 1908 undoubtedly engendered good relations between the United States and the newly federated Australia. While we these days take the alliance with the United States as a given that was not the case in 1908. Alliances are not built on just good feelings. It took the events of 1941 and a great deal since, to establish and build the alliance we now consider a fundamental element in our defence.

It is perhaps worth recalling that in 1908 Australia was part of a naval alliance with Japan. When the First World War began it was Japan that joined Britain, Australia and New Zealand in cleaning out the German possessions in the Pacific. Indeed, when Australia's soldiers sailed to war the escort for the troop convoy included a Japanese battle-cruiser.

Perhaps the real benefit of the visit was for the future Royal Australian Navy. Prime Minister Deakin, who had arranged the visit of the Great White Fleet, had been trying to establish an Australian Navy. Not everyone in Australia shared his vision. Even many of those who did were thinking of an essentially coastal force. However, when in 1909 the First Sea Lord recommended an Australian Fleet unit of a battle-cruiser, cruisers, destroyers and submarines it was accepted. One wonders whether such a recommendation would have gained acceptance had not Australians seen the 16 battleships of the US Navy only the year before.

One of the best stories of the visit of the Great White Fleet is that concerning the Ballarat Naval Cadets. In 1908 Ballarat, although a good way from the sea, had a cadet unit. This was before League or Navy involvement in cadets. It was one of a number of private units that existed at that time.

Not surprisingly the boys of the Ballarat Naval Cadets wished to have the opportunity to see the assemblage of big warships. Enquiries were made as to financial assistance. The Victorian Premier of the day rebuffed them. He said that if the boys wanted to see the ships in Melbourne they should walk. So they did.

Ballarat is some 130 kilometres from Melbourne. The roads were then pretty basic. In August in Ballarat it can be very cold. Nevertheless, leaving Ballarat Town Hall at 9.30am on the morning of the 25 August, 1908 and camping out along the way, the boys reached Melbourne by the 29 August. It was a remarkable demonstration of enterprise, energy and persistence.

Their remarkable effort attracted much attention. The boys were feted by the citizens of Melbourne and by the US Navy. When it came time to return to Ballarat the Victorian government provided free rail transport. So many gifts had been showered on the boys that an extra carriage was attached to the train to carry the gifts. Subsequently a large number of US Officers and Sailors paid a visit to Ballarat.

The City of Ballarat has been actively involved in commemorating the cadets march. At the Ballarat Town Hall on the morning of 25 August 2008 at 9.30am, exactly 100 years to the minute since the cadets stepped off, a photo was taken of the Mayor, various others and some 40 cadets.

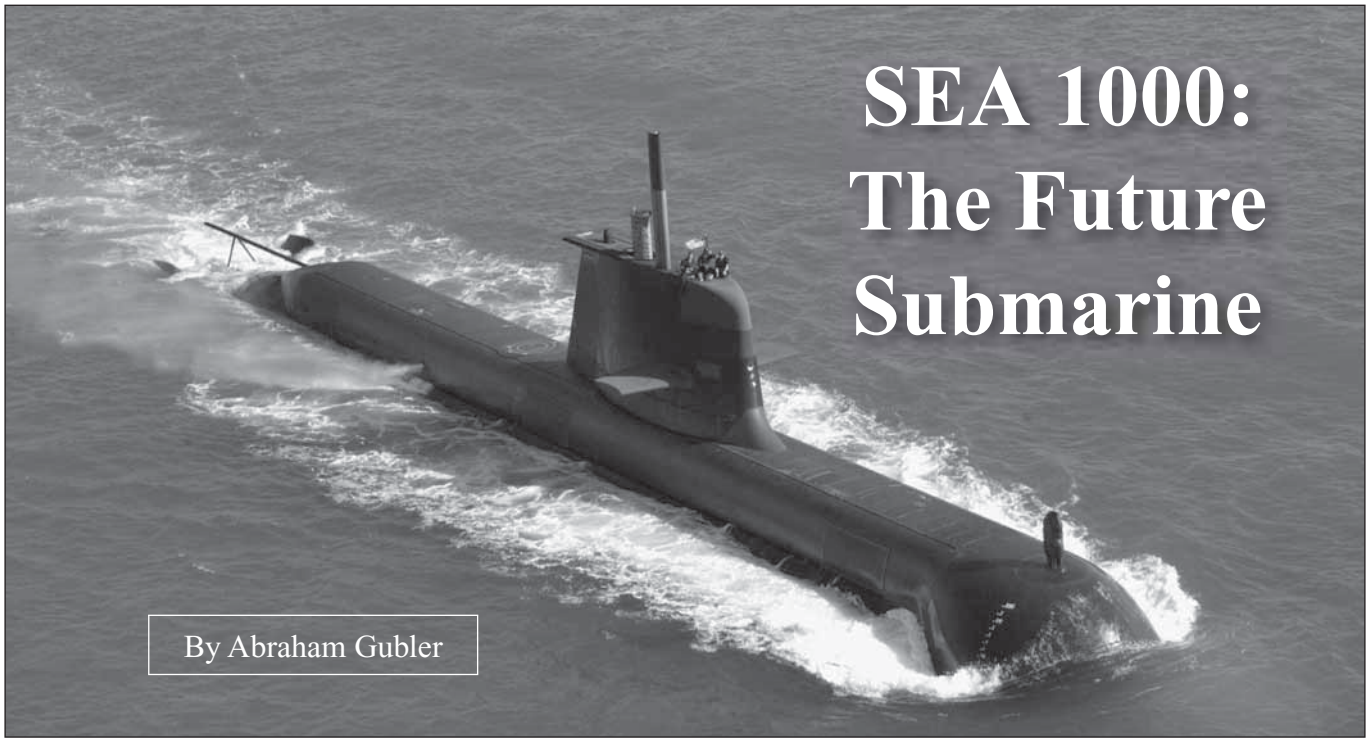
Sad to say the Ballarat Naval Cadets are no more. The 40 cadets for the 2008 photo came from Bendigo.

At the Reception which followed the photos I suggested to those present that the re-establishment of the Ballarat Naval Cadets would be an appropriate way of commemorating the efforts of the boys of 1908.

More Lost

When discussing the discovery of HMAS SYDNEY II in the July edition I remarked that the AE1 was now the only RAN vessel yet to be accounted for. One of our readers, Allan Waugh, Secretary of the HMAS MILDURA Association, has been good enough to write pointing out that this is not so. In June 1944 HMAS MATAFELE disappeared near Milne Bay. None of the crew of 37 were ever found. Let us hope that modern technology will one day enable us to discover what happened to both the AE1 and HMAS MATAFELE.

Mr Graham Harris



SEA 1000: The Future Submarine

By Abraham Gubler

The Collins class submarine HMAS DECHAINEUX on the surface. (RAN)

The replacement of the Collins class submarines under the project title SEA 1000, could be the most globally significant Australian defence program since WW II. The new boats, entering service in 2025 to 2027, will also stabilise domestic warship building by inaugurating a third generation of post-public ownership construction. Abraham Gubler takes a look at some of the new technologies and options in submarines that will need to be considered for SEA 1000.

The announcement in the 2008/09 Federal Budget that the Australian Government will consider first pass approval in the upcoming financial year of SEA 1000 Phase 1A for concept studies of the future submarine publicly launches this vital project. What makes SEA 1000 so significant is the potential to realise a long standing Australian requirement for a conventionally-powered submarine that is competitive in its deployability and tactical loitering to a nuclear-powered submarine.

There are three transformational technology developments that are reshaping the design of conventional submarines and two key technologies changing the way submarines can be operated that make possible these bold claims. High temperature superconductor (HTS) motors and generators significantly reduce the mass and volumetric to power ratio and improve energy efficiency at partial loads compared to legacy copper coil and permanent magnet motors and generators. Lithium-Ion (li-ion) batteries or alternatives like Molten Salt and Silver-Zinc provide significantly higher power density and lower maintenance than conventional Lead-Acid batteries. Customised acoustic signature management for 'snorting' and submarine mast radar cross section reduction design and materials reduce the vulnerability of indiscrete conventional submarines recharging their batteries. Conventional submarines combining these technologies can sprint and cruise faster, stay underwater longer and be much more discrete.

Perhaps most revolutionary is the application of networking to underwater warfare by using through water communications (TWC) to operate unmanned underwater vehicles (UUV) and create a collaborative undersea operating picture (CUOP). Australian developments in acoustic spread spectrum technology (ASST) and networked anti-submarine warfare (NASW) enables submarines, UUVs and surface vessels to discreetly communicate through water with reasonable bandwidths. The fielding of high endurance UUVs is blurring the line between sensors, torpedos and mines. Deployable ocean surface sonar arrays and simple networking of platforms with underwater sensors are significantly extending situational awareness.

These new technologies challenge many historical fundamentals of the 'silent service' and have some way to go before being accepted across the community of submariners. But the potential is immense; being able to transform the capability of submarines in the same way naval aircraft transformed the centre of surface fleet combat power from the battleship to the aircraft carrier. This transformation was achieved by naval air's significant increase in surveillance and the range at which attacks could be launched and countered.

The Legacy of Submarine Construction

Swedish submarine house Kockums was selected in 1987 to provide the technology and design for the Collins class because of their close attention to the specification, modular build experience and then pioneering use of computer aided design (CAD). But the Collins had a troubled introduction into service since the first boat was launched in 1993. Many of these problems relate to build and design issues common to highly complex start programs and have been rectified in due course.

The two most significant challenges were harder to solve. The Swedish broadband acoustic signature management technology was focused on low speed loiter in the very different waters of the Baltic Sea and was unsuitable for how the RAN needed Collins to operate. The ambitious development of a distributed combat management system (CMS) to cut weight, ease upgrade and boost signal processing ended in failure, in part

due to restrictive contract specification. The original Rockwell CMS (now part of Boeing Australia Ltd.) was so bad it was actually displaying less sonar data to the operators than had actually being processed.

To provide a quick fix to the CMS project SEA 1446 acquired two ship-sets of USN augmentation equipment that had been developed to counter similar problems. Using specially developed interface gateways this equipment effectively bypassed the deficient software areas and acts as a new connector between the sonar sets, crew and weapons. The success of the interim fix lead to the RAN and USN singing a 2001 memorandum of understanding (MoU) called the Armaments Cooperation Program (ACP). The ACP commits the two navies to jointly develop heavy weight torpedoes (HWT) and submarine CMS. Subsequently under project SEA 1439 the Collins class are now being refitted with the same base BYG-1(V) CMS as the Virginia class submarine developed by the USN, Raytheon Integrated Defense Systems and General Dynamics Advanced Information Systems. The ACP is not just a one way street and Australian acoustics technology has been instrumental in providing the Mk-48 Mod 7 Common Broadband Advanced Sonar System (CBASS) torpedo with an enhanced shallow and complex water engagement capability (more on this weapon below).

The possibility of competition being injected into the future submarine build is an important consideration. The Rudd Government's commitment at the 2007 Federal Election to build the new submarine at Adelaide's TechPort common user facility (CUF), build site of the Collins and Hobart class AWD, may indicate a fait accompli for boat-builder and Combat System – System Engineer (CSSE) ASC (Australian Submarine Corporation).

However, the changing nature of the Australian defence industry with the acquisition by BAE Systems of Tenix Marine and the shipyard and workforce flexibility at the CUF could enable competition. BAE Systems Submarine Solutions, the sole builder and CSSE of the RN's new Astute class submarines provides a highly competent source for reach back by BAE Systems Australia to compete with ASC.

The Cost of Being an Island Continent

When a diesel-electric submarine transits they spend about 16-17 hours of each day running on the battery and the other 7-8 hours 'snorting' with the diesel generators running via the air induction snorkel. The transit speed is thus a variable of the battery's stored energy, the power needed to run the motor and the submarines ability to generate electricity while sustaining the transit speed. Most diesel-electric submarine can maintain a speed of eight knots through a submerged transit.

This level of transit speed is adequate for most users of conventionally powered submarines because their operational areas are co-located to the main operating bases or comparatively short transits (under 500 NM) away. For Australia the distance between feasible domestic operating bases and operational areas, even in defence of Australia scenarios, is much longer. There is little substitute for building a submarine with high transit speed and very long endurance for Australia.

In recognition of the much longer ranges required by the RAN the Collins was originally specified for a submerged transit speed of 16 knots over 10,000 NM that was later reduced to 10 knots over 9,000 NM with the limitations of then available technology of the 1980s. Further the Collins is designed for significantly more redundancy than other, smaller conventional submarines having the crew resources and onboard equipment to stay at sea in difficult conditions like the hot and biologically active water conditions of the operating areas than those

New weapon systems like the Tomahawk Land Attack Missile (TLAM) seen here being vertically launched by the USS FLORIDA, will expand the future submarine's capability and utility across the spectrum of conflict. (USN photo)

submarines designed for short range European, Middle Eastern or Asian missions.

An Off The Self (OTS) design option could be based on the existing Collins design and vehicle system technology with new mission systems and some enhancements for the changing operational requirements. Including capability for littoral and land attack operations and if space and weight allow a secondary air independent propulsion (AIP) system. This will include new systems like non-hull penetrating modular mast bays and potentially the Raytheon UGM-109 Tomahawk Land Attack Missile (TLAM) vertical launchers. The use of modular bays for masts, usually eight are fitted, allows for new concepts to be explored like submarine mounted guns. The Germans have experimented with fitting the Mauser (now part of Rheinmetall) RMK 30 mm recoilless cannon onto a submarine mast. This provides a weapon for use against small boats. This conservative design would have a range of operational improvements but would continue the limitations of the Collins in particular its transit speed.

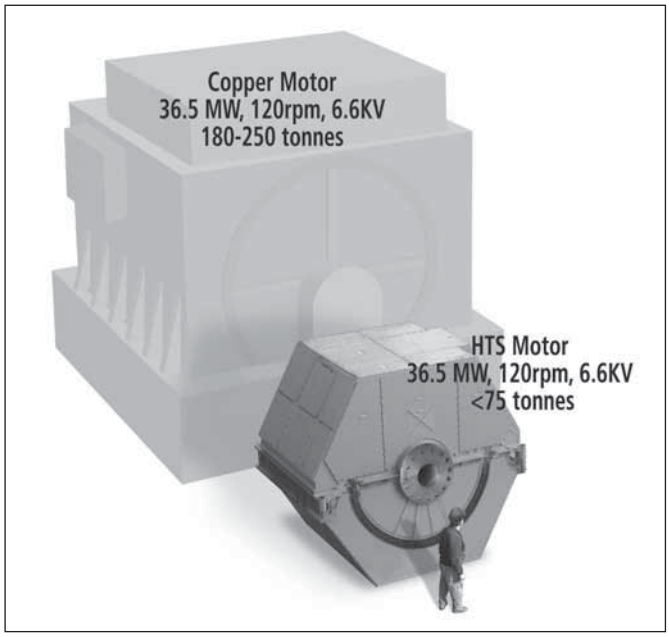
While Collins was unable to achieve the original transit speed goal new technology in electric motors, generators and energy storage is making this specification a reality. The high power density of such submarine also provides potential for increased sprint and tactical speeds and meets the growing need for 'hotel' power to run increasingly power hungry CMS and provide higher standards of crew habitability.

High Temperature Superconductors

Making submarine travel a practical endeavour has been the electric motor. Until the advent of nuclear reactor powered steams turbines, electricity has remained the primary air independent source of torque to propel a submersible. The electric motor and generator has evolved considerably over 100 years of submarine development but most boats still use copper coil electromagnetic motors, or in a few cases permanent magnet motors.

The development and increasingly widespread fielding of high temperature superconductors (HTS) has transformational potential for submarines. The name is deceptive as high temperature for superconductors starts at 77 degrees Kelvin or 186 degrees below zero in Celsius. This makes superconductivity practical as this 'high' temperature can be achieved by cheap and easily handled liquid nitrogen or neon cooling. The motor can then comprise very thin superconducting coils with little or no electrical resistance able to carry 10 times the current of copper wires.

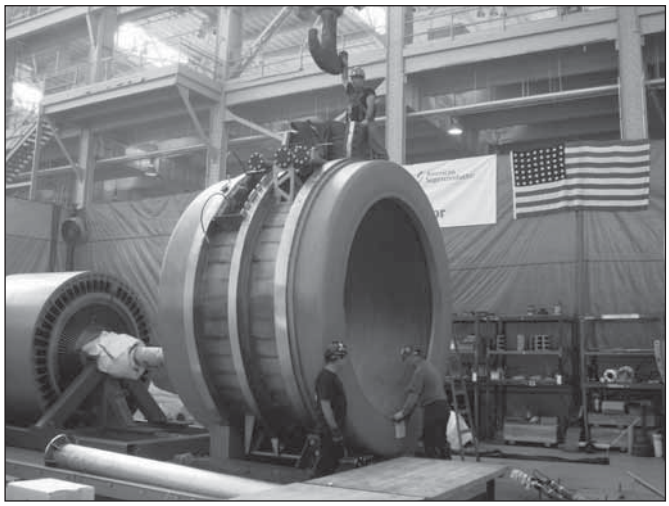
HTS electric motors and generators have at least 20-35% of the weight and occupy less than half the volume of legacy



The weight and volumetric savings of the HTS motors make it possible for diesel-electric submarines to rival nuclear-powered submarines. They also offer improved stealth and lower energy loads at partial power. (ONR graphic)

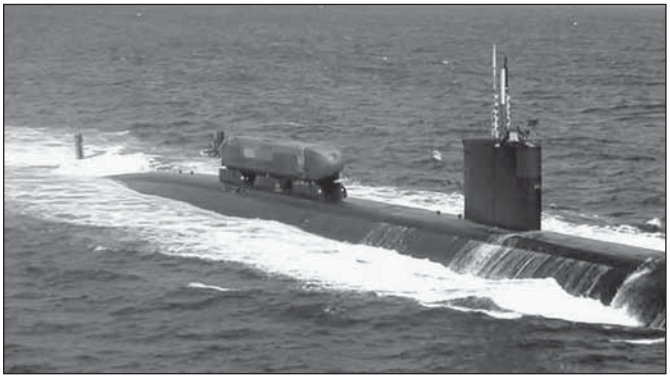
motors/generators of similar power. HTS motors are even more significant for conventional submarines because they are 3-4 times more energy efficient at partial loads. This means a loitering submarine using less than 30-40% of the motor's potential shaft power will consume far less energy compared to legacy motors. This has a significant impact on a conventional submarine's indiscretion rate, reducing the amount of time needed to snort. HTS motors are also acoustically quieter and provide high power densities previously only possible by direct shafting to a nuclear driven steam turbine.

The USN is testing the first HTS motor for installation on the third Zummwalt class destroyer (DDG-1002). American Super Conductor (AMSC), a strategic partner of Northrop Grumman, have developed the Zummwalt class's 36.5 MegaWatt (MW) HTS motor. AMSC had previously delivered a 5 MW HTS motor to the US Navy in 2003 and are working on HTS concepts specifically for submarines. Other companies are developing HTS motors and generators with Siemens having built and tested a 4 Mega Volt Ampere (MVA) output generator in 2005. They expect the generator to be available commercially from 2010.



A Northrop Grumman HTS 36.5 MW motor developed for the Zummwalt class destroyer during production.

Lithium-Ion Batteries



Lithium-Ion batteries are used for the USN's Advanced SEAL Delivery System (ASDS) seen here piggy backing off the SSN USS GREENVILLE. Li-ion batteries offer significantly higher power densities over Lead-Acid batteries and are rugged enough for fleet service. (USN)

Matching the development of new motor/generator technology are significant improvements in energy storage batteries driven primarily by the consumer electronics market and increasingly hybrid powered cars. Li-ion batteries currently offer four times the energy density than lead-acid batteries. With active monitoring and better cycle durability more frequent charging, draining and recharging is possible. They can also be packaged into any shape or cell size. This could enable individual cells sized for submarine exterior hatches allowing easy change and upgrade during refit.

Li-ion batteries are currently at sea as the replacement battery for the Northrop Grumman Advanced SEAL Delivery System (ASDS) midget submarine. ASDS is solely powered by the battery that replaces the original silver-zinc unit that failed to meet the USN's requirements. Yardney Technical Products' subsidiary Lithion developed the warship ready, high power 1.2 MegaWatt Hour (MWh) li-ion battery for the ASDS. This battery weighs only eight tons compared to the 380 tonnes of lead-acid batteries on the Upholder class that can only store around 15 MWh.

Factor in growth in li-ion battery efficiency and the results are even more staggering. Ultra thin li-ion batteries using nanowire anodes being developed at MIT and Stanford promise three times more energy efficiency and commercial availability within 10 years. If an improved cathode can be found this could increase to 10 times more energy efficiency. This is a 12 to 40 times energy efficiency gain for weight and volume over legacy submarine batteries.

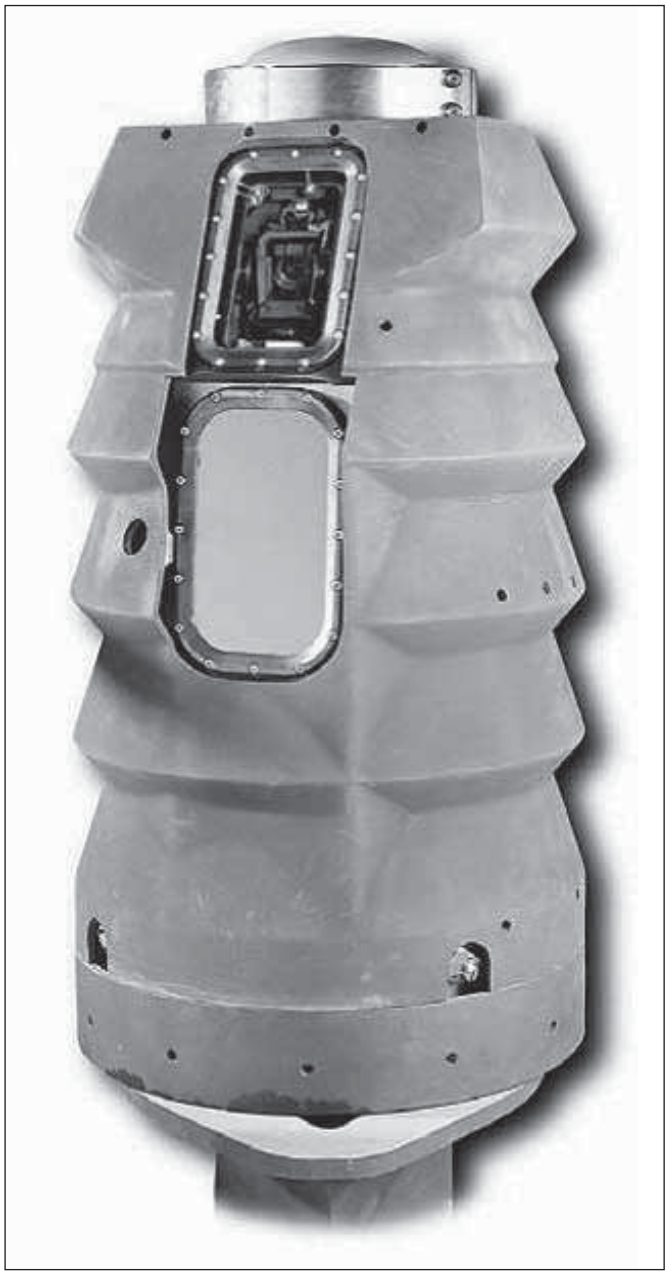
There are other new battery technologies offering considerable improvements over lead-acid batteries. Silver-zinc batteries offer high energy density but at high cost and limited life. Rolls-Royce is marketing a molten salt battery using the South African developed ZEBRA [Zeolite Battery Research Africa] technology that offers 2.7 times more energy efficiency than lead-acid batteries. Like li-ion batteries molten salt batteries are self-contained units that don't require the maintenance and emissions monitoring of lead-acid batteries. ZEBRA batteries have been developed to replace lead-acid batteries in existing diesel-electric submarines and are used in the NATO Submarine Rescue System (SRS).

What makes li-ion so attractive compared to ZEBRA and silver-zinc is their use in civilian applications. 20th century diesel-electric submarines with lead-acid batteries were able to leverage the massive production of these batteries as the car and truck starter battery of choice. For the 21st century, utilising li-ion provides similar advantages as the constant growth in demand for consumer electronics and hybrid cars results in rapid increase in li-ion efficiency and durability.

Reducing Snorting Risk

While li-ion batteries provide considerable power density improvements they are still, currently, 20 times less efficient than diesel fuel. Generation of electricity will still require snorting to obtain oxygen to run the diesels. Snorting compromises stealth by increasing broadband acoustic emissions and exposing a detectable mast above the waterline. Considerable effort has been made by Australian researchers and industry, much of it highly classified, to counter the broadband acoustic signature of the Collins. Reducing the emitted noise caused by the running diesel motors through vibration control and active cancellation has considerably reduced the acoustic snorting signature of these boats.

Submarine mast detection is one of the most difficult roles for radars requiring fast scanning rates and acute angular relationships between the radar and the target. This means flying at low altitude which considerably reduces the area available for scanning compared to high altitude radars. Even the latest Raytheon AN/APY-10 radar, formerly known as the AN/APS-137B(V)5 and being fitted to the new Boeing P-8 Poseidon MPA, is limited to a maximum range of 29nm against a target with a Radar Cross Section (RCS) of at least one square metre against a backdrop of 1m waves (Sea State 3).



The angular shapes of the masthead of the Kolmorgen Photonics Mast Program (PMP) reduces the Radar Cross Section (RCS) of the submarine's above water interfaces improving operational stealth. (Kolmorgen photo)

RCS reducing designs similar to that used in stealth aircraft are now being applied to the above water elements of submarine masts. The Virginia class's Kollmorgen Photonics Mast (PMP) System has a geometrically shaped casing designed to reduce RCS against periscope-hunting radars. Applied to the snorkel and the risk of detection by radars is considerably reduced.

If RCS reduction is comparable to that applied to stealth aircraft then detection range of an AN/APY-10 should be reduced to the realm of under a single nautical mile, even for a comparatively large above water snorkel.

By using more space and weight efficiently HTS motors/generators and li-ion batteries could provide surplus space for AIP systems. AIP systems don't have the power density to offer anything more than sustained loiter speeds but this can be an important tool for diesel-electric submarines facing 'hold down' by overhead anti-submarine threats. However, AIP does not have power densities much higher than current li-ion batteries particular when the space and weight of the additional generator is taken into account. AIP is likely to be an unnecessary duplication of effort for the SEA 1000 future submarine.

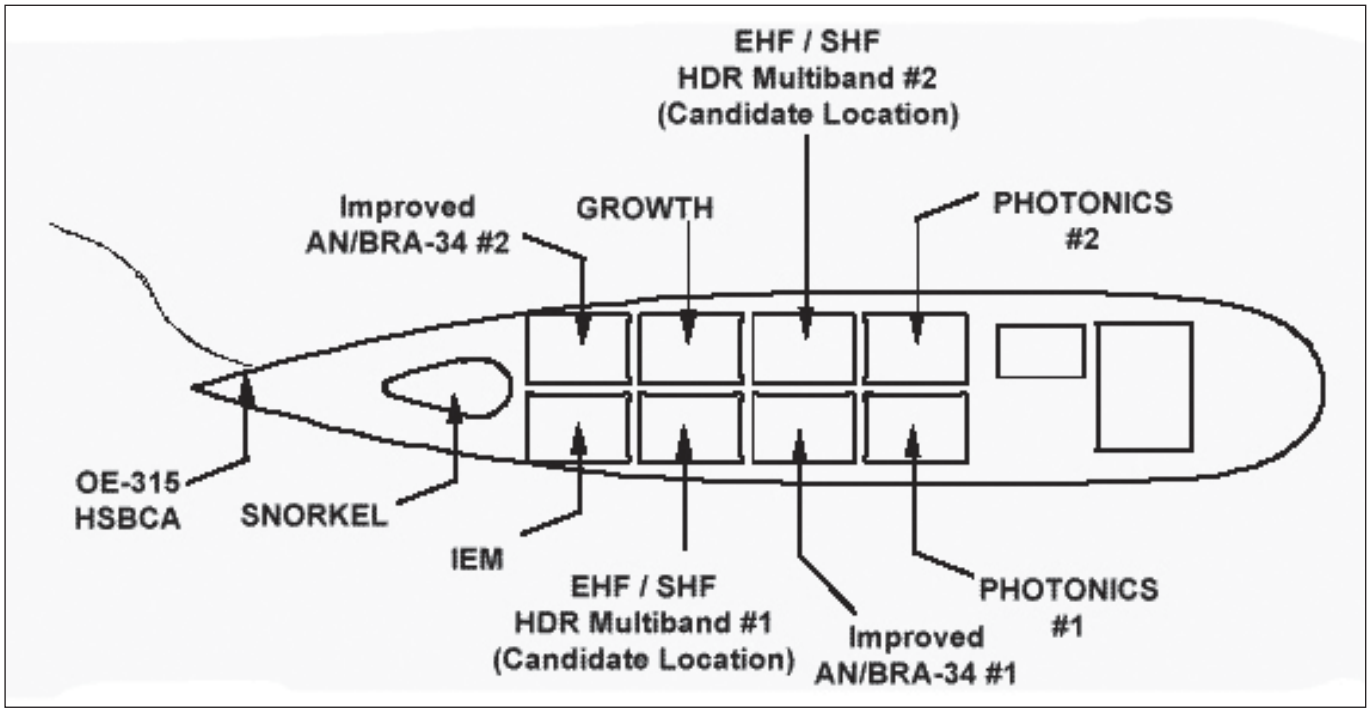
Networked Submarines

Despite the improvements in power density and in reducing the risk of snorting diesel-electric submarines will still struggle to sustain high tactical speeds (not to be confused with the maximum sprint speed) reducing their patrol area compared to a nuclear submarine. Endurance at tactical speed is limited by the battery while the nuclear submarine's is only limited by acoustics. The speed at which the submarine can detect a threat before being detected itself is typically 20 knots for a fourth generation USN boat like the VIRGINIA. This enables the nuclear submarine to cover a patrol area up to five times larger than a four-five knot sustained speed diesel-electric.

Using underwater networking with sonar equipped UUVs, other submarines, surface ships and seabed arrays enables a conventional submarine to significantly increase its patrol coverage. Enabling networking is the TWC (through water communications) ability of ASST (acoustic spread spectrum technology) developed in Australia by Nautronix, now a subsidiary of L-3 Communications. ASST enables high bandwidth, discrete communications through water and has enabled a range of new capabilities to be developed for underwater operations.

Developed to provide a TWC solution for a low cost acoustic monitoring array required to measure the Collins class's underwater signature, ASST spreads a transmitted message over a comparatively large segment of the acoustic spectrum, typically more than 10 times greater than would be required for conventional narrowband communications. Spreading a message across the spectrum transmitted between moving objects is severely degraded by the Doppler Effect, which is 200,000 times stronger with acoustic transmission through water than when compared to that of radio frequency (RF) through air. L-3 Nautronix's ASST technology is claimed to overcome the Doppler effect through a proprietary method.

ASST provides the technology basis for Nautronix Acoustic Sub-sea Hydro-Acoustic-Information-Link (NAS-HAIL) developed under the Capability Technology Demonstrator (CTD) program managed by the Australian Defence Science and Technology Organisation (DSTO). NAS-HAIL is a first generation ASST TWC and provides potentially low probability intercept (LPI) communications and data transfer levels of about 100 bytes per second, adequate for operational



The use of non-hull penetrating modular, containerised masts provides a huge increase in capability and a reduction in the complexity of construction. Using eight mast bays the Virginia class has a full range of capabilities plus a spare slot of an additional mast. (USN graphic)

information transfer or email but not un-processed gigabyte level data like raw sonar feeds. NAS-HAIL is in service with RAN, USN and RN submarines and a growing number of ASW and mine counter measure (MCM) systems.

Despite the rise of network centric warfare (NCW) in first world militaries the underwater domain remains staunchly stand alone operator only. Responding to a tasking from the RAN Defence's collaborative Rapid Prototyping Development and Evaluation (RPDE) enterprise developed a networked ASW system and proved it in an at sea exercise during summer 2007/08. Using the lap top based Rapidly Inserted Panoramic Picture Exploitation Resource (RIPPER) to create a CUP (collaborative undersea picture) RPDE was able to link three RAN frigates with sonobuoys, a submarine, seabed array and a regional command centre (not all during the at sea exercise) to share their sonar tracks.

Apart from significantly expanding the underwater situational awareness of each network participant NASW also improved the establishment of underwater tracks by linking the sonar processors. Because of the very high false positive return rate of sonar thanks to the complexity of the underwater acoustic environment combat systems typically require three positive returns before establishing a track. This can take some time to establish with very quiet contemporary submarines, but by linking three separate processors together they can share their positive returns to quickly reach the required number for a track. For example, if the target emits a single, brief tonal sound as it passes through a patch of turbulent water and this is detected by three networked sonars that is enough for a track whereas without networking, each processor would discount the single one-off sound.

While underwater networking is rapidly been proven as a technology there are still many cultural objections to overcome. NAS-HAIL needs to improve its LPI capability before submariners are willing to use it regularly. Though one suspects submariners are more willing to transfer information to another submarine, despite the level of indiscretion, than they would be to a surface vessel. Submariners also need to develop a more cost-benefit analysis based approach to emissions control (EMCON) like the surface fleet. While current first generation NAS-HAIL technology may be indiscrete like a surface vessel using a data link or radio the advantage of increase in situational awareness of accessing a CUP outweighs the indiscretion of the TWC.

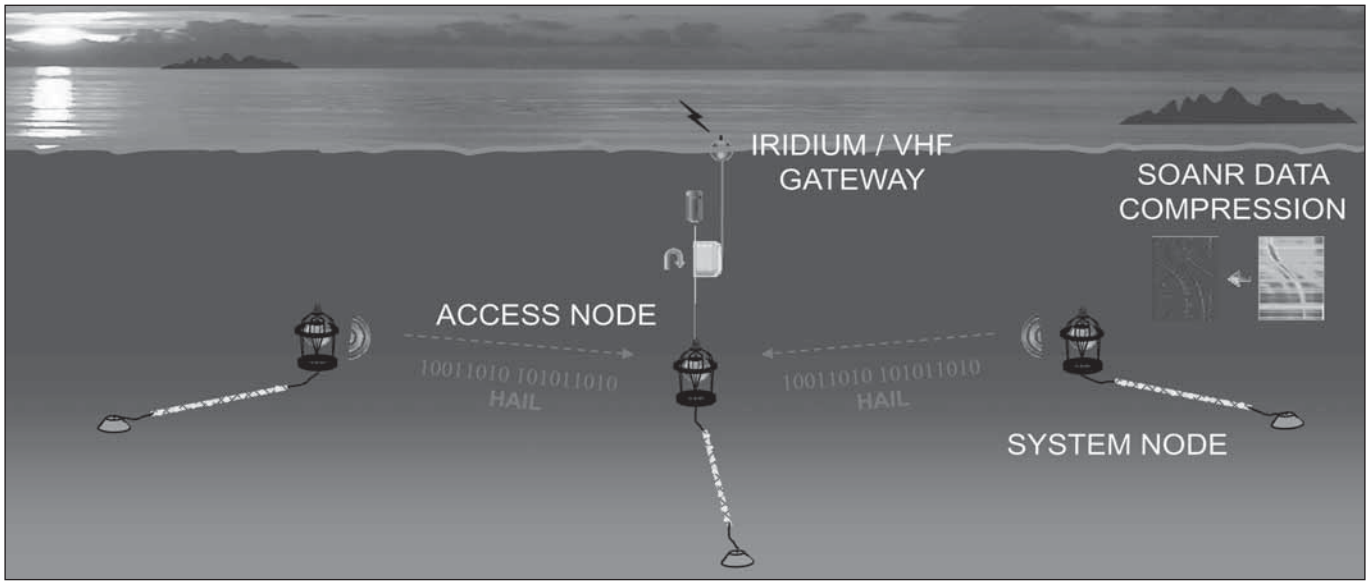
Aus-Net to Catch Dangerous Fish

The latest application of ASST is the Autonomous Underwater Surveillance Sensor Network, or 'Aus-Net', being developed under another CTD program by L-3 Nautronix and DSTO. CTD programs are designed to develop new technology for eventual deployment like NAS-HAIL and another ASST based CTD the Mine-countermeasure Underwater Computer System (MUCS) fielded by the RAN's Clearance Diving Teams (CDT) under Navy Minors project SEA 1740. Aus-Net could provide a solution in competition or cooperation with towed array sonars for the $100-150 million project SEA 1100 Phase 4 Long Range Persistent Subsurface Detection Capability program, due to enter service in 2018-20.

Aus-Net is a rapidly deployable, autonomous seabed based sonar surveillance system that, thanks to ASST, does not rely on fixed cabling or highly accurate placement. Each Aus-Net system will comprise three line array sonars networked together by ASST and including a pop-up buoy with Iridium satellite communications. Heavy use of commercial off the shelf (COTS) systems will drive down cost of the prototype systems.

The deployed array will detect and track surface and underwater vessels and provide this information to friendly forces either through underwater ASST or the pop-up buoy. The CTD Aus-Net will be roughly the size of a contact sea mine enabling deployment by small ships. While recoverable and reusable Aus-Net will have an endurance of two-four years and be cheap enough to be considered disposable. It is feasible that a production version could be sized for HWT tubes like submarine deployable sea mines but this would reduce the use of COTS components and drive up cost.

In water trials will begin in 2009 and the CTD will run until 2010 after which a decision for acquisition and further development will be made. The acoustic potential of stationary sea-bed sonars is well understood thanks to the USN's Sound



The Autonomous Underwater Surveillance Sensor Network ('Aus-Net') will link three recoverable or disposable seabed sonar arrays that can be deployed without precision location. Together they can remotely surveil a wide area of underwater space sending tracking reports back to joint headquarters or nearby friendly units. (L-3 Nautronix graphic)

Surveillance System (SOSUS) that provided high value surveillance and tactical tracking of Soviet submarines during the Cold War. Making this capability deployable, low cost and autonomous is hugely significant across the underwater warfighting domain. For a diesel-electric submarine it provides the capability to discretely boost its patrol coverage to compensate for a lack of sustained tactical speed.

Submerged Survivability

Life in a submarine, even without introducing combat, is perilous. Boats like the Collins and Virginia only have a reserve of buoyancy of 10% while surfaced and none while underwater. Avoiding damage is paramount and even designing in higher resistance to flooding does not necessarily provide survivability assurance. Most Soviet submarines are built for "surface unsinkability" with double hulls and high reserves of buoyancy at over 30%. This is supposed to enable them to survive with flooded compartments. The experience of Soviet and later Russian submarine casualties, such as the losses of the K-278 KOMSOMOLETS (NATO: Mike class) and the K-141 KURSK (NATO: Oscar II), indicates that even without introducing enemy torpedos producing a damage resistant submarine is extremely optimistic.

The key for submarine combat survivability is to avoid getting hit. This can be achieved via the submarine's stealth and sprint speed to avoid detection and reduce the torpedo no-escape zone. Also advanced, adaptive decoys like the fourth generation RAFAEL Scutter that seduce an active-homing torpedo away from the target provide a highly valuable last ditch capability. Scutter is launched from a four inch (102mm) Submarine Signal Ejector (SSE) and propels itself to its operating position away from the submarine where it can operate for up to 10 minutes at a depth of 300 meters.

The threat torpedo's active sonar transmissions are received and analysed by the Scutter identifying the specific torpedo and then broadcasting an appropriate deception signal. If an unknown torpedo is encountered an appropriate generic deception technique is broadcast which also provides a high level of deception probability. The active homing torpedo's computerised attack logic will prefer the Scutter to the legitimate target and attack it repeatedly, stealing its energy until it is expended allowing the submarine to escape.

The first firth generation decoy, the RAFAEL Torbuster, adds a detonation charge to the Scutter to hard kill the torpedo on its first decoyed attack. This provides higher countermeasure assurance and also counters those torpedos programmed to ignore a target after failing to make contact on the first pass, indicating that it is simply attacking a decoy. Scutter is also available in a three inch (76mm) SSE version called SUBSCUT, developed in cooperation with BAE Systems, able to be used on USN and RN submarines with the smaller launcher, and LESCUT a surface launched version deployed from the Mk 36 Super RBOC chaff launcher.

Even with the best seductive decoys the submarine can still be saturated by homing torpedos or bombarded by unguided depth charges. The best way to avoid endangering the submarine is to use standoff tactics. The use of UUVs to extend the reach of the submarine in its principal roles of surveillance and attack also increase the distance between the submarine and the threat and allow it to remain discrete while still influencing the battlefield.

UUV Master Plan

UUVs will provide capability in intelligence, surveillance, reconnaissance (ISR), MCM, ASW, inspection and identification, oceanography, communication and navigation networking, payload delivery, information operations and time-critical strike. All of which are capabilities required by the future submarine. To realise these capabilities the USN's UUV Master Plan is working towards developing four UUV classes, each that comprise several role specific types.

The man portable class weighs 25-100 lbs (11-45 kg) and has an endurance of 10-20 hours. The Light Weight Vehicle (LWV) is under 500 lbs (227 kg) and is sized to match the 12.75 inch (323 mm) light weight torpedoes (LWT). It will carry 6-12 times the payload of the man portable UUV and operate for 20-40 hours. The Heavy Weight Vehicle (HWV) will fit in the 21 inch (533 mm) HWT tube and displace 3,000 lbs (1,364 kg) and double the payload and range of the LWV. The largest UUV is the 10 tonne Large Vehicle that will be the most versatile system in a range of variants. It will be able to ride piggy back style on a mother submarine or be launched by a surface ship.

Most promising for SEA 1000 is the HWV that is designed to be submarine compatible and will leverage the increasing modularity of torpedos. In the US there is a renaissance in

The Midsize Automated Research Vehicle (MARV) is hoisted aboard after testing. MARV is an experimental platform supporting the USN's planned unmanned underwater vehicles (UUV) in particular the 21 inch (533mm) torpedo sized Heavy Weight Vehicle (HWV). Missions for the HWV will include clandestine anti-mine and tactical reconnaissance, littoral access oceanography and long endurance submarine decoy. (USN)

missile development thanks to modular structures and open ended computer control. Rather than design new missiles, they are being assembled in stacks enabling warheads, propulsion systems and seekers to be swapped out to create new weapons. The same applies to torpedos as seen in the rapid development and fielding of the Mk-54 LWT that combines the advanced seeker and warhead of the Mk-50 sans its complex Stored Chemical Energy Propulsion System (SCEPS) that has been replaced by the cheap and reliable Otto fuel propulsion system of the Mk-46 torpedo.

Taken further this process enables seekers, warheads, control systems and population systems to be mixed and matched to create the ideal weapon or UUV for each mission. The USN is developing the 21 inch Mission Reconfigurable UUV (21 MR UUV) as a key element of their future underwater warfare capability. For the Mk-48 HWT this could include replacing the Otto fuel motor with a rechargeable battery and the wire control with NASHAIL. The submarine could then keep a torpedo several miles off its bow to act as a forward sensor picket with immediate lethal response if needed. It would return to the submarine every few days to plug in for recharging its battery. This process applied to the Mk-48 Mod 7 CBASS HWT with its highly capable sonar system can allow the creation of a three in one combination mobile sonar, mine and torpedo.

Ocean Interface

Details of the myriad roles of the UUV are beyond the already wide scope of this article but what is important is how the UUV can integrate with the submarine. Launch and recovery (L&R) is a major engineering challenge for leveraging UUVs for submarines. The Large Vehicle UUV has simple L&R because it can be piggy backed on the submarine but this limits the UUV platforms deployable by each submarine from one to four. While the HWV can be easily launched from the standard 21 inch torpedo tubes and TLAM vertical launcher cells of submarines, onboard recovery and "lock-in" to the pressure hull is more difficult. The large, 26.5 inch (670 mm) oversized tubes of the Seawolf class could provide a lock out/in capability but realistically the submarine would need a dry/wet hangar or large ocean interface.

The third Seawolf class submarine, the USS JIMMY CARTER is fitted with a 30m long Multi-Mission Platform (MMP) insert that enables it to L&R autonomous UUVs and cable tethered underwater vehicles for recovery and deployment of underwater objects. The MMP is an hourglass shaped pressure hull with a large rear facing lock out chamber for L&R. During recovery

The Seawolf class SSN USS JIMMY CARTER on the surface. JIMMY CARTER is the third generation of USN submarine modified to operate Remotely Operated Vehicles (ROV) that are able to deploy and recover from the submerged submarine for intelligence gathering missions. This ocean interface could serve as a blueprint for all future submarines to operate UUVs to significantly expand their operation reach and improve survivability. (USN)

the UUV sails under the boat and then upwards through an opening in the casing to enter the chamber, which is sealed, the water pumped out and the UUV then transferred into a hangar inside the pressure hull. Part of the USN's UUV Master Plan approach is to decide how to manage UUV L&R. Whether through fitting interfaces or wet hangars to ships or finding alternative methods such as external docking and towing.

The Solution?

The Virginia class SSN USS VIRGINIA on the surface during her initial sea trials. With the advance of technology in the form of battery life, stored energy and electric motor power the RAN could potentially use the existing Virginia design for a conventional submarine class. (USN)

The incorporation of all of the above technology and other new systems being fielded in new submarines, in particular the USN's Tango Bravo submarine technology development program, to meet the requirement of the RAN will be the objective of the SEA 1000 Phase 1A Concept Design Studies. The success of the ACP with the USN offers a low risk path to access to the world's best new submarine technology and the potential to leverage their existing Virginia class design for the RAN.

The rival, at least in potential, to this option is British submarine designers BMT Defence Services and their Vidar-36 submarine design unveiled in May 2008. The Vidar-36 leverages many of the advanced technologies available now and in the immediate future. It also has an elegant UUV ocean interface mounted in the bow below upper deck torpedo tubes and aft the bow

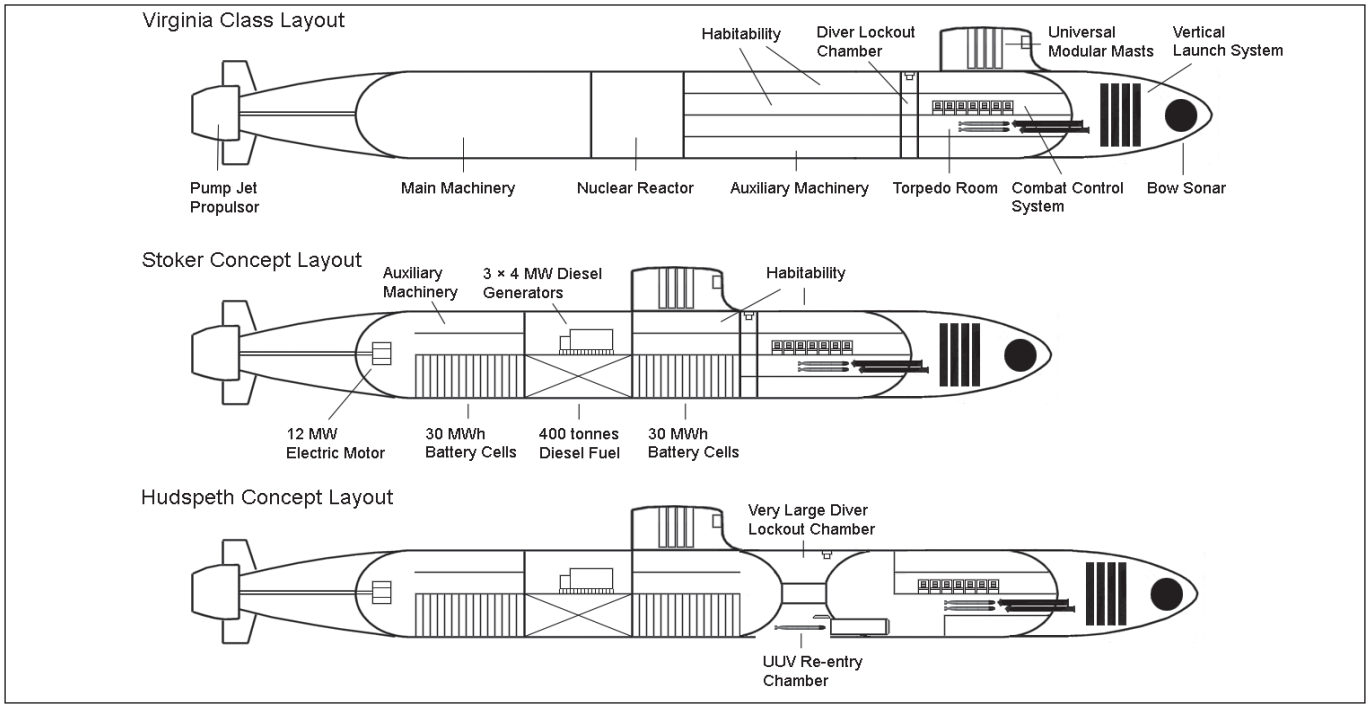
sonar. Unlike JIMMY CARTER's ocean interface this does not require a major structural change to the pressure hull.
However, acquiring Vidar-36 would place the RAN into the sensitive position of being a first customer. The spectacular failure of a range of such acquisition projects in Australia demands linking with larger projects conducted by our allies. The high level marketing campaign by the Americans to provide a SEA 1000 solution, lead by Northrop Grumman but also likely to include General Dynamics Electric Boat offers the most reliable project concept. This offer leverages the enormous investment in submarine development in the USA with the natural operating partners of the RAN.

Stoker and Hudspeth

The most capable and robust project offering would be to build a conventionally powered version of the USN Virginia class submarine. HTS motors and li-ion batteries provide the power density needed to propel such a comparatively wide hull; beam of 10.4 m versus the 7.8 m of Collins and 8.4 m of Vidar-36. This hull provides high levels of internal volume for systems like UUVs and very high levels of crew habitability. It would also come with a USN common mission system with CMS, sensors and weapons bay (reconfigurable to accommodate up to 41 Special Forces personnel) enabling a range of synergies training, logistics and operational synergies.
To illustrate the point the sketch design of the 'Stoker' submarine is presented utilising a common hull, though shorter with the Virginia. From the nine-diver lock-out chamber forward the Stoker would be functionally identical to the Virginia. This submarine would have a length of (90 m, beam (pressure hull diameter) of 10.4 m and a surfaced displacement of 4,250 tonnes with a 12% reserve of buoyancy (4,800 tonnes submerged). It would be propelled by a 12 MW (16,086 horsepower) HTS motor with three 4 MW (5,362 horsepower) diesel generators and a 60 MWh li-ion battery bank.
Indicative performance would enable a sprint speed of 25-27 knots, sustainable for up to five hours and a transit speed of 16 knots over 10,000 NM submerged with only an 8.3% indiscretion rate. Operating at tactical speed of four knots such a boat would only need a daily indiscretion of less than 2.5% (around 30 minutes) to keep the battery at full charge. Further it could stay submerged at tactical speed over eight days without any snorting if circumstances demanded it.
Apart from the propulsion system, repositioned sail with more capable snorkel and improved habitability the Stoker would be functionally identical to the Virginia. To add a UUV ocean interface a JIMMY CARTER type MMP hull insert could be added to create the 'Hudspeth' submarine. To provide synergy for the UUV hangar and the torpedo bay the hull insert would need to be amidships. More development of UUV L&R ocean interfaces could find a simpler solution to this problem.

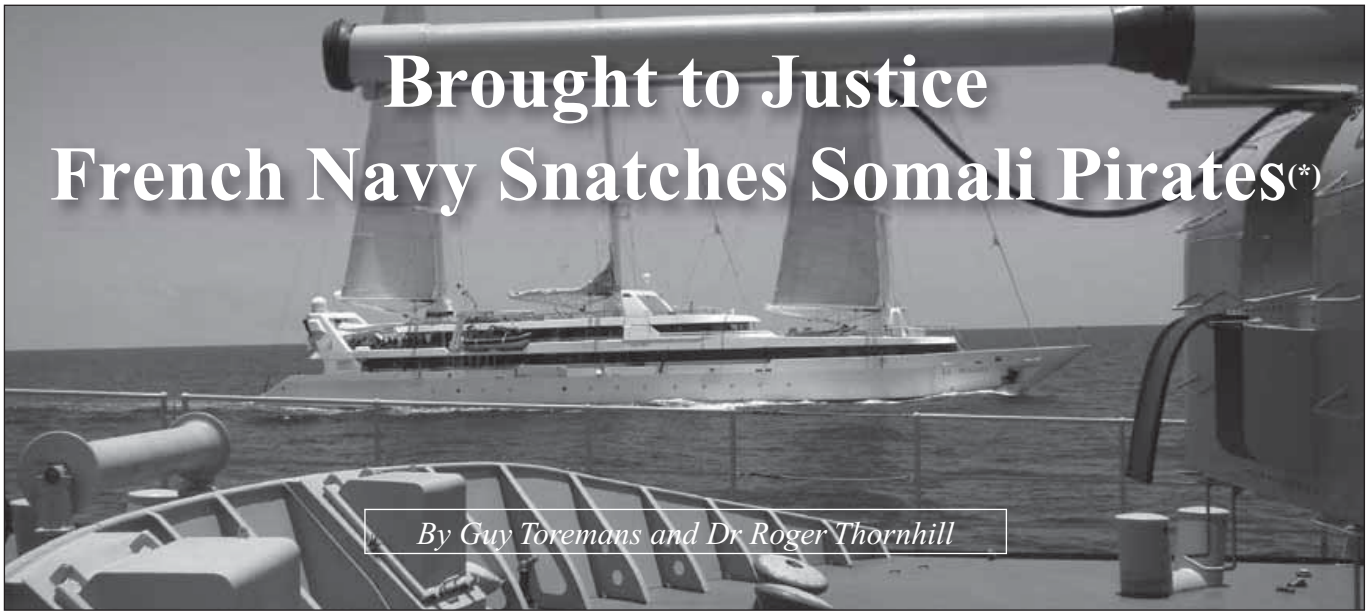
SEA 1000

By the 2025 to 2027 entry into service of the SEA 1000 future submarine with much of the technology we consider advanced today will be obsolete. The centre of innovation in submarine technology is firmly in the USA. The recent announcement by the British government of an investment of 200 million Pounds over 15 years to upgrade submarine research capability is a drop in the ocean compared to the Americans. While the British will soon have a new hydrodynamics tank the USN is using an entire deep water lake for hull testing. This American scale of investment just can't be matched by potential competitors in the near future under current trends.
For SEA 1000 Australia also needs to leverage growing technology like li-ion. It is not overly optimistic to expect that li-ion batteries arrays massing around 400 tonnes that can currently store 60 MWh will be able to store as much as 180-800 MWh by the 2020s. This is an energy density level on par with that of diesel fuel. Since the battery does not need a generator to convert the fuel into energy for the motor it is possible that diesel engines and generators could even become redundant on non-nuclear submarines. This could effectively provide over 2,000 MWh or underwater tactical performance similar to a nuclear powered submarine.
This technology solution is ideal for the RAN but may also find a home in both the USN and RN. Both services are struggling to sustain their number of nuclear submarines with growing costs and budget limitations. Mixing their fleets could provide an out to this dilemma without significant capability compromises. Also traditional users of small, short range conventional submarines are looking at longer ranges due to an evolution from regional to global security. Long range, high speed diesel-electric submarines may soon return to their centre place position as the fleet submarine of choice. Australia is ideally positioned to leverage this undersea change thanks to the Collins program and SEA 1000.



Illustrative arrangements of the Virginia based conventional submarine option for the RAN. (Dan Hebditch and Abraham Gubler drawing)

Brought to Justice
French Navy Snatches Somali Pirates(*)



By Guy Toremans and Dr Roger Thornhill

The luxury cruiser *Le Ponant* on her way back to Djibouti under the escort of the French A-69 frigate FS COMMANDANT BOUAN. (Marine Nationale)

In a display of the value of surface ships and a naval presence in troubled waters, the Marine Nationale (French Navy) mounted a daring and successful apprehension of some of the world's most powerful and sophisticated pirates off the coast of Somali during April 2008. It was a display worthy of history, a hastily convened Joint operation conducted thousands of miles from home and involving lethal force with a very successful outcome.

On Friday April 4, the French luxury cruise ship, the *Le Ponant*, on her way from the Seychelles to the Mediterranean with her core crew on board, was hijacked by pirates 800 km off the northern coast of Somalia, in the Gulf of Aden. Twelve pirates, believed to be members of the infamous 'Somali Marines', boarded the 88m three mast cruiser taking hostage the 30 crew members (22 French six Filipinos one Ukrainian and one Cameroonian).

The 'Somali Marines' are reputed to be a highly organised pirate group with warlord protection and a separate business structure for ransom negotiations. They are the most powerful and sophisticated of all the pirate groups infesting that area of the world and are said to have a very military like structure. They have a fleet admiral, admiral, vice admiral and a head of financial operations (according to the UN Security Council Monitoring Group, May 5). It is said they have a capability to operate further off-shore than any other group and participate in piracy activities involving vessel seizures, kidnappings and ransom demands. Their activities are usually in and around the areas of the central Somali coast of Haradheere.

The 'Somali Marines', or the Defenders of Somali Territorial Waters as they like to be called, are loyal to regional warlord Abdi Mohamed Afweyne.

Curiously, the 'Somali Marines' have a reputation for courteous treatment of their hostages, so long as they are confident that a ransom will be paid. A French journalist, Gwen Le Gouil, was held for eight days by the 'Marines' in December 2007. He said they were "former fishermen, who have converted to illicit operations of various kinds, including hostage-taking and trafficking in people, money and archeological remains. They have no particular political allegiance. Only money counts as far as they are concerned."

Le Vice Admiral Valin (centre) with the A-69 frigate FS COMMANDANT BOUAN in the background.

The Captain of the *Le Ponant*, Patrick Marchesseau, saw the pirates climb aboard the yacht and had just enough time to call the FS VAR (the French flagship in the area) on his staelite telephone to raise the alarm. Admiral Gerard Valin, Commander of France's Naval Force in the Indian Ocean region, immediately relayed the information to Coalition Task Force 150 (CTF-150), the maritime component of the allied anti-terrorist operation 'Enduring Freedom'.

A rescue misison was hastily formed under the name Operation Thalatine (meaning 30 in Somali as a refence to the 30 hostages).

The French A-69 class frigate FS COMMANDANT BOUAN, already deployed in the Gulf of Aden as part of CTF-150, was immediately sent to the area. With the BOUAN not having a helicopter, the Canadian frigate HMCS CHARLOTTETOWN, with an embarked Sea King at the ready, joined the French warship to shadow *Le Ponant*. CHARLOTTETOWN's Sea King provided the first recognition and images of the captured luxury cruiser to the Task Force.

On 5 April *Le Ponant* entered Somali territorial waters. Given her presence in a sovereign zone France sought permission from the Somali President, Abdullahi Yusuf Ahmed, for a forceful retaking of the vessel. The Somalian Government's response was quick and decisive giving the French free reign to do what they felt was needed.

On April 5 18 Fusiliers Marins of the 'Commando Hubert' – the combat dive unit of the French green-bereted Marine Commandos - based in Djibouti, were flown by a French airforce C-160 to an island near the Area of Operations (AO) and then transferred by boat to the FS COMMANDANT BOUAN in preparation for a possible rescue mission.

The pirates sailed *Le Ponant* more than 850kms south and anchored close to the shore off the Somali coastal town of Garacad, south of the Port of Eyl, on April 7. All the while

Le Ponant sailing close to the Somali coastline of Africa under the control of the 'Somali Marines'. Her Captain saw the pirates board his ship and had enough time to call the French command ship in the area to raise the alarm. (Marine Nationale)

being monitored by the FS COMMANDANT BOUAN and HMCS CHARLOTTETOWN, plus a French Atlantic 2 Maritime Patrol Aircraft (MPA)

On the night of April 7 the Fusiliers Marins of the 'Commando Hubert' conducted a night time underwater reconnaissance of the *Le Ponant* for a possible raid but found the current too strong. The large number of sharks was also a contributing factor in abandoning an underwater raid to free the hostages.

The same day the French Navy's Indian Ocean flagship FS VAR (similar to HMAS SUCCESS) sailed from Djibouti with Vice-Admiral Gerard Valin, embarked. The French have a significant military base in Djibouti.

Rear Admiral Giller, Commander-in-Chief of the French Fusiliers Marins and several of his staff were then parachuted in to join the VAR.

The French helicopter training ship FS JEANNE D'ARC was also diverted from her deployment with the cadets of the French Naval Academy and ordered to the area as she had helicopter and medical facilities. Importantly, two of her helicopters, the Gazelles, were equipped with the wire guided anti-tank missile HOT.

On April 8 another 10 commandos of the 'Commando Hubert' were air dropped to the FS VAR while 35 commandos belonging to the assault unit 'Commando Jaubert' (based in Lorient, France) embarked aboard the Cassard class (Type C 70) air defence destroyer FS JEAN BART and sailed from Djibouti at speed the next day.

Colonel Denis Favier, the director of the French national police force counterterrorism group (the Groupement d'Intervention de la Gendarmerie Nationale, or GIGN) also parachuted in to join the VAR, while 10 GIGN commandos had flown in from Paris to Djibouti on April 7. This brought the Special Forces contingent to 73 commandoes.

A news blackout was imposed as negotiations over a ransom got underway. On April 11 it was revealed the *Le Ponant*'s crew had been liberated after talks with representatives of the pirates. French military leaders, who were speaking in a press conference at the headquarters of the French presidency, the Elysées Palace, indicated that no state funds had been paid to the pirates and that the release was done without military intervention. However, spokesman did not rule out the ransom (said to be to USD$2 million) may have been paid by the *Le Ponant*'s owners, the the Compagnie Générale Maritime shipping group. The Fusiliers Marins took the freed hostages aboard the destroyer JEAN BART, and from there they were transferred to the JEANNE D'ARC for a medical check-up.

As soon as the hostages were safe the go-ahead to apprehend the pirates went into action.

The 12 pirates responsible for the capture of the ship had abandoned the luxury cruiser and went ashore. They made good their escape in several waiting 4x4 vehicles, but were unaware they were being tracked by the Atlantic 2 MPA. With the MPA in contact, and the authority to apprehend granted, a small helicopter air armada took off in hot pursuit. Two HOT anti-tank missile armed Gazelles and two Alouette III took off from the JEANNE D'ARC, plus a Panther helicopter from the destroyer JEAN BART.

Once overhead a French commando sniper from one of the Gazelle helicopters shot out one of the vehicle's engines with a .50-cal sniper rifle. The Panther from JEAN BART and two Alouette III helicopters from JEANNE D'ARC each landed three Fusiliers Marins from 'Commando Jaubert'. The nine commandoes then captured the six pirates with part of their 'loot' and flew them back to the JEANNE D'ARC.

However, the battle wasn't over. The HOT missile armed Gazelle helicopters continued to race across the Somali desert and fired their anti-tank missiles at two Jeeps in which some of the other pirates were using to flee. The jeeps were disabled (pulverised was the word used by the French media) but the fate of the pirates is unknown. A local Somali Official said that five 'local people' had died in the attack but the French military denied killing any 'innocent civilians' in the daylight raid.

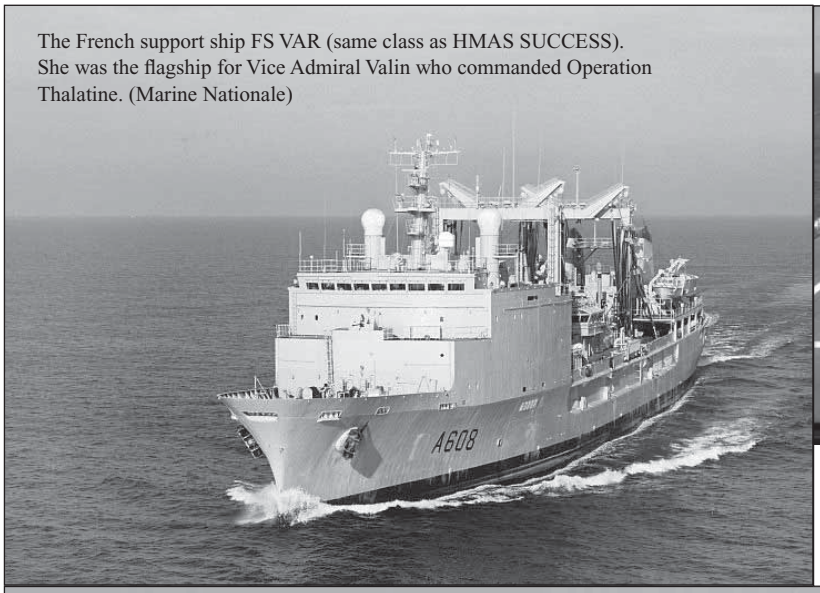
In the meantime, some of the crew of the *Le Ponant* had returned aboard the ship assisted by French Navy personal, and sailed her to Djibouti, which she reached on April 15.

French Foreign Affairs Minister Bernard Kouchner called for tougher UN action against maritime piracy. He is in favour of more United Nations' involvement in actions by the international community to combat piracy in the Gulf of Aden and off the Somali coast, but also in the Gulf of Guinea and (closer to Australia) in the Straits of Malacca. "The international community must mobilise for a determined fight against acts of piracy in the Gulf of Aden and off the Somali coast, because this is where this is one of the most notorious areas of piracy". He also stated that France will present new anti-piracy measures and press for a multinational anti-piracy force with other members of the UN Security Council. He also stressed that countries that have a problem with piracy need to open their seas to international naval patrols and that counties with strong navies like France and Britain, need to set up counter-piracy units.

(*) This article is an updated version of an article that appeared in the June 2008 edition of the UK based magazine WARSHIPS IFR and is reprinted with the kind permission of the Editor and Author.

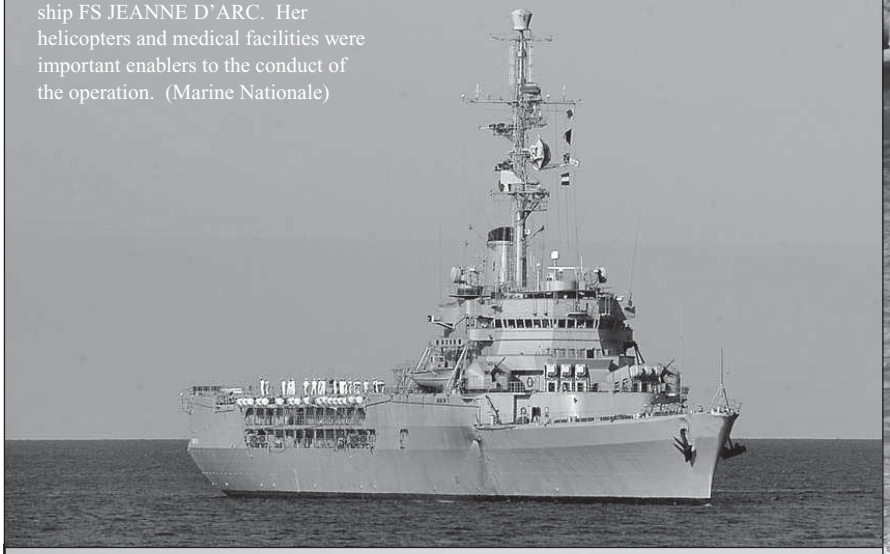
The RCN frigate HMCS CHARLOTTETOWN being moved away from a wharf. CHARLOTTETOWN's Sea King helicopter was able to do the first recognition/location of the *Le Ponant* and relay the images back to the two warships trailing her. (RCN)

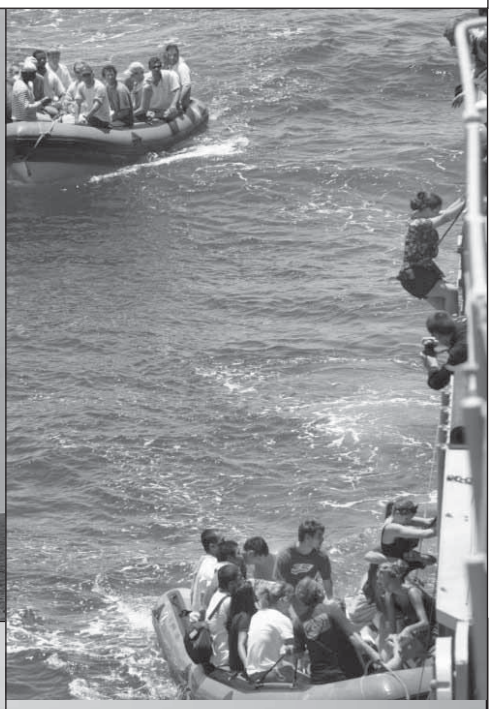
The French support ship FS VAR (same class as HMAS SUCCESS). She was the flagship for Vice Admiral Valin who commanded Operation Thalatine. (Marine Nationale)



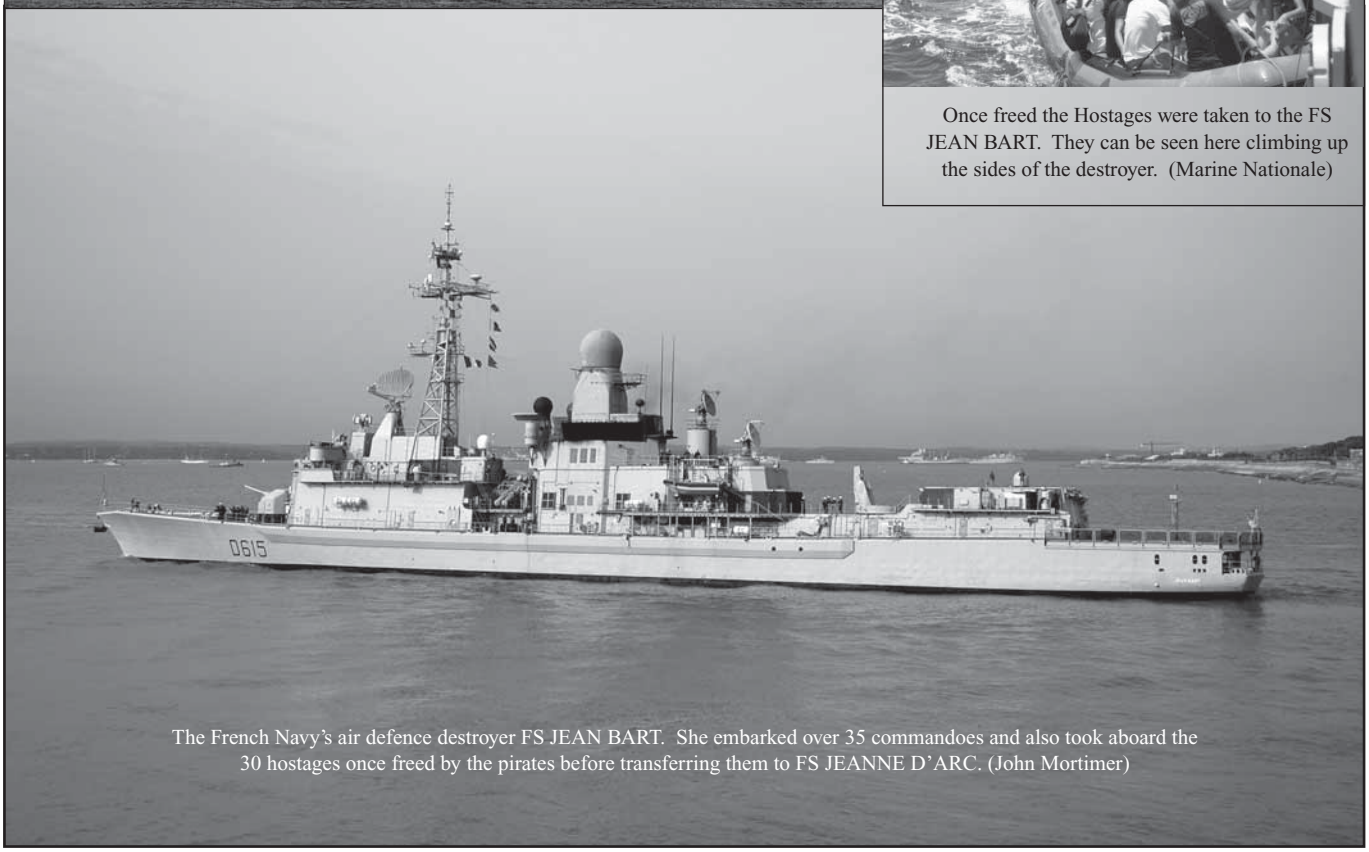
Helicopters of the FS JEANNE D'ARC stand ready to launch. From bottom to top, an Alouette III, a HOT armed Gazzelle, another Alouette III and another Gazzelle. (Marine Nationale)

The French Navy training/helicopter ship FS JEANNE D'ARC. Her helicopters and medical facilities were important enablers to the conduct of the operation. (Marine Nationale)





Once freed the Hostages were taken to the FS JEAN BART. They can be seen here climbing up the sides of the destroyer. (Marine Nationale)

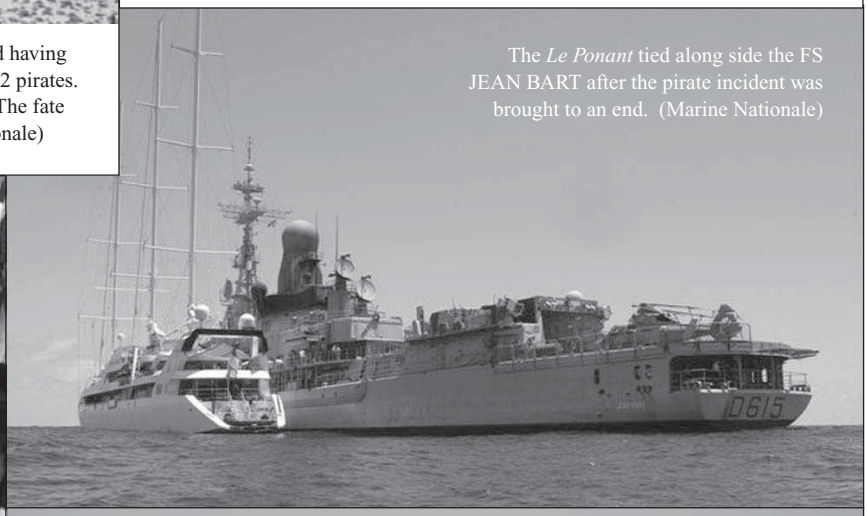


The French Navy's air defence destroyer FS JEAN BART. She embarked over 35 commandoes and also took aboard the 30 hostages once freed by the pirates before transferring them to FS JEANNE D'ARC. (John Mortimer)

In a scene reminiscent of the movie 'Apocalypse Now', helicopters of the French Forces speed across the desert. The only thing missing is Wagner's 'Ride of the Valkyries'and the French Commander claiming "Somali Pirates don't surf". (Marine Nationale)

The French Army HOT armed Gazelle helicopter about to go into action against the 'Somali Marines'. (Marine Nationale)

Two of the Special Forces' helicopters on the ground having landed up to nine commandoes to capture six of the 12 pirates. Their disabled vehicle can be seen off to the right. The fate of the other six remains unknown. (Marine Nationale)



The *Le Ponant* tied along side the FS JEAN BART after the pirate incident was brought to an end. (Marine Nationale)

One of the French commandoes that participated in the capture of six of the 12 pirates. All up, France had 73 Special Forces personnel deployed to ships in the operation to affect a rescue of *Le Ponant*'s crew and apprehend the pirates. (Marine Nationale)

A French Navy Atlantic 2 MPA. Although thinking they had escaped, an Atlantic was tracking the pirates across the Somali desert and was able to vector the Special Forces' helicopter attack force.

FLASH TRAFFIC

MU90 tested from RAN ship

The Defence Materiel Organisation (DMO) has successfully test fired the new MU90 Lightweight Anti-Submarine Warfare (ASW) Torpedo during last June from the Anzac class frigate HMAS TOOWOOMBA.

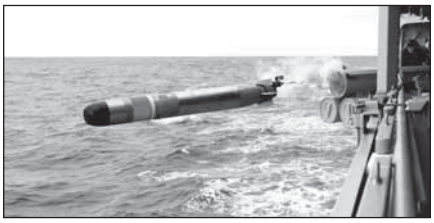
While the MU90 Lightweight Torpedo has been successfully tested in Europe, this Acceptance Test and Evaluation exercise represents the first time an MU90 Lightweight Torpedo has been fired from an Australian warship

The test firing from HMAS TOOWOOMBA at sea in the Western Australian Exercise Area approximately 30kms off Mandurah in Western Australia was a milestone for the project JP 2070, Project Djimindi – Replacement Lightweight ASW Torpedo.

The new MU90 Lightweight Torpedo will provide a significant upgrade to the ASW capabilities of the ADF given its high speed, shallow water capability and decoy recognition with re-attack capability. It will eventually be integrated onto the AP-3C Orion, FFGs, Anzacs and hopefully the SH-70 Seahawks.

The MU90 Lightweight Torpedo is being acquired in a three-phase programme worth $616 million at January 2008 prices. Defence selected the Eurotorp MU90/Impact torpedo in 1999 after a competitive tender.

The MU90 Lightweight ASW Torpedo is three metres long, weighs 300 kilograms, has a range of greater than 10 kilometres and is designed to track and attack quiet-running submarines in shallow water and at depths to more than 1,000 metres.



A test MU90 Torpedo being fired from the Anzac class frigate HMAS TOOWOOMBA during last June. When finally integrated into the ADF, the MU90 will provide a potent ASW weapon against submarines in shallow water. (RAN)

Mk-48 Mod 7 CBASS scores

On 24 July 2008 the crew of the submarine HMAS WALLER successfully fired a new Mk-48 heavyweight torpedo that was jointly developed by Australia and the US.

A retired Spruance class destroyer being lifted out of the water by a new Mk-48 Mod 7 exploding under the keel. (USN).

The firing occurred during the Rim of the Pacific 2008 (RIMPAC 08) exercise, involving multiple navies off the coast of Hawaii between June and July. The controlled exercise resulted in the sinking of a retired US Spruance class destroyer. Just as significant is the fact that the warshot torpedo was assembled in Australia.

HMAS WALLER is the first Collins class submarine to be fitted with the new Replacement Combat System and Heavyweight Torpedo and represents an important milestone in realising the full capability of the Collins class submarine

The Mk-48 Mod 7 Common Broadband Advanced Sonar System (CBASS) torpedo is the latest enhancement for the Mk-48. Considered the world's premier submarine-launched torpedo, the Mk-48 Mod 7 represents a superior capability against both surface ships and submarines with sonar enhancements that make the torpedo an effective weapon in shallow water and in a high countermeasure environment.

The development of the CBASS torpedo has been achieved under an Armaments Cooperative Programme between the USN and the RAN. This partnership has established common requirements, interfaces, configurations and maintenance standards enabling any Australian or US submarine to load torpedoes prepared by any Australian or US torpedo maintenance facility.

This submarine partnership has also led to co-development of a new replacement combat system for the Collins class, which is being progressively integrated into USN nuclear submarines.

This successful live fire exercise underscores the maturity of the joint torpedo and submarine combat system programs for the RAN and USN.

New sonar for Hobart class AWDs

Ultra Electronics has been selected as the preferred supplier of the sonar system for RAN's AWDs. Ultra is currently supplying ASW sonars for the RN's new Type 45 destroyer.

Following a rigorous tender process, the Minister for Defence was advised by the CEO of the DMO, Dr Stephen Gumley and the Chief of the Capability Development Group, Vice Admiral Matt Tripovich, that the selection of Ultra Electronics will ensure the AWDs are equipped with a sonar system that provides excellent ASW and torpedo defence capability.

Ultra Electronics has committed to undertake more than 50 per cent of its AWD sonar systems work in Australia, which represents a great result for Australian Industry.

The AWD Alliance will shortly be issuing Requests for Tender to selected companies for work on the ships' hull blocks, as well as work on other elements of the ships' combat systems.

The AWD Alliance includes DMO, Raytheon Australia and the Australian Submarine Corporation.

Iran issues veiled threat to Persian Gulf naval forces

The Commander of the Islamic Republic Navy (Iran) General Habibollah Sattari said on 13 August that Iran's naval forces are "fully prepared to safeguard the entire Persian Gulf more powerfully than ever".

"The forces, serving under the command of the Commander-in-Chief of Armed

Forces, will protect the country's land and sea borders with full strength and power," said Sattari in an interview with reporters on the sidelines of his visit to a naval base in the provincial city of Sirjan.
Sattari said that faith, unity and integrity between armed forces and Commander-in-Chief of the Armed Forces have now guaranteed the strength of the Islamic establishment and progress of the armed forces.
He said that naval forces are now in control and are closely watching all movements in the region. His comments came after Israel launched an air strike exercise aimed at Iran's nuclear facilities (see FROM THE CROW'S NEST on page 2 in this edition).

RNZN Maverick capable

Two air-to-surface live missile firings were successfully conducted on 5 Sept in a joint exercise involving New Zealand's Navy and Air Force. In a joint operation utilising the RNZN Frigate TE KAHA, Naval Seasprite Helicopters from 6 Squadron and an Air Force P3 Orion, two AGM-65 Maverick air-to-surface missiles were test fired.
Maritime Component Commander, Commodore Tony Parr said that in a first, the Mavericks were fired from Naval Seasprite Helicopters against two targets at sea east of Great Barrier Island.
"This is an important demonstration of the Seasprite and Maverick missile capability. It is also a very good example of sailors and airmen working together to bring to bear that capability," he says.
"The activity involved a 'start to finish' validation of current Royal New Zealand Navy and Royal New Zealand Air Force standing operating procedures, orders and instructions, and to verify the Seasprite as a firing platform for the Maverick missile."
The 'Maverick' missile was introduced to service seven years ago by the New Zealand Defence Force but this was the first live-firing from a SH-2G (NZ) Seasprite, against either maritime or land targets.

HMNZS CANTERBURY confined to home waters

The RNZN's newest ship has been confined to New Zealand waters while the navy and the ship's major contractor try to solve a problem with its inflatable boats.
The multi-role ship HMNZS CANTERBURY was to have spent a short time in the South Pacific for training but that voyage was cancelled for remedial work, including difficulties with the ship's rigid hull inflatable boats (RHIBs).

HMNZS CANTERBURY at the Tenix dock in Melbourne. The 'offending' RHIB alcove can been seen below the aft flight deck on the side of the hull. (Kevin Dunn)

The boats are stored in alcoves on either side of the ship but shortly after Canterbury arrived in New Zealand from Australia on her delivery voyage from the manufacturers, Tenix, one of the RHIBs was swept out of its alcove by a large sea in the Bay if Plenty.
It was found several days later on Great Barrier Island, damaged beyond repair. The second RHIB was also badly damaged.
Despite the alcoves being about three meters above the waterline the RNZN has stated the RHIBs' positioning is safe.
The RNZN and Tenix are now looking at doors on the alcoves to protect the RHIBs in heavy seas.
The RNZN was to get seven new ships under the $500m programme, including CANTERBURY, two offshore patrol vessels (OPVs) and four inshore patrol craft (IPCs).
Both the OPVs and IPVs have failed to gain Lloyds' certificates because they were unable to achieve minimum safety standards.

South Korea launches another Type-214

On 4 June South Korea launched a third Type-214 class submarine, to be commissioned by the end of next year, bringing her total number of submarines to 12.
The latest submarine, named AHN JUNG-GEUN after the late independence fighter under Japan's colonial rule of Korea in the early 20th century, was officially launched in a ceremony at the dockyard of Hyundai Heavy Industries in the south eastern city of Ulsan.
The 1,800-ton submarine will be commissioned and deployed late next year, along with two other 214-class submarines that were launched in 2006 and 2007.
Seoul plans to build three more 214-class submarines in the next 10 years.
The new 214-class submarine is equipped with an air-independent propulsion (AIP) system.

The Type-214 class AIP Submarine AHN JUNG-GEUN just before launch. (ROKN)

ASTER 30 on target

The European PAAMS air defence system (Principal Anti-Air Missile System) achieved a direct hit on a Mirach target which was simulating an aircraft travelling at 450 mph and at a 10km altitude. The missile itself accelerated to Mach 4 off the French coast on 4 June 2008.
The system has been designed for the new RN Type 45 destroyer to defend a fleet against anti-ship missiles

An Aster 30 missile accelerating upwards to a speed of Mach 4 before intercepting its target. (MBDA)

approaching from any direction and at supersonic speeds.
PAAMS is a maritime area air defence system composed of the Sampson active phased array radar, a Combat Management System, long range 3D radar, the Sylver missile launching system and Aster 15 and Aster 30 missiles.
The Aster missiles are highly agile, using an innovative system called 'Pif Paf' which combines conventional aerodynamic control with a novel lateral thrust system. The missile used in this test was a two-stage Aster 30. The Aster missiles also offer a fire and forget mode which allows the ship to engage many targets simultaneously.
Integral to PAAMS is the Sampson Multi-Function Radar which tracks targets and directs missiles towards them.
The trials were conducted from a 12,000 tonne converted barge which carried a full replica of the air defence equipment the new Type 45 destroyers will carry, including long range and missile directing radars, a combat control centre and missiles in their vertical launcher silos.

£300m for Seawolf support

Support for the Seawolf air defence missile system, which equips RN's Type 22 and Type 23 frigates and a number of others in navies around the world, is to be radically revamped under contracts worth around £300M.
Contracts have been awarded to BAE Systems Insyte and MBDA, under the SWISS (Seawolf In Service Support) project to sustain the capability of the Seawolf system and ensure its readiness and improve its availability to the front-line fleet by at least 25% over the next nine years.
BAE Systems Insyte and MBDA have been working together, and with the MOD, over the past two years to develop the optimum Seawolf support solution.

STOVL JSF flies

The successful first flight of the supersonic F-35B STOVL (Short Take Off and Vertical Landing) JSF took place on 11 June at Lockheed Martin's Texas plant.
The F-35B made a conventional take-off and landing, and climbed to 15,000 feet for a series of handling, engine and other systems checks. It landed successfully after 46 minutes in the air.
Air Commodore Mark Green, UK MoD Joint Combat Aircraft (JCA) team leader said "This is a great achievement by Lockheed Martin, Northrop Grumman and BAE Systems and they should be congratulated for their endeavours."
The UK MoD is a partner in the JSF programme and is investing £1.8Bn developing the STOVL version of the fighter.
A British pilot, BAE Systems employee and former RAF Harrier pilot, Graham Tomlinson, flew the F-35B.
The JSF (Joint Strike Fighter) will fulfil the UK MoD's Joint Combat Aircraft requirement and fly off the two new RN Queen Elizabeth class aircraft carriers.

The first production F-35B STOVL JSF making a conventional landing after a successful 46 minute test flight. (Lockheed Martin)

Two RN Type 45 destroyers cancelled

UK Armed Forces Minister Bob Ainsworth has announced a reduction in the number of Type 45 destroyers for the RN from eight to six.
The Minister said "We are bringing forward the replacement programme for our Type 22 and 23 frigates. Combined with the current work on the six Type 45 destroyers and the future carrier programme, this means the industrial tempo in our shipyards will remain steady. The six destroyers already on contract will be formidable warships and far more capable than first envisaged. With their advanced technology they will play a key part in the future force protection package for high value ships."

Dasvidanya PAPA

The legendary Russian K-222 nuclear powered cruise missile submarine, known as the Papa class by NATO, is being scrapped. Dubbed 'Golden Fish' by Russian sailors because of the colour of its titanium alloy hull, it was claimed to have been the world's fastest underwater vessel for almost 40 years.
Commissioned in December 1969, the K-222 could travel at 44.7 knots. Armed with 10 SS-N-9 'Siren' long range anti-ship cruise missiles, it was designed to attack aircraft carrier battlegroups.
However, the record speed came at a cost. Running at full speed, the 'Golden Fish' was very noisy and the crew found the vibrations uncomfortable.
It was also far from cheap – some said the nickname referred to the huge cost of the submarine. It's no surprise that only

The Russian K-222 nuclear powered cruise missile submarine, known as the PAPA class by NATO, seen here on the surface during the Cold War days. (RAF)

one vessel of this type was ever built.
K-222 is being dismantled in the northern naval port of Severodvinsk at the only Russian factory capable of cutting its titanium hull.
To mark the significance of the vessel, veterans have proposed transforming its control cabin into a monument.

Russian Navy back

The large and imposing Slava-class missile cruiser MARSHAL USTINOV. The MARSHAL USTINOV is currently on patrol in the Artic establishing Russia's new military presence.

The Russian Navy has resumed a military presence around the Arctic Ocean archipelago of Spitsbergen, which belongs to Norway, which it previously patrolled during the Cold War.
"Russia's fleet has resumed a warship presence in the Arctic, including in the area of Spitsbergen," a statement from the Russian Government said.
Russia does not recognize Norway's exclusive right to the 200-mile economic zone near Spitsbergen.
The statement also said, "the large ASW ship, SEVEROMORSK, has already entered the area to fulfil its tasks."
It was joined in July by the MARSHAL USTINOV, a Russian Slava-class missile cruiser.
According to the 1982 United Nations Convention on the Law of the Sea, an exclusive economic zone extends for 200 nautical miles (370 km) beyond the baselines of a country's territorial sea.
A coastal nation has control of all economic resources within its exclusive economic zone, including fishing, mining and oil exploration.
Russia's intentions are at this stage unknown, however, they seem to be doing everything in their power to reintroduce another Cold War.

SINDHUVIJAY sails back to India

The Indian Navy Kilo class submarine INS SINDHUVIJAY has departed Russia after an extensive overhaul at a shipyard in northern Russia. The Project 877EKM Kilo-class submarine had been undergoing a refit at the Zvezdochka shipyard in Severodvinsk since 2005.
The SINDHUVIJAY was built in October 1990 at a shipyard in St. Petersburg. In March 1991 it joined the Indian Navy and remained in service until 2005. On June 3, 2005 the submarine docked in Russia for repairs and upgrades.
The overhaul was delayed for six months due to the unacceptable performance of its new SS-N-27 Club-S cruise missiles. In six consecutive pre-delivery test firings in late 2007, the Club missiles failed to find their targets and India refused to accept the delivery until the problems had been resolved.
The Club-S subsonic cruise missile is designed for launch from a 533 mm torpedo tube, or a vertical launch tube. It has a range of 160 nautical miles (about 220 km). It uses an ARGS-54 active radar seeker, a Glonass satellite positioning system and inertial guidance.
New trials were successfully completed in mid-July. The upgrade programme also involved a complete overhaul of the submarine, including its hull structure, as well as improved control systems, sonar, electronic warfare systems, and an integrated weapon control system. The upgrades reportedly cost about USD$80 million.
SINDHUVIJAY is the fourth Indian Navy submarine to have been refitted at the Zvyozdochka shipyard.
Russia's Kilo-class diesel-electric submarines have gained a reputation as extremely quiet boats, and have been purchased by China, India, Iran, Poland, Romania and Algeria.

Turkish Navy to receive more FFGs

The United States is preparing to transfer another two decommissioned Oliver Hazard Perry-class guided missile frigates to the Turkish Navy.
The US Congress recently approved the transfer and President George W. Bush has signed it.
One of the frigates will be granted and the other will be sold, one US official said.
At the end of the ongoing final technical notification talks, the two sides are due to decide on the degree of maintenance and repair work the two ships will undergo in the United States and about the time of delivery, the official said. Turkey should pay for repair and maintenance expenses at US shipyards.
Both frigates, decommissioned from the US Navy in past years, are valued at around $125 million, one US source said.
Turkey's Navy has already been operating eight other Perry-class frigates granted earlier by the United States.

SM-6 successful

The USN successfully conducted the first test of the Standard Missile 6 extended range anti-air warfare missile produced by US company Raytheon.
The missile, launched from the USN's Desert Ship at the White Sands Missile Range, successfully intercepted a BQM-74 aerial drone using the newly developed SM-6 fire and forget active seeker. The active seeker autonomously acquired and engaged the target using the USN's legacy command system to get the missile in the right area for its own processes to take over resulting in a direct hit. This launch demonstrates the first successful integration of the USN's active missile technology into the AEGIS weapon system to provide for both near-term advanced anti-air warfare and future over-the-horizon capability.

SM-6 is being developed by Raytheon to meet the USN's requirement for an extended range anti-air warfare missile. Expected to deploy in 2011, it provides capability against fixed and rotary wing aircraft and unmanned aerial vehicles and delivers a transformational over-the-horizon counter to the ever-evolving cruise missile threat. Employing the Standard Missile-2 Block IVA airframe and the newly developed active radar, SM-6 will be able to autonomously destroy aircraft over the horizon and outside of the launching ships own sensors.

USS AMERICA named

Despite conventional wisdom saying 'don't name ships after the country' the USN's newest class of large-deck amphibious assault ship, LHA-6, will bear the name USS AMERICA, Secretary of the US Navy Donald C. Winter announced while speaking at the USS AMERICA Carrier Veterans Association reunion in Jacksonville, Fla last June.

This ship will inherit a proud tradition, explained Winter. From the American Revolution through the first Gulf War, three warships have sailed with the name America.

"To serve in a ship named after our country adds to the pride one feels in being part of the Navy, and adds to the feeling that when AMERICA pulls into port, there is no more powerful symbol of the power, the ideals, and the greatness of the United States of America," said Winter.

LHA-6 will be the fourth USN ship to bear the name AMERICA. The first AMERICA, a 74-gun ship-of-the-line, was the first built for use by the Continental Navy. However, before having a chance to serve the fledgling USN, the ship was presented as a gift to the king of France to show appreciation for his country's service to the new nation. The second USS AMERICA (ID-3006) was later the name given to a troop transport used during World War I. The third was a Kitty-Hawk class aircraft carrier (CV-66) in commission from 1965 to 1996. Among other notable accomplishments, the carrier AMERICA made three deployments to Vietnam and launched air strikes on Iraq during the opening days of Operation Desert Storm.

LHA-6 will replace the aging Tarawa-class and represents a conscious decision to increase the aviation capacity of future big deck amphibious ships in order to maximize the Navy's investment in future aircraft.

LHA-6 will have an extended hangar deck with two higher hangar bay areas, each fitted with an overhead crane for aircraft maintenance. LHA-6 will also provide increased aviation fuel capacity, stowage for aviation parts and support equipment. LHA-6 will be able to embark and launch the MV-22 Osprey tilt-rotor aircraft, cargo and attack helicopters, the AV-8B Harrier and the short take-off vertical landing (STOVL) variant F-35B Lightning II Strike Fighter.

AMERICA is currently under contract at Northrop Grumman Shipbuilding in Pascagoula, Miss., and is expected to be delivered to the Navy in 2012.

1,000th Tomahawk delivered to USN

US Company Raytheon has achieved a significant production milestone with the delivery of the 1,000th Tomahawk Block IV cruise missile to the USN.

"Tomahawk Block IV provides the Navy with an array of enhanced capabilities to support land-based operations in the global war on terror and across the spectrum of warfare," said Capt. Rick McQueen, the USN's programme manager for the Tomahawk weapon system. "The Navy's receipt of this 1,000th Tomahawk Block IV builds on a legacy of providing the commander with a powerful weapon to shape the battlespace."

Tomahawk Block IV's provides an expanded array of operational capabilities while significantly reducing acquisition, operations and support costs. Tomahawk Block IV employs a two-way satellite data link that enables a strike controller to flex the missile in flight to preprogrammed alternate targets or redirect it to a new target. This targeting flexibility includes the capability to loiter over the battlefield and await a more critical target.

USCGC BERTHOLF (WMSL-750) commissioned

On August 4 the Northrop Grumman Corporation-built National Security Cutter USCGC BERTHOLF was commissioned on the US Coast Guard's birthday, becoming the service's most capable and technologically-advanced maritime asset in its 218-year existence. BERTHOLF is the flagship of the fleet-the largest and most technically advanced class of cutter the Coast Guard has ever known.

In partnership with the US Coast Guard, Northrop Grumman and Lockheed Martin, the joint venture partners of Integrated Coast Guard Systems, have been working side-by-side to design a ship that is not only capable and flexible, but also an economical and enduring platform.

"We are in an era of a persistent conflict, with hazards and threats to be dealt with," said US Coast Guard commandant Adm. Thad Allen. "This ship represents a remarkable step forward, not only in capability and capacity, but also in the competency of this crew. Today, the crew will bring this ship to life and Bertholf will be up to the challenges of the 21st century."

BERTHOLF is named to honour Commodore Ellsworth P. Bertholf,

The new USCG Cutter BERTHOLF on sea trials. (USCG)

the first commandant of the US Coast Guard. The ship is 418 feet long, with a 54-foot beam. Powered by a twin-screw combined diesel and gas turbine power propulsion plant, the NSC is designed to travel at maximum speed of 28 knots.

First Littoral Combat Ship underway

The USN's first Littoral Combat Ship, FREEDOM (LCS-1), put to sea during July for the first time, marking the beginning of Builder's Sea Trials for the first-in-class coastal surface combatant.

The agile 378-foot FREEDOM, designed and built by a Lockheed Martin-led industry team, is conducting Builder's Sea Trials in Lake Michigan. The trials - which are a coordinated effort between the US Navy and the Lockheed Martin team - will include operational testing of the vessel's propulsion, communications, navigation and mission systems, as well as all related support systems.

"FREEDOM is now under way. Our team is looking forward to this trials period to demonstrate all the capabilities our unique design for LCS will bring to the Navy," said Joe North, director for Lockheed Martin's Littoral Combat Ship programme." Following the completion of Builder's Sea Trials, FREEDOM will return to Marinette Marine to prepare for Acceptance Trials that will be conducted by the USN's Board of Inspection and Survey. LCS-1 will be delivered to the USN later this year and home ported inSan Diego, CA.

Growler 'packing heat'

The EA-18G Growler Test Team have conducted its first AIM-120 Advanced Medium Range Air-To-Air Missile (AMRAAM) live fire on July 23, marking another critical milestone for the Growler test programme.

The EA-18G is an electronic attack variant of the F/A-18F Super Hornet, on order for the USN and RAAF, and undergoing developmental test as an eventual replacement for the EA-6B Prowler. In addition to being the first AIM-120 firing, this event marked the first release of any ordnance off the versatile platform. As part of the integrated test and evaluation of the aircraft, the Growler test team comprised of both developmental and operational testers executed a successful shot, demonstrating a lethal, self-contained air-to-air capability that the electronic attack community has previously relied on other aircraft to provide.

SM-2 provides TBM terminal capability

Two Raytheon built Standard Missile-2 Block IV missiles successfully intercepted and destroyed a short-range ballistic missile target above the Pacific Ocean on June 5. The successful engagement demonstrated a near- term, sea-based capability for stopping threat ballistic missiles in their terminal or final phase of flight.

The short-range ballistic missile target was launched from the Mobile Launch Platform operating off the coast of Kauai on the Pacific Missile Range Facility while the crew of the guided missile cruiser USS LAKE ERIE (CG-70) fired the modified SM-2 Block IV surface-to-air missiles.

"This intercept is a major step toward deploying a viable sea-based capability to stop threat ballistic missiles in the final moments before they strike," said Frank Wyatt, Raytheon Missile Systems vice president of Naval Weapon Systems. "SM-2 Block IV can destroy incoming missiles through either direct impact or by exploding close to the target."

This was the second test of a modified SM-2 Block IV and the first to use an

The USN's first Littoral Combat Ship, FREEDOM (LCS-1), on Builder's Sea Trials on Lake Michigan. (USN)

operational version of the Aegis Ballistic Missile Defence combat system that includes the terminal BMD mission capability.

Raytheon also produces Standard Missile-3 designed to defend against short-to-intermediate range ballistic missile threats in the midcourse phase of flight as well as the Exoatmospheric Kill Vehicle, a key element of the US Army's Ground-based Midcourse Defence programme.

DD-21 cancelled at three ships

At a July 31, 2008, hearing before the Seapower and Expeditionary Forces subcommittee of the US House Armed Services Committee, USN officials announced a major change in the service's position on what kind of destroyers it wants to procure over the next several years.

The USN officials testified that the service no longer wants to procure additional Zumwalt (DDG-1000) class destroyers, and instead now wants to restart procurement of Arleigh Burke (DDG-51) destroyers.

Prior to changing its position, the USN had wanted to continue procuring DDG-1000s, and did not want to procure any more DDG-51s. USN plans had called for procuring a total of seven DDG-1000s. The first two were procured in FY2007, and the Navy's proposed FY2009 budget, submitted to Congress in February 2008, requested funding for a third.

The three DDG-51s procured in FY2005 were to have been the final ships in the DDG-51 programme, and Navy budgets since FY2006 have included funding for closing out the DDG-51 programme.

Until the July 31 hearing, the USN for several years had stressed the need for procuring additional DDG-1000s, defended the DDG-1000 programme against various criticisms, and rejected proposals for stopping DDG-1000 procurement and for resuming procurement of DDG-51s.

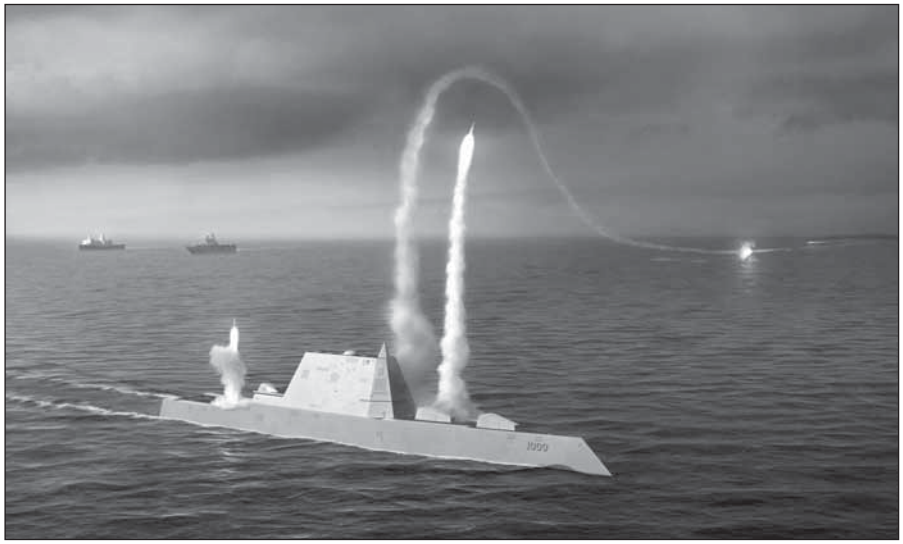
Although the USN's proposed budget requests funding for procuring a third DDG-1000, Navy officials suggested at the July 31 hearing that they would now prefer Congress to instead fund the procurement of a DDG-51 in FY2009.

The USN initiated the DDG-1000 programme in the early 1990s under the name DD-21, which meant destroyer for the 21st Century. In November 2001, the programme was restructured and renamed the DD(X) programme, meaning a destroyer whose design was in development. In April 2006, the programme's name was changed again, to DDG-1000, meaning a guided missile destroyer with the hull number 1000. The first DDG-1000 is to be named the Zumwalt, so the programme is also referred to as the Zumwalt-class programme.

The DDG-1000 is a multimission destroyer with an emphasis on naval surface fire support (NSFS) and littoral (i.e. near-shore) operations. The DDG-1000 was intended in part to replace, in a technologically more modern form, the large-calibre naval gun fire capability that the USN lost when it retired its Iowa-class battleships in the early 1990s. The DDG-1000 was also intended to improve the USN's general capabilities for operating in defended littoral waters, to introduce several new technologies that would be available for use on future Navy ships, and to serve as the basis for the Navy's planned next-generation cruiser, called the CG(X).

The DDG-1000 is to have a reduced-size crew (compared with the Navy's current destroyers and cruisers) of 142 sailors so as reduce its operating and support costs. The ship is to incorporate a significant number of new technologies, including a wave-piercing, tumblehome hull design for reduced detectability, a superstructure made partly of large sections of composite materials rather than steel or aluminium, an integrated electric-drive propulsion system, a total-ship computing system for moving information about the ship, automation technologies for the reduced-sized crew, a dual-band radar, a new kind of vertical launch system (VLS) for storing and firing missiles, and two 155mm guns called the Advanced Gun System (AGS). The AGS is to fire a new rocket-assisted 155mm shell, called the Long Range Land Attack Projectile (LRLAP), to ranges of more than 60 nautical miles. The DDG-1000 can carry 600 LRLAP rounds (300 for each gun), and additional rounds can be brought aboard the ship while the guns are firing, creating what Navy officials call an "infinite magazine."

With an estimated full load displacement of 14,987 tons, the DDG-1000 design is roughly 55% larger than the USN's current 9,500-ton Aegis cruisers and destroyers, and larger than any Navy destroyer or cruiser since the nuclear-powered cruiser LONG BEACH (CGN-9), which was procured in FY1957.



A computer generated image of the DD-21 destroyer. The USN will now settle on only three of the new revolutionary destroyers. (USN)

Kaman doing hard sell of ex-RAN Super Seasprite

Kaman Helicopters has displayed an ex-RAN SH-2G(I) Super Seasprite helicopter for the first time at the Black Sea Defence & Aerospace Exposition on Sept. 24-26 in Bucharest, Romania. Company officials and suppliers were in attendance to brief potential customers and the news media about the helicopter and its capabilities. The aircraft is one of 11 multi-mission maritime helicopters now available for immediate delivery given the Australian Government cancelled the nearly complete project.

Kaman is offering the helicopters with a three-year spares package, full crew and maintenance manuals, a validated training programme, ground-based simulators, including desktop trainers, and a full motion flight simulator, software support centre, and mission preparation and debrief facility.

"These are fully-capable multi-mission aircraft," said Kaman Helicopters President Sal Bordonaro. "We are proud to be able to offer them to the international naval community."

The US Delegation to NATO recently sponsored an initiative for the Baltic and Black Sea states to consider the SH-2G(I) for regional modernisation, standardisation and interoperability for joint exercises. This is one of several reasons Kaman is kicking off its marketing effort in Bucharest.

Observations

By Geoffrey Evans

No Need for Hysteria

This writer has often wondered why, whenever the words "aircraft carrier" are mentioned in connection with the RAN, many commentators immediately express dismay, even outrage, to be followed by official denials that any such acquisition is contemplated. Why should any suggestion or proposal for an Australian aircraft carrier cause such consternation? There seems no logical reason.

Ever since man took to the air in his flying machine the implications for earth-bound mortals were recognised, slowly at first and accelerated in time of war. The potential effect of aircraft on navies was undoubtedly appreciated by Captain J S Dumaresq who in May 1916 when in command of HMAS SYDNEY and a small force operating in the North Sea, fought a duel with a Zeppelin attempting to bomb his ships, the duel ending when the Zeppelin had dropped all its bombs and SYDNEY had run out of anti-aircraft ammunition.

John Saumarez Dumaresq, born in Sydney in 1873, was a Royal Navy officer who after leaving HMAS SYDNEY went on to command the Australian Squadron with the rank of Commodore and subsequently as a Rear Admiral, the first Australian-born officer to hold this important appointment; due to his persistence and efforts, in 1917 SYDNEY was fitted with a revolving aircraft launching platform, the first in a warship, to be followed by a similar installation in HMAS MELBOURNE. In the same year sister cruiser BRISBANE operated a small seaplane lowered to and recovered from the water by crane when in use, while the battle cruiser HMAS AUSTRALIA was fitted with a specially constructed platform enabling the ship to launch aircraft

There is nothing to suggest to the writer that between the two World Wars the RAN lost sight of or neglected the importance of naval aviation: On the contrary, as early as 1925 the government decided to obtain a suitable ship to enable the RAN to gain aviation experience, resulting in HMAS ALBATROSS entering service in 1928. Built at Sydney's Cockatoo Island Dockyard ALBATROSS was small by later-day standards, lacked a flight deck and carried six seaplanes that were hoisted in and out of the ship when operational – Australia's first aircraft carrier! (ALBATROSS was transferred to the RN in 1938 as part payment for the cruiser HOBART and served as a Fleet Repair tender during World War II).

The RAN's relationship -to the Royal Navy enabled Australia to keep abreast of developments in the parent navy and the navies of the United States and Japan throughout the twenties and thirties, a period during which the purpose-built carrier able to operate a variety of aircraft types emerged. Also at this time the five cruisers acquired from Britain by the RAN between 1928 and 1939 all carried catapult launched amphibious aircraft.

World War II provided proof of the vital importance of aircraft carriers, several hundreds of which were in service when the war ended; RAN ships operated with British and American carriers, large and small during those years and the lessons learned were not wasted: In 1947 the RAN was authorised "to implement the first stage of a naval aviation plan" and the training of personnel and preparations for what became the Fleet Air Arm commenced.

In 1949 the light fleet carrier HMAS SYDNEY arrived in Australia followed in 1956 by her greatly improved sister carrier HMAS MELBOURNE (the RN loaned the carrier HMS VENGEANCE during the intervening period) and the two ships, operating a variety of aircraft from their flight decks, kept Australia in the forefront of naval aviation developments.

It is perhaps worth mentioning a vexatious issue for the Royal Navy, not settled until the outbreak of World War II, concerned the manning etc and control of the naval air arm. Eventually settled in the navy's favour when the Government decided the RN rather than the RAF should be the responsible Service, the issue was never really a problem in Australia: Before and during World War II the amphibians carried in the cruisers (including the Armed Merchant Cruiser MANOORA) were flown and maintained by Air Force personnel, while by Government decree the Fleet Air Arm was an RAN responsibility from the start.

As MELBOURNE approached the end of her working life, prolonged and at times acrimonious debate concerning a replacement carrier ensued in the course of which the British Government offered the Royal Navy carrier INVINCIBLE: The offer was accepted by the Australian Government but before delivery could be effected the ship was "offered back" to Britain to take part in the Falklands War if required. In the event, an election took place in Australia and the new Government decided to not replace MELBOURNE, bringing the RAN' s conventional aircraft carrier era to a close in 1983.

Loss of the RAN's ability to operate fixed-wing aircraft from seagoing platforms resulted in the ubiquitous helicopter becoming the mainstay of the Fleet Air Arm: Today all but the smallest naval ships are able to operate helicopters for a variety of tasks, ranging from submarine detection to humanitarian relief. The navy's aviation expertise is an important Australian defence asset and as new sea-platforms become available the RAN can be expected to explore ways of using them:

Not to do so would be unwise.

Defence White Paper

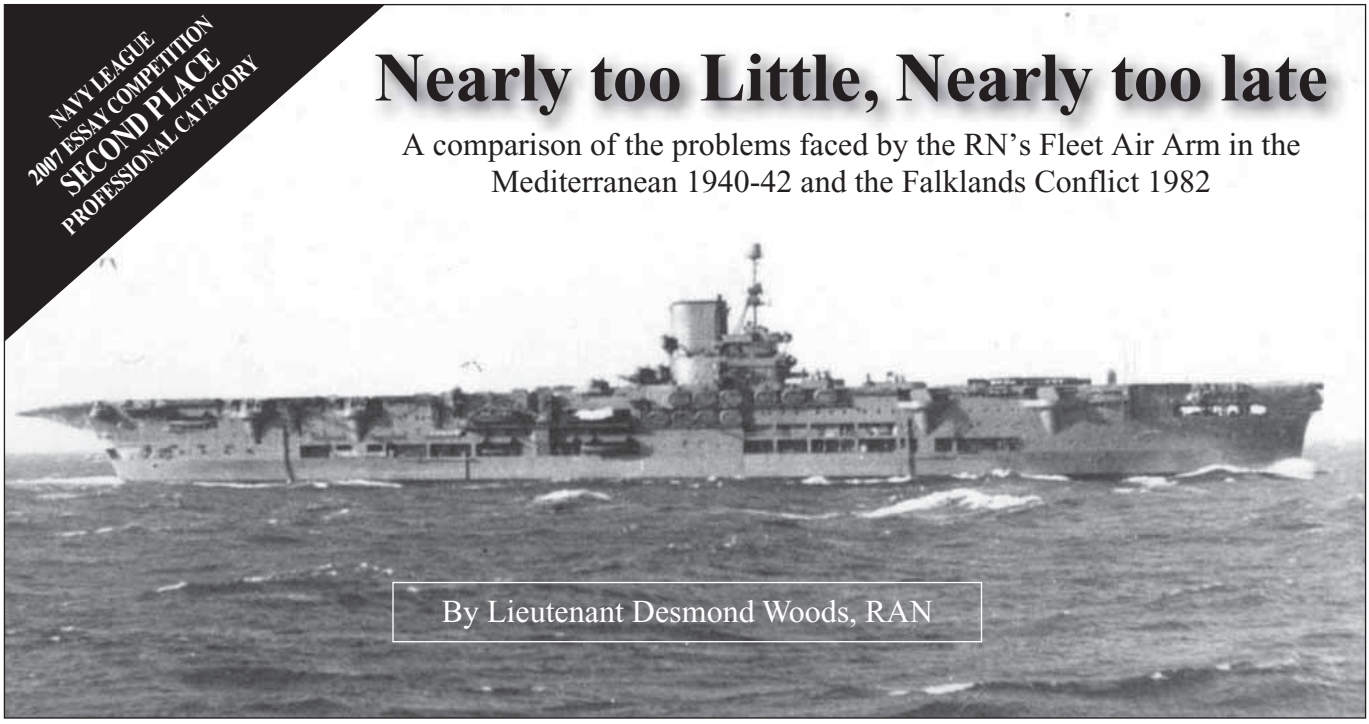
In the course of preparing for the Government's Defence White Paper the Defence Department issued a highly detailed document entitled "Key Questions for Defence in the 21st Century - A Defence Policy Discussion Paper". The Paper, some 60 A.4-size pages including numerous illustrations, among other things canvasses all the possible disasters that could take place in the coming years.

'*Observations*' on a number of occasions has offered the opinion that defence planners face a near-impossible task in an age when mankind has the ability to self-destruct. If the present Government can produce a solution to the world's problems and ensure national security and well-being in a variety of circumstances without bankrupting the country, it will be a remarkable feat.

NAVY LEAGUE
2007 ESSAY COMPETITION
SECOND PLACE
PROFESSIONAL CATAGORY

Nearly too Little, Nearly too late

A comparison of the problems faced by the RN's Fleet Air Arm in the Mediterranean 1940-42 and the Falklands Conflict 1982



By Lieutenant Desmond Woods, RAN

HMS ARK ROYAL. With ARK ROYAL's sinking and ILLUSTRIOUS's departure for extensive repairs, Somerville's Force H in Gibraltar ceased to be a strike force. A case of too little.

The RN Fleet Air Arm (FAA) has had a disappointing history of just scraping through in the many conflicts it has fought in. This has been due to a misunderstanding of the applicability of naval air at sea by the powers that be in Whitehall. Desmond Woods, in this his 2nd place Navy League of Australia Professional Essay Competition entry, examines the RN FAA over two conflicts and uncovers some remarkable similarities. Who said history never repeats?

Royal Navy aviation suffered severely in the inter war period from the fact that Britain's airman were not sea-minded and Britain's seaman did not choose their own aircraft. This situation can be largely accounted for by the fact that after the demise of the RN Air Service following WW I, aircraft embarked in ships had two fathers. The Admiralty had operational control and the Air Ministry administrative management. This decision, in retrospect, was an error of judgement which resulted in naval aviation being an under-resourced orphan during the years when it should have been gaining strength from every technical advance and new design for maritime aircraft available.

Senior RAF officers were aware of the need for carrier embarked aircraft but saw them as fulfilling minor secondary reconnaissance roles. They assumed that they would operate without threat from enemy aircraft and would not, therefore, need to be high performance aircraft. Some senior naval officers remained convinced that carrier borne aircraft would be useful as the 'eyes of the fleet' and to deter an enemy battle fleet but that the battleship was, and would remain, the only true capital ship. The saying was that only battleships 'did it at night and in bad weather.' This dated approach became increasingly inaccurate as the USN and the IJN in the 1930's brought naval aviation to new heights of efficiency and striking power.

The Air Ministry remained responsible for the selection and provision of the Fleet Air Arm's (FAA) aircraft till August 1939. Admiral Andrew Cunningham described this as the period of, " trials and perplexities for the Fleet Air Arm when working under the control of the Air Ministry, and the fatal inefficiency of depriving the Navy of full command of what was rapidly becoming one of its principal weapons."

The RN Fleet Air Arm's history is frequently one of courage, flair and sacrifice being required to take the place of the modern aircraft and weapons which could and should have been available. It is a history of nearly too little, being supplied, nearly too late by planners that initially had trouble adapting to the new reality, which was that sea power was unsustainable without sea borne air power to complement it.

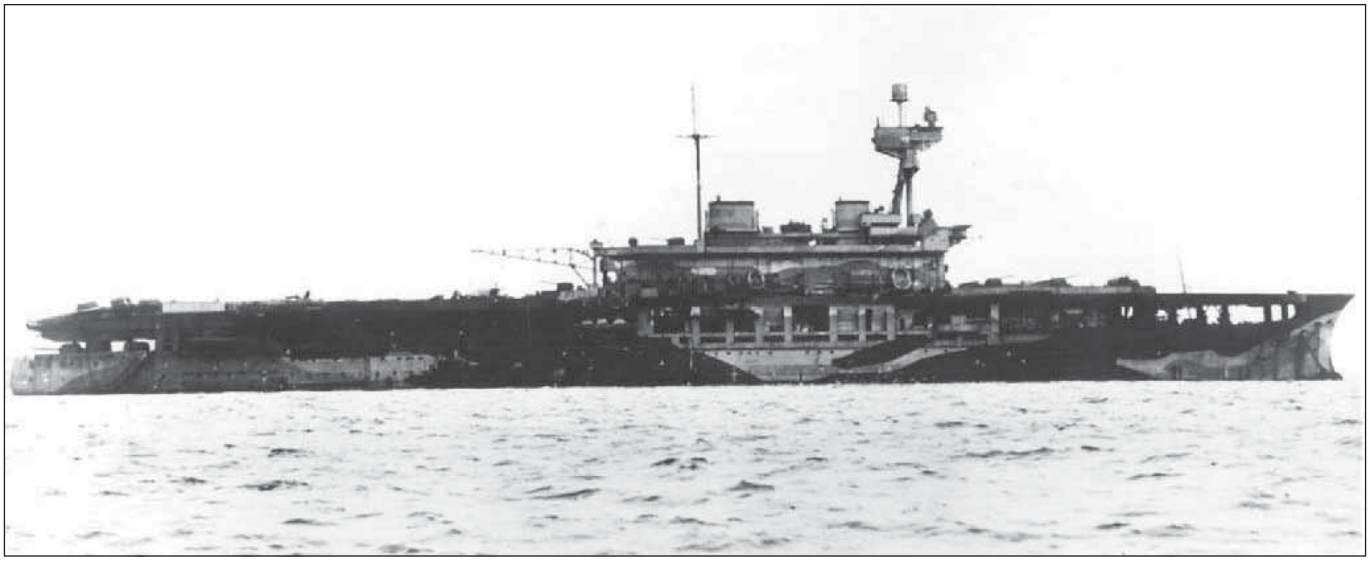
Mediterranean 1940-42 and Falklands 1982

Though separated by time and technology Admirals Cunningham, Somerville and Woodward were faced with the same fundamental problem of trying to fight and win a campaign at sea when they lacked enough carriers and suitable aircraft to ensure victory.

The first of these campaigns, entrusted to Admirals James Somerville and Andrew Cunningham in 1940, evolved from the initial broad strategic aim in 1939 of 'keeping open the Mediterranean to allied shipping.' In practice this three year long naval campaign entailed such diverse operations as evacuating the army from Greece and Crete, neutralising the Italian Fleet, fighting convoys through to Malta, sinking Rommel's supply ships, and ensuring the maritime supply lines of the Eighth Army. At no time were any of these operations anything less than dauntingly difficult in the face of land based air forces and became increasingly untenable after Axis bombers were able to operate from Greece and Crete as well as Italy and Sicily.

The second of these campaigns, entrusted to Admiral Sandy Woodward, was simpler in design but equally complex and risky in execution. It was to retake the Falkland Islands in eight weeks from the time of their seizure by the Argentineans in April 1982. Neither campaign could have been attempted, far less won, without the Fleet Air Arm and the RNs carriers.

These campaigns, though distant in time and place, were not dissimilar in terms of the grave shortfalls in equipment and capability provided to their commanders.



The RN carrier HMS EAGLE in the Mediterranean.

The Mediterranean Campaign 1940 –41

In 1940 with Italy's entry into the war Admirals Andrew Cunningham and James Somerville, operating from Alexandria and Gibraltar respectively, were faced with the ultimate difficulty, the safe convoying of troops and supplies in slow merchant hulls past long range land based aircraft armed with torpedoes and bombs. Cunningham remarked, '*we are well able to look after the Italian Fleet, but I doubt if we can take on their Air Force as well.*'

In practice he had no choice and despite their severe performance limitations the FAA's Skuas and Fulmars, which were normally out numbered three or four to one in combat over convoys, frequently succeeded in shooting down bombers and driving off the fighters. Aircraft from EAGLE, ILLUSTRIOUS and ARK ROYAL based in Gibraltar performed prodigious feats in attacking Italian convoys in 1940.

But when it came to attack on land targets Somerville was very realistic. He wrote *' the very low performance of the Swordfish makes her such easy meat for shore based fighters that unless our attacks are carried out in the dark we should get none of them back.'*

Taranto Night and Matapan

A Swordfish torpedo bomber of the RN FAA Historic Flight. The Swordfish was so vulnerable to both surface and air units that its operations were restricted to night. However, during the early part of WW II the Swordfish was responsible for sinking three Italian battleships in one mission, which transformed the tactical and strategic situation in the central Mediterranean. (RN)

The attack on Taranto on the night of 11-12th November 1940 by Swordfish from ILLUSTRIOUS and EAGLE was necessarily achieved in darkness. Three Italian battleships were sunk. At a stroke this blow transformed the tactical and strategic situation in the central Mediterranean and gave back to Cunningham the freedom of movement he had lacked. On the night of March 27th 1941 at the Battle of Cape Matapan it was the FAA Albacores flying from FORMIDABLE which saved a British cruiser squadron from a mauling by the main Italian battle fleet and made possible Cunningham's successful night action and victory. After Matapan Vice Admiral Royle wrote to Somerville that the FAA '*in spite of the rotten aircraft they find themselves with have crippled and inhibited the enemy battle fleet.*'

The Cost of Crete

However, the true inadequacy of the FAA's aircraft and the RN's lack of carriers capable of carrying enough fighters became obvious during the operations to evacuate Crete in May 1941. Lacking any RAF support Cunningham had no choice but to order his ships to operate north of Crete, only by night and to withdraw before dawn in the face of sustained German Stuka attacks. FORMIDABLE, his only carrier during the Crete evacuation, was quickly reduced to having only four operational fighter aircraft and was quickly severely damaged and forced to leave the Mediterranean for repairs in the USA.

The inevitable result of operating ships off Crete without adequate FAA air cover was the sinking of three cruisers, six destroyers and 22 merchantmen. Two battleships, a carrier, five cruisers and eight destroyers were seriously damaged. Several hundred embarked soldiers and over two thousand sailors were killed. By any measure the Cretan campaign was a costly failure which the RN could not afford in ships or men. Even with good aircraft and enough carriers losses would have occurred, but the scale could have been minimised. Cunningham wrote in his despatch to the Admiralty after the evacuation was over, '*If shore based, long range fighters cannot reach the area where ships must operate then the Navy must carry its own air with it.*'

After FORMIDABLE departed for repairs Cunningham pleaded for another carrier from Dudley Pound, the First Sea Lord. He pointed out that one good carrier filled with fighters should be able to look after herself and that without air power many more ships would be lost. Pound refused to send a carrier

as he had too few operational world wide and regarded them as too vulnerable for the Eastern Mediterranean. Consequently, Cunningham was unable to take his battle fleet to sea from Alexandria for the rest of his time as C-in-C Mediterranean because he lacked fighter protection for his battleships.

This inability of the surface fleet to be present in strength in the central Mediterranean imperilled the whole of the British position in the eastern Mediterranean and made the supply of Malta in early 1942 even more hazardous than it needed to be. For many months Malta ceased to be an effective naval base for operations against Rommel's supply lines. Disembarked FAA squadrons on Malta played their part in striking at axis convoys but too many troops, too much fuel and food and far too many tanks and aircraft got through to the Afrika Corps from Italy and Sicily. If the RN had been protected from above those supplies could have been destroyed. The Afrika's Corps' North Africa campaign should have been a logistical impossibility for the Germans not an arena where they had the means to inflict serious reverses on the Allies.

This was the lowest point in the RN's fortunes in the Mediterranean in the preceding one 150 years. By June 1942 the RN was only just able to stay in the Mediterranean at all. With ILLUSTRIOUS's departure for extensive repairs and the sinking of ARK ROYAL, Somerville's Force H in Gibraltar ceased to be a strike force.

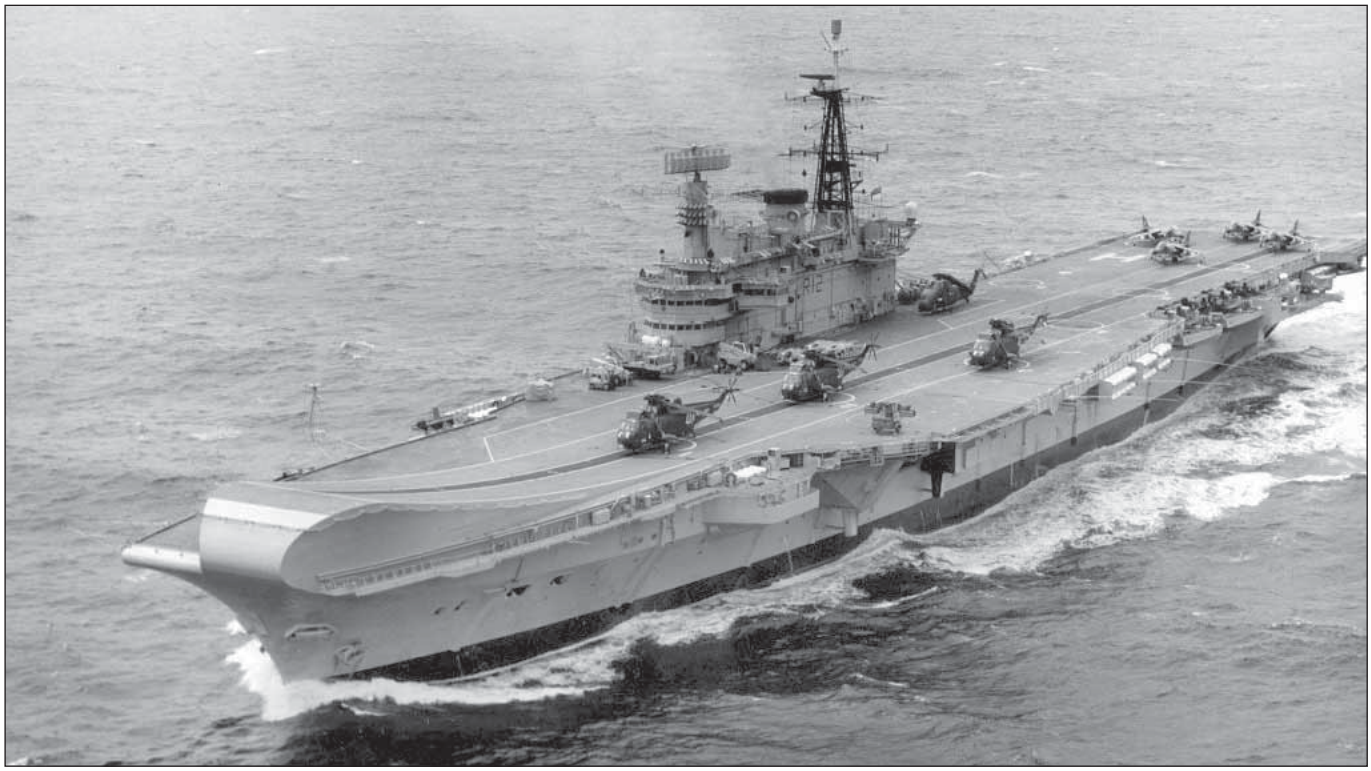
Lack of RAF support

Both Sommerville and Cunningham identified the lack of RAF support over convoys and their escorts as being a key weakness in the British position in the Mediterranean. They particularly complained of inaccurate air reconnaissance – weeks would pass without them having any knowledge of Italian fleet dispositions. Cunningham also complained bitterly that the RAF would not recognise that they had an obligation to defend convoys which were being bombed and torpedoed without interference and an equal obligation to attack enemy convoys. Clearly the airmen were still not 'sea minded.' The RAF refused to 'lock up' aircraft specifically for fleet operations. Eventually after pitched battles with Tedder, Air Officer Commanding Middle East, Somerville and Cunningham got 'Naval Co-operation squadrons.' It was not only shortage of aircraft but also a different strategic concept which bedevilled the relationship between the sailors and the airmen. Cunningham wrote in his autobiography,*' There seemed to be an unwillingness to admit that RAF personnel working over the sea needed special training, though we, with our long and hardly bought experience, knew otherwise.'*

Hard Lessons Learned

By the time the war ended Cunningham had succeeded Pound as First Sea Lord and the British Pacific Fleet under Bruce Fraser and the Eastern Fleet under Somerville consisted of mixed forces of battleships and carriers. Not only was the FAA flying modern fast aircraft off the armoured flight decks of ILLUSTRIOUS, INDEFATIGABLE, INDOMITABLE, IMPLACABLE, FORMIDABLE and VICTORIOUS, but numerous light escort carriers had been created for convoy protection by the conversion of merchant ships. These carriers were the 'maids of all work' in the Pacific providing protection and strike power.

Finally the strategic message had been received and understood in Whitehall. Surface operations without carrier aircraft invite disaster. Land based air power is theoretically able to provide an alternative but in practice is rarely able to do so. That should have been the end of the debate about where air power at sea should originate. Surely, never again would the RN be expected to go into harm's way without its own indigenous air power to protect and provide striking power to a naval Task Force. Never again would Whitehall assume that the RAF could, or would, provide air cover from land bases. The case for large British Fleet carriers with the latest generation of aircraft embarked was finally made.



HMS HERMES. Luckily, she was converted from a purely ASW helicopter carrier to a Sea Harrier carrier before the Falklands Conflict and became Admiral Woodward's Flagship for the duration of Operation Corporate. (RN)

A Gannet AEW aircraft about to trap aboard HMAS ARK ROYAL. Had the AEW Gannet been able to deploy from Admiral Woodward's carriers many ships and lives may have been saved by providing vital early warning and vectoring of scarce fighter assets. Ironically this AEW capability had been refined and exercised by the RN on many carriers over forty years and was discarded just four years before it was finally again needed in the South Atlantic. (RN)

Post War Royal Navy Carrier Operations

In Korean waters in 1950-51 the RN and RAN's carriers' utility and flexibility was demonstrated as they protected troops on the ground and their lines of communication while attacking and disrupting the build up of rear areas echelons and front line enemy forces. For many months American, British, and Australian carriers provided the only aviation bases for strike aircraft and fighters between Hong Kong and Japan. Quite simply they were indispensable and recognised as being so by all the nations fighting the North Koreans and Chinese.

In 1961 Kuwait was successfully defended against Iraqi threats to invade by the carriers VICTORIOUS, BULWARK and CENTAUR which undertook very visible combat air patrolling in the threatened area and deterred aggression at no cost at all. This was a classic example of the capacity of carriers for power projection and deterrence in the post war world.

Collective Amnesia in Whitehall

The long period without the RN's FAA taking part in major operations extended from the Suez crisis of 1956, on into the 1960s and 70s. This had the effect of dulling the collective memory of the Ministry of Defence and the politicians who created UK defence policy. By the middle of the 1960's the FAA's hard won lessons were regarded in Whitehall as being irrelevant to any future operations. The RAF promoted itself as the logical monopolists of British fixed wing flying. The bulk of the Empire was gone and with de-colonisation, it was believed, any risk of purely British maritime operations had gone. The Pentagon asked only for the RN to be good at the niche capability of ASW in the Atlantic which could be done from frigates and submarines. RN ASW carriers with their on the spot aircraft and command and control capabilities were progressively phased out.

The 1966 Healy Defence Review

Notwithstanding this lack of Whitehall support by the time Denis Healy became Labour Secretary of Defence in 1965 the RN had put 10 years work into the CVA-01 carrier project. The first ship was to be named QUEEN ELIZABETH. She, and her sister ship, would have been national assets, capable of operating aircraft from all three services, including aircraft procured jointly for the RN and the RAF. She would have carried a Joint National Command facility. Most importantly, in view of the advent of anti ship supersonic missiles, she would have carried the successor aircraft to the Fairy Gannet with a much-enhanced Airborne Early Warning capability. QUEEN ELIZABETH's cancellation when the design was ready for tender, followed the Healy 1966 Defence Review. He based his decision to cancel the future carriers on the RAF's assurance that there was nowhere that Britain would want to operate at sea without the Americans where the RAF could not provide air cover from land bases.

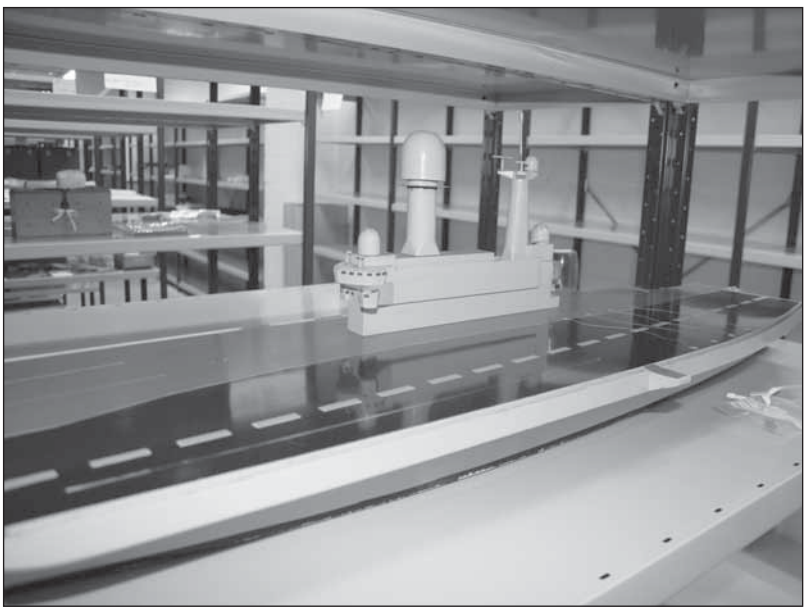
Part 1 of the Defence Review cancelling the carriers stated:

"*Experience and study have shown that only one type of operation exists for which carriers and carrier-borne aircraft would be indispensable; that is the landing, or withdrawal of troops against sophisticated opposition outside the range of land-based air cover. It is only realistic to recognise that we, unaided by our allies, could not expect to undertake operations of this character in the 1970s - even if we could afford a larger carrier force.*"

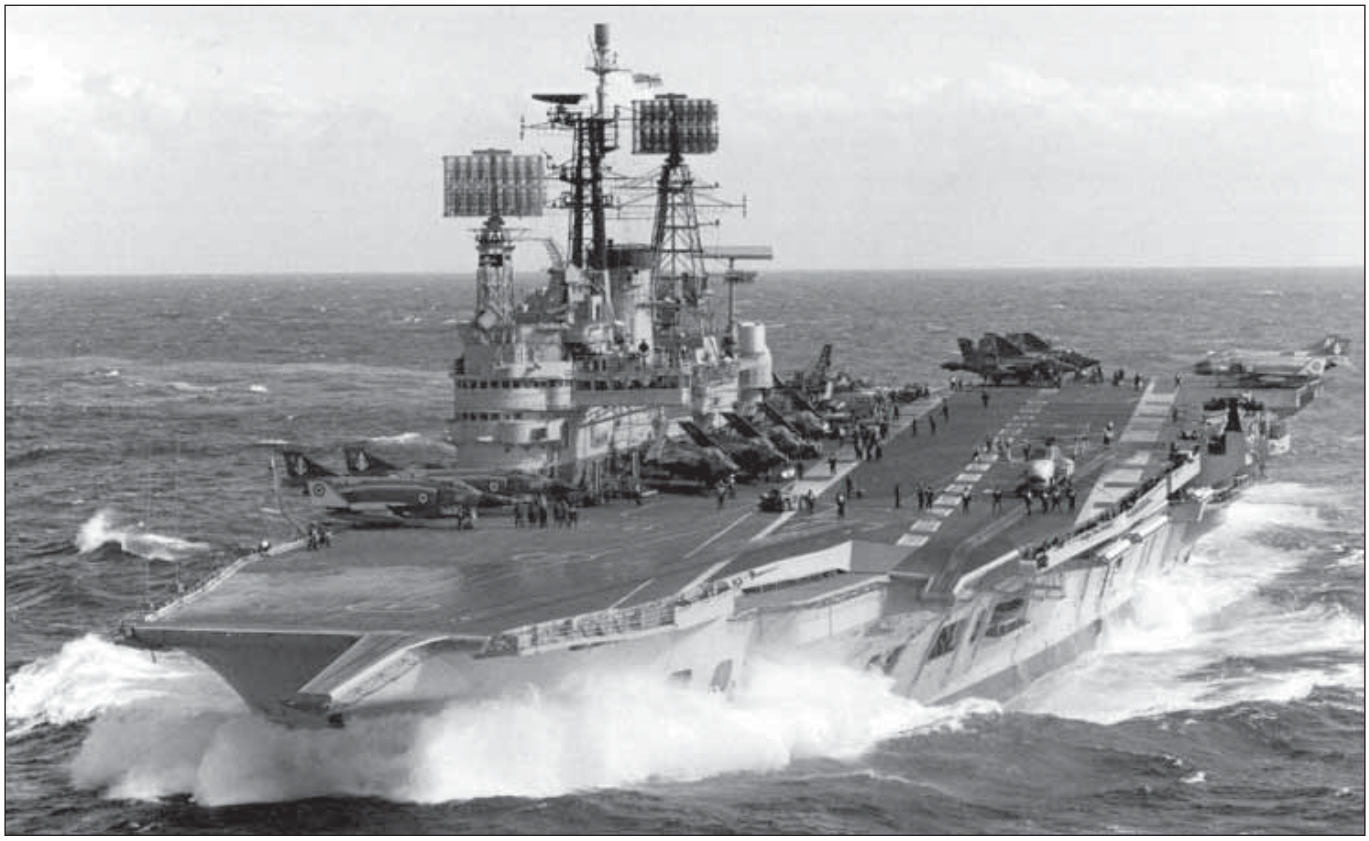
Part 2 of the same document said:

"*The aircraft carrier is the most important element of the fleet for offensive action against an enemy at sea or ashore and makes a large contribution to the defence of our seaborne forces. It can also play an important part in operations where local air superiority has to be gained and maintained and offensive support of ground forces is required.*"

These two statements, which are in sharp contradiction, suggest different authors and a less than coherent national policy. Finally the decision came down to the incoming Labour Government's determination to be done with global responsibilities, particularly those east of Suez, and to save money on politically unpopular defence expenditure and what appeared to the public as a hankering by the Navy for a superseded imperial role.



All that is left of the CVA-01 of the 1960's is this wooden model of the ship in a back store room of the RN's Fleet Air Arm Museum at Yeovilton. Had the 10 years of hard work designing the ships been realised then the Falklands Conflict may conceivably either have never happened or been over very quickly with significantly less loss of life. (Mark Schweikert)



HMS ARK ROYAL with Phantoms, Buccaneers and Gannets on deck. Ironically, she was towed to the breakers just 24 months before the Falklands campaign (RN)

Operation Corporate – April - June 1982 The Recovery of the Falkland Islands

Sixteen years later, "unaided by our allies", British forces were undertaking "operations of this character" liberating the Falkland Islands. The Falkland's scenario might have been written to illustrate the fundamental importance of the *Queen Elizabeth* class of carrier*;* indeed had she existed she might have acted as the deterrent that would have prevented war. In reality it fell to two much less capable ships, the venerable HERMES and the new INVINCIBLE, to make the operation possible. Neither ship could operate AEW aircraft and therefore were incapable of providing any warning to Admiral Sandy Woodward and the task force of incoming strike aircraft or their potentially ship killing missiles. Writing of the Exocet missiles which threatened his two carriers, and therefore the entire operation, Woodward wrote: *" The best course of action is, naturally, to catch and kill the incoming Etendards which carry the missile. For this we really only had Sea Dart, which had not yet proved itself to be even reliable, far less infallible. What's more, the way the Argentineans seemed to fly their Etendards, Sea Dart was not all that likely to catch them even when it was working well. There just wasn't the necessary warning – only AEW aircraft could give that and we had none.'*

Cunningham and Somerville would have understood at once that Woodward was suffering, as they had done, from years of neglect and lack of imaginative expenditure on the FAA. Like him they were dealing with the lethal consequences of the Ministry of Defence's failure to think realistically about what war at sea would entail and require. Max Hastings and Simon Jenkins wrote in their eye witness account of Operation Corporate: *'Rear Admiral Woodward did all that could be achieved with the force at his command. He was the one man who, like Jellicoe, could have lost the war in an afternoon by suffering a disaster to his carriers. The lack of point defence on the ships, of airborne early warning and powerful air cover, was not his fault.'*

The 'Early Retirement' of Ark Royal in 1978 – what might have been

The irony of Woodward's position was that ARK ROYAL, the last of the RN's 50,000 ton Fleet carriers, able to launch all weather Phantom and Buccaneer fast jets was retired from service in 1978 and towed to the breakers just 24 months before the Falklands campaign. She was not at the end of her useful life and had been extensively modernised. She missed her chance to show her real range of capabilities due to the decision by the Labour government that Britain could no longer afford, and would never need to maintain, more than a short range combat air patrol capability.

The Cost of Lost Capability

In 1966 the then Captain of ARK ROYAL was asked what his ship's role was. He said that it was to "travel enormous distances at great speed when ordered and carry out any task on arrival in the operational area." This summarises very accurately the range of options that the true full size modern carrier offers amphibious operations.

Had ARK ROYAL been Woodward's flagship in the South Atlantic in 1982 and her Gannets had been giving his Principal Warfare Officers the airborne early warning they so badly needed there would have been no need to use Type 42 destroyers like COVENTRY as "missile traps", no need either for SHEFFIELD to expose herself as the 'up threat goalkeeper' to protect the carriers and the transports. The Super Etendards that sank *Atlantic Conveyor*, inside the Battle Group perimeter would have been unable to "pop up" on radar after they had launched their two Exocets. With *Atlantic Conveyor* sank 100

million pounds worth of vital Chinook helicopters and their munitions. ARK ROYAL's Gannets were purpose built to give early warning of such threats at four times the distance that sea level radar could provide. Operations rooms could then have vectored aircraft onto enemy intruders long before they became 'weapons free.' This AEW capability had been refined and exercised by the RN on many carriers over forty years and was discarded just four years before it was finally again needed in war.

If ARK ROYAL's 12 fast interceptors been available to Woodward their range would have meant that the Argentinian Air Force would have been engaged, not over the British Total Exclusion Zone, but well to the west before they entered it. A combat air patrol of Gannets and Phantoms would have in all probability have saved *Atlantic Conveyor,* SHEFFIELD, COVENTRY and the Type 21 frigates ANTELOPE and ARDENT from being sunk. It would also have been likely to have prevented the DLG GLAMORGAN and the frigates PLYMOUTH, ARGONAUT and GLASGOW from incurring loss of life and serious damage. Most significantly long range fast jets, vectored by Gannets, would have dealt with the Skyhawks and Daggers before they bombed the LSLs SIR GALAHAD and SIR TRISTRAM at Bluff Cove. Fifty men died in this attack and another fifty seven were severely burned. The aircraft that did the damage escaped unscathed.

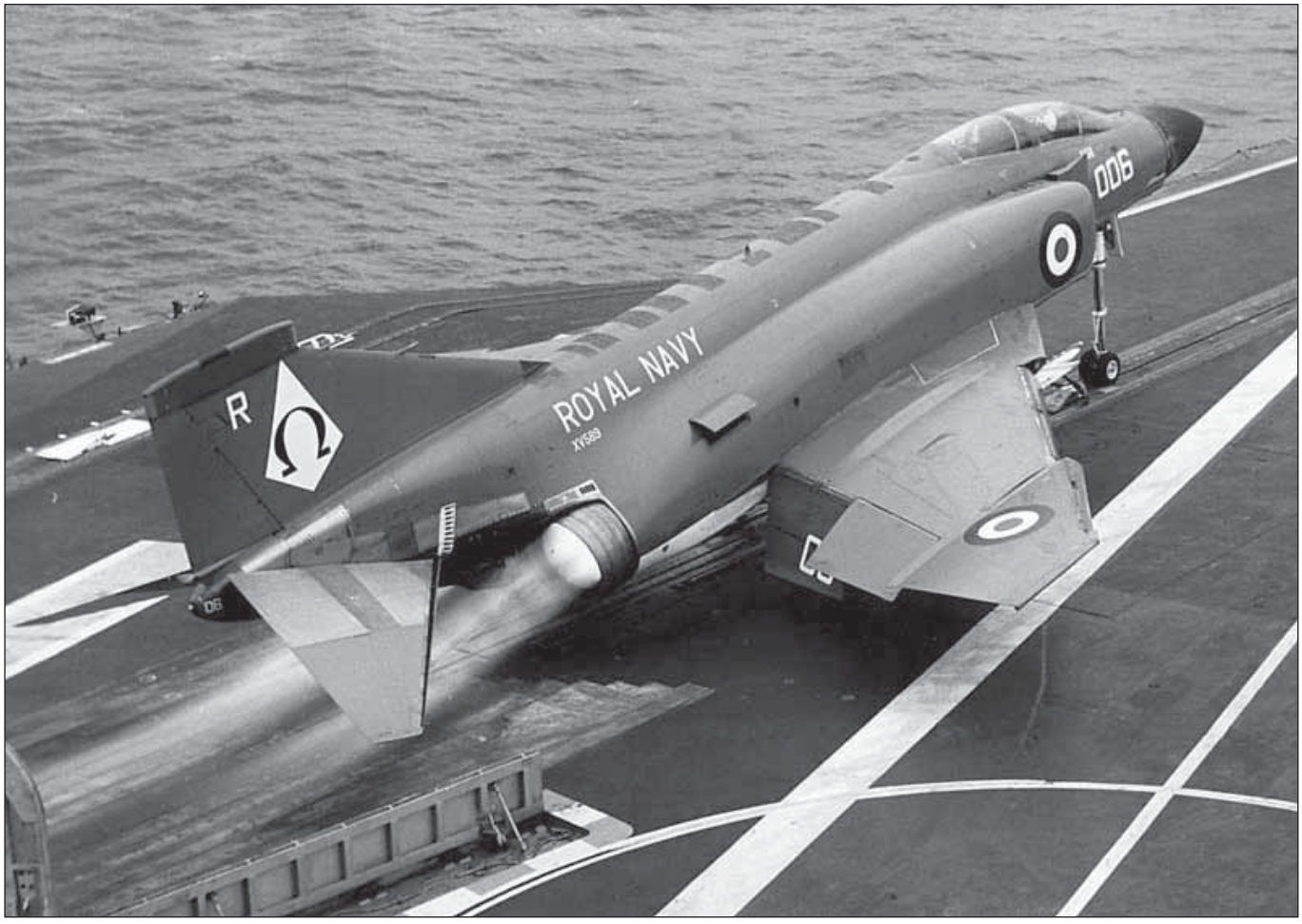
Operation Corporate 1982 - 'A near run thing'

Hindsight and speculation are dangerous, but the strong probability is that most of the UK's casualties at sea during Operation Corporate could have been avoided if wisdom and knowledge of the reality of modern naval warfare had prevailed in Whitehall rather than groundless optimism, wishful thinking and false economy in the decades which preceded the conflict. The British victory in the Falklands was unnecessarily expensive in lives and materiel. Like Waterloo it was a 'damn near run thing'. Woodward called it a "nip and tuck" operation. It could, and should, have been much less expensive and risky. The missing factor was what Cunningham had also lacked when fighting around Crete - carrier based air supremacy, without which every surface vessel is at serious risk from the strike power of land based air forces.

Conclusions drawn and strategic lessons learned

Woodward, Cunningham and Somerville's campaigns have much in common. They were provided with nearly too little and nearly too late. They were forced to take risks and, inevitably, took serious and preventable losses in men, ships and materiel. They were operating beyond the capacity of the RAF to offer more than token support. They lacked the most capable aircraft that were available. They were opposed by a determined and skilful enemy who attacked them by air across narrow waters. They lacked forward reconnaissance and adequate warning of attack. Against the odds, through their own determination and the courage and the dedication of their aircrew and operations teams they managed to pluck improbable campaign victories from what appeared very likely to be serious defeats.

The strategic lesson of lasting value to be drawn from the history of the FAA is that nothing less than the best ships and the best aircraft at sea will ever be sufficient to win a naval campaign. Anything less is likely, once again to result in lost ships, lost opportunities and lost lives. Tragedy at sea during war is the known and predictable price of national neglect of naval aviation in peacetime.



A supersonic air superiority F-4 Phantom about to launch from HMS ARK ROYAL. The effect of 12 Phantoms in the South Atlantic during the 1982 conflict may have been decisive in protecting the fleet and preventing loss of life and ships. (RN)

NAVY LEAGUE
2007 ESSAY COMPETITION
THIRD PLACE
NON-PROFESSIONAL CATAGORY

SENSUIKAN:

Japanese Submarine Operations in Australian Waters During World War II

By Geoff Crowhurst

The Bathurst class corvette HMAS DELORAINE. DELORAINE was the first RAN unit to sink a Japanese submarine during WW II. (RAN)

Third place in the Navy League's inaugural 2007 Essay Competition went to Mr Geoff Crowhurst with his essay on Japanese submarine operations in Australian waters during World War II. During World War II, Australia found itself threatened with isolation from its allies by a naval campaign waged by axis forces. As an island country, Australia depended (and still does) on its sea lanes for survival. Our sea lanes can be easily disrupted with a small amount of effort. Just how small an effort was evidenced by the Japanese submarine campaign around the Australian coast during WW II.

Australia responded to the Japanese threat in an uncoordinated fashion and did not take the initiative until late in the war. The poor material result of the submarine campaign can be attributed to the ineptness and scarcity of the Japanese effort as much as to any allied countermeasures. Australia was not prepared for a war on its doorstep.

By the time Japan entered the war in December 1941, Australia had suffered the attentions of four Auxiliary Raiders of the German Navy. Including both the waters of the Australian Station and the area surrounding the Australian Protectorate of Nauru Island, fourteen ships had been sunk by direct attack, the most famous being the HMAS SYDNEY, lost in action against the raider KORMORAN in November 1941. More than 300 mines were laid by the Germans off the Australian coast, sinking a further five ships as well as closing ports and disrupting shipping schedules while the fields were swept.

The first Japanese submarines to enter Australian waters were four mine laying I-class boats of the IJN Submarine Squadron 6. Commissioned between 1927 and 1928, they were the only purpose built mine laying submarines the Japanese possessed. Each carried forty two Type 88 mines with an explosive payload of 180kgs. These were delivered through the torpedo tubes. These boats were slow and difficult to handle when compared with other Japanese submarines. They had been sent south to support the Japanese assault on the Dutch East Indies by disrupting coastal traffic and the flow of reinforcements from Australia.

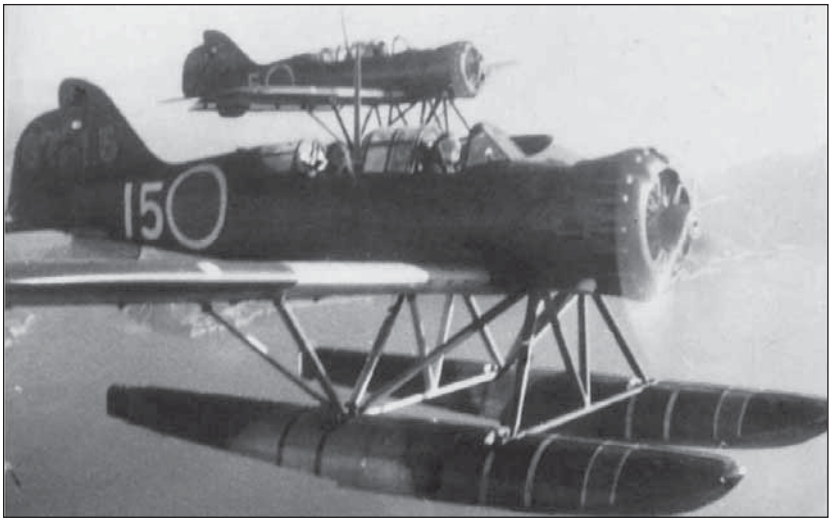
The squadron arrived off the Australian coast on 12 January 1942. Proceeding to their separate areas of operations, they began to lay their mines in the Torres Straits and the approaches to Darwin. The minefields were established by 18 January. The submarines then took station off the port of Darwin to provide Imperial Naval Headquarters with intelligence on allied shipping movements. In the early hours of 20 January an American Fleet Oiler, USS TRINITY was being escorted into Darwin by two destroyers when incoming torpedo tracks were sighted. The ships manoeuvred to avoid the torpedoes and the destroyer USS ALDEN made a depth charge attack on a suspected contact that was subsequently lost.

In the mid-morning the Bathurst class corvette HMAS DELORAINE was ordered to the area to conduct a search. On arrival she immediately came under torpedo attack herself, with the torpedo running only ten feet past her stern. ASDIC contact was made and depth charge attacks commenced. She was soon joined by several aircraft and the corvettes HMA Ships LITHGOW and KATOOMBA. HMAS DELORAINE was eventually rewarded with oil on the surface of the water and was credited with the destruction of I-124.

From January until March the Japanese concentrated their submarine activity on supporting the conquest of the South West Pacific, with only a few reconnaissance missions carried out. On 17 February, I-25 surfaced 100 miles southeast of Sydney and launched its E14Y reconnaissance floatplane. After a three hour flight over Sydney Harbour and suburbs,

the plane returned to I-25 and they sailed south for Melbourne. On February 26th the next flight was flown over Melbourne and Port Phillip Bay. This time the plane was spotted from the ground, but two Wirraways scrambled from RAAF Laverton failed to intercept. On 1 March, I-25's floatplane flew reconnaissance over Hobart and the Derwent River.

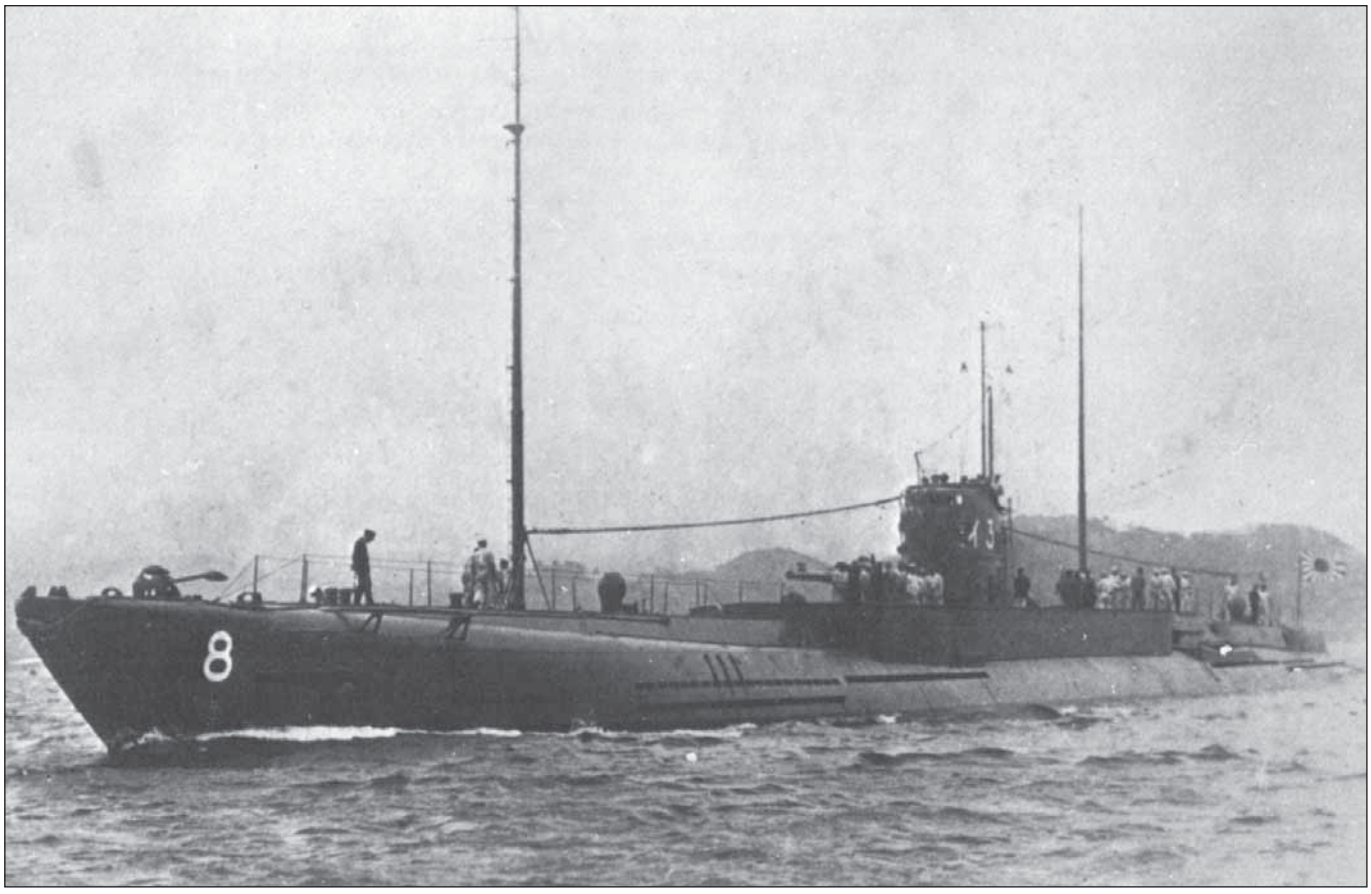
On the other side of the country, three boats of Submarine Division 7 had reached their patrol area off the West Australian coast. On 1 March I-2 engaged the 1,172-ton Dutch merchant, Parigi southwest of Fremantle and sank her with its 5.5 inch deck gun. Two days later, 90 miles off the port of Fremantle, I-3 shelled two British registered ships, SS *Tongariro* and SS *Narbada*. Both were able to escape and send off submarine warnings. Later that same day, I-1 sank the Dutch ship *Siantar* with gun and torpedo fire off the mouth of Shark Bay. Ships were ordered back to port and the submarines quickly departed the area looking for better hunting grounds. Submarine activity around Australia now declined while the Japanese finished their conquest of the Dutch East Indies.



Two E14Y reconnaissance floatplanes. This type of aircraft was used to scout Sydney Harbour before the infamous Midget Submarine Attack in 1942. It also flew over Port Philip bay near Melbourne and over parts of Tasmania. They had folding wings and were housed in a watertight compartment on the deck of the submarine.

With the influx of American forces into Australia in early 1942, command of the coastal forces was transferred over to Vice Admiral Leary USN in February of that year. While a convoy system for troop movements was in place by January, conflicting priorities sometimes lead to the dispersal of escort forces. Merchant ships were not required to sail in convoy. Leary soon realised that he had no understanding of coastal defence and running convoys so quietly handed back control to the Australian Navy, although he retained overall command. Control was further devolved in May 1942, when command of convoys and escorts was delegated to the local area NOIC (Naval Officer In Charge).

Next to approach the Australian coast was I-29. She had been tasked with flying a reconnaissance flight over Sydney Harbour



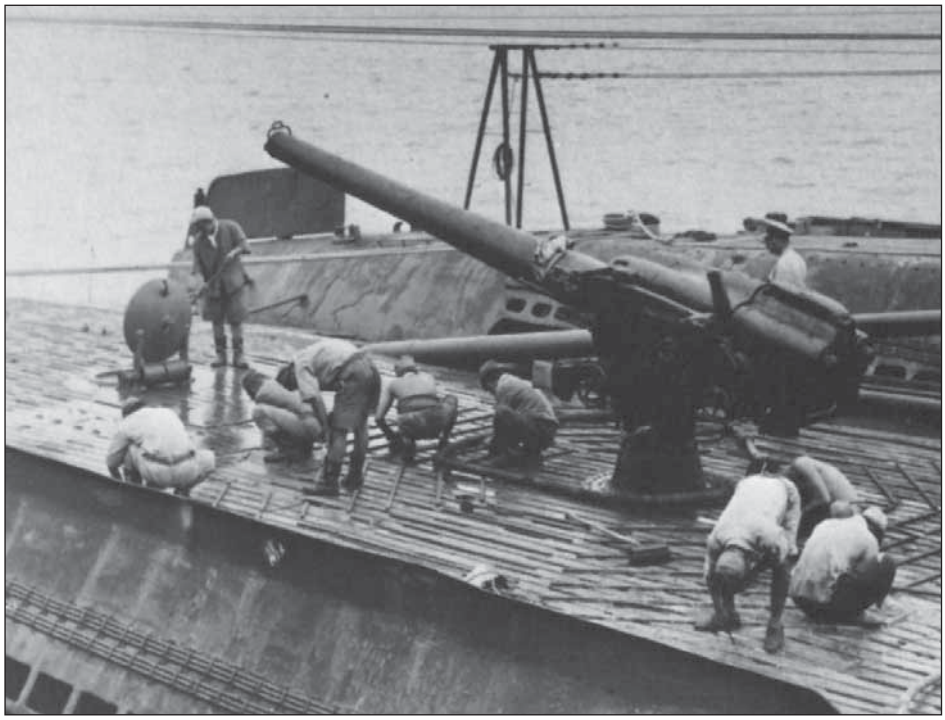
The Japanese submarine I-3. I-3 surfaced and shelled two British registered ships, SS *Tongariro* and SS *Narbada* with her 5.5 inch guns 90 miles off the port of Fremantle during 1942 and was able to escape.

to locate targets for a future midget submarine attack. On approaching Newcastle on 13 May she surfaced and fought a brief action with the Soviet freighter *Wellen.* I-29 dived after damaging *Wellen* and continued towards Sydney Harbour. No search was made for I-29 because NOIC-Sydney, Rear Admiral Muirhead-Gould, decided that she had left the area and because all available ASW ships were escorting a Port Moresby bound troop convoy. I-29 completed her mission on 23 May 1942. The floatplane noted several ships in the harbour but crashed on return to the submarine.

The four submarines of the attack force then gathered outside Sydney Harbour and launched their midget attack on the night of 31 May/1 June 1942. The attack resulted in the sinking of the HMAS KUTTABUL and the loss of twenty-one lives. The three midget submarines were lost with all six crewmen. After launching the midgets, the four 'mother' craft and I-29 sailed south to the area off Cape Banks to await the return of the attack force. When the midgets failed to rendezvous, the submarines split up. I-22 was sent to New Zealand, I-27 went south to Tasmania, I-29 sailed for Brisbane and I-21 with I-24 positioned themselves off Sydney. In the following ten days the Japanese submarines made nine separate attacks on shipping with both gunfire and torpedoes. They succeeded in sinking three ships and badly damaging one other. On the night of 8th June I-21 shelled Newcastle and I-24 shelled Sydney, spreading fear and despondency among the population.

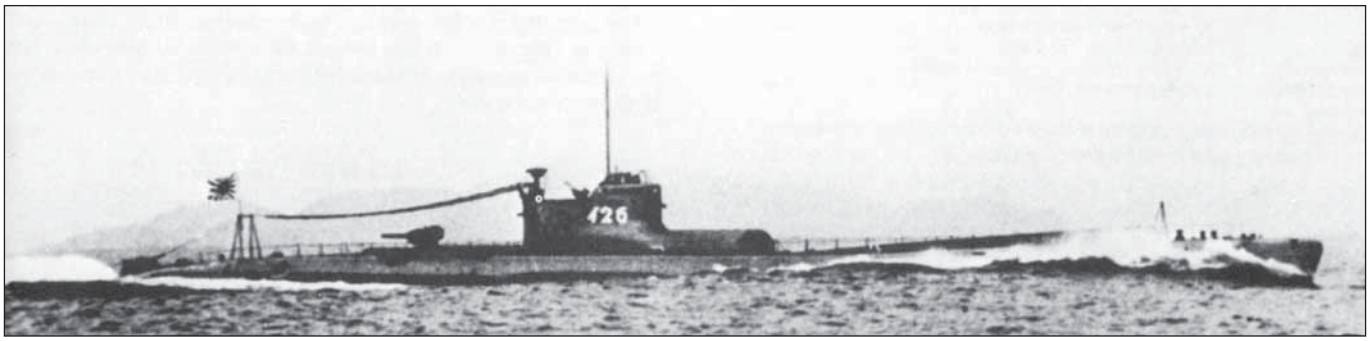
The sinking of the SS *Guatemala* on 12th June, 40 miles south off Newcastle by I-24 signalled the end of the first Japanese submarine campaign against Australian shipping.

The consequences of the anti-shipping campaign along the Australian coast were more than just ships sunk and lives or cargoes lost. On 3 June, the *Iron Chieftain*, the first and largest ship sunk off the East Coast, was torpedoed by I-24. The next day all shipping between Adelaide and Brisbane was suspended except for ships sailing between Adelaide and Melbourne, and from Melbourne to Tasmania. An inland convoy system was introduced, the first convoy sailing on the 8 June from Sydney to Brisbane. Also commenced was the sailing in convoy of all ships from Sydney or Brisbane destined for New Zealand. These convoys would be escorted out to 200 nautical miles then allowed to proceed independently to rendezvous with escorts 200 nautical miles from New Zealand. Vessels under 1200 tons and faster than 12 knots were exempt from the convoys and could proceed independently, however they had to zigzag and were not allowed to sail at night.

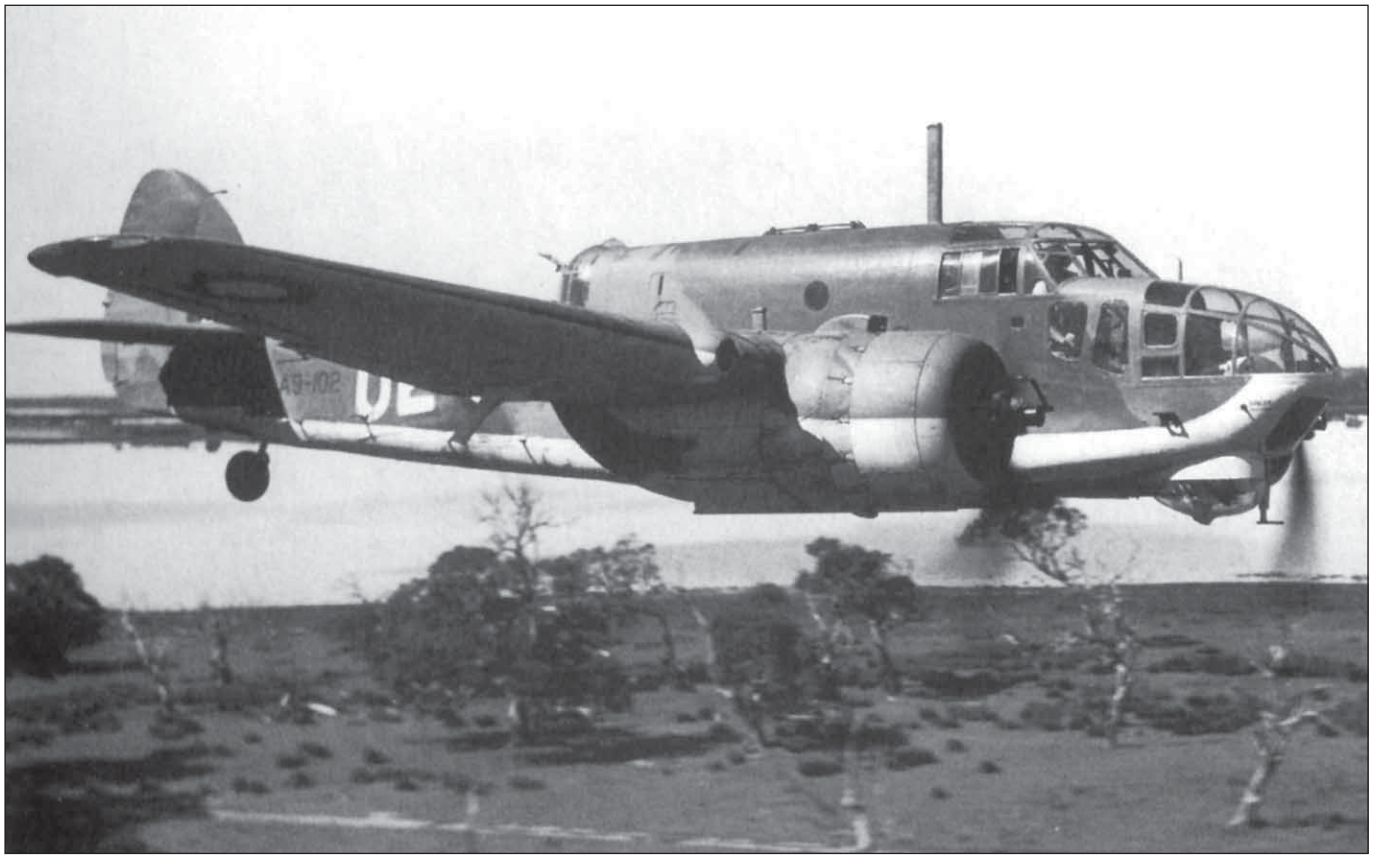


The standard Japanese submarine 5.5-inch (140mm) deck mounted gun. Even by today's standards this is a large gun.

A lull now descended upon the waters surrounding Australia. The convoys continued to sail with their escorts. There were some false sightings of submarines and even a surface attack reported by a freighter that turned out to be nothing more lethal than passing lightening. Signal intercepts establishing that the submarines had cleared the area resulted in the convoy system being dropped on 15 July, on the understanding that it would be re-activated immediately if required. However, to support the Japanese landings on Papua on 21 July, the Submarine Force Commander, Vice Admiral Komatsu ordered the resumption



The Japanese submarine I-26 on the surface. I-26 opened the 1943 campaign by sinking the 4,732 ton *Recina* and its cargo of 8,000 tons of iron ore. Two weeks later she sunk a second ship. Both these ships had been in convoy with naval escorts. I-26 successfully evaded the counter-attacks made by the escorts.



An RAAF Beaufort bomber. The RAAF's ASW effort proved unsuccessful. An RAAF Beaufort claimed a successful attack on a surfaced Japanese submarine off Gabo Island on the east coast during the War but records show no submarine being sunk there.

of the submarine campaign against Australia.

A detachment from Submarine Squadron 3 soon arrived off the east coast and commenced attacks on 20 July, I-11 subsequently torpedoed the 4,883 ton freighter G.S. *Livanos* off Jervis Bay. Three hours later, in the same area, she sunk the SS *Coast Farmer*. Just over 24 hours later, she sank a third ship, the 7,176 ton *William Dawes*. During the same period, I-175 made three attacks around Newcastle and Sydney, sinking a further two vessels and damaging another.

On 4 August came an attack on the other side of the country. The passenger steamer *Katoomba* was attacked on the surface at night by I-32, 188 nautical miles southeast of Esperance. The submarine surfaced alongside the steamer and opened fire with its 5.5 inch deck gun. *Katoomba*'s master put on speed and made evasive manoeuvres while the gun crew returned Japanese fire. After a three hour running battle, I-32 broke off the attack and left the area, en route to Penang.

As a result of these attacks, the convoy system was reintroduced on 22 July. Unfortunately, there was now a shortage of escorts, as the US Navy had taken its destroyers off escort duty and sent them north to Guadalcanal while the RAN had most of its escorts operating off the coast of New Guinea. Ships were now held in port until a suitable escort could be assembled, slowing shipping schedules across the country. By 10 August signals intercepts showed the submarines leaving the area, re-directed to the waters off Guadalcanal. This time the convoy system was not dropped and remained in force until 1944. No further submarine attacks were reported for the rest of the year as the Japanese concentrated their submarine effort to the waters around Guadalcanal in attacks either against allied warships or increasingly as transports.

Allied anti-submarine measures had been dismal, to say the least. Up to the end 1942 the RAN had managed to sink only two submarines, one off New Guinea and one off Darwin, but none in the east coast shipping lanes where most Japanese submarine activity was concentrated. There had been several attacks on contacts, but without any confirmable results. While keeping a submarine from attacking a convoy is a success for the escort forces, the public and the politicians prefer verified 'kills'. In the same period the RAAF claimed between eight and ten definitely sunk, five probably sunk and two damaged. All this by only twenty documented anti submarine attacks during the whole war. In actuality, their score was one submarine lightly damaged. On July 29th a Beaufort bombed I-11 off Gabo Island in Bass Strait, damaging some of the wooden planks on her deck. Despite many claims to the contrary, no submarines were sunk or seriously damaged by the RAAF during the course of the war in Australian coastal waters.

January 1943 heralded the beginnings of the new Japanese submarine offensive. I-21 had orders to fly a reconnaissance mission over Sydney. She announced her arrival off the East Coast on the 18th by sinking the 2,047 ton *Kalingo*. Later that same day she put two torpedoes into the US flagged tanker *Mobilube*, 60 nautical miles off Sydney. A maximum effort ASW search by all available warships from Sydney assisted by ten RAAF planes found nothing. In a four week period I-21 made six torpedo attacks on shipping sinking three and damaging two so badly they were subsequently scrapped.

I-21 flew two recon flights over Sydney, on 25 January and 19 February. On the latter flight the plane was detected by radar approaching Sydney. It was spotted by searchlights and attacked by anti-aircraft fire. Fighters were scrambled but failed to make contact. A destroyer and three separate air searches were tasked to find I-21 but submarine and plane escaped unscathed to return to base in Rabaul. I-21's cruise was the most successful of any Japanese submarine.

Meanwhile, on the other side of the country, I-165 surfaced off the West Australian coast on the evening of 21 January and fired ten shells into the wilds around Port Gregory. This was an attempt to divert allied naval attention from the evacuation of ground forces from Guadalcanal. The good people of Port Gregory thought it was lightening. Days later they discovered the shell holes. This was the only result of the deception effort, a failure by any standards.

After the evacuation of Guadalcanal, some of the transport submarines were able to revert to their offensive roles. In March, I-6 arrived off Brisbane and laid a field of nine German supplied acoustic mines. It also made an unsuccessful attack against shipping, surviving the subsequent depth charging. Five submarines were operating off the east coast by April with I-11, I-177, I-178 and I-180 of Submarine Squadron 3 joined by I-26. Their area of operations ran from Queensland down to Wilson's Promontory in Victoria. I-26 opened the campaign by sinking the 4,732 ton *Recina* and its cargo of 8,000 tons of iron ore. Two weeks later I-26 sunk a second ship. Both these ships had been in convoy and I-26 successfully evaded the counter-attacks made by the escorts.

The very successful, reliable and effective Japanese torpedo of WW II, the Long Lance. Seen here on display at the Washington Navy Yard in the US after WW II.

During the months of April and May 1943 these submarines made a total of 12 attacks on ships both in convoy and alone, sinking seven and damaging two, the most notorious of these being the night attack against the hospital ship *Centaur*. Although easily identifiable as a hospital ship, she was torpedoed by I-177 approximately 24 nautical miles off the Queensland coast. Of the 332 persons on board, only 64 survived. Despite extensive naval and air searches, no Japanese submarine was found.

At around 17.15 on 16th June 1943 two ships in convoy GP55 were torpedoed almost simultaneously 250 nautical miles northeast of Sydney. The 5,551 ton freighter *Portmar* was sunk and a US tank transporter was damaged. The attacker, I-174, survived five depth charge attacks over the next hour to make good its escape. This was the last Japanese submarine attack of the war in Australian waters. Five months later, in December 1944, the convoy system was finally terminated. Other than two periscope recons of northern Australia carried out by I-165 in September 1943 and May 1944 and the sinking of three freighters by the German submarine U-862 between December 1944 and February 1945, there was no further submarine activity in Australian coastal waters.

In World War II, a small number of submarines causing a negligible amount of damage managed to disrupt Australian shipping to a disproportionate extent. Primarily this was due to the lack of preparation by the Government and the armed forces, despite the certain knowledge that war with Japan was inevitable. Between 1942 and 1944, the Australian Naval Control Service estimates that 6,329 ship movements made up 910 convoys around coastal Australia and 254 to and from New Guinea, for a total of 1,164 convoy movements. In the same time, 25 ships were lost to Japanese submarines in Australian waters. It will never be known exactly how many submarine attacks were made due to the destruction of Japanese records at the end of the war. When compared with the battle of the Atlantic, where allied losses totalled 2,353 ships throughout the whole war, the Japanese effort is feeble by comparison.

Also unknown is the number of attacks made by allied escorts on Japanese submarines. Australian anti-submarine forces were woefully inadequate and the country had to depend on the US Navy to provide shipping protection during the early part of the war. Lessons learned the hard way in the Atlantic were ignored. Very few submarines were damaged and only two were sunk. Unfortunately, we will never know how many submarine attacks were prevented by naval escort forces or the RAAF.

During World War II, Japan had both the intent and the opportunity to sever Australia's sea lanes. That they failed to do so is primarily due to the pitifully few submarines allocated to the task. Japan's submarines were always intended to attack warships of the US fleet, to cull their numbers while they fought their way across the Pacific for a major fleet action with the Imperial Japanese surface Navy. Commerce attacks did not suit either their overall strategy or their warrior ethos. Had they concentrated on attacking Australian commerce shipping, it is likely that they could have seriously reduced or even intermittently stopped coastal and overseas shipping movements. While Australia could always feed itself, its war industries would have suffered severely. It would also have been considerably more difficult for the US to use Australia as a base to build up the forces required for the long hard trek back across the Pacific to final victory.

PRODUCT REVIEW

Models

Dragon Wings – Warbird Series

F/A-18E/F Super Hornet
1/72 scale Die Cast Model series.

VFA-14 'Tophatters' F/A-18E
Super Hornet 2005.

VFA-41 'Black Aces' F/A-18F
Super Hornet 2003.

VFA-102 'Diamondbacks'
F/A-18F Super Hornet 2004.

Cost $70.00 each + Postage & Handling.
From: The Armchair Aviator.
8 James Street Fremantle WA 6160
Ph and fax (08) 9335 2500

Reviewed by Ian Johnson

Released by Dragon in 2005, the F/A-18E/F Super Hornet die cast model series overall is good, with squadron colours schemes to match. The current Dragon Super Hornets available are: XO VFA-41 'Black Aces' F/A-18F Super Hornet 2003: VFA-102 'Diamondbacks' F/A-18F Super Hornet 2004: VFA-14 'Tophatters' F/A-18E Super Hornet 2005: with more released later in the year. They are each sold separately. Some assembly of the model, such as the weapons pylons is required, as is deciding if you want the model on a stand or wheels down. What takes away from the fine detail is one glaring oversight, the under wing weapons pylons on these models are modelled to be placed running parallel to the fuselage under the wings, not angled away from the fuselage as they are on real Super Hornets. Modifying the model to match the real Super Hornet will damage the model if not done properly. Without the under wing weapons pylons the model is acceptable, but it is hoped Dragon will correct the model's wing weapons pylons to match the real Super Hornets with future versions of the model. As with the Tomcat series there should be more information on the box about the aircraft and its history. That said, they are not bad models, but know what you are looking for.

Books

Calls of the Deep

The Story Of Naval Communication Station
Harold E. Holt

Exmouth Western Australia
ISBN 0642296545

By Brian Humphreys
Reviewed by CMDR Greg Swinden

The history of the Naval Communications Station (*Harold E. Holt*) in Western Australia has finally been written. The once shadowy world of Cold War communications has been exposed, partially at least, to the bright lights of history.

Brian Humphreys, a former Defence public servant and communications specialist, has written an excellent book on the history of the station ranging from the concept in the late 1950's, construction in the 1960's and usage up to the present day. The history covers all aspects of the base and is also valuable in its description of the social activities of the day for the hundreds of men, women and children who called *Harold E. Holt* their home.

The 235 page, hard cover book is lavishly illustrated with both colour and black and white photographs and would, if it had been published in the 1970's earned it at least a Confidential security caveat. It was published by the Defence Publishing Service in 2006 and is now available from Australian Aviation via their website *www.ausaviation.com.au* or PO BOX 1777 FYSHWICK ACT 2609 at a cost of $39.95 plus postage and handling.

I am not sure why it's available from this source but it is a good read. Highly recommended for anyone who has served at NAVCOMSTA *Harold E. Holt* or those with a desire for knowledge on US-Australian Naval relations.

STATEMENT of POLICY

Navy League of Australia

For the maintenance of the Maritime wellbeing of the nation.

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 close relationships with the nearer ASEAN countries, PNG and South Pacific Island States.
- Advocates the acquisition of the most modern armaments, surveillance systems and sensors to ensure that the Australian Defence Force (ADF) maintains some technological advantages over forces in our general area.
- 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 a highly mobile well-equipped Army, capable of island and jungle warfare as well as the defence of Northern Australia and its role in combatting terrorism.
- Advocates that a proportion of the projected new fighters for the ADF be of the Short Take Off and Vertical Landing (STOVL) version to enable operation from suitable ships and minor airfields to support overseas deployments.
- Endorses the control of Coastal Surveillance by the defence force and the development of the capability for patrol and surveillance in severe sea states 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 support the ADF and 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.
- Believes that the level of both the offensive and defensive capability of the RAN should be increased, and welcomes the decision to build at least 3 Air Warfare Destroyers (AWDs).
- Noting the increase in maritime power now taking place in our general area, advocates increasing the order for AWDs to at least 4 vessels.
- Advocates the acquisition of long-range precision missiles and long-range precision gunfire to increase the RAN's present limited power projection, support and deterrent capabilities.
- Welcomes the building of two large landing ships (LHDs) and supports the development of amphibious forces to enable assistance to be provided by sea as well as by air to island states in our area, to allies, and to our offshore territories.
- Advocates the early acquisition of integrated air power in the fleet to ensure that ADF deployments can be fully defended and supported by sea.
- Supports the acquisition of unmanned surface and sub-surface vessels and aircraft.
- Advocates that all warships be equipped with some form of defence against missiles.
- Advocates the future build-up of submarine strength to at least 8 vessels.
- Advocates a timely submarine replacement programme and that all forms of propulsion be examined with a view to selecting the most advantageous operationally.
- Supports 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 Australia's defence industry, including strong research and design organisations capable of constructing and maintaining 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 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.

The new Italian aircraft carrier CAVOUR. She began sea trials in December 2006 and commissioned on March 27, 2008. Full Operational Capability is expected in early 2009 when she will take up the mantle of flagship of the Italian Navy. The ship is designed to combine fixed wing V/STOL and helicopter air operations (up to 30 aircraft), command and control operations and the embarkation of 400 Marines, 24 tanks or many lighter vehicles (50 APCs, 100+ Trucks). (Italian Navy)

HMAS SUCCESS (foreground) and HMAS TOBRUK at sea during the recent RIMPAC 08 exercise off Hawaii. (RAN)

HMAS WALLER arriving in Sydney for a brief stop over on her way to Hawaii for RIMPAC 08. During her RIMPAC deployment she was the first submarine to fire a Mk-48 Mod 7 torpedo. Her target was a retired USN Spruance class destroyer which was sunk with one shot. (RAN)

The new US Coast Guard Cutter BERTHOLF. BERTHOLF has a range of 12,000nm at 9kts and has a top speed of 28+ kts. She has an automated weapon system consisting of a 57mm rapid fire gun and a Mk-15 Phalanx Block 1B CIWS. Her search radar, passive surveillance, datalink and communications fit out are state-of-the-art. She can also carry two helicopters and a number of rigid hull inflatable boats which can be launched and recovered from stern doors while the ship is in motion. She has a full detection and defence capability against chemical, biological or radiological attack. (USCG)