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THE NAVY

The Magazine of the Navy League of Australia

*The RAN and the
Invasion of Iran
– 1941*

*How to Fly a
Sea Harrier
Part 1 –
The Take Off*

*Navies To Become
The Enforcers*

*Patrolling
Northern Australia*

Australia's Leading Naval Magazine Since 1938

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HMAS ARUNTA departing from her homeport of HMAS STIRLING Garden Island, Western Australia on Monday 12 November 2007 for a six-month deployment to the Middle East. (Defence)



HMAS ADELAIDE seen here arriving in the City of Adelaide for the last time as part of her decommissioning cruise. The Army's 48 Field Battery is firing a salute in reply to a 21-gun royal salute fired by HMAS ADELAIDE. ADELAIDE is to be decommissioned in early 2008. Following her decommissioning, she will be gifted to the NSW Government and sunk off the NSW Central Coast, near Terrigal, to become an artificial reef and a recreational dive attraction. (Defence)



THE NAVY

Volume 70 No. 1

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Front cover: The Arliegh Burke class destroyer USS MITSCHER (DDG-57) moves into position forward of multipurpose amphibious assault ship USS WASP. The RAN will be acquiring a similar capability in these two ships with its Hobart class AWDs and Canberra class LHDs. (USN)

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The Howard Legacy to Defence – Big Shoes to Fill

With the election of the new Rudd-led Labor Government comes the end of one of the most successful peacetime military capability build ups in Australia's history. The ADF went from a force that its own leaders said was incapable of defending the nation, to one that can outclass almost any potential enemy.

At the 1996 election the Howard Government inherited an ADF in a shocking state. Long promised airborne early warning aircraft missing; submarines that did not work; expensive new frigates with no weapons; no attack helicopters for the Army; no strategic airlift; no Chinook helicopters; an army reduced by two battalions; no airborne tankers; an over the horizon radar system that did not work; an army that could only defend against small raiding groups of armed trouble makers in the top end; a navy being forced to resemble a coast guard; and, an air force destined to never leave the confines of its continental airbases. All in all it was a paper tiger structured for the convenient term of 'continental defence' but not even funded to carry it out.



The then Prime Minister The Hon. John Howard at the signing ceremony in Melbourne for the two new Canberra class LHDs flanked by representatives of Spanish company Navantia and Tenix Australia. (Defence)

The first act of the Howard Government in the defence portfolio was the *Defence Efficiency Review*. This programme redirected money from 'the tail' to 'the teeth'. It proved Defence was not hiding or wasting money. This then gave the Howard Government the legitimacy and confidence to start increasing defence spending to the point that the ADF could deploy and successfully conduct operations outside of Australia. The first being to liberate East Timor from Indonesian control.

The Howard Government then instigated a new White Paper with a Public Discussion programme preceding it called the Green Paper. This set the course for a more capable ADF – and one that the Howard Government actually delivered against right up to its election demise, as well as fixing the problems it inherited.

The ADF went from strength to strength and proved to the Howard Government it was worth the expense. It was sent on more missions overseas in pursuit of Australia's wider interests in Iraq, Solomons and Afghanistan, to name a few, as

it now had the capability to do so. In each, the ADF acquitted itself well and gained a worldwide reputation as a professional, well equipped and disciplined force to be reckoned with.

The last few years of the Howard Government's tenure saw a well earned increase in the ADF's warfighting capabilities. Capabilities needed as a result of hard won lessons from the many operations the ADF had conducted. New main battle tanks; updated tracked and wheeled armoured personal carriers; two more infantry battalions; an expanded Special Forces capability; strategic airlift C-17 aircraft; Super Hornets to replace the ailing F-111; new patrol boats; updated Anzac and FFG frigates; and, new troop lift helicopters. But of more importance to readers of this magazine, the Howard Government managed to conduct the contract signing for the two new Canberra class LHDs and Hobart class AWDs before the calling of the election.

Many will recall that the last time the Labor Party unseated a government it immediately cancelled the RAN's major capability programme, the aircraft carrier replacement project, without consulting the nation's sea service experts.

The RAN's current major programmes, the AWDs and LHDs, are the result of lessons learned by the ADF's professionals over the last decade of operations. Anyone contemplating altering any of these projects would be making a gigantic and monumental strategic blunder worthy of the history books.

So what of the new government? During the election campaign their Defence Spokesman, now Defence Minister, Joel Fitzgibbon, said they would honour all the Howard Government's defence capability commitments, thank Heaven for "me-tooism". They further stated that they supported the Defence Capability Plan and the LHDs and AWDs, despite many of their former advisers continually denouncing them in the media.

Only time will tell if the Labor Party bequeath a defence force in as good a shape as the one they inherited. *THE NAVY* wishes the new Minister good luck and every success in the job! He has very big shoes to fill.

Themistocles



(from L to R) Chief of Navy VADM Russ Shalders, then Defence Minister (now Opposition Leader) The Hon. Dr Brendan Nelson and Chief of the Defence Force Air Marshall Angus Houston admiring a model of the new Hobart class AWD. (Defence)

THE PRESIDENT'S PAGE

The 2007 Annual Meeting of the Federal Council of Navy League was held in Canberra in October.

We welcomed some fresh faces at Federal Council, including two from Tasmania. The Tasmanian delegation not only provided a couple of new faces but, to the delight of one of our long serving members, another naval aviator. We expect to hear more of aircraft carriers!

One of the activities that members of Federal Council always look forward to is the Friday briefing at Navy Headquarters. This year the brief was presented by Commodore Ray Griggs, Director-General Navy Strategy, Policy & Futures. As ever, it was a worthwhile opportunity to learn a great deal about Navy's problems, opportunities and future possibilities.

On Saturday at HMAS HARMAN we were joined by the Deputy Chief of Navy, Rear Admiral Russ Crane. Federal Council discussed with DCN a great number of issues, including the future of the RANR; progress with the Air Warfare Destroyer and the new amphibious ships; the Joint Strike Fighter; the possibility of the ADF acquiring the STOVL (Short Take Off and Vertical landing) version of the F-35 JSF; recruiting and retention; and the Australian Navy Cadets.

Each year Federal Council awards the Navy League of Australia Perpetual Trophy – Community Award. The aim of the award is to recognise the remarkable community work done by the ships and establishments of the RAN. Once again there was a large field of ships and establishments from which to choose a winner. From that field Navy Headquarters sent to Federal Council a shortlist of three. They were HMAS NEWCASTLE, HMAS CAIRNS and HMAS CERBERUS. After considering the submissions from the three finalists Council decided that HMAS CERBERUS should be declared the winner for 2007.

As is often the case, there were many entries worthy of commendation. The quality of the submissions seems to improve each year. The League offers its congratulations to the winner and well done to all contestants.

This year the Community Award was not the only prize to be considered by Federal Council. In 2007 the League introduced a Maritime Essay Competition. Entries were invited on *20th Century Naval Warfare* and *Modern Maritime Warfare*. Prizes were offered in both professional and non-professional categories.

The winner in the professional category was CDR David Hobbs with an essay *HMAS MELBOURNE – 25 Years On* which appeared in the last issue of *THE NAVY*. Second prize in the professional category went to Desmond Woods for his article *Nearly Too Little, Nearly Too Late*. This was on the RN's Fleet Air Arm in WWII and the Falklands.

First prize in the non-professional category was awarded to Peter Cannon for *The Royal Australian Navy and the Invasion of Iran 1941*. Second prize was shared between John Henshaw for *HMAS ALBATROSS: White Elephant or Wolf in Sheep's Clothing* and Kelvin F Curnow for *An Island Too Far*.

Our thanks to all who took part in the contest and our congratulations to the prize-winners. Federal Council agreed that the essay competition had been well worthwhile. It will run again in 2008.

The League Statement of Policy is carried in every edition of this magazine. Circumstances, events, government policy and many other factors can alter and the League adapts its Statement accordingly. At this year's Federal Council we reviewed our Statement of Policy. What appears in this edition of *THE NAVY* is a result of our review.

An always interesting part of our annual meeting is the presentation of reports by the State Divisions of the League. Each Division conducts its proceedings in its own way. But they all have a common aim. It was heartening to hear of lunches, dinners, seminars, ship visits, yacht races and many other means employed by the Divisions to promote the League's principal objective – the maintenance of the maritime wellbeing of the nation.

The Navy League intends to remain a vibrant relevant organisation. To that end Federal Council undertook a review of the League website and discussed how it can be improved; we considered how we might better employ the distinguished members of our Advisory Council; we agreed on the need for a modern marketing plan.

It was an excellent conference. It was enjoyed by all. Both Tasmania and Western Australia Divisions have indicated that they would like to host the annual conference. They have been invited to put in their bids.

Next year the conference will be back in Canberra. After that – we shall have to wait and see.

Graham Harris, Federal President Navy League of Australia



Members of the 2007 NLA AGM at HMAS HARMAN in Canberra. From left to right: Mason Hayman (President WA Division), Trevor Vincent (WA), John Wilkins (President Vic Division), John Bird (Federal Vice-President), Robert Albert (President NSW Division), Graham Harris (Federal President), John Jeremy (NSW), Tudor Hardy (President Tas Division), Bill Dobbie (NZ Navy League), Keith Adams (NSW), Derek Le Marchant (Tas), Andrew Robertson (Federal Vice-President), Chris Skinner (NSW), Ray Corboy (Vic), Philip Corboy (Hon. Federal Secretary).



The Navy League of Australia

Second Annual Maritime Essay Competition 2008

The Navy League of Australia is holding a second maritime essay competition and invites entries on either of the following topics:

20th Century Naval History
Modern Maritime Warfare

A first, second and third prize will be awarded in each of two categories: *Professional*, which covers Journalists, Defence Officials, Academics, Naval Personnel and previous contributors to *THE NAVY*; and *Non-Professional* for those not falling into the *Professional* category.

The prizes are:

- *Professional* category: \$1,000, \$500 and \$250
- *Non-Professional* category: \$500, \$200 and \$150.

Essays should be 2,000-3,000 words in length and will be judged on accuracy, content and structure.

The deadline for entries is 29 August 2008 with the prize-winners announced in the January-March 2009 issue of *THE NAVY*.

Essays should be submitted either in Microsoft Word format on disk and posted to: Navy League Essay Competition, Box 1719 GPO, SYDNEY NSW 2001; or emailed to editorthenavy@hotmail.com.

Submissions should include the writer's name, address, telephone and email contacts, and the nominated entry category.

*The Navy reserves the right to reprint all essays in the magazine,
together with the right to edit them as considered appropriate for publication.*



The Royal Australian Navy and the Invasion of Iran 1941

By Pete Cannon

The Anglo-Soviet invasion of neutral Iran in August 1941 has been largely consigned to the footnotes of Second World War history. This essay seeks to outline the role played by two Australian warships that took part in the invasion. Each played leading roles in spearheading the assault of an improvised British Empire force cobbled together at the last minute in one of the truly forgotten campaigns of the war, but one that would have far reaching implications for its outcome.

British interests in the Middle East at the time were vast and the Persian Gulf was no exception. The interest in Persia, known as Iran after 1935, extended back to the days of Napoleon, however the 1907 discovery of oil led to the British Admiralty organising the formation of the Anglo-Persian Oil Company as a strategic asset. A large refinery was built on the island of Abadan, on the Shatt Al-Arab River, a confluence of the Tigris and Euphrates rivers flowing down through Iraq to the sea. The river would later become the border between Iraq and Iran at its southern end as it empties into the Persian Gulf. The refinery was connected by pipeline to the existing oil fields.¹

By 1941 the Iranian oil fields were vital to the Empire war effort. The anti-British revolt in April-May of that year in neighbouring Iraq, also an important oil supplier for forces fighting in the Mediterranean, had unsettled London. The astonishing success of the German invasion of the Soviet Union in June raised the prospect of Axis penetration of the area. It also highlighted the importance of Iran as a gateway for supplying the beleaguered Soviet Army in order to keep them in the field against Hitler. The only other way for the United Kingdom to assist its new ally was the highly problematic, not to mention dangerous, convoying of supplies



Boarding Party No. 1 on ST ATHAM August 1941.
(AB Con Cannon RANR)

through the Arctic to Northern Russia. German influence in neutral Iran, including many enemy nationals, was widespread enough to be used as a pretext for the UK and the Soviet Union to occupy the country in order to further their war aims. A joint ultimatum issued to Iran's Shah on 21 August 1941 was rejected, resulting in two Indian Army divisions entering southern Iran from Iraqi territory whilst a heavier handed Soviet force invaded from the North.²

The Royal Navy's primary objectives as part of the British invasion of Iran were the seizure of the Abadan oil refinery and attendant oilfields along with the capture of the Persian Gulf port of Bandar Shahpur including eight Axis merchantmen sheltering there. These operations were given the code name of *COUNTENANCE*.

This operation encompassed three simultaneous naval undertakings: Operations *CRACKLER*, *MARMALADE* and *BISHOP*. These were to be followed by another three: *MOPUP*, *KAREN RIVER* and *BUNDER ABBAS*. The RAN would play a pivotal role in three of these six operations.³

Operation *CRACKLER* encompassed the landing of Indian infantry on the Island of Abadan to capture the Anglo-Iranian Oil Company (AIOC) refinery and also to destroy one Iranian naval sloop lying alongside. *MARMALADE* involved the neutralisation of the bulk of the Iranian Navy its base at Khorramshahr on the Shatt Al-Arab river. This required the



BAGR after being sunk by HMAS YARRA at the Iranian Navy base at Khorramshahr on the Shatt Al-Arab river 1941 (KANIMBLA Association)



Boarding Party No. 3 on RAF Launch 20. (HMAS CERBERUS Museum)

sinking or capture of Iranian naval vessels, mostly of Italian construction, and the landing of one company of Indian soldiers to secure the shore facilities. Operation *BISHOP* targeted the port of Bandar Shahpur on the Khor Musa river, the Persian Gulf terminus of the Trans-Iranian Railway and the Royal Navy's (RN) most ambitious goal of the invasion. Occupation of the port by more Indian troops would be relatively straight forward, but capturing the German and Italian merchant vessels before they had a chance to sink themselves was the overriding concern, and this would be rather difficult to execute. The navy also had to plan for the two Iranian gunboats based there to contest the issue. *MOPUP* and *KAREN RIVER* encompassed clearing Abadan Island and transporting the army up river to the regional objective of Ahwaz. Finally *BUNDER ABBAS* called for the capture of an Italian merchantman using the port of Bandar Abbas as a refuge.

This series of operations were entrusted to the RN's Persian Gulf Division, a component of the East Indies Station administered from Colombo, Ceylon, under Commodore Cosmo Graham RN, Senior Naval Officer Persian Gulf (SNOPG). By this stage of the war the RN, whilst still a powerful global force and largest navy in the world, was stretched almost to breaking point. This was particularly so in the vicious air-sea battles taking place in the Mediterranean, along with the Atlantic commerce war that had the potential to decide the fate of the United Kingdom and her Empire. The naval forces safeguarding the remaining shipping routes of the world were operating on a shoe string and the Persian Gulf Division was a low priority. As of 1 August, SNOPG, flying his broad pennant in the armed yacht HMS *SEABELLE*, had under his command three regular naval sloops, two lightly armed sloops converted from survey and despatch duties, one First World War vintage river gunboat, one modern corvette, one auxiliary patrol vessel and an armed trawler.⁴ One of the modern escort sloops on hand was the Australian HMAS *YARRA*.

YARRA was a 1,060 ton Improved Grimsby class sloop. Built at Cockatoo Island Dockyard in Sydney to be commissioned into the RAN on 21 January 1936, she carried three single 4-inch guns as her main armament and had a maximum speed of 16.9 knots.⁵ Following a period of escort duties in home waters, *YARRA* deployed for overseas service

to the East Indies Station in August 1940. Crewed by 150 mainly regular navy personnel and under the command of Lieutenant Commander WH Harrington RAN (a future Chief of Naval Staff) the ship primarily undertook escort duties in the Red Sea, including a spirited gun action in which she took on two Italian destroyers attacking her convoy, before joining the Persian Gulf Squadron in April 1941.⁶ She was actively employed during the Iraqi campaign, in providing naval gunfire support and even effected amphibious landings of Ghurkha troops on the banks of the Shatt Al-Arab. Following the cessation of hostilities in Iraq, August found the ship assigned to the forthcoming Iranian operations.⁷

The second Australian ship to be committed, though commissioned in the RN, was the armed merchant cruiser HMS *KANIMBLA*. She had been a 10,985 ton passenger ship working the Australian coast pre-war for the Melbourne based shipping company McIlwraith McEacharn. Completed in 1936 and luxuriously appointed, she was taken over by the British Admiralty as an auxiliary cruiser in line with an agreement previously negotiated with the company. She was commissioned into the RN in Sydney on 5 September 1939.⁸ *KANIMBLA* was then hurriedly converted at Garden Island and armed with seven 6-inch guns and two 3-inch anti-aircraft guns before sailing for the China Station in December. She was manned almost completely with Australian reservists but was deemed a British ship, the bills being paid in London. Following highly successful service operating from Hong Kong, she later found herself in the Indian Ocean prior to the Gulf.⁹ She arrived off Kuwait on 8 August after being diverted from a convoy out of Bombay by the Commander-in-Chief East Indies to augment SNOPG's force.¹⁰ Acting Captain WLG Adams RN (who had recently served in the cruiser HMAS *PERTH*) had been in command since March 1941.¹¹ He became Senior Officer of Force B, the flotilla to take Bandar Shahpur.

Initial planning for *COUNTENANCE* had taken place prior to *KANIMBLA*'s arrival, but Adams and his Officers carried out fine tuning throughout the preparation and training phase, eventually having under their command '...surely the most oddly assorted flotilla that ever flew the White Ensign'.¹² This consisted of the Indian auxiliary sloop HMS *LAWRENCE*, the river gunboat HMS *COCKCHAFFER*, corvette



Burning Italian Ships at Bandar Shahpur 25 August 1941. (HMAS CERBERUS Museum)



HMAS YARRA Iraq 25 June 1941. (HMAS CERBERUS Museum)

HMS SNAPDRAGON, armed trawler HMS ARTHUR CAVANAGH, AIOC salvage tugs ST ATHAM and DELAVAR, Royal Air Force Launch 20, and lastly a small Arab dhow, *Naif*, now known as Dhow 8. The Australians were to provide five boarding parties to distribute amongst the force (one each were furnished by LAWRENCE, COCKCHAFER and SNAPDRAGON) and to lead this truly British Empire effort. Training began at once, KANIMBLA remaining at anchor 11 miles from the nearest land off the entrance to the Shatt Al-Arab. Secrecy was strictly maintained along with KANIMBLA being camouflaged to resemble a troopship. The boarding parties made up their training program as they went, using their merchant ship experience and putting themselves in the shoes of the German and Italian would-be saboteurs, an approach that would prove remarkably accurate. The weather was often unsuitable for boat work and the crews of all ships toiled in extreme temperatures, at times over 38°C in the shade. A and D Companies of the 3/10th Baluch Regiment (from what is now Pakistan) were also ferried out to KANIMBLA on 10 August to undertake the landing. Ships of the force were used to patrol the entrances to the Khor Musa and Shatt-Al Arab, *Naif*'s Australian crew being disguised as Arab fishermen. Force B was reported fully trained and equipped to undertake *BISHOP* on 16 August 1941 and the whole operation eventually given the green light for 0410 local time on the 25th.¹³

Operation *MARMALADE* was less complex and under the command of Commander UHR James RN in HMS FALMOUTH but YARRA was obliged to conduct the operation alone after the British ship ran aground soon after slipping. YARRA arrived off Khorramshahr, which lies at a narrow point of the river, without being detected and Lieutenant Commander Harrington hid his ship behind an anchored British freighter until the landings at Abadan were confirmed to be under way. Gunfire from that direction signalled the sinking of the Iranian sloop PALANG was in progress and at that point YARRA edged ahead to clear her forward two 4-inch guns for action. The ship's searchlight then illuminated PALANG's sister ship BABR lying alongside a jetty. Harrington had decided to sink the sloop, as YARRA was unsupported and also had two 331 ton gunboats, the CHAROGH and SIMORGH to deal with. Besides, the sudden destruction of the most powerful ship present was calculated to discourage further Iranian resistance.¹⁴

The opening salvo from No's 1 & 2 guns simply couldn't miss. The range was so short that the safety depression cut off

prevented the gunnery director from controlling the shoot, so local control was employed to hit BABR dead amidships.¹⁵ Ten salvos were poured into the port side of the hapless sloop, backed up by the ship's 3-pounder guns so that the target was soon burning fiercely. One Iranian gun crew attempted to close up but were prevented from getting into action by a withering hail of fire. The ship came to rest in the mud, heeling over to port, following the detonation of the after magazine which blew an eight foot hole in the bottom.¹⁶ YARRA then began to come under small arms fire from the naval barracks ashore, but her return fire of 3-pounder and the quadruple mounted 0.5 inch Vickers machine guns soon took care of this. As she proceeded alongside the two gunboats, small arms fire was also received from them and it appeared their main armament was preparing to fire. Their decks were promptly sprayed with Bren and Lewis machine guns along with rifles. Boarding parties, consisting of No. 1 gun's crew, stokers, cooks and stewards, were soon over the side and securing the two ships. With only one platoon of Indian soldiers aboard, Harrington awaited the belated arrival of additional troops in FALMOUTH before landing them to take the barracks and surrounding environs. HMAS YARRA took 90 Iranians prisoners on board, including four wounded. At 2130 the ship slipped from Khorramshahr and proceeded to carry out Operation *BUNDER ABBAS*, the capture of the Italian merchantman *HILDA*.¹⁷

Force B's unlikely flotilla moved up the Khor Musa from the Persian Gulf on the evening of the 24th. While navigationally dicey, at least the river was not patrolled by one of the Iranian gunboats, the tug ST ATHAM having been detailed to board her by subterfuge without her being able to raise the alarm if encountered. Just before dawn, KANIMBLA dropped back allowing the small ships to race ahead to get at the Axis shipping at anchor in the harbour. The alarm was raised in the German freighter *HOHENFELS* at the last minute, soon followed by Allied sailors scrambling over bulwarks to be greeted by the sound of exploding demolition charges and rising columns of smoke. The five German ships, *HOHENFELS*, *MARIENFELS*, *STURMFELS*, *WEISSENFELS* and *WILDENFELS*, mainly attempted to make use of flooding to send their ships to the bottom while the Italians in the tankers *BARBARA*, *BRONTE* and *CABOTO*, having disabled their engines sometime previously were more inclined to set their ships alight. *WEISSENFELS* was soon in trouble, heavily afire and taking on water, all efforts to save



HMS KANIMBLA Penang December 1941. (KANIMBLA Association)



HOHENFELS at high tide. (Harold Greer)

her throughout the day failed and she sank early next morning. *WILDENFELS* and *MARIENFELS* were captured intact, all demolition charges having been secured in good time, while two German seamen were killed by British machine gun fire in the process of lighting fires in *STURMFELS*. Another two were believed to have jumped over the side never to be seen again.¹⁸ Australian sailors fought a losing battle with rising water in the engine room of *HOHENFELS*, but the salvage tugs managed to run the stricken German ship onto a mud bank before she could sink. A marathon salvage effort was then carried out by *KANIMBLA* over the next six weeks to save the ship, *KANIMBLA*'s diver, Petty Officer JT Humphries RAN, winning the George Medal for bravery in the process.¹⁹ The two Iranian gunboats, *CHAHBAAZ* and *KARCAS*, were taken without a shot along with a floating dock. Fire fighting in the three Italian tankers was touch and go, *KANIMBLA* having to go alongside *BRONTE* in order to get her under control.²⁰ With so many men out of the ship in boarding parties, cooks, stewards and anyone available battled the fires whilst two 6-inch gun crews were in action trying to stop a train escape from the town and the anti-aircraft guns fired at high flying aircraft. They later turned out to be British, the RAF having stated any aircraft being sighted would be enemy. The Baluch troops were also landed in boats at this time and took the town against sporadic resistance. Thereafter, until sailing for Bombay on 11 October, *KANIMBLA* remained in Bandar Shahpur (with the exception of a short visit to Abadan) and undertook a myriad of duties in charge of the town and salvage efforts. The final tally stood at seven Axis merchantmen either steamed under their own power or towed to India to add their numbers to the hard pressed Allied merchant fleets.²¹ Also the two captured gunboats eventually commissioned into the Royal Indian Navy along with the two taken by *YARRA*.²²

After dark on 27 August, *HMAS YARRA* was seven and a half miles off the Iranian port of Bandar Abbas when a burning ship was sighted. *HILDA* had been set well alight before being abandoned by her crew of whom there was no trace. Fires raged in the superstructure, holds and engine room, the bridge having also collapsed. It was too dangerous for the Australians to take their ship alongside and as Lieutenant Commander Harrington's instructions were to remove the ship under the cover of darkness, *YARRA* spent the next day in the Straits of Hormuz before tackling the diminished fires the next night. The ship was heavily damaged and taking water, but she was towed out of Bandar Abbas and

many of the fires brought under control with great difficulty by dawn on the 29th. Course was set for Karachi and the remaining fires extinguished, but *HILDA* slowly took on water. This along with the weather conditions necessitated her being diverted to Chahbar Bay just short of the Iran / India border and anchored in shallow water on 2 September to await assistance. *HILDA* was pumped out prior to being towed to Karachi by a salvage tug while *YARRA* returned to Kuwait to fuel before taking over the tow of the Italian *BARBARA*. This ship was then towed to Karachi ending the Australian sloop's participation in *COUNTENANCE*.²³

HMAS YARRA went on to perish in the gallant yet forlorn defence of a convoy attempting to escape the fall of the Dutch East Indies on 4 March 1942. She fought to the last against no fewer than three Japanese heavy cruisers and two destroyers.²⁴ *HMS KANIMBLA* saw further service in South East Asian and Australian waters before paying off from the RN and converting to an infantry landing ship. She recommissioned into the RAN on 1 June 1943. She served until 1949 when she was reconverted and returned to her owners.

Overall, the contribution of RAN ships and personnel to the invasion of Iran was instrumental to its success. Not only did *HMAS YARRA* neutralise enemy naval forces in Khorramshahr single handed, but topped it off with another captured merchantman. Commodore Graham had the following to say in regard to invaluable service provided to Operation *COUNTENANCE* by *HMS KANIMBLA*:

Without a ship of great administrative endurance, a large ship's company, spacious accommodation and a merchant vessels attributes it would have been most difficult to co-ordinate the efforts of the variety of craft and personnel employed and weld them into one harmonious striking force.²⁵

Graham was also most complementary in his regard for the Australian sailors of his command. As for the port of Bandar Shahpur, both the British and Americans used the Trans-Iranian Railway to supply the Soviet war machine for the remainder of the conflict. Some of this material would prove vital, not that the Soviets ever admitted as much, to the blunting of Hitler's offensive deep into the USSR in 1942.²⁶

¹ Stewart, Richard. A. *Sunrise at Abadan*. New York: Praeger Publishers, 1988. p. 6-7

² Dear, I.C.B, and Foot, M.R.D. (Editors). *The Oxford Companion to World War II*. Oxford: Oxford University Press, 2005. p 682



WEISSENFELS on fire 25 August 1941. (*KANIMBLA* Association)



White Ensign over the Swastika at Bandar Shahpur 1941.

³ The National Archives of the UK (TNA): Public Record Office (PRO) ADM 199/410, Persian Gulf and Aden Squadrons: War Diaries, Persian Gulf War Diary, Report of Proceedings of the Persian Gulf Division during Operation “Countenance”

⁴ TNA: PRO ADM 199/410, Persian Gulf and Aden Squadrons: War Diaries, Persian Gulf War Diary August 1941

⁵ Lenton, H.T. *British and Empire Warships of the Second World War*. London: Greenhill Books, 1998. p. 243

⁶ Australian War Memorial (AWM) 78, Item 374/1, HMAS YARRA: Reports of Proceedings (War Diary), 1939 – 1942, April 1941

⁷ AWM78, Item 374/1, HMAS YARRA: Reports of Proceedings (War Diary) 1939 – 1942, August 1941

⁸ AWM124, Item 4/191, Naval messages concerning requisitioning of ships, British Naval Command in the Far East and the Publicity Censorship Section of Naval Intelligence Division, Signal from Australian Commonwealth Naval Board to British Admiralty

⁹ Sherman, Peter. *Cry Havoc! H.M.S.-H.M.A.S. KANIMBLA goes to War*. Melbourne: Kanimbla Association, 1993. p. 9 – 42

¹⁰ TNA: PRO ADM53/114473, KANIMBLA, 1941, August 1941

¹¹ AWM78, Item 181/05 – KANIMBLA: Reports of Proceedings (War Diary), 1940 – 1943, March 1941

¹² National Archives of Australia (NAA): MP1049/5, Item 2026/3/455, Persian Gulf Operations, The Battle of Bandar Shapur by Executive Officer HMS KANIMBLA

¹³ NAA: MP1049/5, Item 2026/3/455, Persian Gulf Operations, Report of Proceedings of Senior Naval Officer Force B 10 August to 25 August 1941

¹⁴ AWM78, Item 374/1, HMAS YARRA: Reports of Proceedings (War Diary) 1939 – 1942, Report on “YARRA’s” Movements In Operation “MARMALADE”

¹⁵ Parry, A. F. *HMAS YARRA 1936 – 1942: The Story of a Gallant Sloop*. Sydney: The Naval Historical Society of Australia, 1980. p. 47

¹⁶ NAA: B6121, Item 55E, Persian Gulf Operations (Operation ‘Countenance’) – Report of Senior Naval Officer

¹⁷ AWM78, Item 374/1, HMAS YARRA: Reports of Proceedings (War Diary) 1939 – 1942, Report on “YARRA’s” Movements In Operation “MARMALADE”

¹⁸ NAA: MP1049/5, Item 2026/3/455, Persian Gulf Operations, Report of Proceedings of Senior Naval Officer Force B 10 August to 25 August 1941

¹⁹ Interview: Harry Stirk, Able Seaman HMS Kanimbla. 5 May 2007

²⁰ Diary: Frank Derek Simon, Sub Lieutenant HMS Kanimbla. 25 August 1941

²¹ NAA: MP1049/5, Item 2026/3/455, Persian Gulf Operations, Report of Proceedings of Senior Naval Officer Force B 25 August to 5 October 1941

²² Lenton, *British and Empire*. p. 267

²³ AWM78, Item 374/1, HMAS YARRA: Reports of Proceedings (War Diary) 1939 – 1942, Removal of Italian Ship Hilda From Bandar Abbas Towards Karachi

²⁴ Parry, *HMAS YARRA*. p. 85 – 87

²⁵ NAA: MP1049/5, Item 2026/3/455, Persian Gulf Operations, Report by Senior Naval Officer Persian Gulf on Operation Bishop, 14 October 1941

²⁶ Stewart, *Sunrise*. p. 222

How to Fly a Sea Harrier

Part 1 – The Take Off



By Mark Boast

A modified FA-2 Sea Harrier armed with AMRAAM. In this configuration the Sea Harrier was Europe's most potent air superiority fighter until the arrival of the Eurofighter/Typhoon. The Sea Harrier was taken out of service several years ago due to the cost of keeping her flying operationally. (RN)

Former RAN Skyhawk pilot later Sea Harrier fighter pilot, Mark Boast, provides a first hand account of how to fly a Sea Harrier in this three part series in THE NAVY. In Part 1 Mark talks us through the take off.

Lined up and with all the checks done at RAF Wittering on an early Harrier conversion sortie. Only the actual Take Off to negotiate – and then comes that gentle reminder in a soft Irish brogue from the instructor in the back seat. *“Don't forget to have a smally chat with your left hand lad before we get any further into the day”*. It was the mid 80s and I felt like I was having to re-learn some basic skills in converting to the Harrier after an aborted flying career with the Royal Australian Navy on the Macchi and A-4 Skyhawk. Basic skills like learning to take off safely!

We were in a Harrier T-4 which despite its twin seat layout actually had more power to weight than I was to experience later on operational Sea Harriers. The timely reminder from the rear seat was pointing out the key difference for the pilot between the Harrier family and “normal” fast jets; namely, the presence of two levers that controlled the rotating nozzles poking out from both sides and ends of the large Pegasus turbofan engine. One lever, the nozzle lever, for actually moving the nozzles via an air powered gearbox and chains to all four nozzles. The other, the nozzle stop lever, provided

detents so that the nozzle lever could be moved to a set position against the selectable detents without having to look inside.

And if you haven't guessed by now, a lightweight Harrier actually moves very quickly once the throttle is pushed forward. It was the actions to move the nozzles at various points during the takeoff run that had me re-learning how to take off an aircraft again – and was the basis for the very wise advice to think about what the left hand had to do in addition to just moving the throttle i.e. juggle the nozzle and nozzle stop levers. There were plenty of movies showing just what could happen when the left hand gets it wrong. So pleasing my



A T-4 Harrier training aircraft, as mentioned in the article by Mark when relearning how to fly again. (RN)



The 12 degree ski-jump of the Invincible class aircraft carrier as seen from a Sea Harrier Cockpit. The Ski-jump had a number of advantages. It reduced the length of the take off run to 500ft by providing the aircraft with a vertical boost via the angle which the aircraft would leave the deck (note the '500' stencilling on the deck). Wind over the deck also contributed to the take off effect of the ramp. (RN)

instructor deserved only a relatively low rating compared to that of damaging the aircraft or even losing it!

In this first of three articles on my flying experience with the Harrier, I would like to introduce you to the Sea Harrier and some of its interesting technical and operational aspects through the expedient of describing how to fly it. Let's start with the Take Off since that is where the interesting things start to happen. Next time I will describe what actually happens in the air. And whilst we are on a proverbial logical roll, why not finish with landings?

It was my privilege to fly both the FRS-1 (Fighter Reconnaissance Strike) and FA-2 (Fighter Attack) versions of the Sea Harrier from land and the Royal Navy's Invincible class carriers. And I wasn't the only Australian to do so. The RAN's loss in not receiving a replacement for its last fixed wing carrier was the RN's gain when it came to filling holes in the UK fast jet pilot training pipeline in the post Falklands War era. I still like to think that I was part of a group providing a minor repayment from the RAN Fleet Air Arm that drew so much from its UK heritage. On a personal basis, however, I was to experience an extremely rewarding 18 years where I was provided with more than my fair share of travel and adventure. The traditional naval recruiting promise was met on my watch.

The technical evolution of the RN Sea Harrier from the original RAF/USMC Harrier is well told and I won't repeat it here. Nor will I talk about the Indian Navy Sea Harrier which

remains the only user following withdrawal of the RN aircraft in 2006. But I will dwell on some of the differences between these two first generation types as they relate to naval operations and how they appeared to the pilot's subjective eye. Especially interesting to my mind is how the innate flexibility of the Short Take Off and Vertical Landing (STOVL) design was exploited to take an aircraft designed for ground attack operations from deployed field sites in Northern Europe, to become a fighter with some multi role capability operating from relatively small aircraft carriers in the Atlantic, Mediterranean and Arabian Gulf.

But back to taking off. Unlike most fixed wing aircraft, the Harrier's take off is not solely dictated by the wings ability to generate lift. Simply put, it is not a matter of racing down a runway and pulling back on the stick when the airspeed is sufficient for a controlled take off. After all, the Harrier can take off with no forward speed whatsoever. Simply point the nozzles straight down and provided there is a sufficient margin of thrust over weight, the aircraft will ascend when the throttle is pushed forward to achieve that thrust. An empty weight of seven tons with an engine capable of 11-12 tons of thrust is a simple equation for the Vertical Take Off (VTO). But the combination of fuel weight (a full loaded Sea Harrier carries four tons), half ton of water for engine turbine blade cooling, thrust losses for the reaction control system, thrust margin to achieve a decent rate of ascent and weight of weapons and pylons meant that the VTO was a take off method that was

effectively non-operational due to the very limited duration with few, if any, weapons. It was used however, in some operational situations. The most famous is probably the delivery of additional Sea Harriers from *Atlantic Conveyor* during the Falklands conflict. But the skills were retained and very occasionally used when moving aircraft from the carrier where the normal ski jump run was unavailable due to such things as an aircraft lift being stuck down, or the ship was in port and had no reasonable or safe take off direction.

The next form of take off based on increasing ground run and airspeed was the Rolling Vertical Take Off (RVTO). This technique was used in land based situations where a vertical take off was required, but there was significant danger of Foreign Object Damage (FOD). The trick was to push the throttle forward with the nozzles pointing backwards, and then select nozzles to a position just short of straight down (this is what the nozzle stop lever was for) as full power was achieved. The very short ground run enabled sufficient forward speed to avoid sucking any debris down the intake and thereby damaging the engine. The small wing and flap design of the Sea Harrier did not provide any significant wing lift advantages in the RVTO. In fact the subjective opinion of most pilots was that the wing didn't become useful until above 90 knots! This was very different from the new generation Harrier II family that has a totally different and much larger wing with automatic flap (they're huge) deployment upon nozzle selection. Combined with a more powerful Pegasus

engine, the Harrier II family is a vastly improved aircraft that largely restores the original sprightly Harrier STOVL performance back to an aircraft that is stuffed full of modern weapons and electronics.

The Short Take Off (STO) was the "bread and butter" take off used by the Sea Harrier both on land and at sea. This method involved racing off down the runway with the nozzles pointed straight back, and then selecting a moderate nozzle angle that complemented the available wing lift. This pseudo "rotate" speed was calculated on aircraft weight and thrust. The take off nozzle angle when added to the aircraft's nose high attitude when sitting on its undercarriage exploited the Pythagorean "sweet spot" of a 45 degrees thrust angle. The advantage of this take off was that there was good aerodynamic control effect and no aircraft attitude change was required. This relatively benign take off technique was usually conducted with 99% engine rpm out of a possible 104-108% available when on land in order to give some latitude for a formation wingman, but at sea, full power was always used due to the relatively limited take off run available.

Whilst the STO technique was common for both land and carrier launches, there were some differences that made both the appearance and take off distance required look very different. Apart from some relatively minor points of technique such as holding the aircraft on its brakes until the thrust from the accelerating engine became sufficient to cause the whole aircraft to start skidding forward, thereby preserving



Four Sea Harriers parked on the left and six RAF GR-7 Strike Harriers parked to the right with a Sea King helicopter taking off from the deck of HMS ILLUSTRIOUS. It was the helicopter's capability to operate in bad weather that was the limiting factor for Sea Harrier deck operations, as the helicopters were required to fly in the 'plane guard' rescue role. (RN)

as much of the deck take off run as possible, the major difference with carrier launches was the ski jump. The final angle of 12 degrees afforded by the ski jump, or ramp as it was often called placed the aircraft into the optimum climb attitude and angle. When combined with the wind over deck able to be generated by a moving ship, the take off run was reduced to a routine 450-550 feet. The final launch angle conferred by the ramp also brought one highly desirable advantage when operating from ships. Regardless of the pitching of the ship, the aircraft would usually always be launched with a positive climb relative to the water. The pilot selected the take off timing and it was relatively easy to judge when to apply take off power by waiting for the ramp to just start dropping from its highest point in the ship's pitching cycle. The initial take off run would therefore be mainly "downhill" and by the time the end of the ramp was reached, one full pitch cycle would have been completed and you would be selecting the nozzles down and leaving the ramp with the maximum climb angle. A very comfortable position to be in during in rough weather and especially at night! Of course sometimes the sea can play nasty tricks and occasionally the expected pitch up didn't occur. This is where the ramp angle itself came to the rescue. With both the land and carrier launch, the nozzles were slowly rotated fully aft (pointing backwards) after take off at a rate that maintained an increase in airspeed and altitude. But even this action wasn't required immediately if the pilot was distracted through unexpected events or even disorientated that can sometimes occur with carrier launches in the dark. The standard brief was to monitor the attitude and keep going until happy. This sometimes didn't happen until well over a 1,000ft had been attained and was a welcome safety zone for new night pilots.

The final take off technique was one in which the nozzles were not employed. For this reason it was called a conventional take off and ironically was the most uncomfortable technique in the Harrier. This was due to the undercarriage layout of the Harrier that had a bicycle arrangement for the nose and main wheels, with outriggers providing lateral stability. Whereas in conventional aircraft the main wheels are placed carefully in relationship to the centre of gravity so that the aircraft can be rotated at the take off speed, the main wheel of the Harrier was considerably further back requiring a lot of airspeed and a hefty pull back on the stick was required to get any attitude at all. At operational weights the take off also occurred uncomfortably close to the maximum wheel speeds of the undercarriage and the initial climb performance was usually less than convincing as the tiny wing sought to achieve Bernoulli's promised lift.

Back to the beginning and some more understanding of the implications of the nozzle controls for the pilot during take off. The fundamental difference between the Harrier and a conventional aircraft was that it was necessary to let go of the throttle during take off and grasp the nozzle lever. This relatively simple action was the source of much difficult re-learning as all previous fixed wing training insisted on



Bad weather resulting in a pitching ship could actually be used to help the Sea Harrier take off. The pilot would time the pitching cycle so as the run to the ski-jump would be downhill and the lift off achieved just as the ship was pitching up again. (RN)

maintaining the left hand pushing, or at least holding the throttle forward during take off, and few other aircraft could match the acceleration and speed of cockpit events during this critical flight phase. And yet once learned it was hard to understand why maintaining the aircraft attitude steady during take off and using a control that effectively makes the aircraft rise or climb should not be the normal arrangement. Even a standard helicopter's control arrangements still require some tilting of the whole airframe to gain forward speed. I will leave it to the reader to decide what path the OV-22 Osprey designers took when confronted with this dilemma as it too is able to vary its thrust angle just like the Harrier.

But what about the operational "so what?" of the Harrier's take off characteristics. I have already discussed the major advantage which was a relatively benign launch technique using a ski jump at sea. When compared to conventional flat deck aircraft carriers, the safe launch parameter with respect to deck movement were considerably increased and often only limited by the amount of ship roll making a straight run down the deck more difficult, especially if wet, or by a collective opinion that perhaps the weather was too extreme for safe flying operations. Invariably this decision was given to the SAR helicopter crew as it was their limitations rather than the Harrier take off requirements that held up the red flag on flying. A more subtle but equally important advantage of the launch technique was that it gave a great deal of control over the launch evolution to the pilot. This simplified launch operations by reducing the number of critical actions and people involved, thereby adding some very welcome safety margins in what remains a hazardous and challenging aviation environment.

Next time I will discuss the actual flying characteristics of the Sea Harrier where yet again there are going to be paradoxes. Paradoxes such as "how can an aircraft designed for high speed and low level bombing, also be effective when it is asked to perform medium and high level air defence?" Or "why isn't vectoring the nozzles in flight a good idea in air combat when I've heard that it is one of the Harrier's best tricks?"

Flash Traffic

HMAS ALBATROSS to become new ADF helicopter school

HMAS ALBATROSS, at Nowra in NSW, has been selected as the location of the Australian Defence Force's (ADF) joint helicopter school.

The new helicopter school is being established under the Helicopter Aircrew Training System (HATS) announced in February 2007. The helicopter school will train up to 60 pilots, 40 aircrewmen/loadmasters and 12 Observers per year and will help create around 100 civilian positions for maintenance, support and training roles.

HATS is a \$500 – \$700 million project to replace aircrew training on Navy Squirrel and Army Kiowa helicopters and is part of a broader integrated training strategy.

The project will deliver advanced training systems and better equip ADF aircrew to fly more operationally-advance helicopters such as the Seahawk, MRH-90 Multi-Role Helicopter, Seasprite, Black Hawk, Chinook and the Tiger Armed Reconnaissance Helicopter.

Nowra is a most suitable location to provide the broad range of training environments required for the ADF's aircrew. It has varied terrain to the west of the base where overland skills such as low level navigation can be practiced without undue noise impact. To the east, Jervis Bay and the Eastern Australian Exercise Area are ideal for maritime training and provide an opportunity to work with the Navy's warships.

Building the school at Nowra will see the development of facilities worth approximately \$100 million. This will provide an opportunity for the aviation industry to grow in the Shoalhaven which will result in an increase in aviation jobs and training opportunities in the region.

The selection of Nowra has taken place after a detailed study into how to provide high quality training at the best value for money.

Helicopter aircrew graduating from their initial HATS training will undertake operational flying conversion to other aircraft types. Navy helicopter

training will remain at Nowra, with MRH-90 and Tiger training at Oakey and Chinook training at Townsville.

Construction of the new hangars and associated facilities is planned to start in 2012 with undergraduate aircrew training to commence in 2013.

MRH-90s arrive

The Defence Materiel Organisation's (DMO) AIR 9000 Programme has achieved another significant Programme milestone with the arrival of the first two Multi-Role Helicopters (MRH) in Australia. The helicopters arrived at the Australian Aerospace facility in Brisbane inside a leased Antonov aircraft late last year.

The arrival of the aircraft was celebrated by a small ceremony at the Australian Aerospace facility involving Industry, DMO and Defence representatives.

The AIR 9000 MRH Programme will provide the ADF with an additional squadron of troop lift helicopters and eventually replace existing Black Hawk and Sea King helicopter fleets, for land and maritime operations, respectively. AIR 9000 is a multi-phased program to consolidate and reduce the number of helicopter fleets operated by the ADF.

The first four MRH90 aircraft were assembled at the Eurocopter facility in Marignane, France. The remaining 42 helicopters are being assembled in Brisbane by Australian Aerospace.

Penguin for Seahawk



A USN Seahawk helicopter launching a Penguin anti-ship missile. The USN has used Penguin off its Seahawks for many years. The RAN is now investigating its use off RAN Seahawks given the Sea Sprites were to use the missile but will be unavailable until 2011. The missiles have been in storage since 2001. (USN)

The Department of Defence is finally examining the feasibility of integrating the Kongsberg Penguin anti-ship missile to the RAN's 16 Sikorsky S-70B-2 Seahawk helicopters. The weapon was originally selected for the Navy's Kaman SH-2G(A) Super Seasprite fleet, which is now not expected to deliver until 2010-11.

The integration is expected to be performed under Project Air 9000 Phase 3E. Initial studies were launched in June to determine capability shortfalls and identify potential upgrade options. Defence expects them to be concluded early this year.

Defence says a timescale for integrating the missile will be determined following the studies, along with the selection of a suitable contractor to conduct the work should it decide to proceed. Australia's Seahawks



The second MRH-90 helicopter for the ADF on flight trials. Note the 'Navy' above the cockpit. (Defence)

have already been upgraded with forward-looking infrared sensors, electronic countermeasures suites and self-protection equipment.

SUCCESS in refit

Thales Australia signed a contract with the DMO for Phase 2 of the Type Refit of HMAS SUCCESS on 21st August 2007.

Norman Gray, Managing Director, Thales Australia said, "this is an important contract for us as it is the first of the Navy's new approach to refit contracting Modified Procurement Model (MPM) for Major Surface Ship Repair and is being evaluated for Navy-wide implementation."

Under Phase 1 of the project, Thales Australia conducted scope definition and the planning of the refit over a three month period earlier last year. Phase 2 will consist of a four month production period followed by two months of trials.

Major tasks to be undertaken during the Phase 2 Refit of HMAS SUCCESS include refurbishing the main engines and diesel generators, and overhauling the shafting and Replenishment At Sea systems.

Russian Bears Fly Along Alaskan, Canadian Coastline

Two Russian strategic Tu-95MS Bear-H bombers carried out a flight along the coasts of Alaska and Canada during recent command and post exercises.

"Each Tu-95 plane took about 30 tons of fuel on board, for the first time since the Soviet era. Their average flight duration was about 17 hours, during which the planes covered a distance of over 13,000 km [8,000 miles]," said Alexander Drobyshevsky, an aide to the Russian Air Force commander.

According to the Air Force, the bombers were refuelled in the air by Il-78 Midas tankers.

Drobyshevsky also said another pair of Tu-95MS flew around Greenland into the eastern Atlantic, a flight that took about 12 hours.

President Vladimir Putin announced the resumption of strategic patrol flights on August 17, saying that although the country halted long-distance strategic flights to remote regions in 1992, other nations had continued the practice,

compromising Russian national security.

The latest flights were in line with an air patrolling plan. NATO fighters accompanied the planes.

According to various sources, the Russian Air Force currently has 141 Tu-22M3 bombers, 40 Tu-95MS bombers, and 14 Tu-160 planes.

SM-2 inbound for FFGs

The Department of Defence has awarded Lockheed Martin a contract valued at \$22.8 million to upgrade the Mk-92 Fire Control System to support the introduction of Standard Missile 2 (SM-2) capability into the RAN's four remaining Adelaide-class guided missile frigates (FFGs).

The Mk-92 system, originally developed by Lockheed Martin, provides integrated X-band radar surveillance, target tracking and weapon fire control capability for naval gun and missile applications. Under the contract, Lockheed Martin will provide Mk-92 alterations and related support services for the design, development and integration of the new system features supporting the new missile capability. The upgrade is part of the RAN's SEA 1390 Phase 4B program and will be performed by Lockheed Martin Australia in Sydney, as well as Lockheed Martin's business in Moorestown, NJ.

"The upgrade will ensure robust capability of the RAN FFG fleet against threats that have developed since the introduction of the current combat system," said Paul Johnson, managing director of Lockheed Martin Australia. "The project complements our Aegis combat system integration work currently underway on the Air Warfare Destroyer project."

"The Mk-92 upgrade represents the very first introduction of SM-2 into an FFG-class surface combatant anywhere in the world," said Stan Ozga, Lockheed Martin's director for Naval Radar Programs. "With this contract, Lockheed Martin will deliver a major improvement to the FFG anti-air warfare capability and continue more than two decades of support to the operational needs of the RAN customer."

More than 125 shipboard Mk-92 systems have been produced and are currently deployed in nine different

navies – including the RAN – around the world. It has been installed on more than 70 guided missile frigates, as well as a variety of other surface ships including coast guard cutters, corvettes and fast attack craft.

New uniforms for RAN

Navy is set to benefit from the introduction of a new two-piece fire-retardant uniform, complete with improved safety boots.

Much of the design for the replacement Navy uniform derives from the land warfare version introduced in the mid-90s by the Australian Army. The two-piece uniform will align with other ADF combat uniforms in its use of the Australian Camouflage (AUSCAM) pattern, but will be unique to Navy in terms of the littoral colours used and the addition of reflective tape on the upper arms.

There are tangible benefits in moving to a two-piece uniform in terms of health, comfort and morale. The ability to 'relax' the level of dress, depending on the nature of the operation, is seen as advantageous in combating heat related illness and it will provide both male and female personnel at sea with an enhanced practical contemporary uniform, distinct to Navy.

Patrol Boat crews operating in the tropical and humid environments in our northern waters are particularly looking forward to the introduction of the new uniform, and are mooted to be amongst the first recipients.



The new camouflage uniform for the RAN with large reflective tape around the arms. (Defence)

There will also be a benefit of inventory rationalisation as Action Working Dress, which saw introduction in 1945, is also phased out and replaced by the two-piece uniform.

Following a review of footwear, replacement safety boots will be introduced into service to provide greater comfort and the inventory will be reduced, with the alternative boot expected to do the job of five other types of footwear currently in use.

Sixty thousand sets of the uniform are required for the initial delivery to the RAN, representing a \$13million injection into the Australian textile and manufacturing industries.

Rollout of the new two-piece fire-retardant operational uniform will commence mid-2008.

First production EA-18G Growler for USN delivered

US company Boeing recently delivered the first production EA-18G Growler to the US Navy ahead of schedule and within budget.

"The Growler team put together a program plan that... has remained on cost and schedule, while meeting or

exceeding all performance parameters. I don't get to say that very often about our programs," said The Hon. Delores Etter, assistant secretary of the US Navy for Research, Development and Acquisition, during the delivery ceremony at Boeing Integrated Defence Systems facilities in St. Louis. "We have a great start to a total procurement of over 80 Gs, which will operate in our fleet for decades to come."

The US armed forces' newest airborne electronic attack (AEA) aircraft combines the Super Hornet's proven airframe and mission systems with a next-generation airborne electronic attack suite. By using the Super Hornet airframe, the EA-18G program and the USN can leverage the existing capabilities and known reliability and maintainability characteristics of the F/A-18E/F to provide an advanced AEA platform at a fraction of the cost and time of a completely new aircraft. Unlike the two aircraft already in flight test, the EA-18G Growler delivered recently was entirely assembled and tested on the same production line as the existing F/A-18E/F Super Hornet.

"We're very proud to follow the Super Hornet tradition of delivering on

our promises," said Bob Gower, Boeing vice president of F/A-18 programs. "We made a very ambitious promise to our customer in 2003 that we would deliver this aircraft, built on the same line as our Super Hornets, by the end of 2007. We've not only met those promises; our team has found a way to meet every challenge and deliver a cost-effective, incredibly capable product, ahead of schedule."

"Since the rollout in August of '06, the first flight, the software, the flight testing, it's all coming on time, which is a tremendous boon in my world" said US Navy procurement chief Rear Adm. Kenneth Floyd, director, Aviation and Aircraft Carrier Plans and Requirements. "We're glad to have it, and once we get it out in the fleet, we're going to be flying this thing in ways that nobody ever thought possible. A good day for the Navy, a good day for the nation, and I think the only people that might be having a bad day are the people that end up on the business end of this thing's capacity."

The aircraft, dubbed G-1, will join the flight test program at Naval Air Station Patuxent River, Md., before entering fleet service. The Growler is expected to complete flight testing in



The first full production EA-18G 'Growler' being handed over to the USN at a ceremony at Boeing's St. Louis plant. The Growler will replace the ageing EA-6B Prowler in the electronic attack role and is common to the current Super Hornet. (Boeing)

2008, followed by initial operational capability in 2009.

Boeing, acting as the weapon system integrator and prime contractor, leads the EA-18G Growler industry team. Northrop Grumman is the principal subcontractor and airborne electronic attack subsystem integrator. The Hornet Industry Team divides EA-18G production across Boeing, Northrop Grumman, General Electric and Raytheon manufacturing facilities.

SPY-3 on track

US Company Raytheon has achieved a significant milestone in advancing the final development of the company's Dual Band Radar (DBR) for the U.S. Navy's Zumwalt class destroyer.

Raytheon's Integrated Defence Systems (IDS) led the US government-industry team in the successful installation of the Lockheed Martin Volume Search Radar (VSR) array at the Surface Warfare Engineering Facility at the Naval Base Ventura County, Port Hueneme, Calif.

After extensive testing, Raytheon will integrate the VSR with the SPY-3 X-band Multi-Function Radar to form the advanced, highly capable DBR. The DBR is the USN's most capable radar solution.

The DBR for Zumwalt is two active, phased array, multi-function radar subsystems that integrate X-band and S-band radar capabilities in a single configuration. It simultaneously supports self-defence/anti-air warfare, situational awareness, land attack, naval gunfire support, surface search, navigation and air traffic control. The DBR's innovative software design allows automatic operation with minimal human intervention.

"The Dual Band Radar provides surveillance, target tracking and engagement support capabilities that are far superior to those of conventional single-band radars across all spectra of warfighting," said Ed Geisler, Raytheon's vice president of the Zumwalt program. "Moving forward with this milestone brings us closer to delivering this needed technology to the ship."

Five months of extensive testing is set to begin, representing a critical step in testing the maturity of the S-band VSR technology prior to advancing to full system production. Raytheon's X-band,

SPY-3 completed extensive land-based and at-sea tests with outstanding results over the last two years.

First Scorpene for Malaysia named

The first of two Scorpene class submarines ordered by the Malaysian Navy has been officially named TUNKU ABDUL RAHMAN* at DCNS' Cherbourg shipyard by Malaysian Minister for Defence Najib Tun Razak at a ceremony attended by Malaysian and French officials.

The ceremony was an important milestone in the execution of the contract signed on 5 June 2002 by the Malaysian Government and DCNS as it marked the completion of the construction phase. TUNKU ABDUL RAHMAN is scheduled to be handed over to the Royal Malaysian Navy (RMN) in January 2009 and the second boat 2010.

With an endurance of 45 days, a displacement of 1,550 tonnes and a length of 67.5 metres, the Scorpene submarines will be manned by crews of just 31. Crew training is on schedule to enable the RMN to provide complete crews from delivery.

The Scorpene was designed by DCNS and developed jointly by DCNS and Spanish naval shipbuilder Navantia. Each boat is built partly in France and partly in Spain according to the same industrial process. Benefiting from the latest innovations developed for other programs, the design features a range of advanced technologies, particularly in hydrodynamics, acoustic discretion and automation. The modular Scorpene design can be readily tailored to each client navy's specific mission profiles and requirements.

** Tunku Abdul Rahman (8 February 1903 – 6 December 1990), also known as Bapa Kemerdekaan (Father of Independence) and Bapa Malaysia (Father of Malaysia), was Chief Minister of the Federation of Malaysia from 1955 and Malaysia's first Prime Minister from independence in 1957 until he retired from public life in 1970.*

RSS STALWART delivered to Singapore Navy

On 19 October 2007, DCNS delivered RSS STALWART, the fifth Formidable-class frigate for the

Republic of Singapore Navy (RSN). RSS STALWART will now join the RSN for advanced trials and qualification.

The contract signed in March 2000 by wholly owned DCNS subsidiary DCN International and the RSN calls for the delivery of six Formidable-class frigates and associated logistic support and technology transfers. The first-of-class RSS FORMIDABLE, delivered in July 2005, was designed and built by DCNS' Lorient shipyard. The other five are being built under a major technology transfer program by local contractor Singapore Technologies Marine at a rate of one ship every five months.

US Navy sinks LCS 4

Secretary of the US Navy Donald C. Winter and Chief of US Naval Operations Adm. Gary Roughead announced on November 1, 2007 that the Department of the Navy was terminating construction of the fourth littoral combat ship (LCS 4). This was for convenience under the termination clause of the contract because the US Navy and General Dynamics could not reach agreement on the terms of a modified contract.

The US Navy had not yet authorised construction on LCS 4, following a series of cost overruns on LCS 2. The Navy intended to begin construction of LCS 4 if the Navy and General Dynamics could agree on the terms for a fixed-price incentive agreement. The US Navy worked closely with General Dynamics to try to restructure the agreement for LCS 4 to more equitably balance cost and risk, but could not come to terms and conditions that were acceptable to both parties.

Despite this being the second cancellation of an LCS (see *THE NAVY* Vol 69 No 3 pp 18-19) the Navy remains committed to the LCS program. "LCS continues to be a critical warfighting requirement for our Navy to maintain dominance in the littorals and strategic choke points around the world," said Winter. "While this is a difficult decision, we recognise that active oversight and strict cost controls in the early years are necessary to ensuring we can deliver these ships to the fleet over the long term."

"I am absolutely committed to the Littoral Combat Ship," said Roughead. "We need this ship. It is very important

that our acquisition efforts produce the right littoral combat ship capability to the fleet at the right cost.”

USN increases dunking sonar order

US Company Raytheon has been awarded a \$17 million US Navy contract for the AN/AQS-22 Airborne Low Frequency dunking Sonar system, the primary undersea anti-submarine warfare sensor for the US Navy's MH-60R multi-mission helicopter.

The AN/AQS-22 provides essential anti-submarine warfare mission support capabilities, including submarine detection, tracking, localisation, classification, acoustic intercept, underwater communication and environmental data collection. Raytheon Integrated Defence Systems is the prime production supplier of AN/AQS-22, providing the US Navy with these critical capabilities since 1999.

Full rate production of AN/AQS-22 has been accelerated since the initial fielding of the MH-60R helicopter into the US Navy fleet in 2006. Under this latest contract, Raytheon IDS will provide three additional AN/AQS-22 systems; development efforts for a technology refresh of the sonar transmitter-receiver control module; automated test equipment for analog and digital modules; and increased acoustic test capabilities.

Work on the contract will be performed at Raytheon's Maritime Mission Centre, Portsmouth RI.

Saab to develop RAN LHD combat system

Saab Systems has signed a contract worth \$105 million with Tenix Marine to design and develop the Combat Management System for Australia's new Landing Helicopter Dock (LHD) amphibious class of ships.

Saab and Tenix have agreed on a contract that will see Saab responsible for design, development and integration of the new ships' Combat Management System. Saab will supply the next generation 9LV Combat Management System based upon open architecture and the naval surveillance radar Sea Giraffe AMB. Special features of the system will include helicopter control,

watercraft control and close in self defence against military and asymmetric threats.

“We are highly committed to the Australian Defence Force and pleased to be a part of this project to boost Australia's amphibious capabilities. Saab is ideally placed to provide the LHD combat system because it has existing skills, experience and infrastructure built up over its 17 years of supporting naval combat systems in Australia”, says Merv Davis, Managing Director of Saab Systems Pty Ltd.

“The selection of our system once again confirms Saab's leadership in naval combat systems in Australia”, says Peter Wimmerström, President Saab Systems.

UUV recovered by submerged sub

The Boeing Company has successfully demonstrated for the first time that an unmanned undersea vehicle (UUV) can be recovered by an underway submerged submarine, opening up new possibilities for advanced naval operations.

During recent tests, a USN attack submarine launched the AN/BLQ-11 UUV from one of its torpedo tubes. The vehicle, formerly called the Long-term

Mine Reconnaissance System (LMRS), then returned to the vessel where the system's robotic arm retrieved it into the submarine.

“With this recent success, Boeing has taken another important step in UUV development by demonstrating that the unmanned vehicle can return to the submarine and be recovered by a robotic arm,” said Dan Jones, director of Boeing Advanced Information Systems, a division of Boeing Space and Intelligence Systems. “This milestone represents a critical next step for the USN and opens the door for a whole new set of advanced submarine missions.”

The at-sea UUV tests follow earlier assessments during which Boeing and the USN proved that the UUV could successfully home and dock with the system's robotic arm, while the submarine was underway.

This milestone was achieved with a USN attack submarine on its first attempt and repeated two days later on the second attempt. The AN/BLQ-11 system demonstrated all of the elements required for a complete UUV launch and recovery evolution. The USN then secured from testing after having met all test objectives in half the allotted time.

AN/BLQ-11 also performed several complex vehicle manoeuvres during



The submarine launched AN/BLQ-11 Long-term Mine Reconnaissance System (LMRS) UUV being loaded into a USN SSN for testing. The AN/BLQ-11 was successfully recovered back into the submarine while submerged during trials of the system. (USN)

the tests, including station keeping and so-called 'shadow submarine' during which the system operates underwater alongside the host submarine. Vehicle and system performance deemed solid and predictable throughout the event support the Navy's decision to pursue 21-inch diameter submarine-deployed UUVs.

The USN's Unmanned Undersea Vehicle program office selected Boeing in 1999 to work on the LMRS program, today called the AN/BLQ-11 system. The AN/BLQ-11 is designed to launch from the host submarine's torpedo tube to survey, detect and gather data on underwater threats such as mines that could pose significant risk to sailors. After completing its mission, the vehicle homes and docks with a robotic arm that extends from another of the host submarine's torpedo tubes for recovery back through the launch tube. The system allows operators to retrieve data from the vehicle and prepare it for re-launch.

DIAMOND cuts the waves

The RN's newest and most powerful Type 45 destroyer – DIAMOND – was launched on Tuesday 27 November

2007, from BAE's shipyard at Govan, on the River Clyde.

Thousands of local people turned out for the launch, including many local schoolchildren. The Type 45 destroyers are the larger and more powerful replacement for the existing RN Type 42s. The destroyer will carry the PAAMS system (Principal Anti-Air Missile System) which is capable of defending a Type 45 and ships in its company from multiple attacks by the most sophisticated anti-ship missiles.

Baroness Taylor, Minister of State for Defence Equipment and Support, said: "The new Type 45 Destroyers – such as DIAMOND – will be the most powerful destroyers ever built for the RN.

"We are in the middle of the biggest shipbuilding program for the RN in decades and today's launch of DIAMOND demonstrates the scale of that investment.

"This is an important day for the Govan shipyard, the RN and indeed the UK, and is a tribute to the hard work of everyone involved in this project. I look forward to following DIAMOND's progress through her sea trials."

As well as providing air defence over a wide area, including for the future aircraft carrier, the Type 45 will be able to conduct a wide variety of other operations. They will be able to carry up to 60 Royal Marines Commandos and their equipment, support Special Forces operations, and operate a Chinook sized helicopter from the flight deck. The size of the ship will also allow accommodation standards to be better than in previous classes.

DIAMOND was named and launched by the Lady Sponsor Mrs Suzie Johns, wife of Vice Admiral Adrian Johns CBE, the Navy's Second Sea Lord. The event was followed by an aerial search and rescue display by a Royal Navy Sea King helicopter and a fireworks display.

Good progress is being made on the Type 45 program with two ships currently in the water, DIAMOND, the third launched and the fourth and fifth ships (DRAGON and DEFENDER) being built.

The first of class, DARING, successfully completed initial sea trials in August 2007, and the second vessel, DAUNTLESS, was launched in January 2007.



The RN's newest Type 45 destroyer – DIAMOND – being launched on 27 November 2007, from BAE's shipyard at Govan, on the River Clyde. (BAE)

Second improved Talwar class laid down

The Yantar Shipyard in Kaliningrad, the Russian enclave on the Baltic Sea, has started building a second frigate for the Indian Navy.

A spokesman of the shipyard said this is the largest contract from them so far. The first of the three improved Talwar class frigates was laid down on July 27, and two parts of the ship's frame have already been completed.

The contract to build the three frigates was signed in New Delhi on July 14, 2006. The ships are to be commissioned from 2012 onwards.

This is the second contract for the delivery of Russian frigates to the Indian Navy. The first such contract, worth about USD\$1 billion, was signed in November 1997 for the construction of the TABAR, TRISHUL and TALWAR.

The new frigates will differ mainly in their armament and equipment. In particular, they will be armed with the BrahMos multi-role supersonic cruise missiles (MRCM) created by the Indian-Russian joint venture BrahMos Aerospace.

India refuses acceptance of upgraded IL-38s

India has refused to accept the deliveries of upgraded Ilyushin IL-38SD (Sea Dragon) anti-submarine aircraft from Russia, insisting on additional technical trials of the aircraft's target acquisition and fire control suite.

However, top officials of the Russian company Ilyushin insist that the Indian Navy's demands were not stipulated in the original contract signed in 2001 for the upgrade of five anti-submarine aircraft.

"The Indian side is hindering the implementation of the contract by putting forward unjustified technical requirements," CEO of Ilyushin Aviation Complex Victor Livanov was quoted as saying by Interfax-AVN military news agency.

"We find nothing wrong with the Sea Dragon's targeting system. But the Indian navy won't take delivery of the aircraft suggesting additional tests and putting forward ever more requirements



An upgraded Indian Ilyushin IL-38SD (Sea Dragon) anti-submarine aircraft from Russia, seen here fitted with the new target acquisition and fire control suite. (Indian Navy)

to the technical characteristics of the aircraft not stipulated in the contract," he said.

Livanov said that by now two aircraft upgraded in their St. Petersburg facilities have been delivered to the Indian Navy. The third and fourth are ready for delivery, and the fifth will be completed in September.

"All of the Sea Dragon's functions were proven during live tests but the Indian side continues to insist on further improvements. But that cannot continue indefinitely," Livanov said.

New catapult nearing completion

The new Electromagnetic Aircraft Launch System (EMALS) recently held its final critical design review (CDR) at the prime contractor's facility located in Rancho Bernardo, Calif.

The review team, led by Mr. Dave Cohen of the USN's NAVAIR's Systems Engineering competency was presented a wealth of data by the EMALS prime contractor, General Atomics.

The team spent a week thoroughly reviewing the entire EMALS programme and determined that the design is technically compliant with requirements and is properly documented.

Although a few open action items remain Capt. Stephen Rorke, Aircraft Launch and Recovery Equipment programme manager thought the review "was a rousing success". He praised the

team for their "dedicated efforts to complete preparations for this review" even as the San Diego fires closed the General Atomics facility for a few days in the weeks just prior to the CDR.

EMALS, a new electromagnetic aircraft launch system for the next-generation aircraft carrier, the Gerald R. Ford class (CVN-78), will replace the current generation of steam catapults used on the Nimitz class aircraft carriers.

This switch to an electrical based system versus steam, will lower operating costs, require fewer people to operate, improve catapult performance and expand the range of manned and unmanned aircraft that the aircraft carrier can launch.

The next step in the process is to begin installing the full size, ship representative EMALS equipment in the recently completed EMALS test facilities at Naval Engineering Station Lakehurst, NJ.

The EMALS equipment installation is scheduled to begin in mid 2008, with actual testing to begin in early 2009. Testing will continue throughout 2009.

The first components of the EMALS equipment is scheduled to be delivered to Northrop-Grumman Newport News Shipbuilding, Norfolk, Va. to be installed in the GERALD R. FORD (CVN-78) in 2011.

The GERALD R. FORD is scheduled to be delivered to the USN in 2015.

Observations

By Geoff Evans

The Changed face of Shipping

The Mission to Seafarers in Victoria recently celebrated two events – a Centenary Seafarers' Service held in Melbourne's St Paul's Cathedral and at the same time, recognition of 150 years of service to mariners by the Mission, formerly known as the Mission to Seamen. The service held in Melbourne in 1907 followed a similar service in London in 1906 which was linked to the 100th anniversary of the Battle of Trafalgar.

The Mission to Seafarers and the similarly-orientated Stella Maris Centres (which had their origin in about 1889) were both founded by Churches. The original purpose was almost certainly as much to do with improving the harsh working conditions on board ships at the time as it was to spiritual considerations. Both organisations operate on a world-wide basis, including in ports around Australia, with the object of providing practical support (club etc facilities), welfare and spiritual support to visiting seafarers.

While Anglo-Saxons and Europeans may well have formed a higher proportion of ships' crews than is the case today, reports suggest that sailors from so-called Third World and developing countries who form many present-day crews require as much attention now as was given to their predecessors in times past.

The task of the men and women, in the main volunteers, who go largely unnoticed 'look after' the hundreds of sailors who arrive in the nation's ports every day – not made easier by the security measures that make access to wharves and ships difficult and the very short time many ships remain at their berth.

The Changing Face

Inaccessibility is only part of an apparently decreasing interest by the public – reflected in governments – in merchant ships and shipping. To quote a recent (August 2007) report by the Federal Parliament's Standing Committee on Employment, Workplace Relations and Education on Australian transport problems: "The paradox for transport and logistics, given its economic importance, is that this industry is one of the least visible. Much freight is transported at night and across remote, sparsely-populated regions of the continent, with public awareness only being raised at times when accidents occur or goods fail to arrive".

Merchant ships, briefly seen as they slip in and out of most ports, despite their size must surely be the least visible of all forms of transport.

Other factors indicating lack of adequate attention to the shipping industry are included in the Standing Committee on Transport and Regional Services' July 2007 report on Australia's transport needs:

Referring to ports:

"The ports are also struggling with the problems caused by steadily increasing ship sizes and the associated problem of channel depth. Many are being pressured by urban encroachment and the resultant difficulties in planning transport corridors, especially looking forward twenty years or more"

and referring to dredging:

"The Committee considers that it is essential that Australia's ports are able to keep pace with the growth in cargo vessels. This country is far too dependent on trade to allow itself to become a backwater, because the ports are unable to handle the larger vessels that are rapidly becoming the norm on the world's shipping lanes."

The Committee recommended the Port of Melbourne dredging project be completed as soon as possible.

Both the Committees referred to above included members of the Labor Party; now that their Party is in Office it is to be hoped the hard work of all members will be remembered and recommendations implemented.

Finally, it could be said the 'face' of ships has changed greatly in recent years and most merchant ships (and warships) are no longer objects to be admired for their appearance, but rather as graceless land-objects somehow made to float on water. Nevertheless, graceful or ugly, ships and the associated industry are as vital to Australia's wellbeing today as ever they were in the past. It is time the nation's people and their elected leaders appreciated the fact.



A bulk car carrier entering Sydney Harbour. Most merchant ships are no longer objects to be admired for their appearance. However graceful or ugly, ships and the associated industry are vital to Australia's wellbeing.

(John Mortimer)

Navies To Become The Enforcers(*)

By Anthony Tucker-Jones and Iain Ballantyne

(from L to R) A recent image of HMAS ANZAC on patrol in the Northern Persian Gulf in with company the Royal Navy frigate HMS RICHMOND. Both vessels were involved in the Naval Gunfire Support action on the Al Faw Peninsula of Southern Iraq on 21 March 2003. Any action in the Persian Gulf against Iran will no doubt include the RAN. (Defence)

As the Iranians take the nuclear issue to the brink, it is likely navies will soon be called on to enforce United Nations sanctions. Anthony Tucker-Jones and Iain Ballantyne analyse the naval measures that could be taken against Iran over its nuclear programme.

It was certainly no coincidence that just prior to announcing its intention to recommence uranium enrichment, Iran held an ambitious maritime exercise. The message was clear: Iran will not be cowed by the prospect of sanctions if it does not pull back from confrontation with America, the EU-3 (UK, France and Germany) and the International Atomic Energy Agency (IAEA). The long-running saga over the Persians' atomic energy programme reached boiling point in mid-January 2007, when Iran removed seals at three nuclear facilities, ending a two-year self-imposed freeze.

At a meeting in London on January 16, 2007, that included Russian, Chinese and US officials as well as the EU-3, those gathered failed to reach consensus on how to proceed in the face of Iranian defiance.

It seems everyone is agreed that military action should be avoided if possible and Washington will have been leaning heavily on Israel behind the scenes not to take matters into its own hands. The memory of the Israelis' unilateral (June 1981) strike on Iraq's French-model Osirak reactor looms large, but taking out Iran's nuclear facilities would not be so easy, as they are dispersed throughout the country and very well protected.

Ironically, the Iranians probably learned a lot on how to protect their nuclear facilities not only from the Israeli raid but also from their own, unsuccessful, air attack on Osirak in September 1980.

The only viable option seems to be to request that the IAEA refers the issue to the UN Security Council, which could in turn decide to impose sanctions. The UNSC is likely,



The Iranian Revolutionary Guard Council Navy (IRGCN) ship GARDOUNEH (P229), a fast attack craft, on a routine patrol in the Northern Arabian Gulf, Oct. 6, 2001. The Iranians are well practised at operations in the confined waters of the Persian Gulf. (USN)



The Nimitz class aircraft carrier USS JOHN C. STENNIS in company with the RN Type 22 Batch 3 frigate HMS CORNWALL. The image was taken a few days before a number of crew from HMS CORNWALL were captured by Iranian Revolutionary Guard units in the Northern part of the Persian Gulf. Many believe the Iranians were testing the military resolve of the West by capturing the British Seamen. (USN)

as always, to be highly divided as to the best course of action. Initially, it will undoubtedly demand full compliance with IAEA inspectors, followed by specific sanctions, followed by a much wider embargo if necessary.

Imposition of sanctions will be a naval-led task, which poses all sorts of problems, as the Iranians are an altogether different prospect to the Iraqis or Serbs, who were subjected to naval and air embargoes in the recent past.

The Iranian military is better equipped and motivated and, as it proved in the Tanker War of the 1980s, it will hit out even when the odds are against it. Iran's credible hardware includes 'fully-grown' submarines (Russian-origin Kilo class SSKs), domestically manufactured mini subs and it has plenty of mines as well as anti-shipping batteries overlooking the vital Straits of Hormuz. The effectiveness of these was demonstrated during the recent Israel – Hezbollah conflict with an Israeli frigate being hit by an Iranian land based anti-ship missile. The War on Terror coalition has a number of naval task forces in the Gulf, Arabian Sea, off the Horn of Africa and in the Red Sea, which could be employed to enforce any UN-mandated sanctions against Iran. The presence of the US 5th Fleet HQ at Manama, Bahrain, which has a long history of maritime intervention in the region, is a constant cause of concern to the Iranians.

The US Navy has a powerful Carrier Strike Group committed to the Gulf to support operations across the Middle East and Afghan theatres, plus a complementary Expeditionary Strike Group led by an assault carrier.

The RAN has maintained a patrol in the Persian Gulf for many years and would be expected to participate in any US-led action against Iranian Nuclear ambitions.

In the meantime Iran continues to throw its weight around in the Gulf, as highlighted by the seizure of British marines, British yachtsmen, Iraqi coastguards and the recent capture of sailors from the frigate HMS CORNWALL.

According to the Commander of the Iranian Navy, the armed forces of the Islamic Republic of Iran launched their biggest ever maritime exercises in the Persian Gulf and the Sea of Oman on December 9, 2006. Codenamed 'Ashegane Velaya' the manoeuvres covered over 55,000 square kilometres, ranging from the strategic Hormuz to the port city of Gouater in the southernmost part of Iran. All branches of the military and the Revolutionary Guards, including air, land and naval forces as well as Basij voluntary personnel



The USN FFG USS SAMUEL B. ROBERTS on the back of a heavy lift ship after hitting an Iranian mine during the Tanker Wars in the Persian Gulf during the 1980s. The Iranians are said to have amassed many more mines since the Tanker Wars including intelligent mines that are hard to detect and destroy. (USN)

reportedly took part. Without a hint of irony the Naval Chief, noted the exercise was intended to send a message of peace and friendship to neighbouring states, adding that Iran is ready to work with them to prevent crises in the region. Iran has also conducted military exercises along its border with Afghanistan, where US Marines have been among Coalition troops on the front line against the residual Al-Qaeda and Taliban threat. Understandably, Iranian strategic thinking is shaped by the ongoing presence of Coalition forces in both Afghanistan and Iraq, the US Marines and US Navy having a large presence on the ground in the latter.

Estimates on how long it will take Iran to build a nuclear bomb have ranged from five to ten years. Now the latest assessment is that Iran has halted its nuclear weapon's programme. However, with its Natanz reactor up and running, the Iranians could produce enough enriched uranium to enable weapons manufacture within three years. It has also been reported that Iran has sufficient uranium yellowcake (uranium oxide that can be enriched for weapons use) to produce five nuclear bombs. However, Iranian President Mahmoud Ahmadinejad has stated that his country does not need nuclear weapons, is not seeking to covertly develop them and has the right to acquire peaceful nuclear technology. He has also criticised what he sees as Western double standards. However, the West and Israel remain to be convinced of Iran's good intentions. The fact that it kept its nuclear research effort secret for almost twenty years has not helped matters. Additionally, Iran is the fourth largest exporter of crude oil, and does not really need civil nuclear energy.

Under the Paris Agreement with the EU-3 at the end of 2004 Iran suspended uranium enrichment as well as the assembly and installation of centrifuges at Natanz. By mid-2005 the EU-3 were planning to offer Iran new incentives, including possible assistance with its civil nuclear programme. After the election of Mahmoud Ahmadinejad, Iran made it known that it intended to press on with its enrichment programme. The implication is that Iran feels strong enough to defy possible UN Security Council sanctions and risk possible US or Israeli military intervention. Iran argues it is doing nothing wrong under Article IV of the Non-Proliferation Treaty to which it is a signatory.

The EU-3 remain concerned that Natanz and the Arak 40MW heavy water research reactor project could be used to



A Russian made Kilo class SSK on the surface. Iran has three of these modern submarines which could cause a great deal of anxiety to naval forces operating in the Persian Gulf or Gulf of Oman during hostilities. (RAF)

produce weapons grade fissile material. The hope was that Iran would abandon both in favour of a smaller light-water research reactor.

In August of 2006 Iran resumed activity at its nuclear facilities apart from uranium enrichment. Negotiations over the future of the relevant nuclear programme have since ground to a complete standstill following Iran's announcement it is to resume enrichment.

China is a major oil importer from the Middle East, and so is not keen to do anything that will disrupt such a vital energy source. Similarly, Russia, a major civil nuclear supplier and arms exporter to Iran, does not want to sour a lucrative relationship.

To that end Russia has offered to enrich uranium for Iran. In response to Western bluster Iran has hinted that it might drive up the price of oil, though any threat of war could greatly harm the country's oil revenues. The Iranian news agency IRNA claims that the current row will not affect conventional Russian arms sales. In December, Russian Deputy Prime Minister and Defence Minister Sergei Ivanov defended the signing of an agreement to sell Surface-to-Air Missile (SAM) systems to Iran. It is purchasing 29 TOR-M1 mobile SAMs worth more than US \$700 million (600 million Euros).

The TOR-M1 is a mobile system designed for operation at medium and low altitude levels against aircraft and guided-missiles: perfect for shooting down cruise missiles and naval strike aircraft. Each unit consists of a vehicle with eight missiles and a radar capable of tracking 48 targets and engaging two simultaneously. Such a system could be a real threat to Western sanction enforcement or military action.

Depending on the scope of any sanctions imposed, Coalition naval forces would want to keep the Iranian fleet bottled up. This would require blockading Iranian naval bases at Bandar-Abbas, Bushehr, Kharg Island, Bandar Anzelli, Bandar Khomeini, Bandar Mahshahr and Char Bahar.

This would be no easy task and would undoubtedly be met with hostility by the Iranian Navy. According to the respected International Institute for Strategic Studies (IISS) latest figures the Iranian fleet is equipped with just three frigates, two corvettes and five mine warfare vessels, but significantly has over 250 patrol and coastal craft. The Iranian Revolutionary Guard Corps Naval Forces (IRGCNF) has another 50 patrol craft. The three Kilo Class submarines are former Soviet Navy boats delivered in the mid-1990s and although they could, potentially, close down the Straits of



The Iranian frigate SAHAND seen here burning after being attacked by USN ships and aircraft during Operation Preying Mantis in the Persian Gulf during the late 1980s. The Iranians learned from this experience and now tend to concentrate on smaller vessels using swarm tactics. (USN)

Hormuz just by putting to sea, it is not known how seaworthy they are. It is reported that they suffer from reduced endurance through the batteries not being cooled sufficiently in the warmer waters of the Persian Gulf.

It is the smaller vessels rather than the major warships that pose the greatest danger. Nonetheless, Western navies are well trained in techniques for dealing with Iranian style 'swarm tactics'. Iran also has stocks of up to 3,000 naval mines, which could make life very hazardous for shipping in the Gulf and Straits of Hormuz. The biggest offensive threat to any maritime enforcement task force is likely to come from the IRGCNF's C-801/HY-2 (CSS-C-3) Seerseeker shore-based missile batteries and C-801K air-launched anti-ship cruise missiles. However, as a former intelligence source points out, a number of HY-2s were launched against the USN in the late 1980s and they were all successfully dealt with by a variety of ship and airborne counter-measures. In the mid-1990s there were rumours that Ukraine had supplied Iran with eight 3M80/Kh-41 Moskit SS-N-22 Sunburn missiles for coastal defence. US experts have seen no evidence of these missiles and it remains unclear if they were ever delivered. The Iranians have developed the Tondar anti-shiping missile, believed to be a version of the Chinese C-801. They have also developed their own copy of the Chinese C-802 called the Noor. It was a Noor that hit the Israeli frigate HANIT off the coast of Lebanon.

Once its various weapons programmes are complete Iran will be able to deploy a combination of anti-ship and land-attack cruise missiles as well as ballistic missiles. The Saudi Foreign Minister has claimed that the West is partly to blame for the impasse with Iran, because Israel was permitted to develop nuclear weapons without censure. He also pointed out

that should Iran ever use such a weapon against Israel it would kill Palestinians as well. Of course, Israel, which must be looking on with increasing alarm at developments, has broader options than just airpower for striking Iran, both pre-emptively and in the wake of an Iranian strike on say Tel Aviv. Its three Dolphin class submarines – ultra-modern and built in Germany, with more possibly on the way – are all said to be capable of launching Israeli made nuclear-tipped cruise missiles (possibly a converted sub-Harpoon with a small nuclear warhead).

Meanwhile, the Syrian dictator Bashar al-Assad has recently welcomed the Iranian president to Damascus and made common cause, facing off the Western threat. Assad backed Iran's right to own nuclear technology for "peaceful purposes", while the Iranian leader said that he believed Syria deserved to be free of foreign interference. With both Iran and Syria constantly interfering in the affairs of both Iraq and the Lebanon, as well as Palestine, it was more than a shade hypocritical.

At the same time as the two leaders met, there were warnings from Iran's oil minister that sanctions could lead to fuel price rises that will cause severe damage to the world economy. As financial crises of recent years in Asia have illustrated well, today's world economy is capable of dramatic downturns.

A ripple in the Gulf can easily cause a tsunami of economic woes around the globe. These are truly dangerous times.

() this article first appeared in the UK based magazine WARSHIPS IFR and is reprinted, with some modification, with the kind permission of its Editor.*



An RAN boarding party after inspecting a merchant ship in the Persian Gulf. RAN Boarding parties go heavily armed, in multiple groups of boats and with support from the ship's embarked helicopter as well as the ship itself. This is to avoid a similar fate befalling the RAN as happened to the RN frigate HMS CORNWALL. Any sanctions against Iran over its nuclear ambitions will almost certainly involve the RAN and its boarding party teams. (Defence)

PATROLLING NORTHERN AUSTRALIA

By John Jeremy

The new Armidale class patrol boats being built in Western Australia are now taking up their duties protecting Australia's interests in northern waters. The task of patrolling the seas to the north of Australia has become a major task for the RAN and the Australian Customs Service. It is easy to think that the need is relatively new, but that is not so and in the 1930s efforts were made to improve our northern defences against smuggling and other illegal activities by the purchase of new patrol boats for that purpose. They were to be based in Darwin, taking up station shortly before World War II.

One of the new vessels was a 45 foot (13.6 m) fast patrol boat ordered from Scott-Paine and Company, Hythe, England to a design by The British Power Boat Company. Displacing 12 tons LARRAKIA was powered by three 75 kW Meadows petrol engines for a top speed of 23 knots and an economical speed of 12 knots. LARRAKIA had a crew of ten and was armed with one .303 inch Vickers machine gun.

The new patrol boat was delivered to Sydney over seventy years ago and after final fitting out at Cockatoo Dockyard she was sent to her home port of Darwin. Shortly after arrival in July 1936, she nearly sank when an automatic bailing device flooded the boat at night, but was saved by her crew before serious damage was done. The press reported the Administrator of the Northern Territory (Lt. Colonel Weddell) as saying that her first trial patrol outside Darwin Harbour was 'satisfactory in every way'. The trial run was to Bathurst Island some 50 n miles away, and the boat made 17 knots in open calm sea. The press also noted that 'wireless contact was made with Darwin and Qantas Empire Airways 'planes flying to and from Darwin'.

In the few years before the war LARRAKIA conducted fisheries and security patrols in northern waters and arrested a number of illegal pearling and fishing vessels. After September 1939 she was used by the RAN as an examination vessel in Darwin and she also helped with the preparation of defence facilities around the city. She was formally requisitioned and commissioned as HMAS LARRAKIA on 8 December 1941 and served as a patrol vessel and air-sea rescue launch.

HMAS LARRAKIA paid off on 16 February 1944 and was sold on 3 April 1946.



The patrol boat LARRAKIA at Cockatoo Island in 1936 being prepared for duty after arrival from Britain. (John Jeremy Collection)

The second patrol boat was a more substantial vessel. Ordered from Cockatoo Dockyard by the Department of Trade and Customs on 12 March 1937 VIGILANT was designed by the dockyard under the supervision of naval architect Cecil Boden. Built of steel, she was 100 feet (30.3 m) long on the waterline, 16 feet 4 inches (4.95 m) in beam and her depth to the upper deck was 8 feet 10 inches (2.68 m). Her full load displacement was 105 tons and she was powered by two 240 kW 16-cylinder Gleniffer diesels driving twin shafts through 2:1 reduction gearboxes. Her top speed was 14.75 knots.

VIGILANT was particularly notable in that she was the first ship built in Australia in which aluminium was used as a structural material. Her deckhouse forward of the funnel was



VIGILANT being launched by the floating crane Titan on 12 February 1938. (John Jeremy Collection)



VIGILANT ready for hand over July 1938. (John Jeremy Collection)

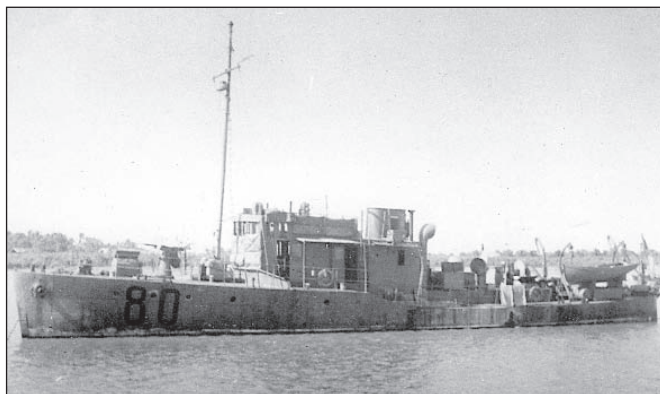
made of riveted aluminium alloy grade 57S supplied by Aluminium Union Limited.

VIGILANT was launched on 12 February 1938 and completed on 25 July. She was armed with a 3-pounder gun and was soon at her home port of Darwin.

This useful ship was requisitioned by the RAN in October 1940 and commissioned as HMAS VIGILANT. In January 1942 she helped HMAS DELORAINIE sink the Japanese submarine I-124 by keeping her supplied with depth charges. Throughout that year she was busy supplying guerrilla troops in Timor and later took Z-force special personnel there. Later in the war she became a survey vessel. She was renamed SLEUTH in April 1944 and HAWK in March 1945. She paid off on 13 September 1945 and was returned to the Department of Trade and Customs.

No longer required for her original duties, VIGILANT was sold in October 1946 to the Nor'-West Whaling Company Limited of Perth. During her conversion to a whale catcher her original engines were replaced with 12-cylinder Paxman diesels to increase her speed. She chased whales off the coast from July to September spending the rest of each year at anchor in the Canning River. In 1962 she had a particularly good year, catching 57 whales.

VIGILANT was sold in April 1966 and returned to Sydney. She was sunk by her disgruntled crew in protest at a lack of pay but was raised and stripped for conversion to a luxury motor yacht. The conversion was never completed and she was finally broken up in Sydney in the late 1960s after a surprisingly long and eventful life for such a lightly built ship, although it was suggested that her hull had progressively been replated several times during her life.



HMAS VIGILANT during WW II. (RAN)



Work underway building a new superstructure for VIGILANT (inboard) in Rozelle Bay in January 1967. The conversion was never completed. (John Jeremy)



The patrol vessel VIGILANT during trials on Sydney Harbour in July 1938. (John Jeremy Collection)

HATCH, MATCH & DISPATCH

HATCH

Last Armidale named NUSHIP GLENELG

The last Armidale class patrol boat to be delivered to the RAN has been officially named NUSHIP GLENELG, in a ceremony that took place at Austal Ships Facility, Henderson, Western Australia, on Saturday 6 October 2007.

GLENELG was named by Ms Dianne Millington, the eldest daughter of Arthur Brierley, a crew member of GLENELG (I), who was also present at the ceremony.

GLENELG is named after the city of Glenelg, South Australia, and is the second RAN vessel to bear the name. GLENELG (I) was a Bathurst class corvette that served with distinction during WW II. GLENELG (I) sailed many miles throughout the Pacific and Australian region, conducting important convoy escort duties.

One of the highlights of GLENELG's (I) four-year career in the RAN was the bittersweet rescue of Australian Prisoners of War, from Ambon, Indonesia, in late 1945. As was customary at the time, Australian units flew the Royal Navy Ensign; GLENELG's crew vetoed this custom and illegally flew the Australian Flag, thus highlighting to the Australian POWs ashore that they were to be rescued by fellow Aussies.

A number of GLENELG (I) crew members were present at the ceremony, and took the opportunity to tour the new vessel, noticing some stark differences in the new state of the art Armidale, from the original Bathurst class corvette.



Workers at the Austal plant in WA assemble at the launch of the last Armidale class patrol boat, NUSHIP GLENELG. (Austal)

The ceremony was attended by a number of dignitaries, with the then Minister for Justice and Customs, the Honorable David Johnston, representing the Minister for Defence, along with Chief of Navy Vice Admiral Russ Shalders, CSC, RAN, and Commander Australian Fleet, Rear Admiral Nigel Coates, AM, RAN.

Also in attendance was the Executive Chairman of the Austal Group, Mr John Rothwell; Chairman of Defence Maritime Services, Rear Admiral John Lord (Ret); Acting Head Maritime Systems and representing the Chief Executive Officer of Defence Material Organisation, Commodore Rick Longbottom, RAN, as well as Councillor Ken Rolland, Mayor of the City of Holdfast Bay, South Australia.

During the ceremony, NUSHIP GLENELG was thrice blessed, just to be sure, by Chaplains Barrie Yesberg, Robert Hosken and Paul Raj.

GLENELG's motto is to be 'Staunch in Defiance', with the crest including the Saint Andrew's cross, alluding to the Scottish Heritage, of the name GLENELG.

As the last of 14 Armidale class patrol boats to be built at Henderson, GLENELG will be commissioned in early 2008.

GLENELG will be crewed by the *Aware* Division, comprising of three crews. The vessels first crew will be *Aware Two*, Commanded by Lieutenant Commander Nick Watson, RAN.

MATCH

LAUNCESTON Commissions

In a centuries old tradition, the RAN's Armidale class patrol boat, HMAS LAUNCESTON, commissioned in Beauty Point near her namesake city 22 September 2007.

LAUNCESTON is the twelfth of fourteen Armidale class patrol boats to be commissioned into the RAN. The first, HMAS ARMIDALE, was commissioned in June 2005.

During the ceremony, the ship's Commissioning Order was read and the Australian White Ensign was hoisted for the first time. In attendance was then Minister for Defence, Dr Brendan Nelson, Chief of Navy, Vice Admiral Russ Shalders, AO, CSC, RAN, Commander Australian Fleet, Rear Admiral Nigel Coates, AM, RAN, the Commander Australian Navy Systems Command, Commodore Steve Gilmore, CSC, RAN who were joined by Tasmanian federal and state parliamentarians, Launceston Council and community representatives, veterans from LAUNCESTON (I) and personnel who served in LAUNCESTON (II), members of the naval community and the Ship's company and their families.

"This is a great day for the Navy, my crew and the town of Launceston. Today marks the culmination of many months of hard work in getting LAUNCESTON ready for her mission," Commanding Officer HMAS LAUNCESTON, Lieutenant Commander Richard Stevenson, RAN said.

LAUNCESTON is one of the four Armidale class patrol boats to be based in Cairns, Queensland as part of the *Ardent* Division, consisting of four patrol boats and six crews. The multi-crewing concept is designed to maximise platform availability without compromising crew respite and training periods.



Crew members on the bridge of the newly commissioned Armidale class patrol boat HMAS LAUNCESTON. (RAN)

PRODUCT REVIEW

James Craig Sails Again – DVD

Executive Producer Robert O Albert

Producers Rob McAuley, Steve Maccagnan,

Narrator John Bell

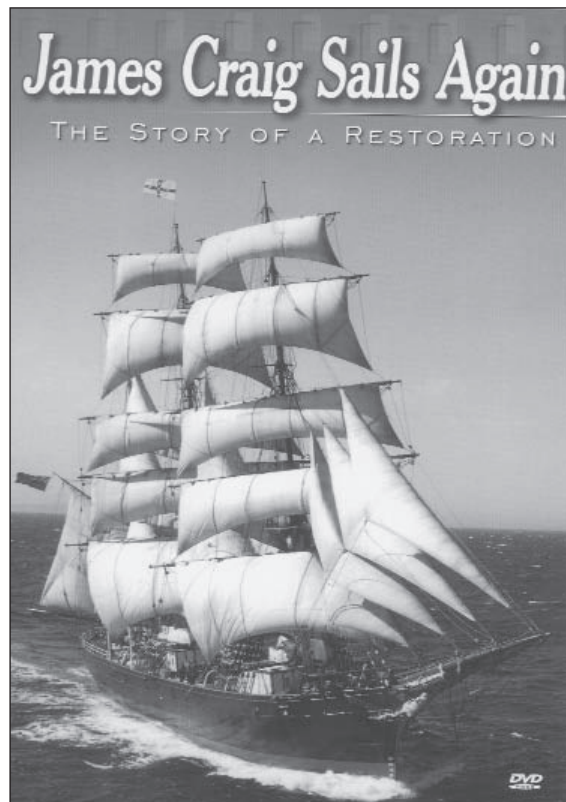
A Moving Planet Production

DVD

92 mins

16:9 ratio

Sydney Heritage Fleet 2007



There are only four operational barques from the 19th Century still capable of sailing – the *Star of India* in San Diego, California, (1863); *Elissa* in Galveston, Texas, (1877), *Belem* in France (1896); and *James Craig* in Sydney (1874). Of these, *James Craig* is the only one in the Southern Hemisphere, and is the only one in the world which regularly carries members of the general public to sea.

The DVD documentary, *James Craig Sails Again*, tells the fascinating story of the discovery of the rusting and abandoned hulk as she lay, half submerged, in the cold and isolated waters of Recherche Bay on the far south-east coast of Tasmania, through her restoration to what is one of the more magnificent sites on Sydney Harbour today.

The barque *James Craig* was built by Bartram, Haswell & Co. in Sunderland, England in 1874. Originally named *Clan Macleod*, her maiden voyage was to Peru.

For 26 years she plied the trade routes of the world carrying general cargoes during which period she rounded Cape Horn 23 times. In 1900 she was purchased by Mr J. J. Craig of Auckland and was used on trans-Tasman trade routes as a general cargo carrier. In 1905 she was re-named *James Craig* and then a short six years later, in 1911, she was laid up because increasing competition from steam ships made sailing

vessels uneconomical. She was then stripped and used as a copra hulk in New Guinea. After the First World War there was an acute shortage of cargo ships. This gave *James Craig* a new lease of life after being towed from New Guinea to Sydney for re-fitting.

Her return to service was brief because in 1925 she was reduced to a coal hulk at Recherche Bay, Tasmania. In 1932 she was abandoned and became beached after breaking her moorings in a storm. She remained beached until 1972 when volunteers from the Sydney Heritage Fleet re-floated her. In 1973 she was towed to Hobart where temporary repairs were carried out. She was towed to Sydney in 1981 and restoration work commenced. *James Craig's* restored hull was re-launched in February 1997.

James Craig is berthed at Wharf 7 Pyrmont and is open to the public for guided tours from 10:00am to 4:00pm daily.

The documentary covering the restoration of the ship is very professionally done with vibrant colour, an incredible array of still images of the ship in service and video footage from the day she was rediscovered in that lonely bay in Tasmania. The documentary is extremely interesting and one that documents what is a part of Australia's national history. It is also a 'how to' of restoring an old ship to the status of living monument. *James Craig Sails Again* is well recommended.

MOVING BASES

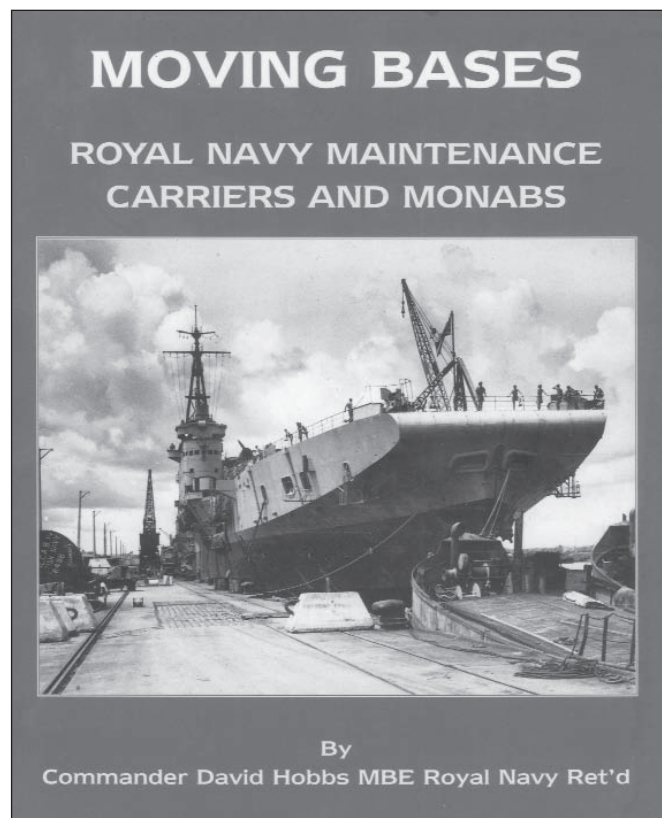
Royal Navy Maintenance Carriers and MONABS

CDR David Hobbs MBE, RN (Rtd)

Maritime Books, www.navybooks.com

Cornwall

ISBN: 978-1-904459-30-9



Writer to *THE NAVY* and Navy League of Australia member CDR David Hobbs, MBE RN (Rtd) has written another ground breaking book such as the last reviewed in *THE NAVY* on small escort carriers of WW II.

His latest book ***Mobile Bases*** explains the rise and success of the aviation support/depot ships and mobile shore bases. It also concentrates a lot on Australia during those years as it was in this theatre during WW II they concept was put to the test.

Faced with the need to provide detailed support for carrier-borne aircraft in a war in the Pacific, 12,000 miles away from the UK, the Admiralty made use of the ideas of the support ship and tented support base for aircraft from WW I. The concept gave rise to a number of converted aircraft carriers whose role became aviation support/depot ships.

The book explains that by August 1945, three maintenance carriers, several aircraft component repair ships, a Transportable Aircraft Maintenance Yard and ten Mobile Operational Naval Air Bases had been commissioned. Between them, they provided over 1,000 naval aircraft for the British Pacific Fleet in its operations against Japan. They did much more, of course, including the provision of 'home bases' for the squadrons to disembark to in Australia.

The book is illustrated with many never before seen images of the aviation support ships as well as some of the mobile land bases in Australia, including Sydney's Bankstown airport.

The book tells the story of the mobile bases for the first time and highlights the very close link the Australian and UK militaries once had. The work serves as an introduction to the RN Fleet Air Arm's many achievements behind the 'front line' in the Pacific Theatre. As David says in his Introduction "There is always more detail but, as the Second World War passes beyond living experience, I hope I am not too late to pay tribute to the men who achieved a great deal. May their memory never fade."

A6M2 Zero Type 22 Fighter – Model IJN Aircraft Carrier ZUIKAKU Air Group; Truk Island 1943 Dragon Wings – Warbird Series

1/72 Scale Die Cast Model

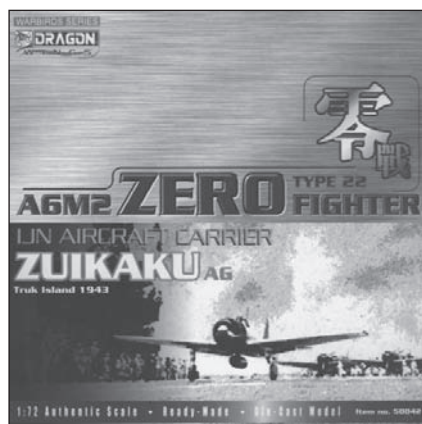
Cost. \$40.00 + Postage & Handling.

From: The Armchair Aviator.

8 James Street Fremantle WA 6160

Ph and fax (08) 9335 2500

Reviewed by Ian Johnson



There are several die cast models of the infamous WW II Japanese Zero already in the marketplace; this Dragon version must rate highly against them. One of the most feared fighters of all time, this 1/72 scale die cast model of a Zero operating from IJN ZUIKAKU off Truk Island during 1943 is brilliantly detailed for its small size, even with hints of paint and metal corrosion along the wings and fuselage. The propellers and wheels need assembly, and a stand is provided. As with most Dragon kits, more information about the aircraft and its history should be provided on the box.

This is one of the best models of the A6M2 Zero Type 22 Fighter available anywhere. If you are going to buy a 1/72 die cast version of a Zero, this must be IT!

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

Dragon Wings – Warbird Series

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.



China's Future Nuclear Submarine Force

Edited by Andrew S. Erickson, Lyle J. Goldstein, William S. Murray and Andrew R. Wilson

US Naval Institute Press

Annapolis, USA

412 pages

ISBN 978-1-59114-326-0

www.usni.org

One of the key concerns of naval strategists and planners today is the nature of the Chinese geostrategic challenge. Conceding that no one can know for certain China's intentions in terms of future strategy, the editors of this timely book argue that the trajectory of Chinese nuclear propulsion for submarines may be one of the best single indicators of whether or not China intends to become a genuine global military power. Nuclear submarines, with their unparalleled survivability, remain ideal platforms for persistent operations in far-flung oceans and offer an efficient means for China to strengthen deterrence and project power.

This collection of essays presents the latest thinking of leading experts on the emergence of a modern nuclear submarine fleet in China. Each contribution is packed with authoritative data and cogent analysis. The book has been compiled by four professors at the U.S. Naval War College who are co-founders of the college's recently established China Maritime Studies Institute (CMSI).

Given the opaque nature of China's undersea warfare development, readers will benefit from this penetrating investigation that considers the potential impact of revolutionary changes in Chinese nuclear submarine capabilities.

This book is essential reading for anyone interested in China's foreign and defence policies, in the future of the U.S. Navy, and in the defence of the United States.

"Unknowns about China's Navy, especially its nuclear submarines, perplex our security planners. China's Future Nuclear Submarine Force presents the most accurate information – and the most savvy analysis – available. This thoughtful compendium is vital to any serious discussion of the PLA Navy." –

Admiral. Joseph W. Prueher, USN (ret.) Former Commander-in-Chief, U.S. Pacific Command and Ambassador to China.

NATO's Gamble: Combining Diplomacy and Airpower in the Kosovo Crisis, 1998-1999

(Paperback)

by Dag Henriksen

Naval Institute Press

Annapolis USA

ISBN 978-1-59114-358-1

263 pages

In this revealing work, Dag Henriksen discloses the origins and content of NATO's strategic and conceptual thinking on how the use of force was to succeed politically in altering the behaviour of the Federal Republic of Yugoslavia (FRY). The air campaign, known as *Operation Allied Force*, was the first war against any sovereign nation in the history of NATO and the first major combat operation conducted for humanitarian purposes against a state committing atrocities within its own borders. This book examines the key political, diplomatic, and military processes that shaped NATO and US management of the Kosovo crisis and shows how air power became the main instrument in their strategy to coerce the FRY to accede to NATO's demands.

The book further shows that the military leaders set to execute the campaign had no clear strategic guidance on what the operation was to achieve and that the level of uncertainty was so high that the officers selecting the bombing targets watched NATO's military spokesman on CNN for guidance in choosing their targets. Henriksen argues that structures preceding the Kosovo crisis shaped the management to a much greater degree than events taking place in Kosovo and that the air power community's largely institutionalised focus on high-intensity conflicts, like the 1991 Gulf War, hampered them from developing strategies to fit the political complexities of crises. Because fighting and wars in the lower end of the intensity spectrum are likely to surface again, study of the Kosovo crisis offers lessons for future international conflicts in which the combination of force and diplomacy will play a very significant role.

STATEMENT of POLICY

Navy League of Australia

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

The Navy League:

- Believes Australia can be defended against attack by other than a super or major maritime power and that the prime requirement of our defence is an evident ability to control the sea and air space around us and to contribute to defending essential lines of sea and air communication to our allies.
- Supports the ANZUS Treaty and the future reintegration of New Zealand as a full partner.
- Urges 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 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 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.

HMS MONMOUTH, HMAS PERTH and FNS VENDEMAIRE alongside at Yokosuka, Japan, after the sea phase of Exercise Pacific Shield, Tokyo Harbour. (Defence)



USMC MV-22 Ospreys line up for take off. The Osprey is currently in Iraq on its first operational tour and is increasingly making its way onto ships of the USN, such as here on the LHD USS Wasp. (USN)



The modern Australian Wolf Pack. Three of the most lethal submarines in the world HMAS RANKIN, HMAS WALLER and HMAS COLLINS transiting in formation through Gage Roads, Cockburn Sound, WA, to HMAS STIRLING after participating in *Exercise Pacific Reach 2007*. (RAN)

