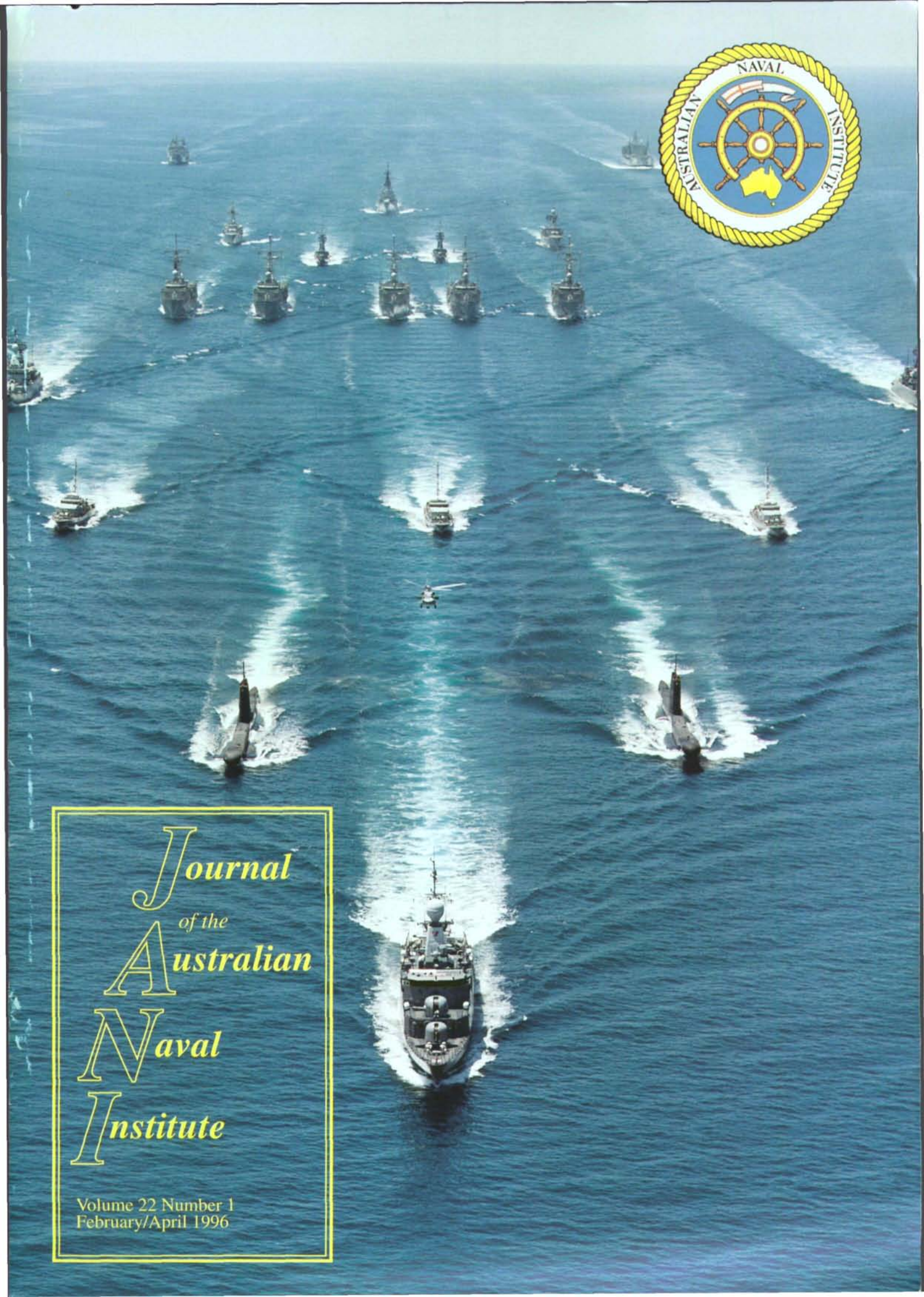

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AUSTRALIAN NAVAL INSTITUTE INC

The Australian Naval Institute was formed and incorporated in the Australian Capital Territory in 1975. The main objects of the Institute are:

- To encourage and promote the advancement of knowledge related to the Navy and the maritime profession,
- to provide a forum for the exchange of ideas concerning subjects related to the Navy and the maritime profession, and
- to publish a journal.

The Institute is self-supporting and non-profit-making. All publications of the Institute will stress that the authors express their own views and opinions are not necessarily those of the Department of Defence, the Chief of Naval Staff or the Institute. The aim is to encourage discussion, dissemination of information, comment and opinion and the advancement of professional knowledge concerning naval and maritime matters.

The membership of the Institute is open to:

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SPECIAL FEATURE

Theme Issue: Naval Operations in the Asia-Pacific.

Regulars

Cover: Asia-Pacific naval units in major exercise KAKADU

Features

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FROM THE PRESIDENT

This issue of the journal looks primarily at naval operations and includes some of the proceedings of last year's SEA POWER conference, of which the Institute was a major sponsor. One of the highlightsof the conference was a presentation given by Norman Friedman on the implications of new technologies on surface ship development. His thoughts were challenging, and I very much appreciate the help of the US Naval Institute in making Norman available. I will recap on just a few of the interesting points he made:

- There is likely to be an increased demand for SEA POWER in the decades ahead. More naval presence operations will take place within the ambiguity between peace and war. Importantly, navies will continue to give governments the ability to better choose when and how far to go, through intervention in limited ways for limited liability.
- Cost effective force projection capabilities are now more available to medium powers through advances such as cruise missile technology and cheap, vertical launch cells capable of supporting a wide range of weapons. However, the associated costs of weapons like *Tomahawk* are substantial because huge amounts of targeting information have to be acquired and processed just for such missiles to miss things like trees, power lines, small buildings and other obstructions. It is unlikely that ships going into action would have the necessary targeting information at hand without adequate warning and responsive data gathering and processing resources.
- Most navies will procure fewer, more complex ships which will need very efficient direction and information support to cover larger areas. Increased costs will result from higher percentages of higher paid crew on each ship. Also, shore establishments will become more complex and expensive, therefore, the percentage of budget devoted to ships is likely to decline; *however*
- The economics of warship design can be transformed, especially by CAD/CAM technologies and steamlined, modular production processes. This may mean that major equipment and spares could be quickly made to order rather than stored in quantity.
- Ship construction and life extension should emphasise a combination of durability, survivability and amenability to modernisation. This involves modular systems, open architectures and larger ships that can change roles quickly and easily (eg. Danish Stanflex 300 Corvette). Getting bigger does not involve much more expense. Major emphasis will be on open software architecture in which each application, or each console, is sufficiently buffered from the others so that it is amenable to changes that do not affect the system as a whole. Therefore, configuration changes will not require rewiring on a massive scale.
- Ship survivability (has wrongly) focussed almost exclusively on the ability to fight off missile attacks. Since the 1960s designers have built ships for short, sharp wars and concentrated on active defence systems against missiles. He argued that because of the growing importance of the naval presence mission, ships should again be built bigger to 'take hits', emphasising that modern missiles are ship disablers, not ship destroyers. He also emphasised that modern ships have become masses of single point vulnerabilities and suggested there were cost effective advantages in building bigger ships using data busing, duplication and moving away from conventional 'spidered' systems.
- Similarly, he suggested that STEALTH technologies must not come to *dominate* naval thinking in the new century. Crews concentrating on remaining stealthy and avoiding being hit, by being overly focussed on staying undetected, can seriously compromise their own survival and their mission.
- Military dominance over new technology has now largely gone. The issue for today's navies is more how they can best exploit civilian technology, especially in terms of software engineering.

Dr Friedman's paper will be incorporated in the proceedings of the conference. For my part, his observations highlight the importance of bringing experts to Australia, and fostering our own experts, who are able to challenge aspects of conventional naval wisdom, and put forward their views interestingly and informatively. Supporting these international visits has long been a priority for the Institute, from when the ANI brought Professor Michael McGwire to support its first major conference in 1979 to last year when we sponsored Norman Friedman's visit. However, our professional obligation is now to understand the *extent* to which Friedman's conclusions can be practically applied to *our* unique geostrategic circumstances. Therefore, I invite the members of this Institute, the RAN and other maritime professions to comment on some of the above observations and contribute to the debate on the shape of the navy in the coming century. While we are at it, let's not neglect 'human engineering' aspects of tomorrow's navy, especially in light of the recent Glenn Review.

Chris Barrie

FROM THE EDITOR

In this issue we look at the cutting edge of modern naval operations and take a peek into operational challenges likely to arise in the new century. We have articles on developments in surface, air and under water operations as well as an article looking at the potential synergy of 'jointery' and the pros and cons of recent changes to ADF joint command and control arrangements. We are also fortunate to have a paper by Rear Admiral John F. Sigler, CINCPACFLT's Deputy Chief of Staff for Operations, Plans and Communications, where he neatly summarises the opportunities and challenges faced by the US Pacific Fleet as it enters the new century.

A writer making his 'maiden voyage' in this issue is Malcolm Davis, who has provided us with valuable and timely comment on the Su-27 production license agreement recently made between Russia and China; a move that exacerbates an already unstable situation in a region of great interest to Australia. In our next issue Malcolm will look at key developments in North East Asia and focus on the strategic implications of tensions between the PRC and Taiwan. We certainly look forward to further contributions from Malcolm.

The operations theme of this issue is well balanced with some very interesting historical analysis, and the acid test of the quality and reputation of any professional journal is the calibre of writer it attracts. Two of Australia's very best historical writers and analysts make regular and very popular contributions to this journal. I am impressed with the thought Geoffrey Bewley puts into his articles, and in this issue he revisits Sturdee's campaign against von Spee in the South Atlantic during World War I where he suggests that Sturdee may not have been as 'stodgy' as he is so often portrayed. Bewley's selection of good stories, ability to successfully challenge conventional wisdom and application of sound common sense to historical analysis always results in a good read.

Graham Wilson is another historian with the ability to write interesting, insightful stories well out of the mainstream of current historical activity. In this issue he gives a well rounded description and assessment of the Irish Navy. In fact, our next issue will feature a kaleidoscope of Graham's historical and analytical works - strange vessels, mutinies, disasters and even a story about bluejackets fighting 'injuns'! If you want to write interesting, readable history - in fact, if you want to write at all - look at the style of Bewley and Wilson and learn.

As we settle into another year we look forward to lots of stories covering the wide spectrum of interests 'out there' among the steadily growing ANI membership. And talking of membership, please make sure you are current and read the gentle reminder below. Note that membership fees are extremely reasonable and have not changed for the best part of a decade - How many organisations 'out there' can make that boast?

Alan Hinge

ARE YOU UP TO DATE WITH MEMBERSHIP?

If not this could be your last journal and you will miss out on some fascinating reading in 1996! Find out if you are 'paid up' by checking your address tab on the back of this journal. The two digit figure at the top, left hand side is the year up to which your membership is paid. If it is '95' you will need to renew now by sending a membership application (included with this issue) crossed 'RENEWAL' to the address provided. Unpaid members will be deleted in June. Note that provision of back issues to members renewing after 1st July 1996 cannot be guaranteed due to expanding membership and the effects of cost containment initiatives. So, why not save yourself some time and trouble and take up the three year *special* rate subscription for $65 ?

ILLUMINATION ROUNDS!

with ODDBALL

FITNESS TESTING AND THE RAN

I read with interest an article in the May/June issue of the journal in which LEUT Cox brought up a number of points which I thought warranted a reply.

I am a strong advocate for higher levels of fitness, but I strongly disagree with the methodology and approach adopted by LEUT Cox. Firstly, the notion of a policy that will not allow 'unfit' members to serve at sea while we can barely crew the ships now is not a good use of manpower. Secondly, the issue of just what fitness to serve at sea really means was not addressed. Previously, I was able to maintain a reasonably high 'fitness' level until posted to a ship where it rapidly declined as a result of increased workload and operational demand. The proposal to be able to do 'X' pushups, 'Y' situps and run a given distance in a set time really does not address the unique problems experienced at sea. Why not make it a practical test by identifying a number of basic tasks that are undertaken regularly by ship borne personnel; for example, lifting 5" shells during ammunitioning or maybe

those frozen meat boxes rated at 30 odd kilograms, or bags of potatoes...The list is endless.

Lastly, why should fitness tests be gender related? Do men work harder at sea? Of course not. In this day and age of equality, surely a fitness test should not discriminate. An example of this is the US Marines fitness test policy which has just been revised. Previously females only ran 1.5 miles while their counterparts ran 3 miles. All marines now run the three miles within a time frame adjusted to allow for age.

POETW D.L Nelson
HMAS CERBERUS

ARMY Lowers the boom

In the February/April 95 issue of the journal I was particularly interested in the article 'Perception, Reality and Navy PR', written by 'Cyclops'. As I understand it, the Cyclops had only one eye. Perhaps your Cyclops needs to have a single eye adjusted, for he makes some pretty disparaging and inaccurate observations about Army readiness. Your readers should be aware that the Army maintains both special and regular forces at high degrees of preparedness to meet a broad range of contingencies. Special Forces on short readiness notice provide counter-terrorist capabilities as well as being able to support conventional military operations. Regular Forces, capable of operating in defence of Australia and meeting our commitments to UN operations, are maintained at short notice and are continually validated to ensure that they are able to respond within the time frame specified by government. The size and force structure of such groups are significant in regional terms; recent operational deployments to Cambodia, Somalia and Rwanda, all achieved at short notice, indicate the ability of Army to meet such contingencies.

Given its size, role and financial limitations the Australian army is a cost effective and appropriately prepared force which can provide for the defence of this country and meet other tasks that it is required to conduct. Furthermore, I dispute Cyclop's claim that the Army is the best at image and myth making. This implies a smoke and mirrors approach to PR. What Army is good at, and getting better at day by day, is communicating to the Australian public what we do and why we do it. I hope this clarifies some of Cyclops' statements for your readers.

R W. CRAWSHAW
Colonel, Director
Army Public Relations

BLAST FROM THE PAST...

(From The *Sydney Morning Herald*, August 13, 1968)

'A Straight Talking Admiral'! (p.6)

Buster" Crabb, formally called Rear Admiral G.J.B Crabb, the Flag officer Commanding the Australian Fleet, 'knows what he is talking about according to Navy colleagues. Last Friday Rear Admiral Crabb talked of the Navy's needs ('a lot more ships') and said it could do with 20 more patrol boats and another Perth Class destroyer. Promptly the Minister for the Navy, Mr C.R Kelly, repudiated Rear Admiral Crabb's remarks, saying the Rear Admiral now realised his statements were 'not correct'. No published words have since come from Rear Admiral Crabb, beyond 'no comment, no comment'. "Buster Crabb", 51, described as a 'tall, rangy bloke with an eager beaver look said in March this year that the RAN had taken enough 'kicking around'.

From the Editorial entitled **Catching a Crabb... '**IT WAS Admiral Crabb, in duet with Admiral Peek, who five short months ago made a song and dance about those who dared to criticise the Royal Australian Navy — a fact which lends certain piquancy to the situation in which he now finds himself. It is not, however, a situation which either parliament or the public can accept. There is something grotesque in the spectacle of a junior minister from a Victorian farm instructing a senior Admiral in the opinions he ought to hold about the effectiveness of the Fleet which he commands. Happily the presence at the Admiral's interview of Members of Parliament should ensure that Mr Kelly does not get away with his clumsy attempt at debarking a sea dog...'

From *Letters to the Editor*: **Ships for the Navy** . '...It now appears that Admiral Crabb has been 'rebuked' by his political head for having the courage to utter in very reasonable terms some home truths about the Navy today. It is a sorry indictment of this day and age that a senior, and presumably, responsible officer cannot speak at important gatherings without having his speech vetted by his political head or by playing safe with "inoffensive platitudes"...' Y.C Reeves, Gordon

Bodge Assumption underpins defence planning

Over the last 20 years Australian defence planning has made big strides and I believe most of our strategic planning methodologies are OK. However, there seem to be a few basic planning scenarios that don't appear credible in that they do not sufficiently take into account Australia's geography. For example, the idea of independent 'enemy' sections, platoons and companies harassing and destroying targets in North-

ern Australia has been around since the mid 1960s and ,somehow, has managed to permeate down to the present. This notion - regardless of various name changes - still heavily influences defence planning and seems to be a carry over from early capability guidance which focussed on ,and may have been obsessed by, Indonesia's *modus operandi* during 'Confrontation' in the 60's. Confrontation, among other things, involved low level incursions into (what is now) Malaysia to draw a disproportionate response and political concessions. However, it is one thing to send platoons into dense jungles 400 miles away; it's quite another to send them against who knows what in vast arid areas 2000 miles away *and then get them back again* .

Are these operations really credible? Realistically, what objectives, benefits and costs would be involved in such low level operations? Put yourself in the *moccasins* of a soldier called upon to hassle Australia in the Top End. The chances are that you are not a normal 'grunt'. Let's call you *Ding a Ling* and you are some sort of special forces type or a paratrooper. You and your amigos will have been expensively trained and equipped. Also, it is likely that you have at least the bare minimum of human intelligence and have a modicum of concern for your personal survival. Meanwhile, the aim of your political masters is to draw a disproportionate response to make Australia's government look bad and draw some political concessions. That's just dandy, but on the question of military/political 'return', what *exactly* does your team *do* when it gets to Australia? Ultimately, to be effective, attacks need targets of value, otherwise, the risk of possible capture or death of expensive, crack troops would not be worthwhile. Hitting valuable targets or killing Australians would seriously escalate the situation and get very bad international press, so your effort to draw a disproportionate response is likely to incur a disproportionate *cost*. If less significant targets are hit, why take the risk at all ? What's the point ? At any rate, once an Australian target of *any* significance is hit, your location is compromised. Cordoning and search operations then become highly effective with the very tyranny of distance that made it relatively easy to 'get in' undetected now making it bloody hard to get out...and for what? Think about it: You would probably have, at the very least, a couple of hundred miles to travel and have an almost complete lack of *sustained* operational familiarity with Australian terrain, and you are probably of *alien* appearance and in uniform. *Cover from fire* is difficult because you are outgunned in terms of speed and firepower if you are quickly moving to a distant RV after an attack. You can't get *cover from view* by 'holing up' for an extended period without sustained support of well organised sympathisers, whose presence may give you away anyway. Furthermore, the probability of detection in an activated, post attack situation would have to be high without at least the facility of quick extraction by submarine or aircraft. But, submarine extraction would raise the stakes tremendously in case of interception a few miles off the coast in shallow water, and could incur escalatory costs that the enemy hoped to avoid, especially if the submarine were sunk! Air extraction would be extremely dangerous, possibly suicidal unless serious Stealth technology capable of cloaking heavy aircraft were available. This further adds to the risk and potential costs of piss farting around in the Top End.

Why risk relatively large numbers of your best special forces and equipment for political and military objectives of questionable return against low value targets? Of course, if you are told to play for real, and a fair dinkum punitive expedition were staged, then you had better be prepared for a major escalation. And watch your 'back'! You will be trapped unless you can be absolutely certain of maintaining comms and logistics links over a big, unfriendly sea-air gap. This of course is not easy; ample warning could (or should) be available to the Aussies during such preparations.

A lesson to keep in mind is that ,while you are expected to use initiative, surprise and *lines of least expectation* in war, you and your political masters are not expected to be *completely* irrational in coordinating means with ends or to be absolutely profligate with scarce resources. Incidently, you also do not want to appear to be a complete *idiot* both at home and abroad. Another lesson is that most success can be had by hitting the opponent where he *a'int*, that is, at the margins of his capability, at the very limits of his (strategic) reach: not where *everything* is going against you....time, distance, likely payoff, international press and potential for escalation. And, above all, remember this: Military genius is figuring out what you can do and doing it, and knowing what you can't do and not even trying!

Now 'credible' means capable of being believed. Yet the *credibility* of the above scenario and perhaps some others that form underlying bases of Australian defence planning seem to involve faulty analogical reasoning (*ie. because a villain did such and such in a given time and place the same thing could happen to us today*) . How many other scenarios are 'incredible' and what capabilities have they been used to justify? Finally, when addressing preparedness planning let's be a little 'street wise' - Put yourself in the *villains* 'moccasins and give him credit for at least the bare minimum of human intelligence and at least a modicum of interest in his personal survival....What he can and can't do will spring from that.

VIKINGE

The Chinese Su-27 License Production Deal and regional security.

By Malcolm R. Davis

The License Production Agreement will result in a further strengthening of Beijing's relations with Moscow. This is a worrying sign given the worsening relationship between Russia and the West.

As a result of the growing power of the communist-nationalist factions within the Duma, the Yeltsin Government's move away from economic reform and respect for human rights, Moscow's brutal war in Chechnya, and numerous areas of tension with the West — notably the issues of NATO expansion into Eastern Europe — Russian arms sales to 'rogue states' like Iran, and differing views on resolution of the Balkans crisis, it can no longer be seriously suggested that the West and Russia are maintaining a solid 'strategic partnership'. Instead the world may be entering a period of 'Cold Peace'. If a hard-line communist or nationalist wins the Presidency in June 1996, this may become a new 'Cold War'. Thus any developing strategic relationship between Beijing and Moscow bears watching. Russian arms sales to China are likely to increase with the signing of the agreement, as debate over License Production of the Su-27 Flanker was seen by both sides as a barrier to further arms deals. It is also in Moscow's interest to have China as an ally rather than an enemy, given that Russia's foreign policy focus for the immediate future lies more to the West and South of Moscow rather than to the East.

Reaction to the signing of the License Production Agreement throughout the Asia-Pacific region is likely to see states thinking in terms of acquisition of a greater number of modern multirole combat aircraft, particularly if China starts mass producing large numbers of Su-27s to replace J-6, J-7 and Q-5 aircraft which are now considered obsolete. Malaysia has recently purchased 18 MiG-29S Fulcrums and 8 F/A-18D Hornets, whilst Indonesia, Singapore, Thailand and the Philippines are all equipped with small numbers of the F-16A Fighting Falcon. Taiwan has purchased 150 F-16A Fighting Falcons and 60 Mirage 2000-5s, with another 60 Mirages on option. Japan is equipped with the F-15J and is soon to deploy its F-16 derivative, the FSX. South Korea is equipped with the F-16. India has purchased MiG-29s and more recently Su-30 Flankers (a slightly more advanced derivative) though they only have a small number of these aircraft. Australia of course flies 72 of the F/A-18A Hornet fighters.

Given the Chinese potential to mass produce large numbers of Su-27 Flankers in the way they have mass produced the J-6 and J-7, China will have both a numerical and technological advantage over regional states. The J-8II Finback, J-10 and B-7 Hong, as well as the MiG-31M Foxhound would only reinforce this advantage. In particular, 'front-line' states such as South Korea, Japan, Taiwan and the ASEAN states as well as India, would have to consider dramatically expanding their airpower capability both in terms of the numbers of aircraft, and their capabilities if China begins to mass produce the Su-27 in large numbers. The acquisition of more effective Airborne Early Warning assets, advanced missiles such as the AIM-120C AMRAAM, and more effective SAM systems might be possible options for consideration. Thus the Su-27 Flanker License Production Agreement has the potential to set off an arms race throughout the region, focusing on airpower capability.

The Su-27 Flanker also comes in a navalised variant - the Su-27K, which is designed for use with Russia's Kuznetsov class CTOL carrier.

Like the MiG-29K naval variant of the Fulcrum, the naval Flanker is designed to take off using a ski-jump ramp. Its thrust has been increased by 12 to 15 percent, it has a strengthened undercarriage, a folding wing and tailplane, an arrestor hook, and foreplanes, which reduce the approach speed to around 130 knots. It is capable of in flight refueling. Although there has been no indication as to whether China has sought to purchase Su-27Ks or the rights to License Produce them locally, such a move would make sense given China's aspiration for an aircraft carrier capability. In the shorter term, China is engaged in negotiations with EN Bazan of Spain for the purchase of a small 11,500 ton VSTOL CV similar to Thailand's new carrier. This will be capable of operations with helicopters and possibly STOVL aircraft such as the Yak-141 Freestyle. In the longer term, China has made it clear that it seeks a CTOL Aircraft Carrier, equipped with a substantial air wing. This would be a far larger vessel, and the Su-27K or MiG-29K would have to be high on any list of consideration for the development of an aircraft carrier. Acquisition of both types is conceivable, as the MiG-29K is optimized for antiship missile delivery, with fleet air defence a secondary mission, whilst the Su-27K is optimized for fleet air defence.

Any move by China to acquire the Su-27K for a CTOL carrier would have to force the US Navy to rethink its decision to rely heavily on the F/A-18E/F Advanced Hornet in the immediate future. Although more capable than the F/A-18C Hornet, the Advanced Hornet will not have the same long range air defence capability as the F-14D Super Tomcat does, or the now canceled A/F-X Tomcat replacement would have had.

The JAST (Joint Advanced Strike Technology) program seeks to incorporate elements of A/F-X into a lighter, smaller aircraft as a replacement for the F-16C, as well as the capabilities of the proposed navalised variant of the F-22 (the F-22N NATF). However JAST may be a casualty of Congressional budget cutting as the A/F-X was. Chinese acquisition of the Su-27 in large numbers, and acquisition of the Su-27K would force the US to ensure that JAST made it onto US carrier decks as quickly as possible.

In conclusion, the Su-27 Flanker License Production Agreement signed recently by China and the Russia will significantly improve China's airpower capability. Obsolete PLAAF aircraft such as the J-6 and J-7 as well as the Q-5 will most likely be replaced with locally produced Su-27s. Thus the PLAAF could experience a quantum leap in its capability to defend Chinese interests and project military power. Taken together with other PLAAF developments including the MiG-31M Foxhound, the J-10 and the B-7 Hong multirole combat aircraft, the likelihood is that in the near future, China will achieve a qualitative edge over regional states, whilst maintaining its large numerical superiority at the same time. This can only encourage regional states to invest more heavily in acquiring highly advanced multirole combat aircraft, with advanced air to air munitions. The potential for a regional arms race in pursuit of advanced fighter technology is clear, as is the potential for yet more regional instability as a result. Clearly, if there was grounds for concern about the future regional intentions of China, this agreement can only lead to these concerns escalating even more.

About the author

Malcolm R. Davis holds an M.A. in International Relations and Strategic Studies from Lancaster University in the United Kingdom, and a B.A. in Politics from the Flinders University of South Australia. He is currently undertaking postgraduate studies towards an M.A. in Strategic Studies at the ANU's Strategic and Defence Studies Centre.

Young Endeavour departs on another fortnights trip!

Address by Rear Admiral C.A. Barrie AM RAN, Deputy Chief Of Naval Staff At the Seapower in the New Century Conference, 23 November 1995

SURFACE OPERATIONS IN TOMORROW'S ASIA PACIFIC

This morning I am going to lead off discussion on surface operations in tomorrow's Asia Pacific. I plan to speak for about 30 minutes providing an overview of surface operations, focusing specifically upon:

- Likely capability developments and their implications for regional navies,
- The affordability of these developments for regional navies,
- The type of operations regional surface forces are likely to be involved with in the asia pacific in the future, and
- Likely developments in the threats to surface ships and possible responses to these threats.

STRATEGIC OVERVIEW

Let me begin by providing a brief strategic overview that I hope will provide some perspective on future surface operations in the Asia Pacific.

We heard yesterday some of the strategic considerations that are likely to shape our region in the twenty-first century. In summary, we can expect to face a region that can perhaps best be described as 'benign but uncertain'.

From a maritime perspective, the regional trend for navies to assume a higher profile in national security will continue. Historically and traditionally, many regional countries have relied upon armies for security. Admiral Roy speaks of 'India's continental mindset' while other commentators have frequently remarked upon the region's inward focus upon security issues. Post Second World War conflicts and periods of tension have often been over disputed land borders or threats to internal stability. Clearly in these situations armies are the most useful security option. However, the recognition of the significance of maritime issues — trade and offshore resources to name but two, are encouraging these countries to adopt a more outward focus for their future security.

A quick glance at any atlas will confirm what most of us already appreciate, that the Asia Pacific region is fundamentally maritime by nature. Put simply, most of the region is dominated by the sea — by the Indian and Pacific Oceans, and by various seas. In comparison with Europe for example, we have a smaller land mass and significantly fewer continental borders.

This maritime dominated geography means that regional countries must confront a series of issues that may threaten their security and are relatively unique To the Asia Pacific region. In particular, competition for increasingly scarce resources — offshore oil and gas and fisheries for example, are already resulting in complex maritime delimitation disputes. The UN Law of the Sea Conventions relating to exclusive economic zones and archipelagic waters will face strong testing in these regional waters. The Spratly Islands dispute is simply the most prominent at this time. The new century may bring many more such disputes.

Of particular importance for regional maritime forces, is that the volume of maritime trade in the Asia/Pacific is predicted to grow by as much as 7% each year for the next 20 years. Interestingly, Dr Kissinger remarked last week that by the year 2020, he expected APEC to account for 70% of world trade.

There is also a significant trend developing towards an increasing level of economic interdependence in the region. In this sort of strategic environment, clearly it is in all countries' interests to keep SLOCs open and to protect maritime commerce. Most significantly, this is the strongest justification for the region's approach to co-operative security.

The 1994 Australian Defence White Paper - *Defending Australia* states: 'over the next fifteen years, the strategic environment in Asia and the Pacific is likely to be more demanding and to be determined, more than ever, by the policies and approaches of regional countries themselves. Australia's engagement with countries in Asia and the Pacific as a partner in shaping the strategic affairs of the region will thus become an increasingly important element in ensuring our security.'

In summary then, Asia Pacific security in the next century will have a significant maritime dimension. Ensuring the security of maritime trade and offshore resource zones will encourage all regional countries to develop and sustain capable maritime forces. Importantly, the vastness of regional waters will determine that, with the possible exception of the United States, no country will be able to act alone. Co-operative regional security will be critical.

Likely regional capability developments

What sort of capabilities will navies need in the Asia Pacific in the twenty-first century?

I think the first point that I would like to make is that we must keep this in perspective. It would be wonderful to put together a 'wish list' for all sorts of platforms and weapon systems. However, few regional countries have the industrial capacity or the operational experience to develop new capabilities on the scale of the countries like the United States. Carrier aviation, nuclear powered submarines and ballistic missiles will be beyond the capacity of most regional countries to afford, operate and support. However in general terms, I think we will see more capable surface vessels, with better equipment, better logistic support and better trained people put to sea in the Asia Pacific in the next century.

Specifically, we will see developments such as:

More capable and an increasing number of submarines:

Thailand and Malaysia have shown some interest in purchasing and operating submarines. Singapore has announced the purchase of a submarine. Indonesia and South Korea will probably upgrade their submarine fleets sometime early next century. A little further down the track capabilities such as air-independent propulsion, submarine launched cruise missiles and wake homing torpedoes could be relatively common in regional waters.

Improved organic airpower:

Non-helicopter capable ships will be a thing of the past. In regional terms, organic airpower will by and large mean helicopters. However, the United States and India will undoubtedly retain a carrier force, while all regional countries will watch the developments in Thailand with interest. I won't steal Captain Ramsay and Group Captain Harvey's thunder, but advances in sensor and weapon technology will make these helicopters far more capable than at present.

Improved sensors:

Three dimensional, phased array, synthetic aperture and over the horizon radar technology; infra red and other electro-optical sensors; unmanned vehicles and towed array sonars will dramatically improve the quality of information available to commanders in the region in the twenty-first century. There is also great potential for the regional development of satellite based sensors.

Wider availability of stand-off weapons

Regional maritime forces will be operating not only harpoon and exocet successors, but also the successors to tomahawk and other highly capable precision guided cruise missiles.

More capable munitions

Guided, longer range projectiles and fuel/air weapons may become widely available.

More efficient, higher output propulsion technologies

Combinations of gas turbine and diesel propulsion will remain in service for some years to come. However, there is potential for the development of alternative propulsion technologies, including superconductor propulsion.

Higher speed, more stable hull forms

I expect the displacement hull will be around for some time to come, however technologies such as small waterplane area twin hull (swath), hydrofoil, surface effect and wave piercing hull forms will become widespread throughout the Asia Pacific, particularly in archipelagic waters. However, in my view, the biggest change we are likely to see in the region in terms of capability development, is in the area of C^3I and C^2W. Rapid, almost exponential growth in the capacity of computers to process data — in terms of volume and speed - have seen great challenges set in the field of information technology, C^3I and C^2W in the past few years. *How well we meet these challenges and incorporate the information from a new generation of sensors, is likely to determine the effectiveness of maritime forces in the twenty-first century*. Some of the key issues include: interoperability, security, affordability, survivability and flexibility. These sort of issues need to be examined in a joint environment (Navy, Army and Air Force), and in a combined environment (regional).

In summary then, with a few exceptions, countries in the Asia Pacific are still some way off acquiring and operating the types of capabilities that I have just mentioned. It is critical to stress that technology forms only one part of the capability equation — support (logistic and training) and people are other critical elements.

Regional affordability of capability developments

How affordable are these sort of capability developments for regional countries?

Leaving aside developmental costs, which are beyond the capacity of most Asia Pacific countries, with the exception of the US and Japan and some other na-

tions with specific skills in some areas, the affordability of new capabilities may become a key determinant for regional security in the new century.

Countries such as Australia and New Zealand, and even the United States, will continue to operate under tight budgetary constraints for the foreseeable future. Pacific Island nations will also have limited resources available to spend on security and will need to invest most carefully. However, Asian nations are likely to be less constrained. Sustained economic growth will allow investment in new technologies and capability improvements at a rate exceeding that of other regions in the world. Interestingly, the economist, Professor Wolfgang Kasper, noted in 1991 that: 'should tensions in the region increase, the Asian nations will be able to raise the share of their national product committed to defence fairly easily. But they will probably not do so without need, as the economic development priority is deeply entrenched and the leaders realise that defence spending is done at the expense of future growth.'

Likely surface operations in the Asia Pacific

Turning to the types of surface operations that navies will be likely to undertake in the next century, my view is that fundamentally they will be similar to those conducted now. The frequency and volume may increase, but these sorts of surface roles will remain key elements of regional maritime forces' concept of operations:

- Surveillance,
- Maritime patrol and response,
- Protection of maritime trade,
- Protection of offshore resources, and
- Strategic strike.

Having said that, there is also a strong possibility that we will also see an increase in the so-called 'constabulary roles' of navies. Maritime boundary delimitation disputes and increasing competition for scarce resources may see surface forces increasingly engaged in operations such as:

- Maritime peacekeeping (boundary enforcement disputes, regional humanitarian missions),
- anti-piracy/terrorism operations, and
- operations in support of environmental concerns.

Surface ship threats and responses

What sort of threats can surface ships expect to face, and how will they deal with these threats in the future?

The student of maritime history would know that the demise of the surface ship has been predicted for a hundred years or so. Threats from submarines, aircraft and missiles have proved very dangerous, but not as decisive or final as their proponents first thought. Consequently, although the environment in which surface ships will be operating in the new century has the potential to be far more hazardous, surface platforms will continue to play an important role.

Frequently the argument is advanced that the increased numbers and increased capability of submarine platforms, and the increased numbers and increased capability — particularly the range — of land-based aircraft will mean that surface platforms will not be able to survive in the Asia Pacific of the future. The argument continues that as a result of this perceived vulnerability, the roles formerly performed by surface ships will have to be conducted by other means. My view is that this is unlikely to occur. I think that the range, endurance, sustainability and 'presence' of surface ships, plus their inherent flexibility, will determine that they will continue to play a critical role in maritime operations in the region.

Returning to the likely threats to surface ships and the responses to those threats, perhaps the most significant threat posed to surface ships, and certainly the most frequently-debated, is that posed by the new generation of anti-ship missiles. High supersonic speeds in excess of Mach 3, and more discriminating seeker heads and targeting algorithms are frightening developments for the surface warfare community. However, developments in ship defence systems, in particular, the continued evolution of systems and weapons that allow a layered defence of the ship with a combination of soft and hard kill defences will reduce, although not negate, the threat posed by these missiles. The next generation of CIWS, nulka and high speed, agile missiles will be relevant in this regard.

I have spoken a little about the affordability of new technologies and capabilities, but it is also important to note that in addition to high-tech, high cost threats such as Mach 3 missiles, surface ships may also face the very real threat of a relatively low-tech, low cost weapon in regional waters — the mine. The lessons of the Gulf war and USS *Tripoli* are being learnt, and the investment across the region in minewarfare capabilities is quite noticeable.

The dependence on limited communication channels by surface ships may see them become increasingly vulnerable to exploitation by computer viruses and electromagnetic pulse weapons. Far more likely however, will be the vulnerability of surface ship sensors to combat-related damage. The exposed position of radar arrays, optronic sensors and aerials mean that any damage inflicted upon a surface platform has the potential to blind that platform. Since the early 1980s

and the Falklands conflict, navies have devoted much time and effort to improving the 'survivability' of ships. However, a disabled ship that survives but is not capable of fighting, simply becomes a burden to the force commander. Maritime forces need to focus some attention on improving the 'fightability' in concert with the 'survivability' of surface ships.

Conclusion

Maritime forces in the Asia Pacific in the next century can expect to face a more complex and uncertain operating environment. There will be a strong emphasis on maritime forces to provide security for nations' trade and offshore resource zones. The steady increase in trade between nations of the Asia Pacific will result in a region of increasing economic interdependence, and this interdependence will require some form of co-operative security.

Regional navies will be heavily committed to a range of surface operations that will not differ greatly in type from those we conduct today, but will perhaps differ in scale and execution. Joint and combined operations will be the order of the day.

Asian nations will be able to afford to invest in new capabilities, and these new capabilities will cover a range of emerging technologies relating to hull design, propulsion, sensor fit and weapons systems. Clearly, navies will find this sort of environment a very challenging one in which to operate.

About the author

Rear Admiral Chris Barrie is currently Deputy Chief of Naval Staff. He entered the Royal Australian Navy in January 1961 and early sea training included service in HMA ships Anzac, Vampire *and* Melbourne. *This period included involvement during the confrontation between Indonesia and Malaysia and, after various courses in the UK, he joined the commissioning crew of the Guided Missile Destroyer HMAS* Brisbane*; this posting included a tour of duty in Vietnam.*

His first sea command was that of CO of the Attack Class Patrol boat HMAS Buccaneer *during 1970-71. Future postings to sea would include Executive Officer HMAS* Vampire *in 1980 and Commanding Officer of the River Class (Modified Type 12) frigate HMAS* Stuart *from July 1983 to December 1984. Other sea postings have included: Navigating and Operations Officer of the Dartmouth training ship HMS* Eastbourne *and the Guided Missile Destroyer HMAS* Perth, *as well as Navigating and Training Officer of the Daring Class destroyer HMAS* Duchess.

While ashore he has served in a wide variety of staff and representative positions. He is a former Commanding Officer of HMAS Watson *where he also served as Director of the RAN's Surface Warfare School and had previously been the Director of the RAN Tactical School at* Watson.

RADM Barrie's last posting was as Chief of Staff at Maritime Headquarters and Deputy Maritime Commander, Australia. He holds an MBA and is a graduate of the National Defence University in Washington, the Joint Services Staff College and the Army Command and Staff College at Fort Queenscliff.

Presentation to Sea Power Conference 1995

Maritime Air Operations: The RAAF Contribution

Group Captain John Harvey
Air Power Studies Centre

Thank you for the invitation to speak here to day I will address the future RAAF contri bution to maritime air operations, and in recognition of the need for joint action, Captain David Ramsay will address the RAN contribution to maritime air operations.

Role of Air Power in Maritime Operations

Increasingly the teeth of armed forces is provided by air power — this is regardless of which Service is the provider. Colonel Phil Meilinger, Dean of the USAF School of Advanced Air Power Studies, estimates that currently 60% or more of all defence funding in the United States is spent on air power (which includes space capabilities as well).' Certainly the RAN is aware of the importance of air power, moving towards an air capability for each of its new ships as well as anti-air capabilities for self and fleet defence.

Control of the Air

The RAAF contribution to maritime operations involves more than aircraft that are directly involved in anti-surface or anti-submarine operations. And as you will see from my later discussion, it certainly involves more than just aircraft. The RAAF recognises control of the air as the prime air campaign. Without control of the air, surface operations are either extremely difficult or impossible. In the maritime environment, ever since the American airman Billy Mitchell demonstrated the use of aircraft to sink the former German dreadnought *Ostfriesland* off the Norfolk coast in 1921, ships at sea without air cover have been at risk. Surface ships' self defence capabilities have obviously developed since that time, but so too have aircraft anti-ship capabilities.

The importance of the need to maintain control is well illustrated by a story that I am assured is true. In the United Stales shortly after the Gulf War and all the publicity surrounding the success of air power a school student was asked why the South had lost the Civil War. After thinking for a while the student replied: "Because they didn't have control of the air." Perhaps not the right answer given the context, but I appreciate the sentiment.

And it must also be remembered that it is not only through Defensive Counter Air actions in the area of maritime operations that control of the air is achieved. Offensive Counter Air actions well away from the maritime battle may be the best way of influencing the battle's outcome. As well, maritime interdiction operations and strategic strikes against, for example, command and control centres can have a direct effect on the outcome of a maritime battle thousands of kilometres away. The RAAF's land based aircraft obviously have range and endurance limits which affect their ability to directly carry out maritime operations. The completion of the chain of northern bases, however, will go a long way towards redressing this limitation in the direct defence of Australia. Additionally, ensuring that all maritime aircraft are air-to-air refuelling capable and the acquisition of an operational tanker capability would significantly improve the RAAF's ability to contribute to maritime operations.

Information Dominance

While the need for air control in the maritime context is now generally well accepted, and will continue to be a requirement, in line with the theme of this session, we need to look to the future and the changing nature of warfare. The end of the Cold War has coincided with what Alvin and Heidi Toffler have described as 'the Information Age'. The use of terms such as 'information warfare', 'information dominance', 'knowledge based conflict' and 'dominant battlefield awareness' are becoming common. 'Information' in this context is used very broadly and applies to unclassified as well as classified data and the communication of that data. Dominance in what has been called the 'information dimension' helps remove the 'fog of war'. And just as control of the air allows freedom of action on the surface, control of information will become increasingly necessary for freedom of action in all three dimensions. In recognition of the importance of information dominance, the USAF has called for a fundamental re-examination of its doctrine:

> Just as the U.S. Air Force strives to dominate the skies over a battlefield, the service is now taking steps to dominate the exchange of information in future conflicts (*Defense News*, Aug 21-27).

Even small forces such as the ADF need to acknowledge the need for information dominance in any future conflict. While the ADF in general, and the RAAF in particular, have yet to explicitly adopt a doctrine including information dominance, as I will show you shortly, implicit recognition of the importance of information can be seen in terms of Defence's investment program.

INFORMATION

Trade-off Between Information Capability and Force Capability

In choosing an appropriate force structure for the ADF, there is a trade-off between what I see as 'information' capabilities and 'force' capabilities.

- At one end of a spectrum we could have full information regarding enemy force dispositions, activities and, ideally, intentions; and would therefore require less force capability.
- At the other end of the spectrum, if we have little or no information regarding the enemy, very high levels of combat forces would be required to address a wide range of possible contingencies.

This can be seen as an extension of the concept of using precision weapons — where application of a small amount of force to the right target in the right place avoids having to apply large amounts of poorly directed force. I can illustrate the point by using the case of Australia's strategy of denying its air and sea approaches — based largely on advanced air and sea platforms.

Consider a large scale anti-surface action in which, for argument sake, a total of 50 Harpoon missiles are fired from a range of air, surface and sub-surface platforms. While this obviously represents a formidable anti-ship capability, the total amount of 'force' applied, that is in terms of high explosive, is only equal to one F111 loaded with dumb bombs.

I should also add here that there is a huge difference in cost — about $2 million for a Harpoon versus about $2 thousand for a 500 pound bomb, a ratio of 1 000:1. Obviously precision comes at a price!

Similarly, in the air control role, a defensive operation involving the use of, say, 50 AIM-7 Sparrows, is equal to only half the same F111 load. It is information, in this case precise knowledge of the enemy's location, that allows a small amount of force to have a disproportionate effect.

The key question for Australia is then one of balance — achieving the most effective mix of 'information' capabilities (in which I include surveillance, intelligence and command, control and communications) and 'force' capabilities.

Surveillance

It has been recognised for some time that the ADF's ability to control its air and sea approaches will be dependent on information — ie the need for a wide area surveillance capability. The RAAF's ability to contribute to the wide area surveillance capability will be considerably improved in the future, primarily in terms of: the Jindalee Operational Radar Network (JORN), Airborne Early Warning and Control (AEW&C) aircraft and the upgraded P-3C Orion aircraft.

JORN

The capability provided by JORN will represent a quantum leap over existing surveillance capabilities. For the first time the ADF will have near continuous, real time, high quality data covering its area of prime strategic interest.

JORN is expected to be in service in about 1999, at a total project cost of approximately one billion dollars. JORN radars have the capability of detecting air and surface targets between 1000 and 3000 km away — representing a total area of some 20 million square kilometres.

As well as detecting aircraft and ships in Australia's area of primary strategic interest, JORN also provides a range of information that contributes to Australia's broader security interests. This includes meteorological data on surface-winds and sea-wave heights and providing early warning weather alerts and cyclone tracking. It is also likely that as the system comes into service new uses will be discovered.

Initially JORN will consist of:

- one transmitter-receiver radar located at Longreach in Queensland,
- a second near Laverton in Western Australia, and
- the JORN Coordination Centre at RAAF Base Edinburgh in South Australia.

The experimental radar at Alice Springs will be converted to a research and development role. A decision on a possible third operational radar will be made after approximately two years of operation.

Correlated tracks from the JCC will be transmitted to the sensor coordination centre at No 2 CRU at RAAF Tindal where value adding in the form of identification and/or merging with microwave tracks is carried out. The JORN tracks, together with all other air tracks, will then be onforwarded to:

- the National Air Defence Operations Centre (NADOC) as the recognised air picture, and
- the Maritime Intelligence Centre (MIC) where it will be fused with data from other sources to form the recognised surface picture.

Targets will be processed by Air and Maritime Command systems and relevant information will be passed on to other Government agencies. Essential to the effective operation of JORN is an effective and survivable communications system. (Even an information system is, therefore, dependent on information).

Detailed command and control arrangements for JORN are yet to be finalised, but JORN will be a national asset under the operational and administrative command of Air Commander Australia. Overall tasking priorities will be set by CDF, in practice HQADF. A total of about 145 service personnel will operate the system with civilian contractor personnel maintaining the remote radar sites.

AEW&C

While broad area surveillance of the air-sea gap will primarily be carried out by JORN, that technology does not allow close control for the intercept and neutralise task. Another key element of the ADF's surveillance capability will therefore be the introduction of AEW&C aircraft. Acquisition of an AEW&C capability has been proposed and studied by the ADF almost since such a capability first existed. While a financial commitment has yet to be made, the project is progressing well and the first aircraft is expected to be in service around the year 2000. While AEW&C is generally synonymous with a radar capability, multiple sensor AEW&C is now recognised as the preferred option. Multiple sensors provide greater capacity for detection, and identification and to reduce the chance of the surveillance capability being defeated. While AEW&C is being acquired to meet the air defence strategic concept, it has great potential to contribute to many other roles and tasks including, C^3, protection of the fleet, and general anti-surface operations — compatibility with surface and sub-surface assets will therefore be essential.

P3C Orions.

The RAAF's P3C Orion Long Range Maritime Patrol (LRMP) aircraft play a large part in maritime surveillance and combat capability to respond to surface and sub-surface threats. In line with the emphasis on the information side of warfare, two major upgrades of the RAAF's P3 aircraft are underway or about to commence.

The first is the P3C Update II which consists of fitting advanced Electronic Support Measures. The upgrade is expected to be finished by the end of 1996. The second, and larger, project, is the upgrade that will extend the operational Life of Type of the P3 fleet to beyond 2015. The upgrade includes replacement of the radar, acoustic system, navigation system, communications system, MAD and the data management system. A key part of the upgrade will be the new radar which will provide 360 degree coverage, long-range surface surveillance, moving-target indicator, track while scan, advanced ECCM and imaging capabilities to assist identification (including SAR, ISAR and range profiling). The upgraded aircraft will start being delivered in 1998 with the fleet complete in 2001. While these capability improvements will improve performance in current P3 operations, the upgrades are so substantial that a fundamental rethink of P3 roles and means of carrying them out may be required. Part of this must be determining how to integrate P3 operations into the full range of ADF maritime capabilities. In terms of surveillance this means integrating with JORN, AEW&C, surface ships and submarines, and, in the attack role, integration with F111 s and F18s as well as surface ships and submarines. With the new capabilities, the P3s could possibly change from a primarily patrol role to more of a ready response role — providing high resolution information based on JORN cuing. Because the upgraded aircraft will be able to classify at long range, tactics may also need to be revised to reflect a new means of engagement and targeting.

Force Capability

At the force application end of controlling the air and sea approaches, at least in terms of RAAF assets, are the F/A18, F111 and P3Cs . The F111 and P3 aircraft are undergoing extensive upgrade projects and a major upgrade for the F18 is planned.

F/A18.

The F/A18s are true multi-role aircraft and provide air control, maritime and land attack and reconnaissance capabilities. A planned future upgrade will be primarily in the 'information' area, particularly in terms of the radar and mission computer. Weapons upgrades will concentrate on the air control role with a beyond visual range missile that will allow 'launch and leave' and a more agile within visual range missile, probably targeted using a helmet mounted sight.

F111

The F111 performs a range of roles, including maritime strike, air control and reconnaissance. The F111 Avionics Update Project also concentrates on the 'information' side of capability, with a complete replacement of sensors, communications and mission computers. Weapons upgrades are also planned. While the current Harpoon missile provides a very effective anti-ship capability, it does not allow precise targeting and therefore has limited utility where rules of engagement are very restrictive. Acquisition of weapons with an imaging IR capability is being considered to redress this deficiency. Also to be acquired will be an anti-radiation missile to both increase aircraft survivability and to increase the Government's

options in response to a maritime threat — providing the option to damage rather than to sink a ship. At the lower end of the threat spectrum, advanced laser guided bombs will be acquired to provide a cost effective means of attacking less capable ships.

P3s

As discussed earlier, the major upgrades to P3s will be in the information area. As for the F111, however, an anti-radiation missile will be acquired to increase response options while at the same time increasing aircraft survivability.

Command and Control

Maximum effectiveness of ADF information and force capabilities can only be achieved when they are integrated into a comprehensive air and surface defence system. An essential part of this will be an effective command and control system which requires extensive secure, jam resistant and broad-band communications capabilities.

One of the outcomes of recent technological developments — particularly in the area of computers — has been the dramatic improvement (or at least the potential for it) in Command and Control. The RAAF's operational headquarters, Air Command, now recognises effective command and control as a capability in its own right. The RAAF is undertaking major developments in terms of C^2 to accommodate the increased range of information available and the ability of new technology to effectively 'fuse' data and to control forces.

Considerable effort is underway in developing a joint operational level command and control capability — an area where the ADF has been lacking in the past. A significant impact on C^2 will be the development of the Collocated Joint Force Headquarters which is now underway.

Future Developments

Looking further to the future, key developments are also likely to be in the information side of maritime warfare. While space-based navigation and communications have been used by the ADF for some time, the use of space based sensors for surveillance and reconnaissance is now being considered. There is also considerable interest in the use of unmanned aerial vehicles. Both the RAN and Australian Army are investigating shorter range UAVs for reconnaissance purposes. The RAAF must start investigating the use of long range, long endurance systems that are now being developed. And when I talk of long endurance I refer to systems that have endurance in the order of three months. These systems are not excessively complex and could be operated and perhaps even built purely with Australian capabilities, contributing to Australia's efforts for defence self-reliance. UAVs with the ability to launch smart weapons, further reducing the risk to aircrew, are also being investigated.

Conclusion

In concluding this rather brief overview of the RAAF contribution to maritime air operations beyond 2000, I'd like to again emphasise the continuing need for air control and, increasingly in the future, the need for information control. An essential element of this information control will be advanced surveillance systems that will provide 'dominant situational awareness'. Information will prove to be the most effective force multiplier. While the need for information dominance has yet to be explicitly identified by the ADF, investment figures show that money is already going in that direction. Using very rough estimates, and looking only at RAAF systems discussed earlier, total investment in what I call the 'information component' of combat capability is approximately $4 billion whereas direct investment in the 'force component' is only approximately $200 million — a ratio in favour of information systems of about 20:1.

The revolutionary changes in capability provided by ongoing or planned developments will require a fundamental rethink of how the RAAF, and the ADF generally, carries out its existing roles. Key to this will be effective command, control and communications systems that effectively integrate the wide range of advanced capabilities available to the ADF. These changes are fundamental to what some are calling a revolution in military affairs (RMA). As Mazzar has observed, however: "Technologies may drive the RMA, but people and organizations will carry it out. In addition to smart weapons, therefore, the RMA calls for smart organizations and smart personnel." The point to note, then, is that new capabilities will only be as good as the people operating and supporting them. I'll now hand over to Captain David Ramsay who will discuss the RAN contribution to maritime air operations.

Maritime Air Operations - The Naval Aviation Contribution

Address By Captain D.J. Ramsay RAN to the Seapower Conference.

Group Captain Harvey has told you of the RAAF's significant involvement in maritime operations. I will describe the nature of naval aviation operations and emphasise the critical importance of joint and combined inter-operability as the limited number of RAN assets face up to the immense task of surveillance, patrol, response and combat operations in the vastness of our region.

CURRENT AVIATION FORCE

Australian naval aviation is on the threshold of an exciting era as projects are under way within the ADF to ensure that every major RAN surface unit will have an integrated naval aviation capability. Let me start by outlining current developments within the RAN's naval aviation force

S-70B-2 Seahawk.

The S-70B-2 Seahawk helicopter is the fleet air arm's most capable platform with good sensors, range and endurance. We are currently operating 12 aircraft with 4 in attrition reserve. All six FFGs are planned to have fully integrated double crewed flights by the end of 1997. The Seahawk is able to operate at a considerable distance from its parent ship, conducting independent operations including ASW, surface surveillance and over the horizon targeting. The RAN variant features a role adaptable weapon system (RAWS) which is designed to permit relatively easy role changes and system upgrades. Aircraft sensor information is relayed by data link to appropriately fitted surface units but there is significant scope for enhancement as communications technology advances. A proposal is currently being considered to introduce the four attrition seahawk aircraft into the operating pool and the seahawk will support the life of type of the FFG, planned for around 2020.

SK50 Sea King.

The RAN operates six Sea King helicopters which were acquired in the mid-1970s as carrier borne ASW aircraft with dipping sonar. They are currently being refurbished and converted to the utility role as the Sea King has an excellent passenger and cargo carrying capacity. The life of type extension refurbishment includes upgrading of the radar, avionics and communications suite and the aircraft will remain in service until at least 2008. Whilst primarily employed in the fleet support utility role the Sea King is an ideal platform for logistics over the shore support for ground forces deployed from the recently acquired training and helicopter support ships.

In addition to these principal types in the ran inventory the fleet air arm operates six AS350 Squirrels for training and light utility duties. These aircraft are still employed as the interim FFG helicopter, pending full availability of the Seahawk and they will become the interim ANZAC helicopter pending availability of the new intermediate helicopters for those ships. The Fleet Air Arm also operates several bell 206 Kiowas for light utility work in support of survey operations carried out by HMAS *Moresby*.

PLANNED AND ONGOING DEVELOPMENTS

As I said, RAN policy is for all major fleet units to be air capable. Accordingly, the two new hydrographic support ships will have aviation facilities capable of fully supporting the operation of intermediate size helicopters although they will not normally employ a helicopter for their survey task as HMAS *Moresby* does now.

The two training and helicopter support ships will be modified to be able to embark and operate Army Blackhawk and Navy Sea King helicopters and to receive the recently acquired Army Chinook helicopters. The full scope of naval aviation operations from these ships is still being developed and may range from periodic short detachments to exercise embarked operations, for training purposes, to significant involvement in logistics over the shore operations to free the Blackhawk for its forward mobility role. I hold it as self evident in our maritime and archipelagic region that a multi-aircraft platform like the this offers great flexibility to government in its response to a wide range of challenging scenarios. It is a sovereign platform with which the RAN can exercise influence, exert will or simply do good in the disaster relief scenario.

Seahawk.

Under a project which has just gone to tender, the Seahawk helicopters will be made more effective with the fitting of electronic support measures and a forward looking infra red sensor. These systems will come on line at about the turn of the century to greatly enhance the aircraft's surveillance capability. The ESM will include missile approach warning system (MAWS), physical counter measures (chaff and flare) as well as a broad band ESM system with on board analysis and recording capabilities. DSTO has conducted extensive research into optimising FLIR operations for tropical conditions which will be beneficial for project considerations.

It is envisaged a mid-life upgrade program will be required for the Seahawk around 2002/03 to address capability and supportability issues which are becoming evident at this point. Apart from a current system upgrade, with possible inclusion of an air to surface missile and dipping sonar, this is clearly the opportunity to significantly enhance communications to include a fleet wide, common data link capability.

SK50 Sea King.

There are plans to provide an ESM fitment for self protection of the Sea King whilst it is performing the utility transport role. This will include a missile approach warning system, radar and laser warning receivers and chaff and flare dispensers.

New Intermediate Helicopter.

The next major development for the Fleet Air Arm will see the introduction of 14 intermediate sized aircraft for the Anzac class frigates. Studies have shown that the ship's surface surveillance capability will be increased by a factor of 10 with an effective helicopter which becomes an extension of the ship's combat system and a force multiplier. The request for tender was recently issued and the main contenders for the NIH contract are the Westland Lynx, the Eurocopter Panther, the Kaman S2G Sea Sprite and the Sikorsky S-76N. It is planned to have the Anzac helicopter entering service in the year 2000. Observing that the first two Anzacs are in the water, the gap will be plugged by the Squirrel and is testimony to the programming difficulties which face the ADF and other regional defence forces with so much to be done and limited funding to do it with.

The primary roles of the NIH will be surface surveillance and ASUW and the aircraft will be fitted with radar, ASM, FLIR and an ESM capability including chaff and flares. The NIH will be crewed by one pilot and one observer and will give the Anzac frigate a capability to engage surface targets at extended range using the NIH with its own ASM or for OTHT. The helicopter will also have a limited ASW capability, being a torpedo carrying platform.

Project 1427 will see the procurement of up to an additional 13 NIH for the offshore patrol combatant (OPC). The introduction of these additional helicopters will be driven by the timing of the OPC/JPV program but I am hopeful that the Squirrel will not have to be the interim OPC helicopter.

THE NATURE OF NAVAL AVIATION IN THE 21ST CENTURY

Admiral Barrie outlined the roles of the RAN and other navies in 21st century operations — the most radical change being in the C^3I area. This change is eagerly looked forward to by all in naval aviation as a necessary next step in realising the full potential of the Seahawk and other, future, embarked aircraft. The increasing emphasis on constabulary roles is an area where the flexibility of organic naval airpower will be particularly useful. For example, boarding operations are hazardous in other than benign circumstances and helicopter insertion is becoming commonplace. The passenger carrying capacity of helicopters will be a consideration in future procurement decisions and more sophisticated armament may well be borrowed from army battlefield helicopters to replace the door mounted GPMG.

The trend towards most warships having organic helicopters and the increasing number of shore based surveillance and AEW&C aircraft is clearly leading to a potential for situations where these assets will encounter each other in areas of significant interest. The air combat capabilities of battlefield helicopters may well be carried across to the maritime environment, especially as air-to-air missiles have a not-to-be-ignored capability against surface targets. We are already seeing counter- and counter-counter-measure systems appearing in maritime aircraft and this trend will continue along with the inherent obligation of air-to-air-capable assets to be able to distinguish friend from foe. This leads us back to a point made by Admiral Barrie — the affordability of the sensors and weapons that technological advances are making practicable for smaller aircraft such as naval helicopters. The rate at which the trend to multi-role sophistication is followed will be driven by the perception of need, modified by the size of the defence budget and good intelligence will clearly be vital to the decision making process. Equally clearly, the rate of technological change is going to require a sea-change in procurement processes. No longer can we afford project gestation periods that exceed the product life cycle by a significant factor.

The principal advantage of organic air power is that it is there when the commander needs it. Of course being there on board ship means little if the aircraft is

unserviceable, the crew exhausted or if weather conditions preclude launch or recovery operations. The technological revolution has significantly improved availability rates but the maritime environment is harsh and minimum manning is forcing us to pursue even more reliable systems with self diagnosing built-in test and repair by replacement philosophies. Although naval aviation assets will become more reactive, cued by wide-area surveillance systems, crewing arrangements will still be required to cope with 24-hour operations in various contingencies. The ability to conduct flying operations in adverse conditions by day or night and for prolonged periods will remain a prerequisite for success in naval aviation. This demands a considerable investment in ship-helicopter integration; rugged, properly marinised helicopters and capable recovery and deck handling equipment to prevent inadvertent losses of expensive assets.

The small number of assets available to any one service or country will see increased emphasis on joint and combined operations. The exercises we conduct today as confidence building measures will become even more important as proving grounds for information systems connectivity. Much has been said at this conference about the prospects for increased naval co-operation in the region, ranging up to standing naval forces. In my view, the potential benefits of the effort that would have to go into making a standing naval force really work are worth it. Inter-operability requires far more than the technical or theoretical compatibility between systems. Mutually agreed doctrine and procedures must be used to allow the operators, the people in the system, to realise the full benefits of the technology. While not ignoring the difficulties, the benefits that would flow from having to work together so closely are immense.

Ran involvement in the gulf conflict and with the multi-national interception force (MIF) enforcing UN sanctions against Iraq has been instructive in the necessity to maintain interoperability. Any significant contingency in the Asia-Pacific region will most likely see a number of countries come together to resolve the situation. RAN units, including helicopters, must be able to communicate effectively with all the players. Another multi-lateral inter-operability factor unique to naval aviation is cross-deck operation. To the maximum extent possible the physical compatibility between various helicopters and the deck handling systems and crews of air capable ships must be established and exercised. Etched in my memory of some years ago are pictures of a very large USN Sea King perched athwartships on a rather small RNZN frigate flight deck and an RN Sea Harrier sitting forlornly on a Spanish container ship, both after emergency landings. Where there is a will there is a way, and overwater aviators will always try to find a way to avoid swimming. Routine cross-deck operations bring about improved communications and procedural compatibility as well as broadening options for the conduct of multi-lateral air operations and for handling emergency situations.

FUTURE DEVELOPMENTS

ASW.

It is clear that ASW will play a more prominent role in the new century as more submarines enter regional inventories. Improved submarine detection technology, such as low frequency active sonar, is likely to be incorporated in the S-70B-2 mid-life upgrade and in helicopters for the new surface combatant. It will take time to regenerate the organisational and technical skills required to operate dipping sonar, however resource pressures dictated the decline and the problems of resurrection that will face the Fleet Air Arm are similar to those of other regional defence forces now developing their ASW capabilities.

OIS.

Operational information systems incorporating artificial intelligence will be required to assist naval aircrew to more effectively operate in high workload multi threat environments. The technology is undoubtedly coming, but again funding constraints will impinge on when and how widespread this level of capability will be in naval aircraft.

UAVs.

The demise of manned aircraft has been prematurely forecast for some time. While UAVs do not yet have the capabilities or performance characteristics to replace manned helicopters at sea the new century will most likely see them utilised at least for high risk surveillance and OTHT operations, complimenting the manned aircraft fleet.

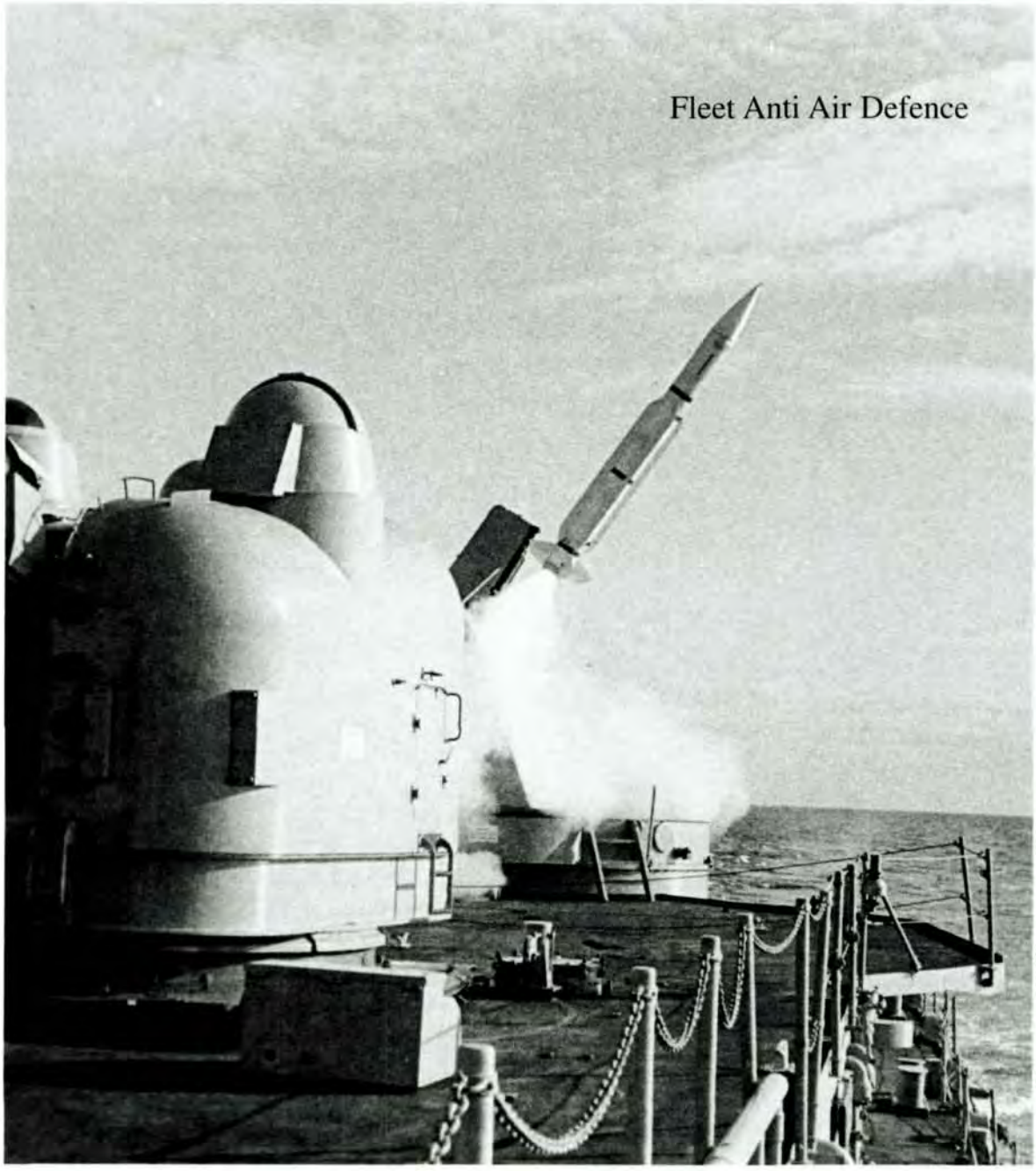
Mine Warfare.

New capabilities are likely to evolve for airborne mine detection. With such a system, appropriately supported helicopters could clear territory faster than surface ships acting alone and a co-operative effort would clearly be most effective.

New radar technologies such as SAR and ISAR are extending the stand off range for positive identification and engagement of surface targets. This is another pointer to the need to extend the reach of a ship's sensor and weapon system by arming organic helicopters. The us co-operative engagement concept technology is seeing weight, space and cost of such a system come down to levels where it may become feasible to fit to organic naval helicopters.

CONCLUSIONS

In terms of naval aviation the implications are clear whether we face evolution or revolution in military affairs. The maritime air assets of tomorrow will need to be more capable and highly flexible. Their air and maintenance crews will need to be multi-skilled. Command, control and communication systems will need to easily cross service and national boundaries. There is no doubt that technology will provide equipment to meet the challenges of the new century. In a world that will be changing with ever increasing velocity, success will demand people and organisations geared to incorporate constant change. For navies in general, and naval aviation in particular this will require constant practice in the forums of joint and combined multilateral exercises.



Fleet Anti Air Defence

Technological And Operational Trends in Submarine and Anti-Submarine Warfare

by
Graeme Dunk

I have been asked to speak on the subject of tech nological and operational trends in submarine and anti-submarine warfare (ASW). The two are obviously closely linked and what happens in one field will affect, and be affected by what happens in the other. I will illustrate the nature of this relationship with three quotations. The first was made by H G Wells at the beginning of this century when he stated: 'I must confess that my imagination, in spite of spurring, refuses to see any sort of submarine doing anything but suffocate its crew and founder at sea'.

How much easier life may have been if this were true! The quotation is used here, not to advocate the suffocation of submariners (however attractive that option may seem), but to highlight the difficulty in foreseeing the operational implications of technological advances, even for someone as farsighted as H.G. Wells. Marshall Foch had the same problem in foreseeing the operational potential of the aeroplane just prior to the outbreak of the First World War.

Who knows, maybe in the next century technological advancement may render the submarine obsolete or it may have followed in the wake of the land mine and become an internationally-banned armament. In both cases the demise of the submarine would be accompanied by the demise of anti-submarine warfare. We must therefore focus on the nearer aspects of the new century and consider the technological and operational trends into the new century.

Moving along the time line to 1937 comes a quotation from Admiral Raoul Castex of the French Navy who wrote: 'Though it (the submarine) is no more able than any other ship to cover the entire sea, it will, however do so in the mind of the enemy, in whose imagination the submarine's invisibility confers the gift of omnipresence. Fear therefore leads the enemy to take constant anti-submarine measures, just as if there were one to be found in every mile of sea.'

Apart from the fact that nuclear submarines are able to cover more of the sea than their conventionally-powered brothers, these words hold true today and continue to reflect the attraction of the submarine to all countries. Submarines do have a strategic impact out of all proportion to their cost and it is this feature of perceived omnipresence which acts, depending upon whose submarines they are, as a strong deterrent or as a strategic concern. One only has to look at events in the Middle East since Iran's acquisition of its Kilo submarines to see that this point is true.

The third quotation used is relatively recent and anonymous although widely by non-ASW officers in the Australian Navy. It states that: 'ASW is like peeing yourself in dark trousers. Nobody notices anything but it gives you a warm feeling.'

This quotation highlights the problem of marketing ASW within the wider defence debate and during the battle for force development funding. The submarine is a coven beast: it lurks, it creeps, it slinks, and it ambushes. Unlike the air or surface threat there is nothing to be seen, sometimes nothing that can be detected, actions taken against it occur in another medium and are hidden from view, and it can strike without warning.

The submarine is unlike other naval vessels in classical maritime strategy. The submarine' sole part is that of sea denial, although Jan Breemer has previously advocated a crisis management and forward presence role for nuclear submarines. The submarine has only a limited politico-military role, only limited peacetime roles. It is in essence an offensive strike or counterstrike capability. ASW in contrast is inherently a defensive capability — being the natural counter to the use of submarines, or the potential use of these vessels, by another nation.

This paper will concentrate on Australia's region where countries such as Singapore, Thailand and Malaysia have plans to introduce submarine forces, while Indonesia is seeking to improve its existing force. Slightly further afield China, Taiwan, South Korea and India are also looking for qualitative and/or quantitative improvements. The focus will be on conventionally powered, rather than nuclear powered, submarines and on the ASW operations against these platforms, even though China has, and India is pursuing a nuclear capability. I will also concentrate pre-

dominantly on the interaction between submarines and non-submarines, although it is acknowledged that submarines can be the most effective ASW platforms

I will also address the impact of technological developments on naval operations, rather than to try to draw the line between what may be deemed operational and what is strategic, as any distinction depends entirely upon what definition is used. Taking the US position, this entire presentation would be operationally-focused, as "strategic" has come to refer to the long range nuclear capability. Other definitions would see the entire presentation as dealing with the preparation for combat, and hence strategic.

Impact of Submarine Technology on Maritime Operations

Developments in submarine capabilities will impact on the conduct of ASW operations and hence on defence roles such as surveillance, maritime patrol and response and protection of shipping. Given the current state of submarine expertise in the region, advancements are more likely to come from the introduction and adaptation of technology developed elsewhere, rather than the development of any completely new capability.

General trends in submarine technology are toward lower levels of radiated noise, lower target strength for active sonar through improved anechoics and design, greater diving depths, higher speeds, better battery and propulsion systems and improved sensors and weapons. As in all other modes of warfare, they also include more flexible and innovative ways to filter, fuse and present, and hence to use, an ever-increasing array of operational and intelligence information. I will, however, limit this discussion to the implications of the following: air independent propulsion (AIP), improved detection systems and improved weapons, including the introduction of anti-air capabilities

Air-Independent Propulsion

The first of these developments is AIP. Current surveillance activities against conventional submarines are heavily dependent on the capabilities of the maritime patrol aircraft (MPA) and the helicopter: using a combination of radar and passive sonobuoys. Both of these systems depend upon the submarine betraying itself in some way: either in exposing a mast above the surface of the water or in increasing radiated noise when snorting to recharge batteries. AIP will have implications for both detection processes, as it will significantly reduce the requirement to snort.

As an indication of the scale of this reduction, Swedish Navy experience with the Stirling Engine in 1000 tonne submarines has shown that underwater endurance without snorting can be increased from a few days to at least two weeks. The detection probabilities by passive sonar, already problematical, will thus be reduced to next to nothing. Radar detection probabilities will also be reduced due to the lesser requirement for the submarine to expose masts. The current tactic of providing continuous MPA coverage over a probability area to catch the submarine when it is finally forced to snort will therefore become largely redundant.

The introduction of AIP capabilities will therefore require a significant change in the conduct of anti-submarine operations. Given that passive acoustic operations will reduce in effectiveness, as will the currently-available non-acoustic detection systems, the focus for future ASW operations must return to active sonar and/or new non-acoustic developments. These will be covered in the later ASW section of this paper.

Submarine Detection Systems

There are likely to be two key areas for developments in submarine detection systems. These will be the ability of the submarine to detect and track aircraft whilst submerged, and the increasing usage of active sonar in submarine-on-submarine operations.

Trials to date have indicated that the detection of aircraft by towed array is possible at long range, and, in some circumstances, the submarine can also determine speed and height. This ability will have significant repercussions for ASW forces, and will exacerbate the impact of AIP.

A submerged submarine will therefore be aware of the presence of a patrolling aircraft and will be able to ensure that any exposure of masts can be undertaken as safely as possible. The current operational posture of a MPA adopting an intermittent radar policy to catch the submarine unawares during periscope exposure will cease to have relevance. A capability to estimate height and speed by acoustic means whilst submerged may also allow the submariner to determine whether the aircraft is engaged in ASW patrol, surface search, or is in transit. Such information is obviously tactically important.

A move to active sonar by submarines against other submarines will be required as a counter to the process of continuing quietening and the reducing utility of passive sonar to achieve detections. It is true that transient analysis is currently believed to offer detection opportunities, but these are also likely to become progressively less reliable as effort is made to reduce the impact of such indiscretions. These active transmissions will be disguised to mimic naturally occurring sounds, such as dolphin clicks. This would lessen the counter-detection impact in using active sonar for detection and/or fire control solution generation.

Weapons

A third factor that will impact significantly on ASW operations will be the introduction of improved and different submarine weapons into the inventories of regional countries. There would seem to be three options here, namely

a) more capable torpedoes, both acoustic homing and wake homing;
b) sub-surface launched anti-ship missiles. Whilst these are already widely used in extra-regional submarines, and in regional surface and air platforms, any success in reducing the effectiveness of anti-ship torpedoes may lead to an increased use of missiles. Countering the missile firing platform is an ASW problem: countering the missile itself is an anti-air warfare (AAW) problem, which illustrates the need for balanced self-defence fit for surface ships; and
c) further away, the introduction of land-attack missiles of the Tomahawk variety.

The mooted increase in submarine numbers in the coming years, the likely increase in the number of countries operating submarines, the introduction of a wake homing variant by European torpedo manufacturers, and continuing development of acoustic homing torpedoes means that there is a high probability that there will be a greater diversity of torpedo types within Australia's region: including wake homers.

The present growing interest in surface ship torpedo defence (SSTD) will also need to consider these developments. Torpedoes are likely to become ever more capable as computer software, perhaps with artificial intelligence, provides better acoustic counter-countermeasures (ACCM) and targeting capabilities. Such torpedoes will be able to discriminate between ship types for better target selection; perhaps by requiring consistency in active and passive sonar responses (target length, movement, radiated noise patterns, etc) New torpedoes are also likely to use multiple simultaneous active frequencies.

The combination of submarine proliferation, a variety of torpedo types, improvements in torpedo target selection and anti-decoy logic will all serve to make passive countermeasures less effective (or more elaborate and expensive) and torpedo success more likely. Significant effort will be required in torpedo defence, especially when considering that it is much easier to sink a ship by letting the water in at the bottom, than by letting the air out at the top. Investigation of hard kill solutions to torpedo defence will require higher priority and a greater investment as a counter to the likely reduction in effectiveness of passive reactions. Hard kill does however require an ability to actively track the torpedo in three dimensions as the engagement scenario unfolds in order that the torpedo can be most accurately targeted.

A most significant development in submarine, and hence anti-submarine, warfare would be the introduction of a land-attack missile capability in conventional submarines. The impact of this would be to force ASW forces away from concentrating solely on the focal areas, and having to consider detection in open ocean areas. This would present a vastly greater problem for ASW forces and one which neither of the belligerents had been able to solve during the free-spending period of the Cold War. As an indication of the size of the problem, defence of Sydney or Fremantle would require the capability to conduct effective underwater surveillance of between 100 000 nm^2 (for a 500 nm range missile) and 1.5 million nm^2 of open ocean (for a 1000 nm range missile). Depending upon the coastal geography the task could expand to over 3 million square miles or roughly the land area of Australia. Current ASW technologies cannot undertake such a task with the implication that a land-attack capability would elicit a classical air defence response.

Submarine Anti-Air Capability

The last submarine development to be covered is the introduction of submarine launched anti-air missiles (SLAM). These would fundamentally affect the current utility of aircraft in an ASW role as current tactics for the prosecution of submarines are based on the ability of aircraft to overfly the submarine's position with impunity.

A SLAM capability is made more likely by an increasing ability of submarines to locate and track aircraft whilst submerged. It may also be possible to develop a system which the submarine leaves in its wake. Such a system could employ an acoustic trigger to activate against aircraft approaching along the submarine's track (the classic engagement tactic). "On-top" calls may come to be a thing of the past, and may well serve only to indicate the ditched position of the offending aircraft

The introduction of a SLAM capability therefore creates two fundamental problems for ASW forces: detection and tracking, and engagement. The operational response to the first problem may lie in Low Frequency Active (LFA) sonar.

A LFA capability, fitted to either ships or helicopters, could allow those units to detect, and then maintain contact on, a submarine from outside the SLAM range. Ships engaged in this activity would also need to remain outside the viable range for anti-ship torpedoes. SLAM would therefore force a substantial change in ASW tactics: away from the current posture of ships clearing the datum and leaving the prosecution to aircraft and toward a posture which would require all units to stand off. The utility of the maritime patrol aircraft in ASW operations will be much reduced,

unless a low frequency capability could be developed for sonobuoys.

The second part of the SLAM problem is engagement. Without the ability to put an aircraft over the submarine's position to drop a torpedo a long range capability is required if submarines are to be prosecuted. There would seem to be a number of possibilities to achieve this, including:

- resurrection of an Ikara-type missile system to deliver torpedoes, perhaps called the "Lazarus" missile system given the current state of Ikara;
- utilisation of an unmanned airborne vehicle (UAV) to carry and deploy a torpedo. An UAV may have significant advantage over a missile system in its ability to loiter in the area of the target if contact is lost or tracking degraded after launch;
- the use of long-range wire guided torpedoes from a hovering helicopter or a nearby surface ship. A heavyweight torpedo would be required to provide the necessary endurance. The disadvantage of this approach would seem to be the length of time that an engagement would take, and the obvious requirement to maintain sonar contact over this period.

IMPACT OF ASW TECHNOLOGY ON MARITIME OPERATIONS

ASW developments, although essentially a reactive, defensive business, will affect submarine operations, and thus affect the ability to conduct military roles such as protection of shipping

Acoustic Detection

As stated earlier in this presentation, the introduction of submarine capabilities such as AIP and aircraft detection will exacerbate the current downward trends in the effectiveness of passive acoustic systems. Taking this premise, the attraction of a technology such as LFA sonar is that it provides a way to get long range detection; at a range greater than the likely submarine torpedo firing range. LFA can therefore place pressure on the submariner: making him have to choose between closing for an engagement, knowing that he stands a good chance of being detected and attacked prior to achieving that aim, or having to fire his weapons from further away, knowing that the fire control solution will be more prone to error and hence that each torpedo will be less effective.

It has also been argued that low frequency active will essentially serve as a beacon to illuminate the potential targets to the submarine at long range. In some circumstances this will be true and LFA will not be any miracle cure for ASW. It can however be a powerful tactical weapon, to be used to one's advantage in the circumstance that a surface group is approaching a focal area; the use of active sonar will not disclose the presence of that group. The submarine will know that ships are approaching; after all, that is probably the reason for its patrol location. What LFA may do is to provide some gratuitous information on ship types, but this may be limited by the use of bistatic or multistatic LFA applications, where only one unit transmits but many receive.

A transmitting unit may be a surface ship, a helicopter, an explosive device, or perhaps a bottom mounted transmitter. The receiving units may be surface ships, helicopters, a bottom array, a sonobuoy or a sonobuoy field, or any combination of these. Provided that the communication problems could be overcome, there is no reason why a friendly submarine could not utilise the active pulses, whilst itself remaining covert. What is required is an accurate knowledge of either the location of the transmitter, or the instant of the transmission.

ASW forces have traditionally operated on own ship sensor information with operational integration undertaken at the manoeuvre or reaction level. Multistatic operations can allow this operational integration to be undertaken at a more fundamental level, at the information gathering stage, and all units can operate with the same raw information.

Taking this strategy one step further, why should it not be possible to share all information between all units, not necessarily those in close proximity. In such a way a picture could be built up by forces prior to entering an area, provided of course that there was at least one asset covering the area. Information could be uplinked to satellite from a bottom array or other system and rebroadcast for use by other units

Non-Acoustic Detection

As discussed previously, the impact of developments in submarine propulsion systems and in the acoustic detection of aircraft will be to reduce the effect of radar detections from maritime patrol aircraft; the classic non-acoustic detection mechanism. What other non-acoustic means may be viable?

There has been much recent interest in lasers for submarine detection, and some commentators have claimed that this will be a significant factor in countering submarines in shallow water. The problem with lasers is that the light does not penetrate beyond about 60 metres, and area search rates that can currently be achieved are low. Lasers may therefore have a part to play in very shallow water with low turbidity, but are unlikely to have a wider application in combating submarines under all environmental conditions.

S—70B—2 Seahawk
ASW and targeting helicopter

Magnetics may also offer some possibilities. More sensitive magnetic anomaly detection (MAD) systems will continue to be used as a localisation aid prior to weapon release, but not as an area search system. Bottom-mounted magnetic arrays may prove useful in focal areas as an alternative to acoustic arrays. Such arrays would need to be integrated with a surface picture compilation system (perhaps a radar site) to correlate any magnetic fluctuations with surface traffic.

Satellite surveillance has also been used against submarines. These systems have been aimed at detecting submarines operating in very shallow water, essentially by visual means, or to detect the presence of a submarine moving in the water column by the use of synthetic aperture radar techniques. SAR techniques will be less effective against conventional submarines, when compared to nuclear boats, due to their smaller size and generally lower speeds. Both parameters will affect the size of the water disturbance, and hence detectability.

More exotic non-acoustic mechanisms are also being investigated. One is magneto hydrodynamics which aims to exploit the current generated as a result of the submarine moving the water around it. This water being electrically conductive and moving within a magnetic field thus distorts that field. The effect is said to last up to 20 kilometres behind the position of the submarine, and 10-15 kilometres to the side. The problem is that the size of the effect is many times less than the background noise and some fancy signal processing will be required to recover it.

Some Conclusions

And now for some fairly obvious conclusions and some recommendations for regional ASW. Firstly, there is no doubt that the numbers of submarines operated by regional countries, the quality of those submarines, and the number of countries operating submarines will all increase. These increases will see the introduction of submarine technologies developed elsewhere, rather than the development of new technology from within. To some extent, the technology which will require counteraction already exists in other areas, but has conveniently been ignored by force structure planners. Torpedo defence is a case in point here

Secondly, the introduction of these technologies, AIP, the ability to detect and track aircraft whilst submerged, and into the future, the ability to engage aircraft whilst submerged will require a fundamental reappraisal of the way in which ASW is currently undertaken. A reduction in the effectiveness of the maritime patrol aircraft is likely to be one result.

Regional countries involved in ASW should therefore consider low frequency active sonar and multistatics as the focus of their ASW effort for the foreseeable future. An investment will also be required in tactical data management (including the provision of planning and operational advice to command). Torpedo defence will also be a necessity, as without this any investment in ASW is made without any insurance. It should be remembered here than a torpedo defence system will be many times less expensive than the surface ship that it may save.

Finally, the acquisition of the right systems is but the first step in developing an ASW capability. A detailed knowledge of the operating environment and the institution of an effective training regime are also required if maximum effectiveness is to be obtained.

Submarine Proliferation

The last point I wish to make concerns submarine proliferation In the coming years. It is likely that Australia, Indonesia, Malaysia, Singapore and Thailand will operate submarines in South East Asian waters. In addition, the US, Japan, China, Taiwan, South Korea, Russia, India and France could have their submarines in the area, either transiting or in direct support of national objectives.

A submarine detection by active-sonar (increasingly the most likely sensor to effect a detection) is therefore likely to pose the important question as to "whose submarine is it?" The answer to this question may be fundamental in what further action is taken: tracking, attempt to force it to the surface for identification or even engagement. Any action that can be taken, either technical or political, to enable the important classification task to he performed (or even to say whose submarine it is not) may be critical.

The U.S. Pacific Fleet into the Twenty-first Century - Challenges and Opportunities

by

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Deputy Chief of Staff for Operations, Plans and Communications
US Pacific Fleet

In 1945, at the end of World War II, the Pacific Fleet consisted of 4,790 ships. By the Vietnam war the fleet numbered 532 ships, and toward the end of the Cold War we totalled 283.

Today we have 196, and we'll enter the year 2000 with about 175. On the other hand, a World War II destroyer displaced 1,800 - 2,200 tons; today our newest class, DDG 51, weighs in at over 9,300 tons. In WWII our largest carriers displaced 33,000 tons, submarines 2,450; today they're 96,000 and 6,900 tons respectively. The increase in lethality is even greater, but on the down side costs have risen dramatically.

However, an interesting point in all this is that, with the exception of battleships, the types of ships that we have today are essentially the same as they were over 50 years ago. The question is where do we go from here — what kind of Pacific Fleet will face the challenges of the Twenty-first Century?

There are a discrete number of parameters that determine what our Navy looks like — the most affective are budget, threat, available technology and the synergistic capabilities of our sister services and allies. An additional parameter that significantly affects the Pacific Fleet is our forward basing in Japan. Because of long Pacific transit times, every ship in Japan represents 3-5 ships homeported in Hawaii or San Diego.

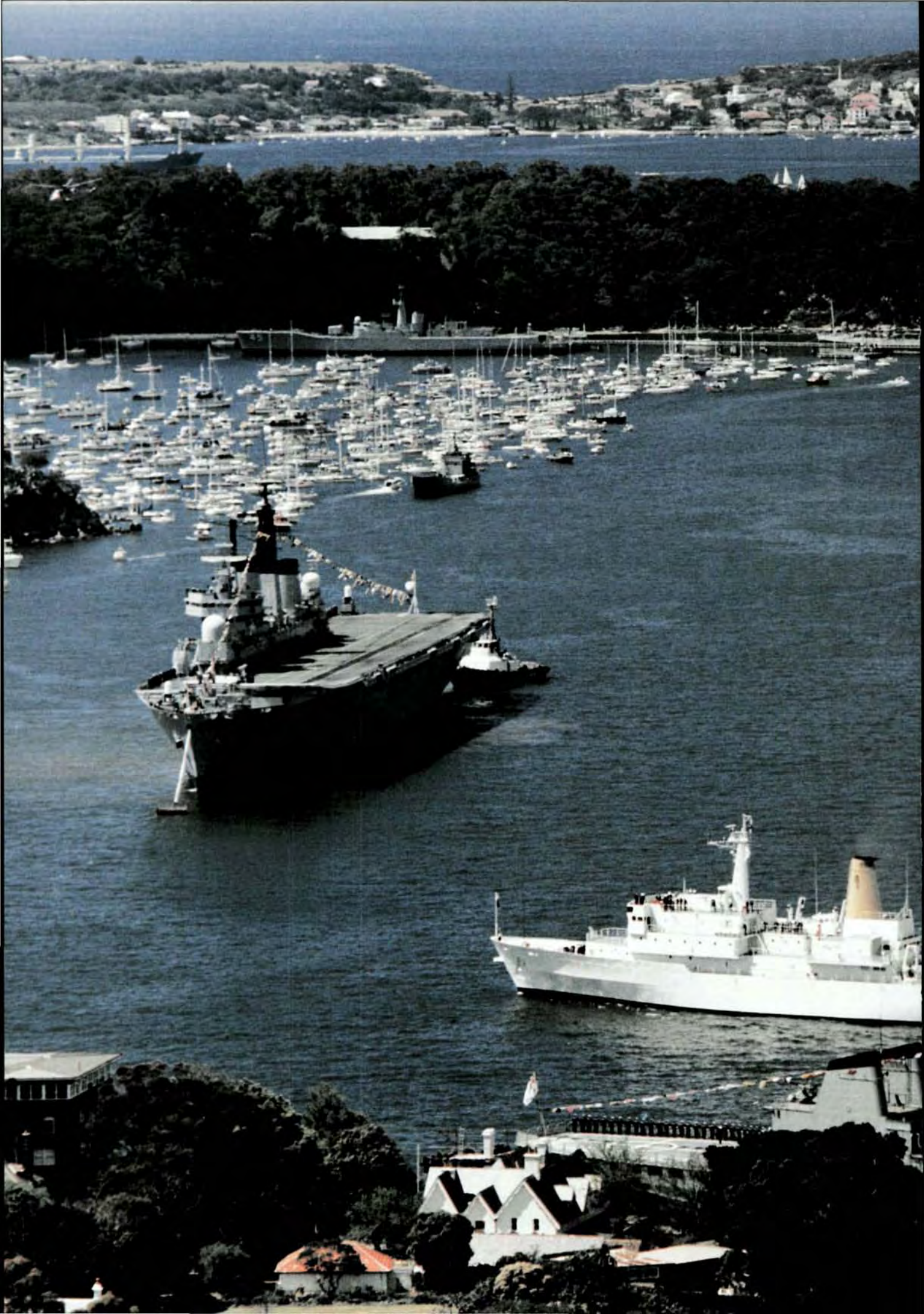
As we attempt to form our strategic plan for the future each of these parameters becomes naturally less certain the further out we look. To put this in perspective, how many of us would have predicted in 1965 what the world would look like in 1995? Or for that matter in 1935 what we'd be doing in 1965?

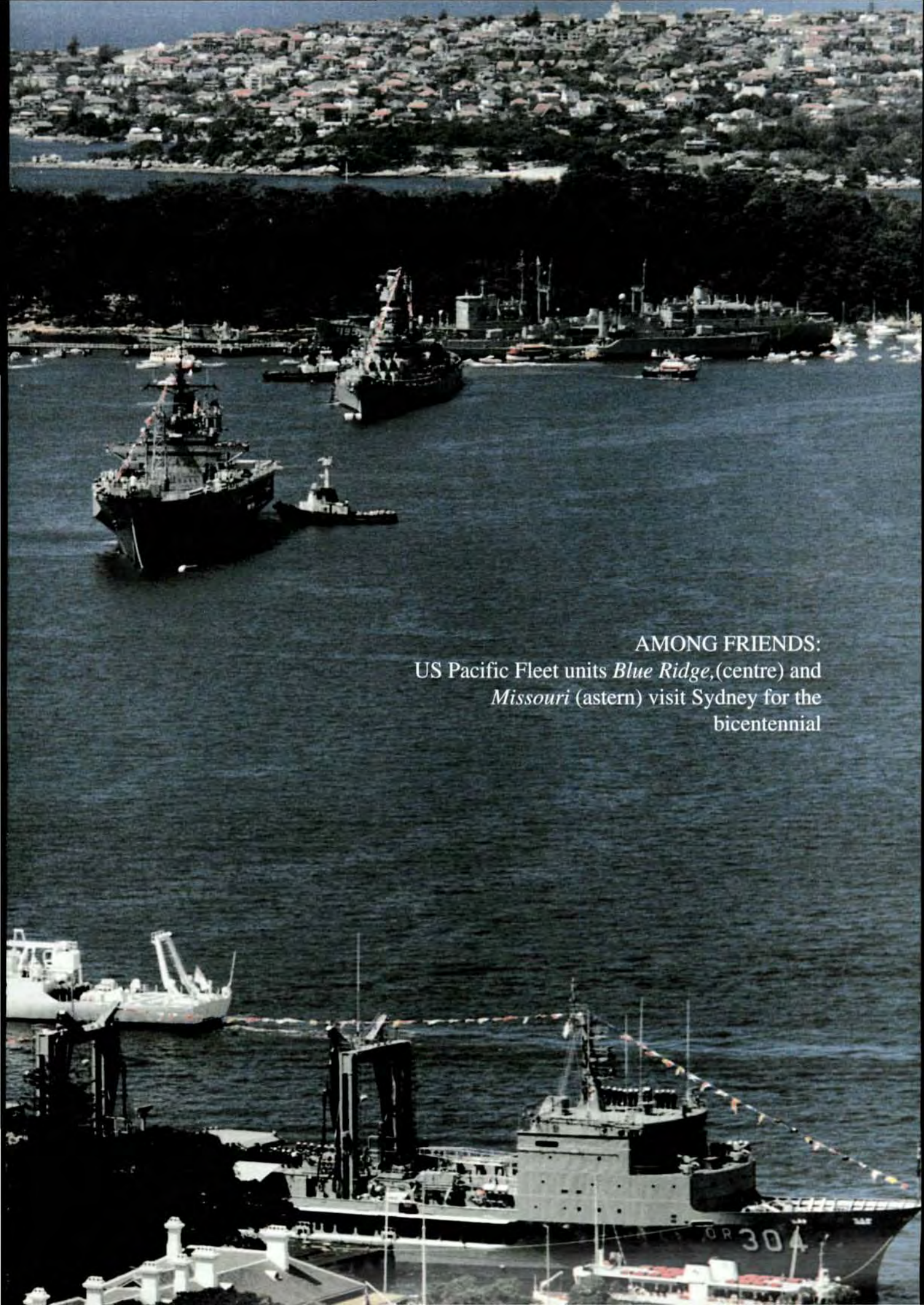
So even a thirty year prediction — a "nano-second" in the rich history of Asia — becomes not only extraordinarily difficult, but will almost certainly be wrong. And yet we build our ships to serve us for 30-40 years. The carrier Midway, for example, served us ably for 46 years until her retirement just four years ago. Likewise a particular type of aircraft may stay in our inventory for over 35 years. P 3's have been with us since 1961, and A-6's since 1963. Even the relatively "new" F-14 has served for over 23 years.

So how do we move ahead? Currently at Pacific Fleet headquarters we are preparing — with the assistance of the Center for Naval Analysis — our answer to that question. To do so we are employing an approach to strategic planning increasingly being used by business — essentially a hedging approach. We are breaking down our future into three categories: enduring principles, identifiable trends and the great uncertainties. For each parameter that affects our fleet we will then develop a range of possibilities from the relatively benign to the draconian; or in the case of technology, to the exotic. Finally we will seek to position ourselves, within budgetary constraints, to be able to respond properly and efficiently to the emergent realities. To make our predictions manageable we are looking at the 2010 time frame, which represents the approximate half-life of a ship commissioned this year.

Here then is our initial assessment of those three categorisations: first, the enduring principles or those things that we believe will stay with us.

- A given is the geography of the Pacific and Indian Oceans. What we call the "tyranny of distance" will continue to make deployments from the United States take a long time, even if we should have ships that can speed along at over 50 knots.
- Further, the geography will continue to have strategically critical focal points — for example the various straits through the Indonesian archipelago.
- The world's economy will remain global, and will be increasingly interlocked.
- Because of the global economy, the United States will retain world-wide economic, political and military interests.





AMONG FRIENDS:
US Pacific Fleet units *Blue Ridge*,(centre) and *Missouri* (astern) visit Sydney for the bicentennial

- The relative importance of the Pacific and Indian Oceans in the world economy will remain pre-eminent. Today half of U.S. trade is with or travels through the Pacific as compared to 20% with Europe.

- Friction, conflict and crises — including natural and environmental crises — will continue to threaten regional stability and U.S. interests.

- The great majority of trade in the Pacific and Indian Oceans will continue to be by sea-going vessels, implying a continued requirement for freedom of the seas — particularly in the sea-lines of communication or SLOC's.

- Naval forces will remain mobile and flexible.

- Naval forces will remain in demand as an instrument of U.S. national policy. As stated in our White Paper "Forward...From the Sea" forward deployed Naval Forces will 'provide the critical operational linkages between peacetime operations and the initial requirements of developing crises and major regional contingencies.'

- U.S. Naval forces will continue to operate in one or more of three regimes — as exclusively maritime forces, as a part of joint U.S. forces, or in combined operations with foreign navies, in predetermined alliances or as ad hoc coalitions.

In our second category of identifiable trends we see:

- Further increases in U.S. trade with the Pacific region. Currently 2.5 million U.S. jobs are directly attributable to trade with this region — forecasted to grow to 4 million by the turn of the century and 6 million by 2010.

- We expect Asian economies to continue to grow at higher rates than the rest of the world. Concurrently we would expect an increasing regional competition for constrained natural resources.

- Over the past few decades technology has not only improved significantly, but the rate of change has accelerated dramatically. In computing, for example, generational changes took 36 months just a few years ago. Now we see generations supplanted after only 18 months.

- Military technology likewise will keep pace, and become readily available to more nations due to increasing sales competition, corresponding falling prices, improved regional economies and increasing technology transfer.

- We expect U.S. defence budgets will range from relatively flat to slight growth as we complete our downsizing.

- The relatively new and as yet not fully defined area of Information Warfare will play an increasing role in military operations in general and naval operations in particular.

From trends we move to our final category, the uncertainties we'll face in the early parts of the next century; we wonder about:

- The nature of unification of the Korean peninsula,

- The direction of a post-unified Korea,

- China's plans and direction; specifically:
  the intent that accompanies a greatly improved naval capability,Hong Kong,Taiwan, and the Spratlys,

- Potential Russian recovery and the direction that nation might take,

- Asian perceptions of U.S. commitment; and our actual and perceived regional influence,

- Continued U.S. access to forward basing,

- Regional balance and stability should U.S. presence and/or influence be diminished,

- Regional proliferation of weapons of mass destruction,

- The future of the India-Pakistan dispute, and

- The effect of transnational movements throughout the region.

Right now the crystal ball is particularly cloudy, but of interest we would expect a number of the uncertainties just mentioned to become much clearer in the next five years.

- For example a reunified Korea may emerge, either peacefully or otherwise.

- Hong Kong will revert to China.

- I believe that the China-Taiwan situation will be heavily influenced by the results of the Hong Kong reversion.

- China's internal situation should be clearer:
  There will be a change of leadership, and
  The political, military and social effects of rapid economic growth may come into greater focus.

- China's view of external regional security should likewise be clearer with respect to their relationship with the United States and Japan, their sense of possible accommodations in the Spratlys, and in a related issue, their stance with ASEAN, particularly with respect to Vietnam.

Although these uncertainties may be much clearer by 2000, others will persist and new ones currently not foreseen will surely appear. The implications, to date, of our hedging approach are that:

FIRST, we must retain our ability to remain forward deployed and ready to respond to likely taskings from humanitarian assistance to major regional contingencies in Korea or Southwest Asia. In our forward deployments we should continue to support USCINCPAC's strategy of Cooperative Engagement through bilateral and multilateral exercises, other kinds of training support and personnel exchanges, and port visits.

SECOND, we must continue to guard and improve, where possible, our quality of life programs because our people are the linchpin of our readiness.

THIRD, we have to maintain readiness in terms of training, maintenance, supply support and an adequate shore infrastructure.

FOURTH, we need to retain adequate force levels. These ensure our ability to provide the sense of stability important to further regional economic development. Because of past lessons learned, we limit ourselves to six month deployments, 50% time in home port for our people, and at least a year between deployments. When one does the resulting arithmetic we find that we can sustain approximately 45% of the fleet underway or deployed at one time. We can surge beyond that level for short periods, and we have additional flexibility in fleet operations when we stay below 45%. As the fleet has come down in numbers about 6% per year since 1989 we've managed to keep consistently about 26 ships in the Western Pacific. Inevitably we have more closely approached the 45% mark each year as we do the same or more with less. We're up to 42% on the average.

The result is that we've given up most of our flexibility and have reached a force level that can not go much lower if we are to meet existing requirements.

FIFTH, we should modernise in an evolutionary way, keeping our fleet relatively young, and on a pace with technological advances in command and control, and offensive and defensive weapons.

The key to this modernisation will be to pick the right kinds of technological improvements to already existing platforms — remember that our ships and aircraft will be with us well past our planning horizon. We need to pick "force multipliers," that is, affordable systems that increase our lethality by more than the cost would seem to imply. Examples are survivability improvements that allow ships and aircraft to apply firepower in littoral areas previously denied to us by weapons like mines, or surface to air missiles. Other examples include precision guided munitions, remotely piloted aircraft and underwater craft, distributed command and control systems, improved intelligence collection and dissemination and information warfare.

At the same time we will need to design the entirely new platforms that will transition us to the mid-Twenty First Century. We will need to answer questions like:

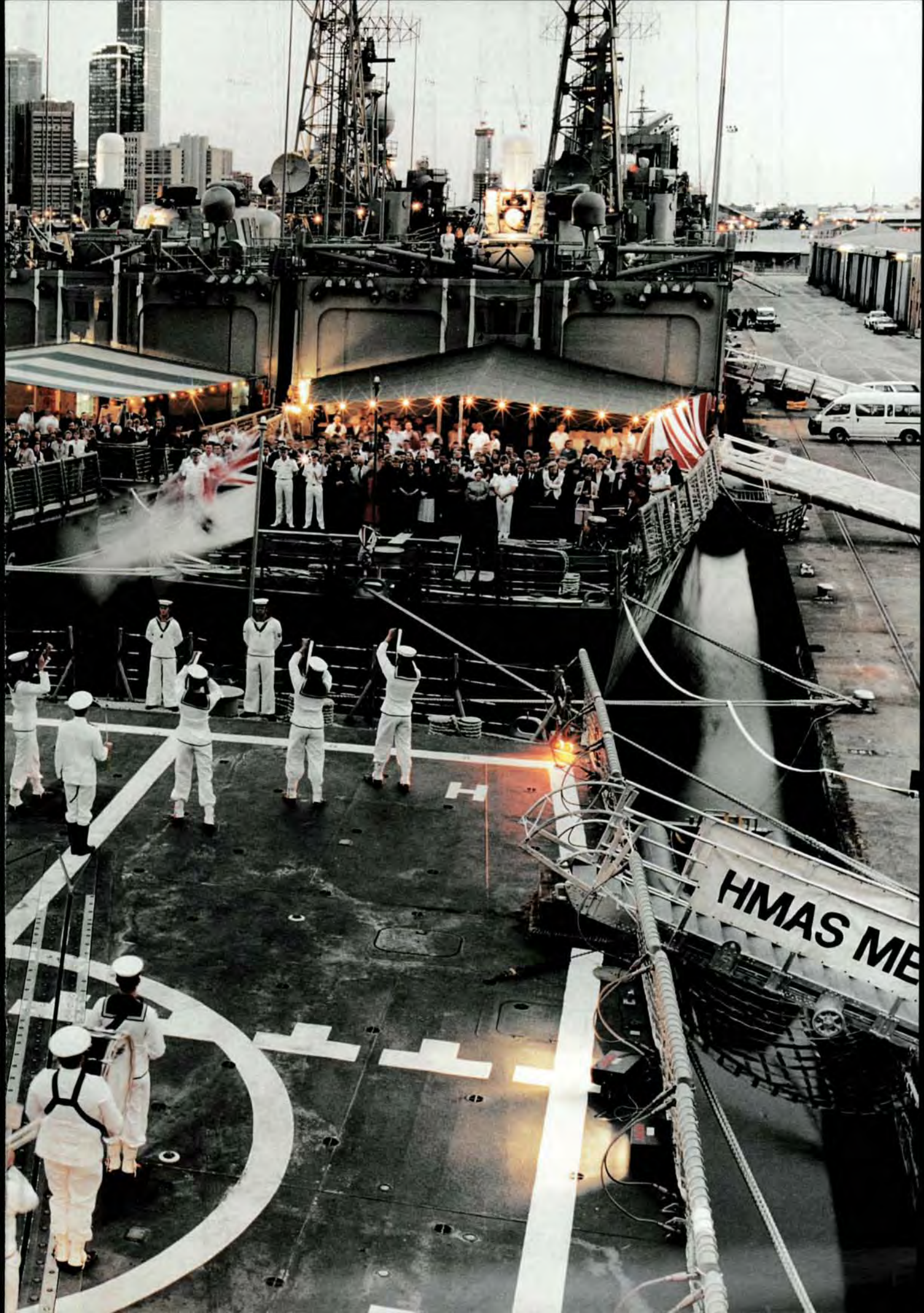
- Should we stay with the trend of the last fifty years and build new ships that are larger and more lethal; or should we go to larger numbers of smaller, more manoeuvrable ships that are still highly lethal due to emergent weapons technologies? If the answer is a mix, what should the mix be?

- How do we ensure that our new systems are completely compatible with, and mutually enhance the capabilities of other U.S. services and allied armed forces?

- Should our doctrine and operational patterns change to reflect newer, as yet unforeseen fiscal and security realities? Will the nature of naval warfare simply further evolve or will there be a revolution?

Our challenge is to design a United States Pacific Fleet for the Century of the Pacific. The givens are our enduring principles and Pacific trends. Our opportunity is our ability to, in the near term, utilise what we already have to greatest efficiency, and to position ourselves for uncertain changes sure to come. In the long term we need to be flexible and innovative, because that is the only way that we can maintain our competitive edge, and because American taxpayers and our allies and friends in the region deserve no less.

Show time in Melbourne, on *Melbourne*!


HMAS ME

FIGHTING SMARTER Pt 3 — This is part three of a five part series by the same author on modern military operations. The first two parts dealt with sea mine warfare (Vol 20 No 3 and Vol 21 No 1). Part 4 (Vol 22 No 3) will deal with naval special operations.

THE SYNERGY OF 'JOINTERY'

Some thoughts on assessing changes to joint arrangements and improving joint performance

by Lieutenant Commander Alan Hinge

'....Military forces tend to be their own worst enemy. They tend to fall into the trap of becoming complex bureaucratic structures with their own subculture, and they tend to reward the ability to operate according to the rules of that structure rather than military proficiency per se'

—LESSONS OF MODERN WAR Vol I [1]

Joint operations are activities in which components from more than one service participate, and in the last decade the processes of 'Jointery' have been enshrined in the ADF as keys to future operational success. There is little doubt that 'jointery' *can* be a major force multiplier. In fact, an authoritative series of studies looking at five major conflicts since 1973 concluded that '... The value of such an approach (Joint) to managing modern war has been a key lesson of every conflict since the beginning of World War II'[2] . However, recent changes to joint command arrangements in the ADF have left some navy personnel viewing them as symptomatic of a peacetime penchant for creating elaborate, centralised headquarters bureaucracies at the expense of military 'muscle'. This involves building layer upon layer of military bureaucracy, repeatedly summarising information, duplicating effort and increasing communications volume and complexity; all of which ends up in dulled perception and response.

'Unbelievers' fear that the juggernaught of 'jointery' has taken on a life all its own; becoming an end in itself which will leave the ADF process oriented and not output oriented. They fear that defining appropriate degrees of service integration and commonality has become an 'all or none' process governed by political correctness and dogma that ignores important doctrinal, cultural, technical *and* cost considerations. For example, the growth of an 'information addicted, control obsessed HQADF' is sometimes cited as a case in point of the 'process orientation' syndrome. Moreover, 'unbelievers' suggest that the last thing we need is another two star ego to 'gum up' the works in the new position as COMAUST (Commander Australian Theatre) in yet another sparkling new headquarters. Meanwhile, at the other end of the RAN opinion spectrum others see such changes, especially at the operational headquarters level, as establishing a recognised *point* of authority and generating collocation synergies that are likely to substantially reduce the number of day to day coordination, processing and command/communications transactions.

While the truth of the situation probably lies somewhere in between, how is a 'navy person' supposed to judge the merit or otherwise of changes to joint arrangements at the strategic, operational and tactical levels and get a relatively objective idea of costs and benefits to the Navy in general and ADF in particular? This article examines aspects of command, control and conduct of ADF joint operations and proposes some criteria for judging the merit or otherwise of current changes. It also *speculates* on possible directions for improving joint operations.

Our methodology for doing this comprises a three step process in which the following issues are addressed:

Where we are now. That is, what *are we doing* in Joint C3 and operations? Recent changes in command and control of joint operations and some reasons for them are briefly summarised.

Where we want to go. That is, *what we want to be able to do* as measured in terms of ADF 'output'. We will consider empirical research done on a wide variety of military operations conducted during 1973-91; this can help set a baseline for judging the merit or otherwise of our current approach to changes in joint arrangements.

How we can get 'there'. Having established where we are (Situation A) and where we should be (Situation 'B'), we can touch on some directions for future change to get from 'A' to 'B'.

WHAT WE ARE DOING

Changes in Joint Command and Control

The importance of Command, Control and Communications (C3) in today's information intensive, joint combat environment is widely recognised, because quick, accurate decision making input and precise communication of orders simply gives a commander

better control of combat in terms of time, place, rate and degree of engagement. C3 is basically a process of military resource allocation by a recognised point of authority to achieve an objective. Good C3 systems magnify command's ability to observe, process, decide and respond. They accelerate accurate detection, identification and tracking of targets together with coordinated attacks from geographically dispersed forces. Such systems should be capable of rapidly allocating, assembling and dispersing units; that is, preserving their order and cohesion so that they are capable of attack, defence and retreat as situations demand. On the other hand, lack of attention to C3 has often caused catastrophic loss through failure to avoid blunders, loss of control over rates of engagement and limiting a commander's freedom of action.

It is often difficult to relate organisational command and control changes to measurable military advantage in peacetime. This is because a fundamental dilemma stems from higher command's *quest for certainty*. Increased certainty about the 'picture'(conditions, positions and intentions of own and enemy forces) at the top/headquarters level has often meant increased uncertainty, in the form of distraction and delay, 'below' due to increased barriers, reporting, duplication and lines of authority to cross. Too often in the past, setting up a strong hierarchy of command has adversely affected responsiveness, flexibility and innovation at *every* level of operations. On the other hand, delegating more control over resources at intermediate levels of command has often caused more uncertainty at the higher levels of command.[3] Consequently, achieving an organisational balance that does not translate centralised command into centralised control presents a fundamental challenge, as overly centralised control involves a bias towards micro management and the temptation for inappropriately high levels to direct day to day unit operations and fighting. This inhibits initiative and responsiveness of the units that ultimately have to perform and win on the battlefield.

A classic example of this tendency to centralise control of forces was highlighted in the failed 1980 US hostage rescue bid in Iran. The Holloway Committee of Investigation revealed the many problems encountered when conventional commands in multiple layers attempt to control a large scale joint service operation. The Committee concluded that the mission was an over managed effort depending far too much on sequential checks, orders and coordination linkages between single service units and Arms that not only did not work, but seriously compounded errors.[4] In short, overly centralised control destroys the pulse of endeavour of a force by making it 'process oriented'(focused on rules, reporting and procedures) instead of 'output oriented'(focused on military performance).

In the ADF's case, centralisation of command (and some would argue control) has progressed consistently in the last decade and continues as recent changes have focussed on the strategic and operational command levels. Key command oriented changes include:

- Centralising strategic command by collocating the Service Chiefs (to be named Chiefs of Navy, Army and Air Force respectively) with CDF and the Secretary at a new Russell complex.
- Centralising operational command by establishing a hi-tech Headquarters Australian Theatre (HQAST), which will be an integrated headquarters at the operational or campaign level. This involves collocation of Joint (Maritime, Land and Air) commanders and their staffs who will be served on site by a Theatre Joint Intelligence Centre (ASTJIC).
- Appointing a new permanent two star Commander Australian Theatre (COMAST) to run HQAST.

Let's look at some reasons given for these changes.

Why change?

The tendency to over centralise control of ADF operations has long been recognised. For example, almost a decade ago a review of ADF command and control arrangements concluded that HQADF was too much involved in the detailed planning and control of operations and that this served to detract from its proper functions as a national strategic headquarters. It suggested that operational level planning - that concerned with the preparation, conduct and control of military campaigns - should be delegated.[5]

Today, at the strategic level, collocation of the service chiefs is said to lead to better use of their professional knowledge and experience in ADF planning. At the Operational/Theatre level the changes are basically seen to ensure minimum change to command arrangements when conflict starts, as well as encouraging tighter cooperation between Joint commanders by reducing ambiguity and avoiding continual reference to Canberra. Importantly, lessons of KANGAROO Exercises have been cited as significant factors in the operational level changes, and the current changes are said to represent a logical increment in finally consolidating CDF's command over the ADF.

General Gration, Australia's CDF during 1987-93, sees the changes as contributing to much tighter cooperation between the three services at critical moments, and gave an illustration of the necessity for the changes in the following example: "...I recall one afternoon during Exercise KANGAROO '92 when in the space of 30 minutes two ships, one with a battalion of infantry embarked were sunk through lack of air cover. In real life this would have been a national tragedy, and the new arrangements should give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ARMY/NAVY JOINT OPERATIONS:
HMAS *Tobruk* working with Army.
Tobruk's role is being taken over by HMA Ships
Kanimbla and *Manoora*

us better chance of avoiding such disaster."[6] The implication is that lack of prompt coordination and/or cooperation led to this situation and a permanent *overseer* of joint commanders was required. Certainly, a single operations room with maritime, land and air annexes is likely to be better than three separate headquarters. But, how can we be confident that such changes really amount to a *simplification* of the C3 process in war? Can the changes be further supported by solid empirical evidence from recent conflicts involving joint operations?

The benefits of changes to joint arrangements must ultimately be seen in terms of their likely effect on ADF output, right down to the unit or tactical performance level. But just what is ADF output supposed to be?

WHAT WE WANT TO DO

The Strategic Review 1993 gives guidance on the *prime* focus of ADF output when stating that:

'The overall development of the ADF will need to have a particular emphasis on the key principles of joint operations, the selective adoption of advanced technologies, the promotion of professionalism and the application of a rigorous approach to preparedness....To optimise the ADF's preparedness in the defence of Australia, the first priority is for the ADF to develop and exercise joint capabilities, and to plan and conduct joint ADF activities... (and) planning also needs to consider the demands involved in sustaining forces deployed at dispersed and remote locations for lengthy periods. Our strategic geography demands the same broad levels of range, integral support and flexible firepower for the defence of Australia as will generally be required for tasks further afield'.[7]

Improving the ADF's output therefore involves improving its effectiveness and efficiency in executing:

- a wide range of sustained, joint, conventional missions
- over long distances
- at remote places
- for long times
- by practised professionals
- with limited infrastructure support

Having established these parameters we can set up an analytical baseline by looking at the good, bad and indifferent experiences of other nations in the conduct of long range, conventional joint operations, while being careful to test similarities and differences as they apply to Australian circumstances.

Joint Effectiveness: Some General Observations

Searching for common factors derived from a variety of relatively recent conflicts may give clues on what can be done to improve the way Australian forces conduct joint, long range, conventional operations. One of the best works in dealing with these issues is the comprehensive, three volume study based on research conducted for the US Advanced Research Projects Agency (DARPA) on the lessons of modern war between 1973 and 1990.[8] The conflicts analysed cover a very wide variety of conflict, including the Arab Israeli conflict of 1973, the Soviet Invasion of Afghanistan (1979-89), the first Gulf War between Iran and Iraq(1980-89), the 1982 Israeli invasion of Lebanon and the Falklands War (1982). These events cover a broad spectrum of conflict styles, task environments, political backgrounds and participants: From a World War One revisited scenario in the Middle East to modern conventional power projection at its extreme limits in the South Atlantic, to mixtures of conventional and irregular warfare fought under a broad spectrum of conditions and constraints. Obviously, the five conflicts varied in terms of objectives, force structures, weapons employed, tactics and training and support, but particular areas of focus during the studies were in examining the:

- conduct and value of joint and combined operations ashore and afloat;
- utility and impact of military technology and relative impact of tactics and force numbers;
- level and importance of support technologies as adjuncts to or replacements for major weapons systems;
- impact of weather, terrain, distance and other special combat conditions; and
- role of warning, threat assessment, intelligence and tactical C3 and C3I systems.[9]

Consequently, DARPA based research may help point to some ways for improving long range joint, conventional operations conducted by the ADF. In fact, four key joint performance enhancing factors emerged. These are:

- Keep Focused on outstanding 'Time on Target ' performance
- Make Training and Practice Realistic
- 'Fuse' Command/Control/Communications Together
- Decentralise logistics support (User Managed Systems)

Lesson 1: Achieve Outstanding 'Time on Target ' performance

Good 'Time on Target' performance involves coordinating all Services and Arms to bear on an area in

the shortest time and in the most appropriate capability mix; the ideal being to achieve as near a real time mission response to threat as possible. However, mastering the 'Time on Target' problem through joint and combined arms operations generally proved very difficult for *all* twelve parties looked at in detail in the research. Amazingly, most parties failed to truly realise how critical quick follow up after target acquisition is to effectiveness under a wide range of conventional *and* irregular warfare conditions. An example used to highlight the difficulty of coordinating operations between services and between arms is given by the Israeli invasion of Lebanon in 1982:

'....Israel exhibited far better combined arms capability in 1982 than in 1973....(the IDF) failed, however, to solve the most critical single problem in modern combined operations: creating an effective interface between offensive air, artillery and manoeuvre units in support of the air-land Battle...the IDF (a) could not properly target artillery and close air support (b) could not ensure that aircraft and artillery could strike with the proper munitions and precision, (c) experienced serious coordination and delay problems, and (d) could not always cope with the special conditions imposed by rough terrain and mountain and urban warfare. In spite of years of effort, Israel lacked both the C3I/BM (C3I/Battlefield Management) resources and targeting, lethality and munitions delivery capability necessary to implement its ambitious tactics and plans'[10]

While the time on target requirements of the IDF may at first be considered 'worlds apart' from the level of performance needed by the ADF, some important commonalities exist. First, the Israeli example was used as a case in point to reveal that minimising *response time* during operations and ensuring tight interfacing between units in joint and combined arms operations remains a major challenge, even in the best of forces. Second, both the ADF and IDF emphasise speed of response and high mobility in rugged terrain for their operations. While strategic and operational *warning time* for Australian forces is likely to be much greater than for Israeli forces, warning time is only one component of response time which also comprises reaction time (the sum of 'load up', inter unit coordination and transit times). Given that coordination and transit time will usually be considerable in the Australian case anyway, it would be particularly important to minimise reaction time.

Because of large distances likely to be crossed, ADF reaction time ashore and afloat must be minimised. This factor was highlighted in an independent, 1991 review of the Australian Army which pointed to speed of reaction as the *first* of six key characteristics that would be important to an ADF land force response. The study emphasised that,'...tasks will frequently need to be undertaken at very short notice and speed will be essential to protecting vulnerable assets, assisting the rapid engagement of the hostile force and preventing its extraction. Even for forces already deployed to the north, deployment distances could be 300-400 km and there would be little time to assemble additional equipment and assets'.[11] The latter point concerning the effects of not having the right combinations of capabilities and logistics arriving *together* so far from support areas is especially important in the Australian situation. Missing or delayed components of response so far from bases could have a disproportionately bad effect on operational effectiveness at points of contact. This concern is reinforced by the research finding that the higher 'tech' the force structure the more disproportionately bad were the effects of lack of capability in a single area on overall performance.

The research also concluded that two key factors contributed to poor time on target response under a *wide range* of combat conditions in the five conflicts. These factors are :

- Poor joint and combined coordination, and
- Lack of realistic training and practise.

The first suggestion for improving time on target performance was to forge *much* stronger links between the Services and Arms. This is likely to be assisted by collocation of personnel and equipment at the strategic, operational and even (in some cases) Unit/tactical level, and it appears that ADF changes to joint C3 arrangements, at least at the strategic and operational levels, seem to be on the right track in terms of potentially contributing to a more responsive chain of command and administration. But such changes are relatively easy and inexpensive and change should not stop there. Most importantly, DARPA research indicated that more responsive chains of command should have the ability to directly assign and target sorties.[12] This implies a high level of resource autonomy or 'self containment' for smaller formations. Specifically, the research concluded that this could best be done ashore by allocating organic helo and air support in direct support of brigade or regimental sized units. For example, the research made it clear that a common and consistent contributor to poor time on target performance in a variety of modern military operations was the inadequacy of Close Air Support (CAS). Consistently, CAS had much less impact on the ground battle than expected, and the studies emphasised that,'....Air forces seem almost congenitally incapable of honestly assessing and improving their capabilities in these areas'.[13] The studies suggested that permanent collocation of direct support air units at Army brigade/regimental level would help remedy this problem, *if a cost effective method could be found*. In the Australian context, this kind of arrangement might involve permanent deployment of a squadron of FA18 to Townsville in direct support of the RDF and per-

haps specialising in CAS and air defence. Similarly, collocation of a squadron of F18 at HMAS Albatross in the East Australia Exercise Area could be worth investigating given the importance the research attached to building strong, permanent unit links so that consistent levels of professionalism, realistic practice and mutual knowledge are attained (These possibilities will be discussed later).

The research concluded that poor time on target response was also due to an,'...almost universal failure to insist on ruthlessly realistic operations research and combined arms exercises, testing and evaluation before combat'.[14] This highlights the second key requirement of effective joint operational response: The critical importance of realistic training and practice.

Lesson 2: Make Training and Practice Realistic

All case studies clearly indicated that regardless of force numbers, composition and weapons, professionalism and innovation remain the decisive force multipliers. Readiness and leadership that stemmed from superior training and practice decided outcomes, especially in conflicts fought under unique or improvised conditions. Moreover, the research emphasised that,'....training, manoeuvre and innovation are all parts of a single process that must be encouraged as much as possible and which must be tied to operational need. Improving force quality involves far more than acquiring equipment...'[15]

Surprisingly, DARPA research indicated that *all* participants had an exaggerated view of the lethality of modern air and artillery munitions. PGMs (Precision Guided Munitions) were generally much less effective that expected and did not 'come close' to their theoretical kill probabilities, often due to a lack of training, practise and adequate arrangements of C3 assets.[16] Moreover, combatants tended to forget '...how quickly forces can "dig in" and disperse after the first air strike or artillery round, emphasising the critical importance of massive initial area lethality over precision strikes. This tends to validate the present NATO emphasis on improved C3I/BM and smart area weapons and the experience of past wars that air force and artillery officers greatly exaggerate the effectiveness of their weapons in peacetime, and underestimate the need for constant training and practise'.[17]

Lack of realistic training led to a pronounced failure to appreciate how much targeting conditions can alter with terrain. Also, munitions, spares and POL expenditure rates far exceeded prewar calculations, and low peacetime practice levels were identified as major causes of this problem. Deployed weapons simply do little good if crews are not trained to use them during frequent, realistic exercises. For example, long range bombing, even with smart weapons, rarely had anything approaching its anticipated effectiveness. Margins of bombing error in Lebanon, Iran, the Falklands and, according to other sources, in Libya, Grenada and during the second Gulf War (1991) were unacceptably large. Bombing accuracy claims of up to 80% immediately after the second Gulf War were highly exaggerated. Even laser guided munitions under staged test conditions only realise about 60-70% effectiveness. In combat, this figure reduces to 30-50%, with the higher result only being achieved in the second Gulf War after resistance was crushed.[18] Even the highly publicised Patriot Missile had a SCUD hit rate well under 10%, despite claims made at the highest official levels during the war that the rate was of the order of 95%.

Professional and realistic training, coupled with the best use of available technology still seems to remain the winning combination in successful joint operations. A common, critical lesson arising from the research was that tactical skills were consistently more important than technical performance. The ability of personnel to make the most out of their weapons and opportunities has long been a characteristic of superior military organisations, consequently, it comes as no surprise that well trained and highly motivated troops simply 'put things together' better to get the best out of whatever they have at the time. For example, during the Falklands War, research emphasised that the British demonstrated just how much of an operational edge military professionalism, practice and adequate training can give.[19]

Australian forces still enjoy a good reputation for professionalism and training, but the Services may find the benchmarks of professionalism arising from consistent training and practice increasingly difficult to maintain. The research findings seem to have general relevance to the situation the ADF finds itself in, where readiness and sustainability (the so called 'soft budget targets') have, according to some, been for too long constrained at the expense of force modernisation and composition (that is, numbers and types of platform). In fact, in October 1993 the CDF at the time (Admiral Beaumont) expressed deep concern over the deteriorating defence funding situation and the growing readiness and sustainability imbalance, suggesting that government expectations of capability could and possibly should be varied:

'....I have a genuine concern about the continuation of funding for defence, because I consider it important that we receive adequate funding to do what government expects of us. If government wants to change what its expectations are, that's fine by me, but I think we are probably down about the bare bones'.[20]

Some defence commentators suggested this situation would probably get worse as all Services continued to curtail readiness related operations due to 'fundamental shortages'.21

Lesson 3: 'Fuse' Command/Control/ Communications

DARPA based research also emphasised that few parties appreciated the stress combat puts on C3I/BM systems and emphasised the force multiplier effect of a strong and effective command system backed by secure communications at *all* levels. Of all the conflicts examined, only the British seemed to combine a clear hierarchy of command with suitable flexibility and innovation at every level of operations:

'....the British reinforced their professionalism with a unified command and with a heavy emphasis on joint operations and inter service cooperation. The value of such an approach to managing modern war has been a key lesson of every conflict since the beginning of World War II. Virtually any command barrier or problem in creating an effective command capability for joint operations leads to major military problems, whether the barrier is an inter service barrier or one within a given service'.[22]

According to the research, many C3 failures and tactical problems occurred because of four main reasons:

- Lack of inter service and intercommand 'fusion' or coordination centres.
- 'Compartmentalisation' of intelligence away from other C3 centres and activities.
- Emphasis was on middle/higher level command communications and control, rather than on detailed battle management at the small unit level (where most battles are fought and won), which contributed to
- Inadequacy of C3 systems in linking together smaller combat units.

Consequently, the need to forge better links between smaller units to improve battle management at lower levels appears to be another area where significant efficiencies may be made. Most importantly, "...freedom of communication at all levels within the armed forces and command process is essential. The two way flow of realistic information from top to bottom in any military service is an essential condition of success'[23] . This *connectivity* is in itself a fusion or 'blending' process and the natural tendency to organise forces into efficient compartments and functions can be a powerful threat to efficiency, unless '...personnel in each compartment are forced to cross the barriers and lines of authority as part of their normal duties' [24]

A number of the changes to ADF joint arrangements seem to be supported by the 'fusion' or blending together argument , especially establishing a well endowed, integrated headquarters at the operational or campaign level which is supported *on site* by a Theatre Joint Intelligence Centre (ASTJIC). 'Fusion' of the service chiefs with the Secretary and CDF at the strategic command level would also appear to be positive. However, the process of fusion may be able to be taken 'down' much further in terms of blending combat and logistics units that will have to work together in war.

Lesson 4: 'User Managed' Logistics

Not surprisingly, the importance of logistics was underlined in all conflicts. Interestingly, the research clearly indicated that improvements in logistics and support technology could be used as substitutes for mass, that is, weapons numbers and manoeuvre forces.[25] Herein lies a potentially valuable source of operational efficiencies. Moreover, a salient lesson is the increasing need for logistical responsiveness, with the supply infrastructure being brought up as close as possible to the 'user'. In fact, the most successful forces developed 'user managed' systems that rapidly responded to small forward unit demand; as opposed to systems that fed forward echelons from a large, centralised network. Most importantly, all parties learned (especially the Israelis, British, Iraqis and Soviets) that rapid, local support unit response when supporting forward combat units, according to their ever changing needs, is 'critical to success'.[26]

In some very important ways, logistical decentralisation may be more cost effective than traditional centralised, functional resource control. The research suggests that:

'....There is considerable evidence that overly complex, demand "pull", and "supplier managed" systems are less effective, and ultimately more costly, than pushing a steady stream of "oversupply" forward to the front,....(this means) maintaining large numbers of forward deployed stocks and relying on "user managed systems". The C3/BM problem is complex enough without trying to layer complex logistics and management support systems over the conduct of more critical phases of war.'[27]

Taking 'User Managed' systems a step further

The advantages of shifting from highly centralised functional control of assets to much more decentralised (user managed) control are implied by strategist, Professor Martin Van Creveld as he points out attributes of complex functional organisations that usually translate to higher costs in terms of time, money and effectiveness:

'....the more numerous and differentiated the departments into which an organisation is divided, the larger the number of command echelons superimposed upon each other, the higher the decision thresholds, and the more specialised the individual members, then the greater the amount of information processing that needs to go on inside the organisation. *Uncertainty, in other words, is not dependent solely on the nature of the task to be performed; it may equally be a function of the organisation itself* (my emphasis). '[28]

In his excellent study *Command in War*, Van Creveld suggests that the hallmark of most superior military organisations is that they are:

'....cohesive, self contained organisations, both tactically and in regard to their command systems. The cohesion - often obtained by carefully selecting men and their commanders and allowing them to serve together for comparatively long periods of time, even at the expense of overall flexibility - and self containment have the effect of reducing the need for communications and information processing both inside the units themselves and between them and higher headquarters; they also ensure that errors, when made, will be limited in scope. Furthermore, the self containment of subordinate units helps simplify planning by reducing the time and effort that have to be spent on overall coordination. If exercising central control over limited resources is one way of maximising cost effectiveness and certainty, (then) distributing these resources among subordinate units may, by virtue of eliminating much of the need for planning, coordination, and disruption in the communications process, be another way.... *I would suggest that distributing the resources may often be the more effective way to maximise cost effectiveness* (my emphasis)'.[29]

This approach is radically different to the functionally oriented, matrix management which has characterised ADF joint organisation and operations. Matrix organisations draw resources from their specialised functional groups on an ad hoc basis to complete tasks, and are used widely by large corporations in project management.[30] However, major difficulties in the matrix approach to joint operations have been observed in Australian operations (see General Gration's comments above). A former Director of Joint Operations and Plans in HQADF once summed up this kind of fundamental difficulty when testifying before the Joint Parliamentary Committee on Foreign Affairs, Defence and Trade that: '...(During a KANGAROO Exercise) we took personnel from all round Australia, and quite obviously that is a major problem if you look at it in the context of handling or coping with any sort of emergency which arises'.[31] This experience is shared by other countries, including the US. For instance, the Holloway Committee highlighted the numerous difficulties involved in continually having to build up equipment interfaces and inter-personal relationships between disparate units in modern joint operations:

'....JTF (Joint Task Force) planners underestimated the significant cohesive benefits that accrue to organised combat units that train together as a team on the same equipment and use the same doctrine and techniques over a sustained period. This underestimation tendency is endemic among our military and civilian leadership: personnel turbulence is chronic in our armed force. Such turbulence would not be tolerated if the teamwork benefit were truly appreciated. Parallel to this is the tendency to overrate the ease with which ad hoc units of otherwise well qualified units can be thrown together to accomplish a special mission'.[32] Consequently, significant efficiencies may be gained by collocating some Australian units to act as permanent formations capable of operating with a high degree of 'self containment'.

WHAT COULD THIS ALL ADD UP TO FOR THE ADF?

Investing in three general areas could improve the efficiency *and* effectiveness of sustained, joint conventional operations conducted by the ADF:

1. 'Fuse ' our Forces together

'Compartmentalisation' kills. There appear to be sound reasons to believe that efficiency and effectiveness benefits can be gained by experimenting with a resource decentralisation bias that moves away from the ADF's current emphasis on discrete, functional groupings of platforms, processes and people that only get pooled together in exercises and during wartime. Best 'Time on Target' performance seems to arise from maximum operational integration or 'fusion' of Services, Arms, C3, logistics and intelligence capabilities into their 'wartime groupings'. Consequently, strong, *permanent* unit links could be established so that consistent levels of professionalismand cooperation are attained and maintained; this reduces compartmentalisation and is likely to develop a more responsive chain of command. Specifically, an example of 'Capability fusion' or force blending ashore might be able to take place at the Brigade level and could include collocated, dedicated fighter and air transport support as well as collocated groups from other Arms. Keeping all these units together and well practised could optimise their effectiveness and responsiveness if the force multiplier benefits of 'fusion' suggested by DARPA based research and Van Creveld exist . Of course, inevitable logistics problems in permanently deploying and maintaining relatively small numbers of aircraft, artillery and tanks etc would exist. 'Self Containment', or permanent amalgamation of selected units, may have to done at the expense of some platform maintenance flexibility and, perhaps, even some platform availability.

An example of 'Joint Fusion' for the RAN could involve dedicated FA 18 air support permanently based in the East Australian Exercise Area, possibly at HMAS ALBATROSS and focusing on support to the fleet. Again, collocation may prove be more cost effective than traditional centralised, functional resource control, through many 'sums' based on direct and opportunity costs could be done to *disprove* it. This is because actual operational value of such changes is hard to measure quantitatively, while dollar and opportunity costs are relatively clear. Nevertheless, a redistribution of already available resources in exchange for a potentially substantial increase in combat effectiveness may well be worth further, far more detailed investigation.

2. **Practice for REAL** Training must be realistic, consistent, continuous and occur under varied conditions of weather, stress and terrain. Again, strong, permanent unit links should be established so that consistent levels of professionalism and mutual knowledge are attained and maintained. This reinforces the need for the 'fusion' or blending approach being pushed beyond establishing integrated strategic and operational headquarters, and reinforces the need for selected force groupings to have a large degree of 'self containment' and commonality of approach. The importance of realistic practice underlines the importance of readiness and sustainability as two key pillars of Australia's military capability. Readiness and sustainability may well have been seriously neglected in the drive for force structure modernisation during the last decade, and efforts to restore balance to the situation should be made, even if force composition (platform numbers and types) has to be changed to accommodate the requirement.

Most importantly, especially during long periods of peace, fighting units must be able to develop and transmit a military ethos which stems largely from familiarity with their weapons, platforms and tactics, and regularly working with comrades (not strangers) in realistic exercises. *The quality of the entire force stems from this*. Given that a critical lesson arising from the research was that tactical skills were consistently more important than technical performance, more time aiming for best time on target performance at sea, in the field and in the air could prove more cost effective than a tightly rationed 'bean counter' or efficiency oriented approach . This change of focus would yield solid measures of effectiveness based around times, distances, synchronisation and rates of engagement.

Rebalancing readiness, sustainability, modernisation and force structure could have a dramatic effect on much of the next generation of ADF equipment, in which a requirement for minimum support during extended operations would become a primary selection criterion for equipment. This involves high equipment reliability, ease of repair and low spares consumption rates. Consequently, the design of some types of equipment may have to give higher priority to robustness and maintainability, rather than *peak* performance.

3. **User managed logistics** Logistics and support technologies can increasingly be used as substitutes for mass. Convincing evidence exists that complex, demand "pull", and "supplier managed" systems are less effective than "user managed systems". A strong bias should be given to user managed supply systems capable of delivering 'oversupply' to operational units.

Conclusion

Fighting smarter depends on having insight into when and how to best use various strategies, tactics and weapons systems. This involves setting up organisations and procedures in peacetime that can make quick and effective use of resources when trouble happens. Today, in what is rightly called the 'Information Age', the main game is still to put in place a clear hierarchy of command which can elicit - not hamper - responsiveness, flexibility and innovation at *every* level of operations. A big part of this in war and peace is ensuring the two way flow of necessary information from 'top to bottom' by removing barriers to communication between areas like the political leadership, operations, intelligence, planning and logistics systems. Several recent changes to joint command and control arrangements in the ADF represent attempts to achieve this aim, and in this article I have tried to assess these changes in the light of evidence from a number of recent conflicts. I have also *speculated* on directions which may further improve the effectiveness of ADF joint operations.

Many in the ADF have justifiably grown to fear the spectre of overmangement and, on the surface, some of the current changes to joint command and control arrangements may seem to exacerbate a tendency to micromanage the force and invest in 'fat' rather than 'muscle'. However, the fundamental test of benefit is whether these changes are likely to amount to a clarification or *simplification* of the C3 process during conflict. On the basis of the empirical research cited in this article the answer is, on balance, Yes. Command is likely to be appropriately centralised and simplified at both the strategic and operational levels. Moreover, an appropriate degree of control is likely to be decentralised from 'Canberra' to a well equipped, 'fused' operational level headquarters. Simply put, collocation of key players at strategic and operational headquarters *should* enhance cooperation and promote homogeneity of approach and outlook (pre requisites for genuinely decentralising control) in the services . However, in a sense, setting up these organisational frameworks is easy. It is relatively simple to set up joint organisations, build headquarters and change

organisational charts if money can be found. While integration or centralising of strategic and operational headquarters may streamline the workings within these headquarters such efficient compartments and functions can, paradoxically, be powerful threats to military effectiveness. *Connectivity* between various headquarters and units remains critical and connectivity goes well beyond high tech, secure data links and command oriented, 'Top down' change. Ensuring freedom of communication and similarity of approach at and between all levels of command is vital and, unless personnel in each 'compartment' are inclined to cross the barriers and lines of authority as part of their normal duties, compartmentalisation will have simply been *rearranged* by these changes. Fewer, but stronger 'feudal kingdoms' can exist.

The 'Top down' command oriented changes are positive but they cannot guarantee widespread, successful human interaction and may not significantly improve capability of the ADF as a whole. This has to come largely from the 'bottom' up. A complementary, 'bottom up' approach to decentralising control may now be needed, and probably starts with permanently collocating units that have to work together in conflict so that real *homogeneity of approach* is likely to be achieved throughout the ADF, right *up* from the tactical level.

Essential in achieving decentralised control is recognition of the ***primacy*** of building up strong, permanent unit links so that consistent levels of professionalism, realistic practice and mutual knowledge within the ADF are attained, maintained and perpetuated. 'Fusion' or collocation of combat units and their support demands a fundamental rethink of traditional 'dollar based' arguments supporting the advantages of centralised, functional management of ADF resources. Fundamental to these considerations is the common and critical lesson arising from the research cited that tactical skills were consistently more important than technical performance in conflict. Improving the *quality of the force* from the bottom up involves rebalancing the four 'pillars' of military capability (readiness, sustainability, modernisation and force structure) in favour of readiness and sustainability, even at the expense of some platform performance, availability and maintenance flexibility.

Having successfully put in place a plan for strong, centralised command over the ADF from the 'top down', the next test of generalship, or Admiralship, may be to complement this by creating a genuine decentralisation of control bias *throughout* the ADF from the 'bottom up'; a bias that elicits and optimises responsiveness, flexibility and innovation at *every* level of operations. However, successfully coupling centralised command with genuinely decentralised control has been an elusive goal achieved by very few nations in history...This is the stuff of - dare I say it - RMAs! [33] Yet the opportunity may exist for the ADF to get close to this happy condition in the not too distant future and, while the risks and costs of this new approach for the ADF are substantial, the challenge is clear.

About the author

Lieutenant Commander Alan Hinge was born in South Melbourne in 1955. He holds a Masters Degree (MA) in Strategic Studies and a BSc (Physics), both from the ANU. In 1984 he became the first junior officer in the ADF to be awarded a Defence Fellowship, and since then has had forty articles published in professional military journals in Australia and overseas. These articles have covered a wide range of topics, from leadership, management and adventurous training to naval operations, weapons technology, defence economics and project management. He has also written a book on mine warfare ; edited two others on project management and is a contributing author to the Australian Dictionary of Biography. He has won ten major prizes in international essay competitions and edited this journal during 1987-88 and 1994-1995. In 1993 he became the inaugural Rockwell Scholar in Strategic studies and is currently Co Director of the Australian Defence Studies Centre's Defence Industry and Logistics Program. In June 1996 he takes up the inaugural CDF Scholarship. His topic is: **Achieving More Cost Effective Defence Preparedness in the Post Cold War Era.** *This paper represents some preliminary research into this topic.*

Notes:

[1] Cordesman.A and Wagner.A, Lessons of Modern War Vol I (Westview Press, Boulder,1991) p.353

[2] Cordesman.A and Wagner.A, Lessons of Modern War Vol III (Westview Press, Boulder,1991) p.351

[3] Van Creveld.M, Command in War (Harvard University Press, Mass, 1985) Chapter 8 discusses these concepts at length.

[4] Earl. R, 'A Matter of Principle', US Naval Institute *Proceedings*, February 1983 cites results of the Holloway report in his article. The Holloway Report was prepared for the US Joint Chiefs of Staff by ex CNO Admiral James Holloway III USN(retd) and five other active and retired very senior military officers. The 78 page report which was released on 23 August 1980 is considered the definitive analysis of Operation 'Bluelight', the codename for the abortive hostage rescue mission. Importantly, many elements of the US forces seemed to have learned from this experience as operations in the late 1980s and early 1990s indicate. For the Ground Force commander's comments on the mission's background, organisation and operation, see Beckwith. C, 'Delta Force' (Arms and Armour Press,1984). In particular, see p.295 with regard to better conduct of joint operations.

[5] Some results of this report are cited by Cheeseman.G, 'The Search for Self Reliance' (Longman Cheshire, Melbourne, 1993), pp.85-86

[6] Weekend Australian, January 20-21, p.10

[7] Strategic Review 1993, p.47,49

[8] Key results of the DARPA analyses are used by Cordesman and Wagner(1990), op cit, in Vols I,II and III of their work.

[9] See Vol 1 of Ibid, p.6

[10] Cordesman and Wagner, Vol III, p.394

[11] Woodman.S and Horner.D (Eds), 'Re Shaping the Australian Army: Challenges for the 1990's', (Canberra Paper on Strategy and Defence No 77, SDSC ANU, 1991), p.93

12 Cordesman and Wagner, Vol III, op cit p. 392

13 Ibid, p. 388

14 Ibid.

[15] Cordesman and Wagner, Vol I, p.353.

16 Cordesman and Wagner, Vol III, p.394 and Vol I, p.10

[17] Ibid, p.394

[18] Ibid, pp.389-90. For a discussion of Gulf War inaccuracy, even under close to ideal conditions, see Badsey.S and Primlott.J (Eds), 'The Gulf War Assessed' (Arms and Armour Press, 1992) pp.122-23.

[19] Ibid, p.395 . Also, Van Creveld.M, 'Fighting Power' (Arms and Armour Press,1983) looks in detail at the operational edge good training gave the German Army during World War II. In particular, see Chapters 8 and 11 where he suggests that enduring common factors exist for attaining and maintaining fighting power.

[20] Cited by Cameron Stuart in the Weekend Australian 22-23 Jan 94, p.1 'Forces unable to counter Threats'.

[21] See Ibid

[22] Cordesman and Wagner, Vol III, p.351

[23] Cordesman and Wagner, Vol I, p.353

[24] Ibid.

[25] Cordesman and Wagner, Vol III, p.396

[26] Ibid, p.398

[27] Cordesman and Wagner, Vol III, p.397

[28] Van Creveld (1985) op cit, p.269

[29] Ibid, p.271

[30] Matrix management is defined by Massie, J, 'Essentials of Management' (Prentice Hall, NJ, 1979) pp.81-82

[31] JPCFAD 1984 Report 'The Australian Defence Force: Its Structure and Capabilities' (AGPS), p.132

[32] Earl, op cit, p.36

[33] An acronym not in widespread use in the Navy. RMA (Revolution in Military Affairs) has become the hottest military 'buzzword' of the 90s and, like the Maltese Falcon, it may be 'the stuff dreams are made of' in that it can be all things to all (military) men and women. If you are in the Air Force it could be something along the lines of 'the result of the integration of four new and emerging warfare areas: Precision Strike, Information Warfare, Dominating Maneuver and Space Warfare'. If you are in the Army it can be reduced to a simple equation: RMA = Time x Technology x Tactics. The Navy seems to be less excited about the term than the other services. While remaining open to new missions and adaptations of current doctrine, many believe that the role of current platforms and operations will probably increase in future, especially in non warfighting roles. What the disparate components of the so called RMA offer Navy are likely to be force focusing options that can be selectively 'taken on board' and exploited to maintain capabilities in an environment of increasing austerity.

Sturdee Steams South

by

Geoffrey Bewley

The war against the German cruisers in 1914 has always made a popular subject. It's almost in the class of the Bismarck chase and the battle of Jutland. Like the Bismarck chase, it's a suspense drama, with an early reverse, a search, a pursuit and a reckoning. Unlike Jutland, the outcome could hardly be more clear cut. Apart from this pattern of drama, most writers have focussed on the two defeated admirals, Cradock and von Spee. Both were gallant, brave and unlucky. Their strategies and tactics have been studied at great length, judged, and praised or blamed. The final winner, Sturdee, hasn't had nearly so much attention. His strategy and tactics have mostly taken critical punishment, even though they actually did the trick. Where they haven't been faulted, they've been mostly disregarded. Has Sturdee been done justice? Does his part in the campaign deserve a closer look?

The campaign's first move was made before war was declared, before a cause for war had even arrived. Vice-Admiral Graf Maximilian von Spee sailed with his squadron from Nagasaki on 28 June, 1914, for a flag-showing cruise through the German islands in the Pacific. Next day the German colony at Tsingtao, on the Chinese coast, heard of the death of the Archduke Franz Ferdinand, and the cruiser Emden wirelessed it on to von Spee.

News from Europe kept von Spee up to date on the drift to war. When the war started five weeks later, the Royal Navy's China Squadron put Tsingtao under blockade, barring the empty stable. But nobody knew where von Spee was, or where to start looking for him. He could have been anywhere between Singapore and Cape Horn, Alaska and Antarctica.

An Australian expedition was getting ready to seize German New Guinea. Vice Admiral Sir George Patey in the battlecruiser H.M.A.S. *Australia* was standing by to guard it against von Spee's armoured cruisers, *Scharnhorst* and *Gneisenau*. In London, the Admiralty wondered if von Spee mightn't still be somewhere near China. All round the world, British squadrons were hunting German cruisers and armed raiders.

Actually, von Spee had been in the Caroline Islands, a thousand miles north east of New Guinea. After war broke out, he steamed north-west to Pagan Island to meet supply ships and the *Emden*. He detached *Emden* to go raiding by herself, and on 13 August he turned eastward across the Pacific. His force was too big, needing too much coal, to operate sensibly against Allied shipping. He set off to try to steam on round the world, through the British blockade, home to Germany.

Captain Muller in *Emden* made a great nuisance of himself, raiding shipping and shooting up ports. Von Spee apparently decided he was making enough of a nuisance of himself just by keeping his squadron at large. He didn't give away his position until 14 September, when he had a shot at surprising Patey's squadron at Samoa. Patey had been and gone, Samoa was safe in Australian hands, and von Spee's ships disappeared to sea again.

A week later, he turned up off Tahiti and bombarded Papeete. He did a good deal of damage, but he put himself back on the map and showed he was heading east toward South America. After a couple more stops, which didn't give away his position again, he reached the Chilean coast and started looking for the British squadron there.

This was Rear-Admiral Sir Christopher Cradock's, with two armoured cruisers, a light cruiser and an armed liner. Cradock's big cruisers weren't as well armed as von Spee's and their crews were inexperienced reservists. They were probably slightly faster, so Cradock might have tried to avoid action. But he'd made up his mind to fight at any odds, in the hope of damaging the German ships enough to stop them.

When the squadrons met at Coronel on 1 November, 1914, everything that could have gone wrong for Cradock did go wrong. He hit von Spee's ships, but not hard enough to hurt them enough. His own big ships, *Good Hope* and *Monmouth*, were sunk with all hands. Von Spee put in to Valparaiso after the battle, then disappeared to seaward again.

Coronel came as a great shock. The world wasn't used to the idea of the Royal Navy suffering a defeat. The Royal Navy weren't, either. The Admiralty sorted swiftly through the cruiser postings. At the same time, they were already sorting through their admirals.

The First Sea Lord, Admiral Prince Louis of Battenberg, had resigned two days before Coronel, after press agitation over his German birth. The First

Lord, Winston Churchill, had replaced him with the aged but still ferocious Admiral of the Fleet Lord Fisher. Fisher's first target was Vice-Admiral Sir Frederick Doveton Sturdee, Prince Louis's Chief of Staff, who'd sent out the searching cruiser squadrons.

"Never such rot as perpetrated by Sturdee in his world-wide dispersal of weak units," Fisher wrote at the time. "I'm in the position of a chess player coming into a game after some damned bad moves have been made in the opening of the game by a pedantic ass, which Sturdee is, has been, and always will be!"

Churchill wasn't so keen to give Sturdee the push. He knew why Fisher was really against him. The great feud between Fisher and Lord Charles Beresford had split the Navy before the war, and Sturdee had been on Beresford's side, as his Chief of Staff in the Mediterranean and the Channel. Besides, if another senior admiral was shifted out of the Admiralty so soon after Prince Louis, it would be bad for public morale.

Was there a way to get rid of Sturdee without actually sacking him? Yes, there was. He was a good sea officer, even if he wasn't a specially good global strategist. So, he could be promoted out of the Admiralty to a sea-going post, Commander in Chief South Atlantic and South Pacific, taking charge of all the ships and squadrons hunting von Spee in those waters.

The idea even appealed to Fisher. He meant to be rid of Sturdee with or without a scandal, but without was better. Sturdee had made the cruiser deployments leading to Coronel, and now he could try to make good his mistakes. If he nailed von Spee, well and good. That would be the end of von Spee, and Sturdee would still be out of the Admiralty. If he failed, that would be the end of his career. No more Sturdee around, either way.

If he did find von Spee, he'd have to fight and win. To Fisher, that looked like a job for battlecruisers. He'd invented the type ten years before with just this sort of work in mind. Before Coronel, Prince Louis and Sturdee had suggested sending out a couple, but Churchill hadn't wanted to weaken the souadrons with the Grand Fleet. But Coronel changed all that.

The battlecruisers *Princess Royal, Invincible* and *Inflexible* were pulled out of the line. *Princess Royal* went to the Caribbean, in case von Spee dodged north and east through the neutral Panama Canal. *Invincible* and *Inflexible* were detailed for the South Atlantic, to bar the way round Cape Horn, and *Invincible* became Sturdee's flagship.

Invincible and *Inflexible* were two of the earliest British battlecruisers, launched in 1907, commissioned in 1908. They displaced about 17,500 tons, they carried eight 12-inch guns and 6-inch armour belts, they were capable of 28 knots. They were bigger than *Scharnhorst* and *Gneisenau*, much better armed and much faster.

They stopped at Devonport Dockyard to fit out for the long cruise ahead. *Invincible's* original experimental electric turret machinery had recently been replaced by hydraulics, and this needed adjusting. Both ships had to be scraped, painted, topped up with ammunition and stores. Under pressure from Fisher in London, this was all done in a great hurry. Sooner than send them out on Friday, 13 November, Churchill told the yard to try to have them ready by the Wednesday. They sailed together at 4.15 on the Wednesday afternoon.

If Fisher and Churchill expected Sturdee to set some sort of speed record, then, between England and the South Atlantic, they had a surprise. Once he was out from under the Admiralty's thumb, he steamed south at a modest 10 knots. He stopped to coal ship in the Portuguese Cap Verde Islands, he hove to and checked passing merchant ships, he took a day off for battle practice and lost more time still when a target-towing wire caught round one of Invincible's screws. He sidestepped for a look at Rocas Rocks, off Brazil, in case the raiding cruiser *Karlsruhe* was lying there. At last, he met Rear-Admiral A.P. Stoddart's cruiser squadron at Abrolhos Rocks off the Brazilian coast on 26 November.

Sturdee spent two days there, coaling ship, meeting his captains, giving his fighting instructions. The combined force steamed south to the Falkland Islands at 12 knots, under wireless silence. They reached Port Stanley on 7 December, and they set about coaling at once. Sturdee planned to start the search for von Spee at noon next day.

Actually, the search was already over. At about 7.30 next morning, a lookout ashore noticed two more warships offshore. These were von Spee's ships *Gneisenau* and *Nurnberg*, looking to raid the place. The German lookouts saw warships' masts in the harbour, and the old battleship *Canopus*, grounded on a mudbank for local defence, hit *Gneisenau* with a warning salvo. *Gneisenau* and *Nurnberg* rejoined *Scharnhorst, Leipzig* and *Dresden* on the horizon, and all five steamed away eastward. But they'd already seen the tripod masts of the battlecruisers, and they knew only a miracle could save them.

There was no miracle. As the German light cruisers scattered, the British cruisers went after them. Sturdee's battlecruisers fought von Spee's big cruisers at long range, slowly knocking them to pieces, taking little damage themselves. *Scharnhorst* and *Gneisenau* went to the bottom that afternoon, *Nurnberg* and Leipzig went down that evening. Only

Dresden got away, to hide among the islands of the Chilean coast, to scuttle herself when she was caught there by British cruisers three months later.

The Falklands Islands action was a smart, decisive victory. British might had triumphed, the seas were safe, the gallant Cradock was avenged. The public were delighted. Sturdee's name was made. But Fisher at the Admiralty wasn't so happy.

He wasn't pleased *Dresden* had got away, and he wanted to call the battlecruisers home and leave Sturdee in command of the cruiser force until she was run down. Churchill pointed out that this would look curious to the public, and instead Sturdee collected a baronetcy and went to command the Fourth Battle Squadron of the Grand Fleet. He led it at Jutland, and he stayed in the post through the rest of the war. He was considered for the command of the Grand Fleet after Jellicoe, but that job went to Beatty.

Fisher didn't admire Sturdee's tactics. He said Sturdee had wasted time and ammunition, fighting at long range. *Invincible* and *Inflexible* had fired off 1174 rounds of 12-inch shell, between them, to put von Spee's big cruisers on the bottom. Fisher had meant his Dreadnought battleships and battlecruisers to deliver a crushing volume of fire at decisive range, not to spar across the horizon.

More recently, Sturdee's reputation took more punishment. Later students of the campaign noticed the time it had taken his battlecruisers to get to the Falklands. If he'd arrived a day later, he'd have found the German flag flying over Port Stanley. Von Spee would have dealt British prestige a second heavy blow.

In most modern accounts, von Spee appears as a skillful, thoughtful commander, an able strategist who finally made a fatal wrong move. Cradock appears as a gallant thruster, obviously brave, perhaps not awfully bright. Sturdee shows up as a rather dull plodder, who comes good at the end by a stroke of blind luck. He only finds the enemy when they trip over him, and than he's so powerfully equipped he can't possibly lose.

Von Spee benefits a bit from the famous British gift for seeing the best side of British enemies. He's a sort of naval Rommel. His big decision, head home to Germany by way of the Horn, was sound without being brilliant. It wasn't a winner, as it turned out, but any other choice would probably have turned out just as badly.

His strategy in the Pacific wasn't so sound. Appearing at Samoa showed where he was, appearing at Tahiti showed which way he was heading. He made no mistakes at Coronel, not a very complicated action. Afterwards, though, he lost far too much time loitering on the Chilean coast. Was he waiting for orders from home? None came, because the German Admiralty thought it better not to interfere. Nobody really knows what was in his mind.

Cradock's not so easy to judge. He had no hard decisions to make. At Coronel, even with the odds against him, he had a fair chance of doing enough damage to cut short the German squadron's career. It didn't turn out that way, but he was right to try. And apart from that, he was a British admiral, and centuries of tradition ruled out any idea of retreat. No captain can do very much wrong if he lays his ship alongside that of an enemy.

How bright was he, really? It's hard to tell. At Coronel, it hardly mattered.

In that case, a stubborn seadog, a reckless bonehead, a second Nelson would all have done the right thing. Any close, deep study of his character turns out to be rather beside the point.

Sturdee can be brought into better focus than the other two admirals. He's never been such an attractive figure, but he was around longer. After 1914, he was always a man to notice. He moved in higher circles, before and after 1914. He's a figure in Beresford's, Fisher's, Churchill's, Prince Louis's, Jellicoe's, Beatty's lives, while von Spee and Cradock are mainly figures in one another's lives. He made more of an impression along the way.

It wasn't always a specially good impression. Fisher's words about him probably needn't be taken too seriously, but other people mention pomposity, self esteem, touchiness, conceit. But even if he wasn't easy to get on with, it doesn't mean he was a poor admiral. "An officer of keen intelligence and great practical ability", was Churchill's version.

How good was Sturdee, really? How well did he really do? We ought to try to see a bit beyond the easy fact of the victory. How much of this success was due to skill, and how much to luck? How might he have done even better? What errors did he make? What did he really get wrong?

Most charges against him can be dismissed pretty easily. *Dresden's* escape was a pity, but not a great pity, and anyhow it was hardly Sturdee's fault. He had more ships than von Spee, but he had-only two fast light cruisers to von Spee's three. If the German ships scattered, he couldn't have expected to run down more than two of those. On paper, his big cruisers were only fast enough to catch von Spee's big cruisers. His battlecruisers were faster, but they'd be otherwise engaged.

Actually, the pursuit at the Falklands didn't even start out as well as that. The light cruiser *Bristol* had drawn her fires for boiler examination, and she was late off the mark. Instead of chasing the main enemy force, she was sent westward to run down what turned out to be von Spee's colliers. To make up for that, the armoured cruiser *Kent* steamed better than anybody could have expected when she caught *Nurnberg*. Good luck balanced bad.

The great weight of 12-inch ammunition spent against *Scharnhorst* and *Gneisenau* wasn't a waste, it was one side of a damned good bargain. A short-range action would have made for faster hitting, a higher percentage of hits, the German guns smothered and knocked out and the ships sunk sooner. But before the German guns were knocked out, they'd have had the chance to score damaging hits in return.

It's hard to imagine the German gunners lasting long enough, being lucky enough to actually get the upper hand. But Coronel had shown their shooting couldn't be taken lightly. A few well-placed 8.2-inch shells might have put a battlecruiser out of action for a long while, weeks or months of dockyard work. A couple on the waterline might have stranded a battlecruiser at Port Stanley for longer, making patchwork repairs before she could limp home.

At short range, Sturdee would have scored more hits, but von Spee would have scored hits back. At long range Sturdee scored enough hits, and von Spee couldn't score any. Sturdee's ships were on leave from their main task in home waters, and Sturdee knew they'd be wanted back there. At that stage of the war, aggressive action by the Kaiser's battle fleet still looked to be in the cards. If they came out, they'd come at full strength.

Sturdee knew a close action would play into Germany's hand. It may also have crossed his mind that Fisher wouldn't thank him for getting his ships knocked about. It's more likely, though, that he had enough sense to do the right thing in any case. Fisher's charge about waste of ammunition looks like a case of mere stubborn small-mindedness, of being out to do Sturdee down by hook or by crook.

The charge of time-wasting on the way south to the Falklands is much more interesting. Most recent writers on the Falklands campaign have raised it. Some are just plain disapproving.

'Lack of a sense of urgency," says Ronald Bassett, in his book on British battlecruisers. He's not happy with Sturdee's modest cruising speed, his time out with passing merchantmen, his day's break for exercises.

"Admiral Sturdee was also...proceeding in a surprisingly leisurely fashion," says Paul G. Halpern. And, again, "Sturdee, however dilatory he may have been in reaching the Falklands..."

"Suddenly displaying the sense of urgency which he had previously lacked..." says Geoffrey Bennett, about Sturdee's orders for rapid coaling at Port Stanley, and his plan to leave for the Chilean coast within 48 hours.

"Sturdee appeared to be as unaware of the need for security as for speed," says Richard Hough.

Captain Stephen Roskill, in a review of Bennett's book, is sterner still. "Though he wasted several precious days on the way," he says, "his dalliance was exceeded by that of von Spee, who made no move for four weeks after Coronel. Sturdee, with perhaps more luck than he deserved, thus reached the Falkland Islands in the nick of time..."

Captain Roskill takes up his cane again later, in his biography of Beatty. "In truth luck had been on the British side over the Falkland Islands success, since Sturdee had dallied unnecessarily on his way south..."

In his biography of Fisher, Admiral Sir Reginald Bacon manages to cover the Falklands campaign without once using Sturdee's name. He turns the time factor upside down, giving credit for the victory to Fisher for getting the battlecruisers away in such a hurry.

"A delay of twenty-four hours in the sailing of the cruisers might have been fatal," he says. "One of forty-eight hours would most decidedly have been so."

This calculation doesn't stand up too well to a close look. Since Sturdee's not named, his post-Devonport strategy isn't touched on either.

Some writers suspect Sturdee must have had some sort of a serious reason for hastening so slowly, and they have a quick look round for one. Bennett and Hough put forward some second thoughts.

"It wasn't Sturdee's way," Bennett says. "Though his ships could make 16-18 knots, he preferred 10 in order to husband his fuel and search for enemy shipping as he steamed south."

"The search for von Spee was likely to be a long and difficult task," says Hough, looking at Sturdee"s options on his arrival at Port Stanley, "and he knew that a successful outcome for the venture demanded the most careful planning."

Barrie Pitt looks at Sturdee's run south in the light of wider strategic issues, including operations in South Africa and German South-West Africa. "...The situation posed the question," he says, "as to whether the Asiatic Squadron was coming up the Atlantic toward

the British squadron, or whether it was crossing their front toward the Cape of Good Hope."

Elsewhere, Pitt puts it still more clearly. He mentions Sturdee's ships coming down the South Atlantic, "...searching all the time for von Spee's ships in case they had already come round the Horn..."

Pitt seems to be the only writer to have tried very hard to put himself in Sturdee's shoes. Today, a glance at a map of the campaign, the two dotted lines coming to meet at the Falklands, may suggest the strategic issues were about as tricky as a head-on train wreck on a single track. In 1914, to Sturdee, on *Invincible's* bridge in mid-Atlantic, they must have looked much, much trickier.

If Sturdee could find von Spee's ships, he could sink them. But could he find them? Since the start of the war, von Spee had kept out of sight pretty well. He'd shown himself for a few hours at Apia, at Tahiti, at Easter Island, and for a day at Valparaiso after Coronel. By the time Sturdee sailed from Devonport, he'd been off the map again for more than a week. Nobody knew his course. No other ship had seen him. The rest of the world could only guess at what he might have in mind. Even if Sturdee had been setting out from Valparaiso instead of Devonport, the trail would have looked pretty cold.

With colliers in company, von Spee's squadron could make about 10 knots. So, if Sturdee drew a circle on his chart, centred at Valparaiso, showing how far von Spee might have got, he'd have started at Devonport with a circle more than 3000 miles across. Then, he'd have had to set the radius 1000 miles wider every four or five days.

As *Invincible* and *Inflexible* were starting south, von Spee might already have been off Cape Horn. On the other hand, he might have turned north to pass through the neutral Panama Canal, to strike in the Caribbean. In that case, he'd most likely be somewhere between Peru and the Galapagos Islands. It wasn't so likely he'd backtrack across the Pacific toward Australia, but he might have decided on that just because it wasn't likely. In that case, he'd be somewhere out toward Easter Island.

If von Spee was steaming north or west, there wouldn't be much Sturdee could do about it. If he came round Cape Horn, he'd have to be brought to bay. But then, round the Horn, he'd have another range of courses open. He could head north to the River Plate, to attack Allied shipping off Argentina and Brazil. He could steer wide into the middle of the Atlantic, away from the shipping lanes, where he'd have a better chance of slipping homeward unseen. He might steam on eastward, to interfere in German South-West Africa or to startle Capetown.

That was the situation when Sturdee sailed. An easy exercise on the chart would have shown him that in a week's time, at 10 knots, von Spee might be near the middle of the South Atlantic, or the River Plate, or Panama, or else steaming somewhere between Easter Island and Tahiti. At more than 10 knots, of course, he might have covered much more ground.

A little more work with the chart would have shown von Spee's most dangerous course was a run up the middle of the Atlantic. With any luck at all, the German ships might slip round Sturdee's flank while the two squadrons were on opposite courses. Then, even if Sturdee soon found out about it, he'd be in for a long stern chase before he could bring them to action. His battlecruisers speed gave them a handy edge in tactics, in combat. It wouldn't be such a great help in strategy, in a search across thousands of miles of ocean.

If von Spee crossed to South Africa, he'd probably be settling for a one-way trip. Stopping long enough to do much good would mean giving the Allied net time to close around him. If he raided along the South American coast, he'd draw squadrons to hunt him down. Either way, he'd be putting himself back on the map, taking a load off Sturdee's mind.

Sturdee had to cut in ahead as von Spee was trying to get away north. But in that case, he'd need a pretty good idea of where von Spee was going to be. As he sailed from Devonport, he wasn't even sure any longer which ocean von Spee was in. It wasn't a good start, and as the days passed things didn't get much better.

This looks like the best explanation for Sturdee's 10-knot cruise south. The slower he went, the more stops he made, the more time he was giving von Spee to break cover. A sighting report at sea, a discovery at a remote anchorage, another visit to a neutral port, and Sturdee could start making much smaller circles on his charts.

Even at 10 knots, the farther south Sturdee steamed, the more danger there was of finding von Spee had turned up somewhere north of him. There were reports of German wireless activity off the Chilean coast, but that was perhaps just trickery, German agents and hired colliers signalling one another while von Spee was keeping silent somewhere else. The villain wasn't likely to lurk round the scene of the crime any longer than he could help. Sturdee had to guard against the worst possible case, and that was an early, fast break for home.

As it turned out, von Spee wasn't nearly as energetic as Sturdee had to expect. The wireless messages off Chile were real clues after all. He really was still lurking round the scene of the crime. After Coronel and the visit to Valparaiso he'd steamed west, back into

the Pacific, but only as far as Mas Afuera in the Juan Fernandez Islands, about 500 miles from Chile's coast. He'd stopped there for nine days, coaling and completing repairs. He only left on 15 November, four days after Sturdee left England.

Then he showed much less sense of urgency than Sturdee, with much less excuse. He took six days to steam 1000 miles to San Quentin Bay, in the thinly populated archipelago of Chile's southern coast. He stopped there for another five days, coaling, sharing out 300 Iron Crosses among his sailors. When he sailed again on 26 November, Sturdee was meeting Stoddart off Brazil.

He was still much nearer Cape Horn than Sturdee was, but he threw away the last of his lead when he captured the British barque *Drummuir* south of Tierra del Fuego. She had a cargo of coal, and he spent three days at Picton Island, 50 miles north of Cape Horn, shifting it into his squadron's bunkers. By then, Sturdee was on his last leg to the Falklands.

The nearer Sturdee got to the Falklands, it seems, the less he liked to hurry. At the Abrolhos rendezvous, he called his captains to *Invincible* to confer.

He seemed to be thinking of stopping there a few days longer, but Captain Luce of the *Glasgow* urged him to keep moving south. It seems Luce was the first to suggest von Spee might be making for the Falklands, too.

When Sturdee did head south from the Abrolhos, he deployed his ships in an extended line abeam, sweeping a track between 50 and 100 miles wide. This wasn't a cruising formation, it was a search formation. If von Spee was already east of the Horn, coming north, this gave the best chance of bumping into him.

By this time, Sturdee wasn't the only one who thought von Spee might be so far north. "We are getting quite excited now," wrote one of Carnarvon's midshipmen on Sunday, 29 November, "and expect to meet the Germans on Tuesday next."

Meanwhile, back in London, Fisher and Churchill were apparently happy with Sturdee's progress. They must have noticed he was taking his time. Even while he was keeping wireless silence, they must have seen days were ticking by without anything much happening. Both of them were terrifically energetic, impatient, domineering, and would have been easy for either of them to dash off a hurry-up signal. They both resisted this temptation.

Maybe they drew the same circles on their charts, and came to the same conclusions. Best to give von Spee time to turn up again. If he showed himself in an attack on British shipping or territory, it would be unfortunate. If he slipped past Sturdee and eventually got home, it would be a disaster. Spurring Sturdee ahead might be playing into von Spee's hand. If they left Sturdee alone and von Spee did get away, it would be Sturdee's fault, not theirs.

Sturdee wasn't a second Nelson, but evidence suggests he was more than just a plain sea-dog. He'd shown up well on the Australia Station in 1898, as captain of the third class cruiser *Porpoise*, representing British interests at Samoa, in the long dispute between the Americans and the Germans there. With his support, the Americans had put the rightful King on his throne, instead of the rebel backed by Germany.

This probably wasn't a feat of diplomacy in the Disraeli class, but it earned him a CMG and a step in promotion. It suggests there was a bit more to him than the stern pomposity and conceit. Intelligence? Insight? Judgement? It may be a mistake to settle for the line of his service rivals and enemies.

Was Sturdee right to play a waiting game, trying to stay between von Spee and home until von Spee made a wrong move? Yes, probably. Looking at the slight, outdated intelligence in his hands, it's hard to fault him. Did the waiting game actually pay off? No, it didn't. Sturdee steamed all the way to the Falklands without picking up any more solid clues.

Until then, Sturdee's luck was right out. When he dropped anchor in Port Stanley, he still didn't have much idea where von Spee might really be, or what he might be planning to do. The best evidence, not strong, suggested he was still skulking on the Chilean coast, but that made least sense. Sturdee had given him every chance to show himself, and it hadn't worked. At the Falklands, Sturdee was just at the point of trying a much more energetic policy when von Spee suddenly turned up on his doorstep.

Von Spee's defeat was all his own fault. The attack on the Falklands was a poor idea. Whatever he did there, he'd have put himself back on British maps.

He had no reason to suppose the islands would be unguarded. In fact, even if Sturdee hadn't been around, he'd have had to face the big guns of *Canopus* in the port. How much damage to his ships could he have risked? The only possible result was failure or defeat.

If he'd steamed on north past the Falklands into the open South Atlantic, he'd have won the round. Then he'd have had a clear run while Sturdee was heading away round Cape Horn. Every hour, the squadrons would have been 20 or 30 miles farther apart. A few days of that, and Sturdee would have been out of the hunt for good. So, von Spee made two mistakes; loitering off Chile, then showing up at Port Stanley. This turned out to be one mistake too many. Sturdee didn't

make any mistakes. He was, perhaps, just about to make one when von Spee saved him the trouble.

In action at the Falklands, Sturdee showed the sort of calculation he'd shown in his strategy earlier. The result there was never in much doubt, but by fighting at long range, hammering Scharnhorst and Gneisenau when they couldn't hit back, he made sure of the best result possible.

His tactics don't leave much room for serious argument. His strategy turns out to be much more interesting. On the one hand, it looks like the best strategy possible. On the other hand, it didn't actually work. Von Spee's rather doubtful strategy actually defeated it.

In the end, it came down to a matter of luck. Apart from being wrong to strike at the Falklands, von Spee was terrifically unlucky to hit on the day Sturdee was there. Sturdee's luck was out for weeks while he was steaming south, and it turned his way at the last possible moment.

If von Spee had wasted even more time off Chile, if he hadn't caught the *Drummuir*, if Sturdee had steamed faster or slower, it would have turned out more predictably. If von Spee had attacked Port Stanley at any other time, Sturdee would have come racing down from the north or back from the west. He'd have caught von Spee there, or he'd have started scouring a much smaller stretch of sea. If Sturdee had left Port Stanley for Cape Horn, he might even have run into von Spee on the way.

Lots and lots of ifs. Sturdee did his best to cope with them, and it wasn't a bad best. It wasn't his fault it didn't come out the way it should have. He deserved his stroke of luck.

Here and there, writers dealing with the battle take a second look at Sturdee's share of the credit. One of Lord Fisher's more recent biographers actually strikes a blow for fairer play.

Sturdee's "pomposity and conceit did not necessarily endear him to other officers. But the spectacle of Fisher basking in the congratulations showered on him, while busily denigrating Sturdee's contribution and decimating his recommendations for honours, does not command our whole-hearted approval."

No, it doesn't. And "contribution" probably isn't the best word there, either. Fisher sent the battlecruisers, and that was a good idea. But it was a pretty obvious idea, and apparently it was Sturdee's idea first, anyway. The rush to get the battlecruisers to sea was no real help, as it turned out. All the rest was Sturdee's work, and Fisher probably deserves most credit just for leaving him to get on with it.

Sturdee deserves more credit than he's generally been given, and his part in the campaign deserves much more attention than it's been given. The balance of factors and the judgement of courses open to each side, day by day, is a fine subject for study. The human side, gallantry and vengeance, is nicely dramatic, but Sturdee's policy and strategy are the stuff to think hard over.

There are lots of points of interest in the 1914 cruiser campaign. Here are a few more.

Ship speeds.

Listed designed speeds are only a rough guide. Generally, the British ships seem to have been faster than claimed; the Germans slower. *Invincible* and *Inflexible* were designed for 25 knots, but in service they reached 28. *Bristol* and *Glasgow* could both improve on their designed 25 knots.

The German light cruisers were a knot or two slower than the British to start with, and it was a while since *Leipzig* and *Nurnberg* had been docked and refitted. *Scharnhorst* and *Gneisenau* hadn't been docked for a while, either. *Jane's Fighting Ships* credits *Gneisenau* with 24.8 knots, but *Scharnhorst* with only 21. A note says *Scharnhorst* grounded badly in 1909, and couldn't steam as well after.

Before Coronel, Cradock left the battleship *Canopus* trailing astern of his cruisers because he thought she couldn't make more than 12 knots. Evidence come to light more recently suggests she could really make 16. Would this have made a difference to Cradock, if he'd known? What difference would her presence have made at Coronel? Would von Spee have risked fighting her? He'd heard she was a ship of a later class, bigger and more powerful. Would Cradock have chased von Spee, leaving her astern, still 5 or 6 knots too slow? Something to think about.

Von Spee's delay.

Why did he waste so much time at Mas Afuera and San Quentin Bay? Waiting for news of the British squadrons hunting him? But he already knew they were all around him. Trying to baffle them? But they'd be baffled whatever he did, as long as he kept out of sight. Waiting for orders from home? What orders?

Von Spee always knew he had almost no chance of making it home. If he got as far as the North Atlantic, he'd still have to get past the British blockade, the battlecruiser squadrons and the Grand Fleet. Otherwise, he could raid or he could hide. If he raided, he'd risk damage he couldn't repair. If he hid, sooner or later he'd be found and sunk.

How could he best serve Germany? Fighting a quick, mutually destructive action, or wasting the enemy's time and coal in a long hunt? Could he find any course open that wouldn't lead to the loss of his ships and men?

He must have given some thought to internment. Various lonely Russian commanders had found safety in neutral ports during the war against Japan, ten years before. Of course, he'd have to do some fighting first. But if he'd done his best, if his ships were damaged, low on ammunition, out of coal, if he couldn't sensibly hope to do any more damage or get away home, then internment would be justified. Most likely the Kaiser's army would be in Paris before Christmas, and then he could head home in something like triumph.

His visit to Samoa looks like a fair shot at mutual destruction. However well any action with the Australian squadron went, it wasn't likely his ships would get away unhurt. But two armoured cruisers for a battlecruiser would have have been a fair balance of losses.

Internment may have been in his mind at Coronel, though. If *Good Hope's* 9.2-inch guns had scored a couple of hits, he might have retired to Valparaiso to sit out the rest of the war. But his victory at Coronel left him worse off than before, short of ammunition, still surrounded by enemies, still far from home, but not yet quite ready or able to throw in the towel.

Perhaps at Mas Afuera and San Quentin Bay he was hoping from a signal from home suggesting, permitting, ordering internment. Valparaiso was handy. He'd still be one up on the British. He'd save his ships. But he was too proud to suggest it himself, and the Kaiser's naval staff were too proud of him to notice he was so badly placed.

History shows it's mostly best for naval staffs at home to leave all tactics and much strategy to the commander on the spot. In this case, perhaps it wasn't. Anyhow, internment was never mentioned, and von Spee let that chance pass, and put to sea toward a much grimmer fate.

Von Spee's squadron.

Did von Spee really have the right ships for the job? Seeing the length of time he was at large, it's interesting to note how little damage he did. The *Emden* probably gave the Allies as much trouble all by herself.

Big, expensive coal-eaters like *Scharnhorst* and *Gneisenau* weren't the best raiding cruisers imaginable. Von Spee mostly looked to be trying more to save them than to use them. Germany's cause might have been better served by two more light cruisers instead, and the squadron scattering to raid like *Emden*.

The big cruisers were fine for peacetime flag-showing, just the shot for impressing the British, the French, the Americans, the Japanese, the Chinese. In a straight fight between Germany and France, they'd have given the French a lot of trouble. In the war that actually happened, they just about pulled their weight. But light cruisers, even under captains less outstanding than *Emden's* Muller, could have caused as much nuisance for less risk and cost.

Did the German government and Admiralty reject wartime fighting efficiency in favour of peacetime pomp and show? Was this a reasonable choice, at the time? More food for thought.

From CMS to INS: A Brief History of Ireland's Navy

by

Graham Wilson

At the end of September 1984, the Irish registered trawler *Marita Ann* was intercepted off the coast of Ireland and detained under suspicion of smuggling arms to the Irish Republican Army (IRA). As it transpired, these suspicions, originally raised by the American FBI, were well founded as *Marita Ann* was eventually found to be carrying over seven tons of arms and ammunition.

The Irish police officers who boarded the arms ship and arrested the smugglers had been transported to the scene of the incident off the south-west coast of Ireland by a warship and had been backed up by a naval boarding party. The ship (LE *Emer*) and the men of the boarding party came from the Navy of the Republic of Ireland, the Irish Naval Service, and this was not the first time that the small navy of this small and neutral nation had contributed to the fight against international terrorism.

The aim of this article is to outline briefly the history of the Irish Naval Service (INS), to place the INS within the context of the Irish Defence Forces (IDF), and to compare the problems and challenges which face the navy of this small island nation with those facing the navy of another small (in terms of the size of population) island nation, Australia.

It is interesting to note that the Irish have quite a rich maritime tradition and, like Irish soldiers of fortune, Irish "sailors of fortune" have made their mark around the world. Prior to colonisation by the English, Irish navigators and seamen voyaged far afield, both trading and raiding. Later, Irish monks navigated the treacherous North Sea to settle on Iceland and also journeyed into the Mediterranean. The first "Irish Navy" was established in 1641 by the Confederation of Kilkenny who were resisting Cromwell's invasion. Following the defeat of this last gasp of Irish nationalism in 1652, the only place for Irishmen to serve as sailors was in either the Royal Navy or that of another country.

Irishmen served prominently in the navies of other European nations as well, including Spain, Portugal, France, Austria and the Papal States. Many Irishmen reached high rank in these navies including Hugh O'Donnell who commanded the Spanish Mediterranean fleet in the 1640s and Felix O'Neill who rose to the rank of Admiral in the Spanish navy.

The navies of Brazil, Argentina, Ecuador and Chile were all founded by Irishmen and the naval academies of Argentina and Ecuador are named after their navy's founders, William Brown and Thomas Wright respectively. Of even more significance in terms of Irish maritime history is the fact that the United States Navy was founded by an Irishman, Commander John Barry. Interestingly enough, during the American Civil War the Confederate Navy was also founded by the Irish Captain Buchanan (whose brother served in the United States Navy).

Despite this international effort, however, the fact remained that there was no Irish navy up until the Anglo-Irish Treaty of 1921 which set up the Irish Free State as an independent dominion within the British Empire. Prior to that date, naval defence of Ireland was the responsibility of the Royal Navy and at the outbreak of World War One the Royal Navy maintained a force consisting of one cruiser and a destroyer flotilla in Southern Ireland. As the war progressed, this force expanded to eventually include three battleships (American), a cruiser, over 75 destroyers and sloops, four torpedo boats, nine mine sweepers, two depot ships, an unknown number of Q ships and 90 seaplanes of the Royal Naval Air Service.

As well as escorting convoys and conducting anti-U-Boat operations, the RN also took part in operations against the rebels during the Easter Uprising of 1916 when the gunboat *Helga* steamed up the River Liffey and shelled rebel positions in the Four Courts and the Dublin GPO.

Following the Anglo-Irish Treaty of 1921, the Royal Navy withdrew from Southern Ireland and, in terms of maritime defence, the new Irish nation was technically on its own although the Royal Navy retained rights and obligations under the treaty. This ushered in the period of Irish naval development which can be divided roughly into four major periods i.e.:

- the inter-war years, 1921-39
- the Emergency (World War Two), 1939-45
- the Irish Naval Service, 1945-70
- the Irish Naval Service, 1970-95

The Inter-War Years, 1921-39

The Anglo-Irish Treaty of 1921 did not mean the end

of fighting in the Free State (as the new nation was then known). Anti-Treaty rebels and republican diehards refused to accept the treaty and accused the new Irish government of selling out to the British. A bitter and bloody civil war ensued which was to last for three years.

In pursuit of its campaign to destroy the rebel forces, the Provisional Government utilised ad hoc maritime units to patrol the coastline, protect tactically important regions such as the River Shannon and convoy troops. In particular, following the widespread destruction of transport infrastructure by the rebel "Irregulars", the use of sea transport to move National Army troops quickly around the country was an important element in ensuring the eventual victory of the government over the rebels.

These operations were very ad hoc, however, and it was not until early 1923, when the civil war was all but over, that a naval service was formally established. This was the oddly titled Coastal and Marine Service (CMS) which was established on 4 May 1923.

The CMS was a small service which at its height totalled 356 personnel (124 officers, 13 cadets, and 219 ratings). It comprised three branches — a coastal patrol service, a marine investigation department and coastal infantry. The latter were actually army units but were directly under command of the CMS although their strength is not included in that of the CMS. Personnel for the new service came mainly from the merchant marine although a number of army officers, including Major General Joseph Vize, the commandant of the Service, were provided for staff work.

The CMS had its headquarters in Portobello Barracks in Dublin and had four operational bases, namely Haulbowline Island in Cork Harbour, Dun Laoghaire, Galway and Killybegs. Merchant Navy rank titles were used for officers and modified merchant navy uniform was worn by all ranks. Military training was rudimentary and confined to foot drill, musketry and gunnery.

The coastal patrol service operated a small fleet of armed trawlers and auxiliaries for patrols and interdictions. The coastal infantry and the marine investigation service basically operated as a coastwatching service

The CMS was short-lived. The coastal infantry units were disbanded in October 1923 and their personnel transferred to normal infantry battalions. The Marine Investigation Service was disbanded in December of 1923 and the coastal patrol service followed suit in March 1924. The CMS was disbanded as a result of a combination of the end of hostilities and lack of money to pay for the service. There was also an innate feeling on the part of the dominant political faction in Ireland at the time that the Royal Navy could be relied on to protect Ireland.

Ireland's embryonic navy had lasted a total of ten months and 27 days and the country was to be without a naval service until the outbreak of the Second World War, despite a number of strong recommendations for the establishment of a navy being made during this period. Not only was it without a navy, it did not even have a coast guard or life-saving service, having to rely on the (British) Royal National Lifeboat Institution (RNLI) for the latter service. From 1924 onwards, the only armed vessel in Irish service was the fishery protection cruiser *Murichu* (operated by the Department of Agriculture and Fisheries) and even this had its single three pounder gun removed in 1935!

"The Emergency" (World War Two), 1939-45

In 1938, at the height of the Munich Crisis, Britain handed over the forts at Cork, Berehaven and Lough Swilly to the Irish Free State. To man the forts, the Irish Army formed a new Coast Artillery Branch and deployed batteries to man each of the forts. With war looming, however, the Irish government had to look beyond a mere strengthening of coastal defences and was at last forced to look seaward.

In August 1939, a small Coastwatching Service was established. Earlier, in May, the Irish government had placed an order for two motor torpedo boats (MTB) from England. These vessels were to equip the Marine Service which was established in December 1939. The role of this new service was in line with Schedule 13 (Rights and Duties of Neutral Powers in Naval War) of the 1907 Hague Convention and were listed as follows:

- control of the use of territorial waters and ports by belligerent warships,
- control of the use of territorial waters and ports by merchant shipping,
- mine laying, mine sweeping and the notification and destruction of mines,
- protection of the country's fishing limits,
- escort duties, and
- protection of navigational aids and sea rescue work.

The first two MTBs, rather unimaginatively titled M1 and M2, arrived in Ireland in March and July 1940, respectively. Originally intended for the Estonian and Latvian navies, the MTBs were designed for operation in the sheltered and relatively benign waters of the Baltic and they were spectacularly unsuited to the wild waters of the Irish coast. Selection of these craft is a reflection of the lack of any real naval knowledge in the higher levels of the Irish military and defence

hierarchy at the time.

Despite being immediately proved to be unsuitable, and disregarding the advice of experienced fisheries officers who had been appointed to the Marine Service, the Irish government ordered a further four MTBs from Britain, which arrived between August 1940 and February 1943.

The Marine Service eventually reached a strength of 2,500 all ranks, including the obscurely named "Maritime Inscription", a second line naval reserve or home guard. The Service was commanded by Commander Seamus O'Muiris, an Irish born former Royal Navy officer who had resigned his commission (and changed his name from James Morris) in 1921 in protest at being forced to transport Irish political prisoners to England in his ship. Commander O'Muiris was appointed Commander and Director of the Marine Service in 1941.

Besides the six MTBs, the Marine Service operated a "sea-going" flotilla of two inshore patrol vessels, one antiquated mine layer and a sail training auxiliary. One of these craft was the venerable gun boat *Helga*, the very same *Helga* which had been used by the British to shell the Dublin rebels from the River Liffey during the Easter Uprising of 1916 — this made it *Helga's* third "Irish naval war", as she had also served the Free State government as a gun boat during the Irish Civil War.

In addition to the MTBs and other "sea-going" craft, a small fleet of launches, tugs and trawlers was operated by the Port Control and Examination Service. This was probably the hardest worked part of the Marine Service, especially the section based at Lough Swilly in the north as the sheltered anchorage there was constantly being used by stragglers from North Atlantic convoys sheltering from bad weather.

Another hard worked section of the Marine Service was the Minefield Section which was responsible for the establishment and the control of minefields at Waterford, Cork and Cobh and the destruction of rogue mines, both Irish and Allied and German, which had broken loose and drifted into Irish waters or ashore. The Minefield Section destroyed almost 1 000 mines afloat and ashore during the Emergency. At the end of the Emergency, the Irish minefields were blown up by the Marine Service (the Irish government allowed a Royal Navy mine sweeping flotilla to operate out of Cobh for two years after the war sweeping the Irish Sea).

The Naval Service, 1945-70

With the end of the Emergency, the Irish Defence Force (IDF) was drastically reduced. This meant the Marine Service as well which was quickly cut back from a wartime peak of over 2,500 to just 163 officers and men. Three of the six MTBs were inoperable due to lack of spares and most of the other vessels of the Marine Service were either handed back to their original owners or disposed of. Ireland's ad hoc wartime navy was rapidly fading away.

However, as a result of the experiences from the late conflict, as well as a perceived need to project Irish sovereignty further afield, the decision was made in 1945 to establish a permanent navy, to be an integral part of the IDF and named the Irish Naval Service. The role of the new service, which was authorised in 1946 and formally established in 1947, was "to patrol the territorial seas, protect principal harbours and provide the State with a fishery protection service." The new service would wear naval uniforms and use naval rank titles and forms of address but would not be an independent service. Militarily, Ireland was, and is, divided into four commands, namely Western, Eastern, Southern and Curragh — the new Irish Naval Service (INS) was considered and is still considered a fifth, "off-shore", command of the IDF.

The government selected the magnificently nautically named Haulbowline Island in Cork Harbour as the base for the new service. Haulbowline, a former RN Barracks and Hospital, had been used on a temporary basis by both the CMS during the Civil War and the Marine Service of the Emergency period but its selection for the INS base was now of a permanent nature. Although somewhat antiquated and run-down, the facilities on the island were ideal for the fledgling INS and Haulbowline remains the main (and only) base and dockyard for the INS to this day.

After some searching, the government settled on the purchase of three "Flower" Class corvettes from Britain, representatives of the class of 285 small escort vessels which had been built in Britain and Canada during the war to escort the North Atlantic convoys and close cousins to the Australian "Bathurst" Class of the same era. The three ships purchased, the former HM Ships *Borage*, *Oxlip* and *Bellworth* (in order of their acquisition), were renamed *Macha*, *Maev* and *Cliona* respectively. The ships were named after female figures from Irish mythology, a custom which continues in the INS to this day. From this time also, ship's names were prefixed by the letters "LE", standing for "Long Eirennach" or "Irish Ship".

Bigger than any other ships yet operated by the IDF, to this day still the most heavily armed ships ever operated and the only Irish naval ships ever to have an ASW capability, the "Flowers" represented a good but very temporary stop gap. Although relatively new in terms of the fact they were all less than ten years old, the "Flowers" had all seen hard and extended service in the violent North Atlantic and were tired and worn out. Unfortunately, for reasons of economy

the "Flowers" were to serve the INS for over 20 years and far beyond their reasonable effective life expectancy. LE *Macha* was taken over by the Irish Naval Service in 1946 and was finally paid off and scrapped in 1968. *Cliona* followed in 1969 but poor old *Maev* soldiered (sailored?) on until 1971.

Although not exactly suited to the requirements of the INS, the three "Flowers" did give the new service a limited sea-going capacity and in 1948, for the very first time ever, an Irish naval ship undertook an overseas voyage. This occurred when LE *Cliona* sailed to France to collect the remains of the distinguished writer W.B. Yeats from Nice and return them to Ireland. Yeats had died in France during the German occupation and it had obviously been impossible to return his remains until then. This first trip was a great adventure for those Irish sailors who undertook it and they were warmly welcomed by the British and French navies at Gibraltar and Nice respectively.

Several other overseas ship's visits were conducted between 1948 and 1954 with corvettes visiting ports in England, Scotland, Denmark, Sweden, Belgium, France and Spain. Overseas visits were all but abandoned from the mid-1950s onward due to financial restrictions, the only trip undertaken between 1954 and 1975 being a voyage by LE *Cliona* to Antwerp to pick up a cargo of Belgian FN rifles for use by Irish UN troops in the Congo.

In 1961 the then Chief of Naval Service (CONS), Capt. McKenna, submitted a memorandum to the Chief of Staff of the IDF and the Department of Defence which outlined the enormous gap existing between Ireland's naval requirements and the forces available to implement them. Capt. McKenna urged the setting up of an independent Naval Headquarters commanding three Naval Districts with a number of naval bases around the coast. To provide Ireland with an adequate naval defence, Capt. McKenna submitted that the INS required a force consisting of:

- 8 all weather ASW frigates
- 6 coastal mine sweepers
- 11 inshore mine sweepers
- 2 seaward defence boats

The memorandum was fairly coolly received and its recommendations were not taken up, mainly due to financial restrictions. Nothing daunted, the indefatigable Capt. McKenna next turned his attention to the interlinked problems of morale and retention, hosting a one day conference on the problem for all senior officers of the INS on 4 October 1962. The conference identified a number of reasons for the low level of morale and poor retention rates for the INS but could offer no constructive solutions which did not require an increase in funds, an increase which all knew was out of the question.

The only highlight for the INS in the 1960s was its involvement in the recovery of the bodies and wreckage of an Aer Lingus Viscount airliner which crashed into the Irish sea off Wexford in March 1968. Operation TUSKAR, however, was something of a humiliation for the INS as it was unable to provide a vessel to recover bodies from the crash, this task eventually falling to units of the RN and the RNLI. Capt. McKenna of the INS was, however, appointed search and recovery co-ordinator for the later international operation mounted to recover the wreckage of the aircraft. But again, while the Irish government provided a total of five ships, including two corvettes of the INS, to the operation, the actual work was undertaken by the Royal Navy.

In January 1970, the Naval Service entered a new decade with only one ship in commission, LE *Maev*. To say that replacement ships were desperately needed would be an understatement. At least the Irish government had recognised this fact and had agreed to have a purpose designed class of ships built in Ireland for the INS at the Verolme Shipyard in Cork. In the meantime, however, the gap had to be filled and to fill it the INS was authorised to obtain three Ton class minesweepers.

The first of the INS's new ships, the former HMS *Oulston*, was taken over in December 1970 and she was commissioned into the INS as LE *Grainne* on 30 January 1971 at Portsmouth. The other two ships, HM Ships *Blaxton* and *Alverton* were taken over at Gibraltar by Irish crews flown out there for the purpose in February 1971, being renamed *Fola* and *Banba* respectively. After harbour and sea trials, the two ships sailed for Ireland at the end of March. With the arrival of LE *Grainne* in January 1971, the Naval Service was finally able to pay off the last of the corvettes, LE *Maev*, and she was sold for scrap at Haulbowline in March.

The Irish Naval Service 1970

The purchase of the minesweepers represented something of a culture shock for the INS. Prior to that time, the only ships which Irish sailors had served on were the World War Two vintage corvettes whose machinery and systems were so out of date that the INS had to institute a massive training program, with heavy assistance from the Royal Navy, to qualify its peoplefor the new ships. On the other hand, the purchase of the mine sweepers allowed for a very useful lead-in period to the introduction of the Naval Service's current generation of modern seagoing patrol vessels. The Naval School on Haulbowline Island was expanded and modernised.

In 1971, the Irish government, after extensive research and consultation, finally let a contract with Verolme Cork Dockyard Ltd. for the construction of the lead

ship of a class of indigenous Irish warships. The hull of this ship, to be named LE *Deirdre*, was designed and tested by NEVESBU, the famous Netherlands naval ship design and construction bureau based at the Hague. The INS had stipulated that it required a vessel capable of operating offshore patrols in all weather conditions and the final design was based on ships used by the Royal Norwegian Navy for North Sea patrols, a design which was itself based on deep-sea trawlers.

LE *Deirdre* was laid down in August 1971 and handed over to the INS in May 1972. Her arrival was a milestone in Irish naval history. For the first time in its history, the Naval Service had a modern, purpose-built patrol ship capable of operating in all weather conditions off all of Ireland's coasts. More importantly, *Deirdre* was brand new and Irish built, something which contributed significantly to the restoration of morale and self-esteem in a navy which had been facing extinction only two short years before.

Although relatively small at 205 feet overall and with a displacement of 960 tons, and lightly armed with just a single Bofors L60 40mm gun forward (later supplemented by two single .50 cal machine guns), *Deirdre* was light years ahead of the mine sweepers and, especially, the corvettes in terms of range, communications, sea keeping and, a very strong point, accommodation and habitability. *Deirdre* had a complement of four officers and 37 other ranks and the accommodation offered by the ship was like nothing the men of the INS had experienced previously. Officers and senior petty officers had single cabins while petty officers and junior rates had twin cabins. Separate mess decks for senior and junior rates were served by a modern and spacious galley.

LE *Deirdre* quickly joined the three mine sweepers on fishery patrols but in March 1973 she took part in a dramatic counter-terrorist operation which proved that the INS could perform other roles just as well. This was the interception and arrest of the arms smuggler MV *Claudia* which left Libya on 21 March bound for Ireland with a load of arms and ammunition for the IRA. Tipped off to the *Claudia's* cargo and intentions by international police and intelligence agencies, the Irish government mounted a huge, in relative terms, operation involving all arms of the Irish Defence Force (Army, Naval Service and Air Corps) as well as the Irish Police force, the Garda. LE *Deirdre*, *Fola* and *Grainne* were deployed for the operation with *Deirdre* being tasked with the actual interception, the arrest being carried out by a boarding party of police and sailors. The operation was a stunning success with over five tons of arms, ammunition and explosives being seized.

In January 1973, Ireland joined the European Economic Community (EEC) and this event was to have far reaching consequences for the Naval Service. While Ireland's new membership of the EEC did not impact on her traditional policy of military neutrality, the requirement for the nation now to conform to the EEC's fisheries policies, specifically protection of the Community mandated 200 mile exclusive economic zone (EEZ), had an enormous impact on the INS. It was this EEC requirement which decided the government to let a contract for the construction of an improved Deirdre class OPV in December 1975.

The second OPV, now to be referred to as P21 class, was commissioned in June 1978 as LE *Emer*. She was followed in January 1978 by *Aoife*, and in May 1980 by *Aisling*. Purchase of these ships, as well as for the corvette *Eithne* (P31 — commissioned December 1984) and two P41 class coastal patrol vessels (former RN Peacock Class) *Orla* (May 1985) and *Ciara* (October 1985), was made possible by heavy cash subsidies from the EEC.

As well as the patrol vessels, the INS acquired the former Commissioner of Irish Lights tender MV *Isolde*, renamed LE *Setanta*, in 1976 for use as a transport and training vessel. This latter task was a welcome addition to the Naval Service's capabilities as until then it had not had a sea-going training ship and all non-shore based training had been carried out on operational vessels on an on-the-job basis.

In 1979, as part of a general reorganisation of the IDF, the position of the senior officer of the INS, the Chief of Naval Service, was renamed Flag Officer Commanding Naval Service and was upgraded in rank to Commodore. This was welcome recognition of both the expanded capability and the increased responsibilities of the Naval Service. Notwithstanding this, the INS remained, as it still remains, an integral part of the IDF, theoretically subordinate to the Army, rather than an independent service in its own right.

Also in 1979, the government accepted INS proposals for a follow-on class of ships to the P21 OPVs. This class, to be designated P31, was larger than any other class of ship hitherto operated by the Irish navy. Purpose designed to INS specifications by NEVESBU in the Netherlands , the design envisaged a ship comparable in size and capability to the US Coast Guard's medium endurance cutters. The keel for what was hoped to be the first of a class of at least four ships was laid at the Verolme Cork Dockyard in December 1982. Two years later, in December 1984, the new ship was commissioned into the INS as LE *Eithne*.

Eithne is 265 feet long and displaces 1910 tons at full load. Her complement is 85 (including 9 officers) and she is equipped with a 57mm/70 Mk 1 automatic gun and two Rheinmetall 20mm cannon as well as sophisticated radar, navigation and communications fits. Sadly for Ireland, LE *Eithne* was the last ship to be

built at Verolme Cork Dockyard. Unfortunately, the dockyard went bankrupt during construction of *Eithne* and closed down after she was commissioned. One result of this was the decision by the EEC to withdraw funds for a second P31.

Throughout the 1970s, the INS expanded not only in ships but also in men. In 1970, the strength of the Naval Service stood at 412 while in 1980 it was over twice that at 900. This expansion put a severe strain on the facilities at Haulbowline Island. This was partly relieved when the INS took over nearby Spike Island from the Army in 1980 but it was forced to relinquish the island in 1985 to the Department of Justice who now operate it as a civil prison. To compensate for this, the INS was provided with facilities and accommodation at Murphy Barracks in Ballincollig, a situation which the Naval Service views as unsatisfactory at best.

Other highlights of the 1970s and 1980s for the Naval service include: heavy involvement in the 1979 Fastnet Ocean Yacht Race rescue operation; the operation to intercept the *Marita Ann* in 1984 (which has already been described); the disposal of the mine sweepers (LE *Banba* in 1984 and the other two in 1987); the search for the wreckage of the Air India 747 blown up by Sikh terrorists over the Atlantic in 1986; the activation of the Naval Support Squadron of the Irish Army Air Corps in 1986; and the acquisition of two ex-RN Peacock Class coastal patrol vessels (LE *Orla* (ex-HMS *Swift*) and LE *Ciara* (ex-HMS *Swallow*) in 1988.

The Naval Service Today

This brings us up to the present day, 1995. It is worth examining in a small amount of detail the current situation of the INS with some emphasis on where it fits into the scheme of things within the Irish Defence Forces, the IDF.

IDF Organisation.

The Irish Naval Service is not an independent service in its own right but is rather an element of the IDF. The same holds true for the Irish "air force", which, although it operates quite sophisticated aircraft, including jet fighters, is part of the Irish Army and is known as the Irish Air Corps. Technically it could actually be argued that the Naval Service is part of the Irish Army. The President of Ireland is the supreme commander of the IDF but command is actually devolved to the Chief of Staff (COS — an Army General) through the Minister of Defence. Directly under the COS, who sits on the Defence Council, Ireland's highest level defence committee, with the Minister, the Departmental Secretary and the Adjutant General (AG) and Quartermaster General (QMG), come the four territorial commands of the army, the military college, the Army ranger unit, the five "arms corps" of the Army (infantry, cavalry, artillery, signals and observers), the Naval Service and the Air Corps. The AG and QMG respectively command staff branches, combat support and service support corps and other establishments relevant to their staff functions. Neither the FOCNS nor the GOC Air Corps sit on the Defence Council, a strong indication of their non-independent and subordinate position within the IDF hierarchy.

INS Organisation and Establishment.

The IDF currently has an establishment of 18,000 regular personnel but an actual strength (1994 figures) of 12,700 all ranks. The Naval Service has a Permanent Force establishment of 1281 (160 officers, 578 NCOs, 543 seamen) but an actual strength of just under 1000.

The INS is organised into Naval Headquarters, Naval Base and Dockyard, and Fleet units. Naval HQ is located within IDF Headquarters in Dublin. The Naval Base and Dockyard is located on Haulbowline Island in Cork Harbour and this is home port and base for all of Ireland's naval ships. In addition to these establishments, there is a small permanent naval detachment at Murphy Barracks in Ballincollig and small detachments of regular naval personnel are attached to naval reserve depots at Waterford, Dublin, Limerick and Cork. Day to day control of the navy and its ships is managed through the Naval Operations Section which is divided between Naval HQ and Haulbowline Island. Under the Officer Commanding Naval Base and Dockyard come the Naval School (including the detachment at Murphy Barracks), the Naval Depot, the Maintenance Engineering Section and the Signals and Ordnance Sections.

Roles and Tasks.

In September 1993, the Irish government defined the roles of the Irish Defence Forces as:

1. to defend the State against armed aggression;
2. to aid the Civil Power;
3. to participate in United Nations missions in the cause of international peace;
4. to provide a fishery protection service in accordance with the State's obligations as a member of the European Community; and
5. to carry out such other duties as may be assigned to them from time to time, such as search and rescue; air ambulance service; VIP transport; assistance in the event of natural or other disasters; assistance with the maintenance of essential services; and
6. protection of the environment.

Within the overall ambit of IDF roles, specific roles

for the Naval Service are divided into primary or wartime roles and secondary or peacetime roles.

Primary roles are:

- deter and resist aggression
- uphold neutrality by patrolling territorial waters using air, surface and subsurface surveillance
- seaward defence of the country's main ports
- mine sweeping of designated channels and estuaries.
- Secondary roles, in order of priority, are:
- offshore fishery protection and surveillance of the Exclusive Economic Zone
- aid to the civil power
- maritime search and rescue
- support to Irish UN contingents
- pollution control
- salmon fishery patrols (inshore fishing)
- Army and Air Corps co-operation
- hydrographic survey
- diving operations.

Fleet.

The INS fleet currently consists of:

- 1 P31 Class corvette (LE *Eithne*)
- 1 Deirdre Class OPV (LE *Deirdre*)
- 3 P21 Class OPV (LE *Emer*, LE *Aisling* and LE *Aoife*)
- 2 P41 Class Coastal Patrol Vessels (LE *Orla* and LE *Ciara*)
- 1 Harbour Launch (*Colleen II* general duties craft attached to Haulbowline Island)
- 1 Sail Training Yacht (*Tailte* — attached to the Naval School for seamanship training)

While the above fleet list may look fairly impressive for a small nation like Ireland, the fact is that it is not big enough to effectively carry out all of its functions. In 1977 the Irish Defence Minister, Robert Molloy, stated that for the 200 mile EEZ to be effectively policed, a force of 15 offshore and ten coastal patrol vessels would be required. Even with financial assistance and subsidies from the EEC, there is little chance that Ireland could ever afford to establish such a force. Also, given the difficulty in both attracting and retaining men for the Naval Service, it is unlikely that a force the size of that envisaged could be manned without resorting to conscription, something no Irish government is prepared to contemplate now, or in the foreseeable future.

One severe problem for the Naval Service is the lack of a sea-going training ship and transport. LE *Setanta*, the former Commissioner of Irish Lights tender taken over for use as a training ship and transport in 1976 was paid off and sold for scrap in 1984. She was not replaced and there is no hint of a replacement in the foreseeable future. The two results of this are that first, sea training for both officers and ratings must be carried out on an on the job basis on operational ships with a detrimental effect on both training standards and operational efficiency, and second, the Naval Service is forced to use an OPV to transport stores to and from the Irish UN contingents on Cyprus and in the Middle East. While this gives the Naval Service a chance to send its sailors on all too rare overseas voyages, it also means that the Service is regularly without the use of one of its ships for several weeks.

Air Support

The Naval Support Squadron of the Irish Air Corps is equipped with two navalised SA 365F Dauphin 2 helicopters, replacing a series of leased fixed wing aircraft which had operated in the maritime surveillance and SAR roles in support of the Naval Service. One of the Dauphins is permanently embarked aboard LE *Eithne*. A further three Dauphin 2s are operated in the SAR role from land bases by the Air Corps' SAR Squadron. In addition to the helicopters, the Air Corps operates three Casa CN 235 fixed wing aircraft in the maritime recconaisance role as part of the Maritime Squadron, replacing three highly unsuitable Beechcraft Super King Airs operated between 1977 and 1990.

Naval Base and Dockyard.

The Irish Naval Service's only base and main training centre is on Haulbowline Island, in Cork Harbour, which the Naval Service shares with Irish Steel Limited. Accommodation consists of a mixture of upgraded ex-Royal Navy buildings and modern purpose-built buildings. Haulbowline Island, which has been connected to the mainland by a bridge since 1965, is the home of the Naval Dockyard, the Naval School (which also maintains a detachment at Murphy Barracks in nearby Ballincollig), the Naval Diving Unit, the Naval Museum and the Naval Service Pipe Band.

Recruitment.

Although there is legislative allowance for conscription, service in the IDF, including the INS, is currently purely voluntary. Both officer cadets and general recruits for the INS are recruited by means of specific recruitment drives, mounted annually in the case of officer cadets and as required for general service recruits. The small size of the INS means that there is no requirement for a constant flow of general service recruits and recruiting drives are currently held on average every two years with recruit intakes generally being no larger than 50. Service in the INS is open to all Irish citizens, including citizens of Northern Ireland, as well as persons of proven Irish descent from other countries. Enlistment for general entry recruits is for a minimum of four years with a further

reserve commitment of seven years.

Training.

Recruits are trained at the Naval School at Haulbowline Island and at the Naval School Detachment at Murphy Barracks. Most technical training is conducted by the Naval School, although promotion courses are conducted by the Irish Army at Southern Command NCO Training Centre at Collins Barracks, Cork. Additionally, some technical courses are conducted at Army specialist schools and at the Apprentice School, for instance, communications technicians attend advanced training at the Signal Corps and Ordnance Corps schools, while pipers, drummers and buglers are trained at the Army School of Music. Some advanced specialist training is also carried out in the UK.

Officer cadets spend their first three months of service undergoing purely military training in the Cadet School at the Irish Military College in the Curragh, following which they are sent to the Naval Cadet School within the Naval School on Haulbowline Island. The full course for officers of the Executive Branch lasts for four years, while for those of the Engineer Branch it lasts for six years. Part of this time is spent in the UK, at Britannia Royal Naval College, Dartmouth, for Executive Branch officers and at the Royal Naval Engineering College at HMS *Manadon* for Engineer Branch officers. Successful completion of the academic portion of officer training results in the award of a degree from either the University College, Galway (Executive Branch) or Cork Technical College (Engineer Branch). Follow-up courses are attended at the Naval School, Army specialist schools, the Irish Military College and training establishments in the UK.

As mentioned above, a severe deficiency for the Naval Service as far as training goes is the lack of a sea-going training ship. Since LE *Setanta* was paid off in 1984, the INS has been without such a facility and all sea training is of the on-the-job variety, with its accompanying penalties in the degrading of both training standards and operational efficiency. While this situation is admitted by senior INS staff to be "less than satisfactory", it is unlikely to be rectified in the foreseeable future. In the meantime, the Naval Service does the best it can with what it has and manages to maintain good levels of training standards and operational efficiency.

Support Services.

Although the INS sometimes chafes under the strictures of being subordinate to the Irish Army within the framework of the IDF, this arrangement does have the benefit of freeing the Naval Service from having to provide sophisticated and manpower intensive support services of its own. The Irish Army provides provost, legal, medical, dental, transport, communications and some supply and technical maintenance services to the Naval Service. An example of the latter is the maintenance and construction of barracks which is carried out for the Naval Service by the Command Engineer, Southern Command, while small arms and vehicles are maintained by the Southern Command Workshop unit of the Army Ordnance Corps. In addition, the Army Air Corps provides the Naval Service with its modest but effective air wing, while the Signal Corps provides specialist communications support, including the permanent posting of a Signal Corps officer to the Naval Base at Haulbowline Island.

While members of the Naval Service may sometimes resent being the "poor cousin" to the Irish Army, in reality, they have the best of both worlds. Although the service is nominally a part of the army, it has its own distinct identity, wearing naval style uniforms and using naval rank titles. At the same time, the provision of extensive support by the Army means that the Naval Service can concentrate most of its manpower at sea.

Reserves.

A second line reserve organisation, the somewhat bizzarely titled "Maritime Inscription", was raised during the Emergency (World War Two) and was responsible for port and harbour security and seaward defence. After the war, it was decided to maintain a naval reserve as part of the IDF and counterpart to the army's reserve force, the FCA.

The naval reserve is divided into First and Second Line. The First Line consists of discharged or retired regular naval personnel and is very small. The Second Line Reserve is known as An Slua Muiri and consists of part time servicemen without any previous naval experience. With an establishment of 675, An Slua Muiri has a current (1995) strength of 432 officers and men and is organised into five shore companies based at Dublin (two companies), Cork, Waterford and Limerick.

Although enthusiastic, An Slua Muiri suffers from the lack of proper sea-going craft for training and operations, the craft being available to it consisting of four Gemini inflatables, 18 dinghies and two elderly sail training yachts. As with the acquisition of a sea-going training and auxiliary vessel for the Naval Service, acquisition of proper craft for An Slua Muiri is an urgent priority but one which is not likely to be filled in the near future.

Uniforms, Badges, Flags of the Irish Naval Service

The main body of this article will be concluded with some information near and dear to the author's military collector's heart, namely, detail on the uniforms, badges and insignia of the Irish Naval Service (this article actually had its genesis in some research carried out by the author into Irish uniforms, badges and insignia — like many of the author's other projects, the whole thing then took on a life of its own!)

Uniforms.

Uniforms of the INS resemble those of the RN and RAN although badges of rank more closely resemble those of the US Navy. Officers, warrant officers (WO), chief petty officers (CPO) and petty officers (PO) wear "square rig" consisting of dark blue reefer jacket and trousers with white shirt and black tie and a white peaked cap. The jacket is double breasted with eight gold buttons, the buttons have a plain foul anchor in a rope circlet for officers while WO's, CPO's and PO's buttons have crossed cannon barrels behind the anchor. Commodores have two rows of laurel leaves on the cap peak, captains and commanders have one row and all other officers, including chaplains and cadets, have a plain peak.

Rank for officers consists of lace at the cuff or on shoulder boards (depending on order of dress) with the lace surmounted by a five pointed star. The two junior officer ranks are ensign and sub-lieutenant who wear one stripe and one stripe with a narrow stripe above respectively. Officer rank lacing from lieutenant to commodore are then the same as for the RAN. Warrant officers (something of an anomaly as there are no warrant officers in the army or Air Corps, the senior non-commissioned rank in both being Battalion Sergeant Major, equivalent in rank to Senior Chief Petty Officer) wear a single stripe of narrow lace with branch badge above. Naval cadets wear the uniform of a junior officer with a small twist of white lace and a small officer pattern button in each lapel.

Rank badges for CPO and PO consist of combinations of gold chevrons and arcs worn on the right arm — three stripes for PO, three stripes with an arc above for Senior PO and three stripes with two arcs above for CPO. Senior CPO wear the same as CPO with the addition of the IDF sunburst in the centre between the top stripe and the bottom arc.

Junior sailors wear "round rig" similar to the RAN but with a few notable differences. The sailor's cap closely resembles that of the RAN but is distinguished by a blue pompom (called a "bobbin" in the INS) on top while a gold IDF sunburst badge is worn centrally above the cap tally. The tally carries the word EIRE in Gaelic script and is tied at the back in a swallow tail which hangs down to the collar, rather than in a bow at the side. The blue jean collar differs from the RAN version by having one thick and one thin row of white tape rather than three narrow ones and carries two fouled anchors, one at each point, with the anchors placed diagonally with the foot of the anchor pointing out. Ordinary seamen and able seamen wear one or two diagonal red stripes respectively on the right cuff while leading seamen wear two gold stripes on the right sleeve.

Working and action working dress for all ranks consists of light blue shirt and dark blue trousers with appropriate rank badges. In these orders of dress all ranks wear either a dark blue beret with appropriate cap badge or a helmet with anti-flash hood and gloves.

Air Corps personnel serving with the Naval Support Squadron wear standard Irish Army uniform or flying suits with the Air Corps badge, a winged tricolour (gree/white/orange) roundel, on the shoulder. Appropriate aircrew badges consisting of the IDF sunburst with one or two wings depending qualifications are worn by pilots (two wings) and aircrew (one wing).

Badges.

Cap badges for officers, WO and CPO/PO are almost identical to RAN badges but with the crown replaced by the Celtic sunburst badge of the IDF. The IDF badge is also worn, as previously mentioned, by junior sailors above the cap tally. From a strictly military numismatic point of view, the design and development of the IDF badge, redolent as it is with ancient Irish symbology and heraldry, is worthy of an article in its own right (maybe another time).

As previously mentioned, WOs wear branch badges above their narrow lace. There are four branches, namely Engineer (three bladed propeller), Executive (crossed fouled anchors), Communications (crossed lightning bolts) and Administrative (crossed key and quill). Besides WOs, these branch badges are worn by other non-commissioned sailors on the left sleeve.

Chaplains wear a special collar badge on junior officer's uniform with no rank lace. In working dress, the chaplain's collar badge is worn on the shoulder boards. As an aside, it is interesting to note that although the INS is overwhelmingly Roman Catholic, the Service makes provision for observance of any religion and besides appointing chaplains from the Church of Ireland and inviting the Church of Ireland primate to join in blessing all newly commissioning INS ships, the INS even has a Rabbi on call should one ever be required!

Besides branch badges, the only other badges authorised for wear in the INS are the Naval Diver's Badge (which can also be worn by qualified members of the

Army), the Sick Berth Attendant's Badge (which is the same as the Army Medical Corps' Ambulanceman's Badge and signifies a medical attendant trained to para-medic standard), the IDF Parachutist's Badge, the IDF Marksman's Badge and the Champion Shot of the IDF Badge, the shoulder title worn by members of An Slua Muiri, and the piper's and drummer's badges worn by members of the Naval Service Pipe Band.

Flags

All Irish ships, both naval and merchant, fly the Irish national flag, the green/white/orange tricolour, as the ensign. When in port or at anchor, ships of the INS fly the Naval Jack, a flag of green wool with a yellow harp embroidered in the centre, at the fore between the hours of sunrise and sunset. This flag is also flown at the naval base when a court-martial is sitting.

The FOCNS has a personal flag consisting of a green swallow tail pennant with a yellow star in the centre. This flag is flown whenever the FOCNS is present. A plain green burgee signifies the 'Senior Officer Afloat' when INS ships are sailing in company.

Finally, all ships of the INS have a commissioning pennant of white bunting with a blue canton with a white harp on it. As in the RAN, the length of the pennant varies with the amount of time a ship has been in commission.

Conclusion

Prior to concluding this article, it is useful to draw some comparisons between the Irish Naval Service and the navy of another island nation with a large coastline to protect and police and a small navy drawn from a small population base with which to do it, namely, Australia.

The similarities between the INS and the RAN are quite remarkable. Both are small all-volunteer services, highly professional and operating sophisticated ships and weapon systems. Both are tasked with protecting a large coastline with fleets which, while modern and efficient, are really too small for the task. Both suffer acute manpower problems compounded by relatively small and shrinking recruiting pools, high wastage rates, and the relative unattractiveness of the navy as a way of life, although this latter point is probably more relevant to the INS than the RAN. And both navies serve countries where the profession of arms, while not exactly looked down on, is certainly not as highly regarded as in other countries.

On the other hand, the RAN, unlike the INS, is a true sea-going "blue water" navy with a good mix of up to date surface and sub-surface ships and aircraft with which to carry out its primary task of defending Australia. Unlike the INS, the RAN enjoys the luxury of a number of bases, dedicated sea-going training ships, for both the regular navy and the reserves, and a dedicated naval air arm (of sorts). For all its professionalism, competence and expertise, as well as the relative sophistication of its equipment, the INS cannot really be regarded as anything more than a maritime police force. While the ships of the INS are modern, well maintained and fairly sophisticated, the bulk of the seven ship fleet are really only converted fishing vessels, the only two true warships in the fleet being the two Peacock Class Coastal Patrol Vessels. A glance at the stated roles of the INS listed above will indicate that the Naval Service would in all likelihood be unable to carry out its primary roles, lacking the ships, aircraft, weapons and surveillance assets to be able to offer any sort of a credible defence of the country (this is not to say that they would not try). On the other hand, the service is well equipped to perform the majority of its secondary roles, although the small size of the fleet limits the ability of the Service to adequately patrol Ireland's EEZ and the ships of the fleet are unsuitable for inshore patrolling.

Although the RAN has its problems, it would probably be fair to say that the INS has more or them. Poor recruiting rates, high wastage rates, relatively low rates of pay and relatively poor living conditions, slow promotion (INS officers spend an average of three times as long in rank as their counterparts in the Irish Army), inadequate equipment, inadequate training facilities and low funding are the major ones. To this should be added the restrictions on the employability of the Service's ships mentioned above. To counter these problems, the INS would need to at least double the size of its existing fleet, with an accompanying expansion in personnel and accommodation and facilities. The expansion would have to include a number of purpose built warships, not necessarily large, to augment the converted fishing vessels which currently constitute the bulk of the fleet, as well as considerable expansion of air assets available to the INS. The IDF, the INS and the Irish government would all also have to bend every effort to raising the visibility and the esteem of the Naval Service in the eyes of the Irish people in order to make the Service into a truly national institution, service in which would be attractive and seen as honourable and desirable.

In the end though, despite its many drawbacks, the Irish Naval Service remains an efficient, professional and hard working force, always doing the best it can with what it has. It can safely be said that, like the Australian people with the RAN, the Irish people certainly get their money's worth from the INS.

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