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RESEARCH REPORT

THE INCREASING MARITIME ROLE OF THE U.S. AIR FORCE

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AND

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AIR UNIVERSITY
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MAXWELL AIR FORCE BASE, ALABAMA

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THE INCREASING MARITIME ROLE OF THE U. S. AIR FORCE

by

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EXECUTIVE SUMMARY

TITLE: The Increasing Maritime Role of the U. S. Air Force

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This paper briefly reviews the history of recent Air Force participation in maritime operations and support of the U. S. maritime strategy. It analyses Air Force capabilities in antisurface warfare, mine warfare, antiair warfare, and maritime aerial refueling. Improvements in these capabilities are suggested. The paper concludes that Air Force aircraft have a significant role in U. S. maritime operations. However, JCS force planners and theater commanders must carefully plan how to use these scarce resources to best advantage.

BIOGRAPHICAL SKETCH

Lieutenant Colonel L. Dale Autry is an Air Force test pilot with over 3000 flying hours in a wide variety of aircraft types. He has operational experience with the Strategic Air Command (SAC) as a B-52 aircraft commander and test pilot experience in the B-1A and B-1B developmental and operational test programs. Additionally, he participated in the test programs for the air launched cruise missile, ground launched cruise missile, short range attack missile, and KC-10/KC-135 hose-drogue systems. Lt Col Autry also served on the SAC Headquarters Staff as B-1B Systems Acquisition Manager. A graduate of the Air Force Academy, Air Force Test Pilot School, and Armed Forces Staff College, he holds an MS from Purdue University and is a 1989 graduate of the Air War College.

Commander Donald G. Norton is a Surface Warfare Officer with a career primarily in destroyers. He has served in Operations and Engineering Department billets in USS Cayuga (LST-1186), USS Oldendorf (DD-972), USS Chandler (DDG-996), and as Executive Officer of USS David R. Ray (DD-971). Additional tours of duty include assignment to the CINCPACFLT Propulsion Examining Board and the staff of Commander, Destroyer Squadron Twenty-three, which included experience as an Antisubmarine Warfare Commander Watch Officer in a

deployed carrier battle group. A graduate of Princeton University and the Surface Warfare Officer Department Head School, CDR Norton is a 1989 graduate of the Air War College.

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CHAPTER I

INTRODUCTION

In 1982, the Department of the Air Force and Department of the Navy concluded two memoranda of agreement on the enhancement of the Air Force contribution to maritime operations. These agreements were the latest in a series of attempts to define a logical Air Force maritime role since the Department of Defense was created in 1948. They identified a number of maritime mission areas in which Air Force capabilities could be used, including: anti-air warfare (AAW)/counter-air operations, anti-surface warfare (ASUW), minelaying, and aerial refueling (AR). These memoranda further stated Air Force/Navy agreement to improve cross-training, platform/system interoperability, and joint doctrine, as well as providing joint warfighting concepts for evaluation by the Joint Chiefs of Staff (JCS) and unified commanders.[1]

Using the joint memoranda as a starting point, this paper will examine Air Force and Navy progress in joint maritime cooperation between the conclusion of the Fall, 1982 agreements and December, 1988. A number of research papers written during that time frame have described U. S. and Soviet naval forces in some detail and related how USAF B-52's came to be adapted to carry the Harpoon cruise missile. The discussion which follows will briefly review these factors. Then, however, we will go on to focus on the problems of adapting USAF aircraft designed for other missions to the maritime environment. The fact that these aircraft are capable

of bringing additional sensors, weapons, and aerial refueling capability to sea to augment the U. S. Navy is only a starting point. Their benefit is only realized as joint tactics and operating procedures are developed and practiced, equipment modifications to eliminate problems are implemented, and actual theater warfare contingency plans for the aircraft are developed.

This last point is particularly significant. Although many types of Air Force participation are possible in small-scale conflicts, the time when such assistance is really needed is in event of theater or global conventional war, when both USN and USAF tasking significantly exceeds their resources. This study attempts to identify Air Force assets which, given competing priorities for resources, might reasonably be available for specific maritime tasks during general conventional war. As such it might help stimulate thought among theater warfare planners as they seek to plan future force structures and allocate scarce resources within their contingency plans.

CHAPTER II

THE AIR FORCE AND THE MARITIME STRATEGY

A recent report by the Supreme Allied Commander Atlantic (SACLANT) indicates that he would be about 50% short of the maritime forces he would require to simultaneously conduct his necessary campaigns in a North Atlantic Treaty Organization (NATO) wartime scenario.[2] The realization of the force size needed to implement the maritime strategy (described in Appendix A) has fueled increased interest during this decade in the capability of the U.S. Air Force to support that strategy. Since 1951 the Air Force has had maritime "collateral" missions to use the inherent capabilities of Air Force aircraft procured for other purposes to perform, when required, such missions as antiship, antisubmarine, and mining operations. Since under Department of Defense regulations collateral missions cannot be used to justify force procurement, these maritime missions received little priority in terms of training, weapons, and force availability in times of crisis.[3] By September 1982, however, the need for effective joint use of Air Force assets in the maritime role was stated in clear terms in the "Memorandum of Agreement of Joint USN/USAF Efforts to Enhance USAF Contribution to Maritime Operations" signed by the Chief of Naval Operations and the USAF Chief of Staff. That document states that "the combined assets of the Navy and Marine Corps are insufficient to meet the threat in all areas," and that the goal for the joint effort is "to enhance the total force capability to conduct

maritime operations and, in particular, defense of the SLOCs [sea lines of communication]."[4]

Enhancement of Air Force maritime capability has proceeded at an unprecedented pace since that time. By early 1983 the Air Force had completed a test program for employment of the Harpoon antiship missile from the B-52G. A January 1984 Memorandum of Agreement (MOA) between the Navy and the Air Force established the ground rules for Air Force Harpoon operations. By the end of 1985 the B-52 wings at Loring AFB, Maine, and Andersen AFB, Guam, were fully Harpoon capable.[5] Eventually all 61 of the B-52Gs not equipped for the Air Launched Cruise Missile (ALCM) were modified for Harpoon capability, and in 1988 they were removed from the Single Integrated Operations Plan (SIOP) nuclear role and dedicated to conventional missions in support of theater commanders-in-chief (CINCs). Also in 1988 the Air Force began modification of the F-16 wing at Misawa, Japan, for Harpoon capability and concluded a memorandum of understanding with the Navy concerning air refueling support for Navy operations.[6] At the same time the Joint Chiefs of Staff released JCS Publication 3-04, "Doctrine for Joint Maritime Operations (Air)," in test publication format.

The following chapters will analyze Air Force potential contributions to maritime operations in the areas of ASUW, mine warfare, AAW, and air refueling, considering force availability and resource allocation constraints in the scenarios in which the support would be most needed.

CHAPTER III

ANTISURFACE WARFARE

The ability to detect, localize, identify, and attack surface ships is one of the principal capabilities which any aircraft, Navy or Air Force, must have to be useful in a maritime role. With their standoff range, precision, great destructive power, and high potential for surprise or short reaction time, maritime cruise missiles have become one of the preferred modern weapons for air to surface attack at sea. Much of the discussion of potential Air Force maritime missions has centered on the ability of Air Force aircraft to carry and launch the Harpoon cruise missile. However, successful employment of any cruise missile at sea presents special challenges which are not always fully appreciated. These problems will now be discussed as a prelude to evaluation of Air Force aircraft capabilities in the maritime surface surveillance and attack missions.

Detection

The first problem to be solved in the surface surveillance and attack missions is detection. The oceans present vast areas in which no or few targets will be found; yet they can also provide hundreds of targets in a relatively small area. An obvious conclusion considering the sheer size of the areas to be searched is that the on station endurance of the search platform is an important characteristic. Beyond this endurance, the characteristics of available sensors on the search platform next

affect its potential success in ASUW.

Any aircraft can potentially fly over water and detect targets visually. This method of surveillance has had great value in past warfare and continues to have value today. However, the quality of visual search is easily degraded by night, rain, fog, sea state, and lack of observer training. Night is particularly troublesome due to the effectiveness of deceptive lighting techniques, such as warships altering their lights to resemble merchant shipping. Augmentation systems such as forward-looking infrared (FLIR) are a help. But the proliferation of surface to air missiles at sea has made visual search an increasingly risky business. Even "harmless" cargo or fishing vessels may carry shoulder-fired weapons whose range exceeds the range to which aircrews must approach to make a confident visual identification of a surface craft. To ensure round-trip missions maritime aircraft must increasingly rely on methods other than direct visual observation. The Air Force's current usefulness as simply "extra sets of eyes at sea" is not as great as in the past.

Radar, one of the most commonly used extended range search sensors, must be able to detect and track targets against "clutter" from the sea surface, a problem which becomes more difficult as sea state increases. Similarly, it must be able to distinguish targets close to land or ice, and despite the effects of rain. Radar can also be degraded by a target's use of chaff or electronic countermeasures. In any case, at best it provides little information as to target identity and reveals the presence

of, and perhaps identifies, the search platform to the target. The point is that the mere presence of search radar on an aircraft plus its ability to carry and launch cruise missiles is no guarantee of success.

Synthetic aperture radar (SAR) and inverse synthetic aperture radar (ISAR) are recent equipment advances which offer the possibility of combined standoff detection and identification. These types of radar are currently being introduced into some naval and Air Force aircraft. The APS-137 ISAR is operational as a backfit to P-3C's and is planned for the S-3B and proposed for the A-6E, while SAR is part of the B-1B offensive avionics system.[7] Lack of SAR or ISAR may soon be thought of as a significant disadvantage in maritime aircraft capabilities. Another radar-related item which should be mentioned is identification, friend or foe (IFF). Since receipt of valid IFF responses, including crypto secure mode, from surface contacts may serve to eliminate friendly units from groups of unknowns being evaluated as possible missile targets, good IFF interrogation capability is desirable for maritime patrol aircraft.

Acoustic information is also useful for targeting surface shipping. If underwater acoustical conditions favor long-range sound propagation, detection of broadband noise offers a bearing to a noise source, and hence possible target, at some distance. With narrowband noise analysis and passive target motion analysis techniques and systems developed for locating submarines, surface targets can be located in both bearing and range and identified as

to type. Navy antisubmarine warfare (ASW) aircraft have, in varying degree, the ability to deploy sonobuoys and gather and analyze the acoustic information that they provide. As Air Force aircraft lack this expensive equipment and are unlikely to acquire it to support ASUW alone, lack of acoustic detection capability is and will likely remain a USAF disadvantage in the maritime role.

Electronic support measures (ESM) equipment provides another important source of target detection capability. Here the key question is whether maritime aircraft have the equipment to intercept, position fix, and identify electronic emissions in the frequency bands which surface craft may use. Surveillance and targeting by this method has the advantage of being possible at standoff ranges commensurate with the range capabilities of cruise missiles, and without revealing the presence of the search platform. It has the disadvantage of requiring a "cooperative" target, one which will radiate detectable emissions.

A final source of useful information for maritime search aircraft is theater and national level sensors. A variety of information about actual or potential location of surface targets may be available from area photographic reconnaissance, electronic/communications intercepts, or intelligence sources. To use such information, maritime aircraft crews need tailored support to make it available in near real time both for briefings and during missions. In addition, localized theater information from all sensors may be shared between platforms which have Link 11/Naval Tactical Data System (NTDS) capability.

Identification

Once targets of interest have been detected, they must be identified and localized before an attack can be considered. These steps will often occur simultaneously. For purposes of discussion, we will consider identification first.

We have already mentioned the increasingly hazardous nature of visual identification of surface targets. The best Soviet shipboard surface-to-air missiles (SAMs) now have ranges of up to 75 nautical miles (NM), with ranges on the order of 25 NM being commonly encountered; additionally, Kiev class aircraft carriers could operate AA-8 missile and gun pod armed YAK-36 Forger fighter-bombers up to about 100-200 NM away from the ship (although these aircraft are relatively slow, hampered by poor onboard sensors, and in peacetime seldom stray far from their deck).* In near coastal areas the presence of land-based air cover overhead a Soviet surface group cannot be discounted. Just as A-10's can no longer safely make multiple passes over modern missile-defended battlefield targets, reliance on visual "identification runs" by maritime aircraft is no longer a method of choice.

The lack of identification capability in radar, other than ISAR, was mentioned previously. While the use of associated IFF systems may identify own or Allied forces ships, it will not help sort out hostile from neutral forces, or identify friendly merchant shipping.

Identification by means of ESM may be done covertly at ex-

tended range. However, ESM is by no means foolproof. Unambiguous identification of emitters is not always possible. For example, many commercial surface search radars and naval search/fire control radars have similar characteristics. Electronic deception by surface ships, in which they assume a false electronic "fingerprint," is frequently encountered. Furthermore naval vessels are careful not to radiate warship or class-specific emitters unless absolutely necessary. Intercept of tactical HF/VHF/UHF communications may be helpful, but it requires unusual equipment and aircrew available only in a few specialized aircraft. Finally, even a solid identification on a class or ship-unique emitter carries a position error which may overlap a number of surface radar returns. Triangulation by several platforms with accurate ESM equipment and corroboration by other sensors offer the best solution to these problems.

Acoustic data offers similar challenges to ESM data when used for target identification. In fact, narrowband acoustic data suffers from even more platform identity ambiguity than ESM because of more complex environmental factors. Acoustic data is also processed by less automated means and yields position and identity much more slowly than ESM. As is the case with ESM, acoustic data is also subject to deception techniques.

Theater and national level sensors may be of some use in establishing identity. However, while they may enable a search to be focused in a small area, the position uncertainty of the information is often so great that the identity of specific units within

that area must be determined by other means. Its value is greatest when it can be provided in real time, since the ships being tracked are normally moving at up to 30 NM/hr. In any case, such information shows the presence of target(s) of interest but does not exclude the presence of other units in the same area.

Localization

Even with correct identification, a target must also be localized to an accurate position if it is to be attacked with cruise missiles. Since these weapons normally attack the first valid radar contact detected by the missile radar seeker, regardless of its identity, the positions of the firing platform, the target, and any unintended targets must be known accurately when the missile is launched. If this accuracy is not attained, the missile(s) may miss altogether, attack a low value target, attack neutral or friendly ships, or attack landmass or floating ice.

Localization is a process of reducing the range and bearing errors in the target position as much as possible. All of the sensors discussed under detection and identification have some sort of position error, usually expressible as an ellipse centered on the assumed position of the target. The error in radar positions is usually not great, whereas the error in passive acoustic or ESM positions may be quite large. The best method of reducing position error is to have multiple search platforms and multiple types of sensors holding contact on the target, although single search platform triangulation utilizing running fixes is also possible. The latter technique assumes, however, that the target cooperates

by radiating emitters long enough for a single search platform to get successive fixes along the leg of a triangle. In any case, navigational accuracy on the searching platform(s) is often critical, since target position data received from another source must be plotted based on search platform position. In sum, to be good at localization, maritime aircraft need accurate sensors, accurate navigation, and suitable equipment for voice/data exchange with cooperating search platforms.

Attack

The attack phase of cruise missile employment presents its own set of difficulties. Both accuracy and currency of firing platform, target, and unintended target(s) positions are critical to success. Since the elements in the scenario are moving, old information, even if plotted correctly, may not result in a successful engagement. Allowances must be calculated for environmental factors and entered into the final solution. These factors include anything which will alter the actual flight path of the missile or the performance of its radar seeker, such as wind, air temperature, rain, snow, and sea state. The area which will be swept by the missile radar seeker must be carefully checked to be sure that there is a good chance of its acquiring the intended target and little chance of its acquiring an unintended target. Even the missile flight path is potentially hazardous, as missile cruising altitudes are low enough to permit collision with masts or deckhouse structures on ships which lie along the path to the intended target. In light of the difficulties presented by straight

line flight paths between the launch platform and the target, more capable cruise missiles have "waypoint" features allowing them to be programmed for heading changes along the flight path.

Even if all problems of target identity, unit positions, and missile flight path clearance have been solved, a successful attack still depends on the overcoming of target defensive systems. These defensive measures include chaff, jamming, SAM's, guns, and ship maneuvers. A difficult target such as a Kirov class battle cruiser can bring to bear a quadruple layer of SAM and gun systems plus chaff and jammers. Here is where the advantage of surprise can be great. If the firing platform(s) avoid using active sensors which give away their presence and evade detection by the target's radar, warning time would be reduced. If they attain accurate position information and environmental corrections, missile radar seeker activation could be withheld until late in the flight path, further enhancing surprise without risking a miss. Time for the target to recognize the threat and bring defensive systems to bear would be very short. Jamming of the target search and fire control radars could be employed if surprise is not achieved. Another tool for overcoming target defenses is saturation. If a number of cruise missiles can be placed on top of the target nearly simultaneously, the handling capability of the defensive systems can be overloaded and some of the incoming missiles will get through unopposed. Such multiple arrivals are most effective if launched by several platforms located on different bearings from the target. Finally, some missile systems offer variable maneuvers in the fi-

nal run-in to the target, so that defensive system operators are further challenged by not knowing how each individual missile will behave close in.

The Wrong Target: A Case Study

As an illustration of the overall difficulty of ensuring that a cruise missile hits its intended target, consider an incident which occurred on the Pacific Missile Test Range near Honolulu on 11 December 1988. On that date a U. S. Navy F/A-18 from USS Constellation fired a training version of the Harpoon cruise missile at a target hulk. Unfortunately, despite range surveillance efforts and notice to mariners warning of the danger, a merchant ship strayed into the firing area. The harpoon missile seeker failed to acquire the target hulk and, continuing its search, found and locked on to the SS Jag Vivek. The missile penetrated the merchant vessel's superstructure, and despite having no warhead, killed one crewman.[9]

Harpoon Joins the Air Force

Harpoon is the first tactical cruise missile fielded by the U. S. Navy. It comes in air, surface, and submarine launched versions. The current production model, designated the AGM-84D, has increased range (over 67 NM) compared to the original design, and also features the addition of waypoint capability and selectable terminal maneuvers.[10] In 1980, the USAF bought an initial stockpile of 85 harpoons as part of an ongoing effort to increase maritime capabilities in the B-52 fleet. These weapons had been built for export to Iran.[11] Mid-1970s studies had concluded that

the alternative GBU-15 "smart bomb" had insufficient range when compared to Soviet naval SAM's.[12]

Why did the Air Force develop the capability to employ Harpoon? The answer is that the Navy did not have enough Harpoon capable units for worldwide theater antisurface warfare operations. This was true in spite of the Navy's best efforts to increase in-house Harpoon assets, including the addition of Harpoon capability in the fleet of 380 long range land-based P-3C ASW aircraft. The importance of the P-3C's primary mission of hunting attack and strategic ballistic missile submarines limits the aircraft's availability for the ASUW role. The Air Force can help to make up this shortfall by conducting both independent ASUW and coordinated ASUW in cooperation with Navy ships, aircraft, and submarines.

Having the Air Force provide additional aircraft to conduct ASUW in parts of the operating theaters that the Navy has insufficient units to cover is a straightforward idea. A less obvious concept of equal importance is the desirability of conserving at-sea harpoons by bringing out air launchable versions via land based air. Unclassified studies, such as a 1981 Brookings Institute report, estimate that larger Soviet combatants would require 3 to 6 missiles on target simultaneously to disable them. This equates to attacking with up to 18 missiles to allow for missile attrition by layered ship defenses.[13] If AAW capable escort vessels are added, a mission kill on a well escorted high value unit might require dozens of Harpoons.[14] The large number of missiles

required to successfully engage a well defended target makes the B-52 attractive as a supplementary launch platform working in concert with Harpoon-capable naval ships or aircraft. Since most carrier battle group (CVBG) or battleship battle group (BBBG) ships cannot reload Harpoon launchers at sea, coordinated operations in which B-52's provide some of the Harpoons might become attractive.[13] For example, CVBG/BBBG groups operating in support of NATO would realize an advantage by conserving their limited number of "organic" missiles.[14]

A Comparison of Aircraft Capabilities

We have discussed the advantages of bringing air launched Harpoon to sea via land-based air and have seen that the effective employment of those missiles depends on both the characteristics of the missiles and their firing platforms. At this point it is instructive to compare the capabilities of Air Force aircraft which might be used in the ASUW role with the Navy's principle long range land-based ASUW aircraft, the P-3C. This chapter will conclude with an evaluation of which aircraft are best suited for ASUW and how they should be employed. Consider Table 3-1.

ASUW Capabilities of USAF Aircraft vs USN P-3

		Aircraft Type			
ASUW Characteristics	P-3	B-52	B-1B	F-16C	E-3
Range (NM)	4140	G>6513 H>8685	6475*	>800	3000
* without internal tanks +without drop tanks					
Endurance (hr@ 1346 NM radius)	3	G:8 H:12	6	N/A	4
Aerial refuel	no	yes	yes	yes	yes
Nr harpoon carried	6	12	none*	2+	none
* could be adapted to carry 14 externally +Penguin mod also avail.					
Self defense:					
+air-air radar	no	no	no	yes	yes
+air-air weps	no*	yes	no	yes	no
* Sidewinder mod being tested					
+SEAD capable	no	yes*	no+	yes	no
*max 30 Tacit Rainbow antiradiation drones +disregarding nuc SRAM					
+chaff/flares	no	yes	yes*	yes	no
* also low observable design, 1% radar cross section of B-52					
+ECM vs surf ships	no	good	good	no*	no
* without ECM pods					
Inertial Navigation	yes	yes	yes	yes	yes
Comm equip:					
+UHF radios	2	2	2	1	12

Table 3-1

ASUW Capabilities of USAF Aircraft vs USN P-3, cont.

	Aircraft Type				
ASUW Characteristics	P-3	B-52	B-1B	F-16C	E-3
+VHF radios	1	0	0	1	1
+HF radios	2	1	1	1	3
+Teletypes	1	1	1	0	1
+Satellite comm	0	1	1	0	0
+Submarine comm	yes	no	no	no	no
Air-surface radar:					
+Range (NM)	>150	>150	>150	>80	>200
+At-sea performance	good	fair	good	good	good*
* no surface capability without "austere" or "full" maritime mod					
+SAR/ISAR	yes*	no	yes	no	no
* conversion in progress					
+IFF interrogator	yes	no	no	no	yes
Optics	FLIR	LLLTV+FLIR	no FLIR+LANTIRN		no
NTDS/Link 11	yes	no	no	no	yes
ESM vs surf ships	fair*	good	good	fair	fair
* P-3C update IV with ALR-77 ESM good					
Acoustic equip	yes	no	no	no	no

Table 3-1, cont.

Sources: Gaddie, pp. 8, 12; Grosik et al, pp. 30, 31,35; Cook, pp. 30, 41; Jane's, pp. 350, 369, 391, 414, 469; Harrell, p. 38; AFNS, p.6.

Keeping in mind our earlier discussion of the detection to attack problem, from Table 3-1 we can see that the P-3C's strengths in ASUW include its capabilities in radar, IFF interrogation, NTDS, and acoustic tracking, and its communications compatibility with friendly ships, aircraft, and submarines. Its ASUW weaknesses include shortfalls in ESM, satellite communications (SATCOM), self defense, and aerial refueling, as well as its reduced Harpoon load resulting from tradeoff between the ASUW and ASW mission.[17]

The B-52's strengths include: range, endurance, refueling capability, self defense, suppression of enemy air defense (SEAD) capability, optics, SATCOM, and large number of Harpoons carried. Its weaknesses include radar performance, IFF interrogation, NTDS, acoustics, and communications compatibility with ships and submarines. Several of these points deserve amplification. On the positive side, an individual B-52's SEAD capability, here meant to be capability to suppress naval SAM's with the new Tacit Rainbow system, has been likened to the firepower of over a dozen "Wild Weasel" F-4G aircraft. In addition, the same aircraft's ECM capability is similar to that of an EC-130H "Compass Call" aircraft and an EF-111 EW aircraft combined.[18] On the negative side, the B-52's limited overwater radar performance and communications compatibility problems have been noted in several recent studies, and its Harpoon launch interval has also been said to be too long.[19]

The F-16C has been included in Table 3-1 because of the two squadrons based at Misawa that have been modified to carry Harpoon

as a supplement to naval forces in the surrounding waters. In addition, the Norwegian variant of the F-16C has Penguin missile capability, which could be procured by the USAF if needed.[20] The F-16C's strengths as a maritime platform include its small radar cross section, ability to attack low and fast in groups carrying a mix of weapons and sensor pods, refueling capability, and self defense. Its weaknesses include range, endurance, radar and ESM performance, lack of NTDS and acoustic capability, and the need to choose between weapons, sensor pods, and drop tanks on any single aircraft.

Maritime variant E-3 airborne warning and control (AWACS) aircraft, while not weapons carriers, can be used for maritime surveillance. The aircraft's strengths include endurance, refueling capability, IFF interrogation, extensive communications, and NTDS. Its weaknesses include self defense, ESM, acoustics, and optics.

The B-1B has been included here as "food for thought" for future operations because it might become available on a limited basis once the B-2 is fully deployed. Its advantages in a maritime role would include range, endurance, speed, a large potential weapons load, self defense, SATCOM, and radar, while its disadvantages would include IFF, acoustics, NTDS, and optics. There is logic in the argument that strategic bombers should continue to shift to conventional roles as more modern replacements are fielded as a way of getting full use out of these expensive and very capable airframes.[21]

Based on our analysis of aircraft capabilities, we conclude that P-3's, B-52's, and groups of F-16's are viable individually as maritime antishipping platforms. Support from E-3's and tankers can further enhance this mission, however, because of the high theater and strategic demand for the relatively small number of these aircraft, our primary efforts should lean toward employment plans and tactics which do not depend on AWACS and tanker assistance. We should consider recent proposals to reengine B-52s with engines such as those planned for the C-17 transport which promise decreased dependence on air refueling as a result of increasing B-52 range by up to 70 percent.[22]

Finally, several authors have noted the synergism resultant from combining B-52's and P-3's into ASUW "hunter-killer" teams.[23] For example, the B-52 can compensate for the P-3's smaller harpoon load and self defense deficiencies while the P-3 provides much better detection, identification, and localization capability than the B-52 alone possesses. We agree that this concept should be developed, practiced regularly, and included in the formulation of theater commanders' war plans.

CHAPTER IV

MINE WARFARE

Mine warfare includes both minelaying and mine sweeping. The minelaying aspect is a mission for which Air Force bombing aircraft have a very effective inherent capability. This chapter will consider the potential contributions to the total warfighting capability that can be made by Air Force aircraft in a maritime minelaying role.

Mining can be effectively used for offensive, defensive, and protective purposes. Offensive mining involves placing mines in the enemy's home waters to prevent his naval forces and shipping from moving or to destroy them when they do. Defensive mining involves placing mines in strategic straits and choke points to deny the enemy access to selected bodies of water. Protective mining, also with a defensive purpose, involves placing mines at selected locations in friendly waters to protect harbors and shipping lanes.[24] Mines to accomplish all of these purposes can be placed on the surface, on the bottom, or moored at a fixed depth. A variety of fusing options are available to trigger mines, including acoustic, pressure, seismic, magnetic, and contact devices. Modern sophisticated mines may use a combination of sensors and fusing options, including counters that allow one or more ships to pass before reacting to a subsequent contact.[25] Such mines, when suitably fused and accurately placed, can greatly hinder the enemy's ship and submarine operations through fear, uncertainty,

and actual destruction of his naval assets.

Naval mines can be delivered by surface ships, submarines, or aircraft. Although surface ships have a potentially large capacity for delivering mines, the U.S. Navy has chosen in recent years not to equip its ships for that mission because they lack the desired degree of rapid mobility and are vulnerable to enemy surface, submarine, and air forces in most mining scenarios. Submarines, because of their ability to avoid detection, are very useful for clandestine mining operations in heavily defended enemy waters. Like surface ships, however, submarines lack rapid mobility and the ability to return quickly for weapons reload. Additionally, a significant load of mines displaces torpedoes needed for the submarine's primary mission. Aircraft, on the other hand, have great mobility and capability for rapid reload for subsequent mining or other operations. For that reason the Navy's primary mining assets are P-3s, with their long range and global mobility, and carrier-based attack aircraft, with their ability to deliver mines in areas too heavily defended for P-3 operations.

Air Force long range bombers, such as the B-52 and B-1, have a very effective inherent capability to aid in wartime mining operations. Compared to the P-3, these aircraft have greater range (further extendable by air refueling), payload, speed, and ECM capability, which add up to significantly greater mobility and survivability for mining operations. Additionally, the crews and aircraft of the Air Force bomber force are more specifically trained and equipped than those of the Navy ASW force for the

accurate delivery of large ordnance loads to fixed locations. As a result, the Chief of Staff of the Air Force and the Chief of Naval Operations signed a series of agreements in 1971, 1974, and 1979 to facilitate the delivery of Navy mines by Air Force aircraft, specifically the B-52, as the most effective way to handle many mining contingencies.

The ability to use Air Force aircraft in a mining role is also facilitated by the availability of a variety of mines that fit standard Air Force bomb racks. These include the "destructor" series of mines which are standard 500, 1000, and 2000 pound bombs, which, with specialized fuzes, become the Mark 36, Mark 40, and Mark 41 mines. The similarity between the bomb and mine version of each weapon is such that an aircraft equipped and certified for release of such bombs is able without further testing or modification to carry and release the corresponding mine. As a result, the B-52 can currently employ all of those mines and the B-1 can employ the Mark 36.

A more specialized mine which the B-52 has been adapted to employ is the Captor ASW mine. The Captor is a 2000 pound bottom mine with an encapsulated Mark 46 torpedo programmed to attack submarines.[24] This mine is an excellent weapon for mining points controlling exits from such areas as enemy harbors, the Barents and Baltic seas, the Greenland-Iceland-United Kingdom (GIUK) gap, the Mediterranean Sea, the Sea of Japan, and the Sea of Okhotsk. Inhibiting the passage of Soviet submarines through such areas would contribute immensely to the total ASW effort.

The use of B-52s as mining platforms in an ASW operation is a good example of appropriate and efficient joint use of multipurpose resources to increase the effectiveness of the total force. In recent years some authors have suggested that Air Force aircraft such as the B-52 could assume an active ASW role if equipped with sonobuoys, associated information processing equipment, magnetic anomaly detectors, and Mark 46 ASW torpedoes.[27] In our judgement, however, the extensive aircraft modification and crew training required to make an aircraft like the B-52 effective in the very specialized ASW role would be extremely impractical unless the aircraft and crews were largely dedicated to that mission. On the other hand, the B-52s and crews do possess an inherent capability for mining, without significant modification or specialized crew training, and are more suited to the task than the Navy P-3 force. By using the B-52s for tasks for which they are best suited, the active ASW effort is enhanced by allowing the P-3 aircraft and crews to concentrate on the specialized ASW tasks for which they are best trained and equipped.

In an impending or actual high intensity conflict scenario, we might need to accomplish mining operations early, quickly, and at widely dispersed locations. The range, payload, and speed of long range bombers makes them ideally suited for the task. However, the demand for SAC's B-1 and ALCM capable B-52 bombers for SIOP nuclear alert in such a situation would most likely leave only SAC's dedicated conventional force of 61 B-52s available for conventional missions. These aircraft, which are not currently

assigned to theater CINCs might be split between primary and secondary theaters of operations, and within each theater would be called upon to perform both maritime and land attack operations. Possible missions in addition to mining include sea surveillance, harpoon employment against surface ships, attacks on enemy airfields, and short notice attacks on massed enemy ground forces. This valuable but small bomber force would therefore have to be carefully managed to perform missions sequentially and on a priority basis, with careful consideration of attrition risk when determining priorities and order of execution.

CHAPTER V

ANTIAIR WARFARE

The Need

The Navy's antiair warfare mission includes, according to the JMO(AIR) doctrine, "actions to destroy or reduce to an acceptable level the enemy air and missile threat...both before and after launch."[28] The importance of this mission is growing with the increasing threat posed by Soviet land based naval aviation. This threat forces a large portion of the air wings aboard U.S. aircraft carriers to be devoted to the AAW mission in defense of the fleet. The Navy's four battleship battle groups have no organic fixed wing aircraft and are currently dependent upon shore-based air for AAW support. The Air Force capability to contribute to the maritime AAW mission is primarily in the areas of fighter support, early warning, and direct attacks on Soviet naval aviation bases.

Fighter Support

According to a recent Tactical Air Command (TAC) paper, antiair warfare is the one maritime mission for which the tactical air forces are best prepared.[29] The extensive training and equipment of F-15, F-16, and F-4 units for the Air Force defensive counter air (DCA) mission is directly applicable to the AAW mission. These fighters have the capability to employ all the air-to-air weapons used by the Navy except the long range Phoenix

missile system on the F-14. They have very good ability to conduct intercepts using their own radars as well as extensive training to work under the control of ground-based or airborne tracking systems. Such aircraft are based near many maritime choke points throughout the globe, are all air refuelable by Air Force tankers, and if available could provide a valuable addition to fleet air defense or air cover for amphibious operations.

Early Warning

The USAF E-3A Airborne Warning and Control (AWACS) aircraft is much larger than the Navy's E-2C carrier-based early warning aircraft. The E-3A's range and endurance range can be extended by air refueling. It has an extremely capable long-range radar tied to an extensive electronic counter-counter-measures (ECCM) and communications capability. E-3A crews train extensively with U.S. Tactical Air Command and NATO fighter crews in the air defense intercept mission. There is tremendous potential for enhancing fleet air defense when the E-3A is effectively integrated into a joint surveillance, warning, and control system.[30] The great capability of the E-3A, however, makes it a valuable and scarce resource needed in many theaters, and it would therefore be available for a general war maritime role most likely on a selective short term basis only.

Attacking the Source

Rather than just remaining constantly alert for the time at which the enemy chooses to launch a massive coordinated air attack, the air defense of the fleet is better served by attacking

Soviet naval aviation bases to destroy aircraft on the ground and degrade their sortie generation capability. The long range of Soviet land-based aircraft puts CVBGs well within enemy range before carrier-based aircraft can launch an effective strike against their bases. Submarines could move in close enough to strike some bases with sea-launched cruise missiles such as the Tomahawk, but this mission would divert attack submarines from their primary duty of hunting Soviet subs. Furthermore, a large enough load of conventional cruise missiles to make an effective strike would displace much of an attack submarine's torpedo load. This is especially true considering that frequent repeat strikes would likely be required to keep a base degraded, and that submarines do not have the luxury of being able to return to base quickly and at will to replenish or change weapons loads.

An attractive alternative is to use long-range Air Force bombers such as the B-52 to attack the Soviet bases. Such bases would certainly be heavily defended, but current development of standoff weapons is greatly increasing the conventional ground-attack capability and survivability of Air Force bombers. One example is the Tacit Rainbow anti-radar missile recently test fired from a B-52 internal rotary launcher. This weapon is designed to precede strike aircraft, loiter over threat sites, and attack enemy radars when they radiate.[31] Another is the proposed conventional cruise missile (CCM) described in a statement of need (SON) recently submitted by SAC. This weapon would have a 1000-2000 mile range (compared to a conventional Tomahawk range of

600-700 miles) and could be armed with submunition packages combining runway cratering weapons with antipersonnel area denial mines.[32]

These enhanced conventional capabilities, however, also increase the value of the B-52 conventional force in other missions such as follow-on forces attack (FOFA) in the land campaign. The versatility of this bomber force and the large number of missions it would be called upon to perform in a wartime scenario demands an effective system for prioritizing missions, sequential use on a variety of tasks, and careful consideration of attrition risks when choosing the order in which missions are to be performed. Standoff weapon development and procurement is essential to the capability and conservation of this valuable resource.

CHAPTER VI

AERIAL REFUELING

Another mission area where Air Force assets have a tremendous potential for enhancing maritime operations is that of aerial refueling support by land-based tanker aircraft. This potential and the need for it have increased in recent years because of the evolution of Air Force and Navy aircraft types and capabilities.

The Air Force's fleet of over 600 KC-135 tankers is equipped with the flying boom aerial refueling system compatible with most Air Force aircraft. To refuel most Navy aircraft, which use the hose and drogue system, the KC-135 must have a hose and drogue adaptor installed on the end of the boom before takeoff, making it capable of only hose and drogue refueling on that mission. A permanent hose and drogue system for the KC-135, to be installed in addition to the current boom system, has been tested but not procured.

In contrast, the Air Force's newer fleet of 59 KC-10 tankers is equipped with both a boom and a hose and drogue system on each aircraft, allowing a KC-10 to refuel any aerial refueling capable Air Force or Navy aircraft without reconfiguration before takeoff and to refuel both types on a single mission. This capability was enhanced by the July 1986 decision by the Defense Resources Board to modify the KC-10s to enable them to assume a three-drogue configuration by carrying two wing-mounted hose and drogue pods. That decision included authorization for purchase of 40 sets of

pods.[33] Since that time, however, only 20 aircraft have been modified and 15 sets of pods purchased because of budget considerations.

Aerial Refueling at Sea

The need for aerial refueling support has increased for the Navy as it has procured the F/A-18 aircraft. That aircraft has greatly enhanced carrier air wing flexibility because of its dual role (fighter/attack) capability. The penalty, however, is that the F/A-18 has shorter range and endurance than previous attack aircraft. Additionally, the F/A-18 does not have the "buddy store" (external hose-drogue pod) tanker capability of the A-7 that it is replacing. This has caused the increased use of the A-6 attack aircraft in the buddy store tanker role, to the point where on some cruises a majority of A-6 sorties are for aerial refueling support of other aircraft.[34] The Navy is procuring buddy store systems for the S-3 ASW aircraft, but this solution will divert S-3s from their primary ASW and ASUW roles.

The employment of land-based tankers to support carrier air operations can enhance the firepower, reaction time, security, and flexibility of a naval force through a variety of means. Simply releasing attack aircraft from the tanker role may make more aircraft available for attack missions. The larger offload capability of land-based tanker aircraft and their greater flexibility in distance of aerial refueling areas from aircraft carriers allows naval air strikes from greater distances. This enhances the security of the carrier battle group and the strike force through

increased surprise and standoff distance. It also decreases the time required for a carrier to reach a position from which a strike can be launched.

Security of the fleet and firepower of the strike force is further enhanced if land-based tankers refuel the fleet's combat air patrol (CAP) aircraft, releasing A-6s for the attack role while extending the radius and endurance of the air defense perimeter. Through use of tanking in conjunction with AWACS support, the Air Force can also create an umbrella of land based CAP to protect surface forces which lack carrier air, such as BBBG's. The ability of the KC-10 to refuel both Air Force and Navy aircraft on one sortie adds great flexibility in aerial refueling support of joint operations where Air Force strike, air defense, or surveillance aircraft are used in conjunction with Navy aircraft.[35]

Tanker Support for General War: Limited Options

The fact is, however, that the Air Force tanker fleet is an extremely valuable resource in support of a variety of missions with total needs that exceed the capability of that fleet in a general war situation. When the Strategic Air Command (SAC) bomber force is generated to a full scale alert status, which could be expected in any such crisis, a large majority of the tanker force is required for alert in support of the Single Integrated Operations Plan (SIOP). In fact, the capability of that bomber force is in one respect currently limited by tanker force capability because of the fact that if more tankers were available to support the SIOP, the bomber force would be capable of carrying

a larger number of strategic nuclear weapons. In addition, the shortfall in airlift required to deploy U.S. forces overseas at a desired rate in time of war is widely recognized. A primary function of the KC-10 fleet is to refuel deploying tactical fighters while transporting fighter wing support equipment and personnel. Furthermore, now that all the intertheater transports of the Military Airlift Command (MAC) have aerial refueling capability, any available tankers could be used to enhance the airlift effort.

The Navy, therefore, has a very understandable concern that in time of general war or serious crisis the Air Force tanker force will be unavailable for support of maritime operations. For that reason the Navy in 1985 included a request for its own fleet of four land-based tankers in its FY 87 Program Objective Memorandum (POM). That request was eventually denied by the Senate Armed Services Committee, but the Navy continued to hold out for its own tanker fleet while refusing to sign an Air Force generated draft MOA concerning Air Force tanker support for naval operations. Under pressure from Congress the Navy has now signed an air refueling memorandum of understanding (MOU) with the Air Force, but a very significant statement in that MOU is that "In the event of DEFCON 3, or as directed by the JCS, SAC may be required to terminate air refueling support."[36]

The Navy must therefore retain and improve an organic air refueling capability in its carrier air wings, both for flexibility and because of the possibility that land-based tanker support will not be available. This capability should, however, be prima-

rily in the form of dual purpose aircraft able to participate as combat aircraft when air refueling is not needed or when land-based tankers are available to meet the requirement. Meanwhile, the potential for land-based tankers to enhance naval combat capability is so great and the competing demands for those tankers are so numerous that the Air Force should use maritime air refueling needs as justification for increasing the size of the tanker force.

CHAPTER VII

CONCLUSIONS

It is clear that a variety of Air Force assets, including bombers, tankers, fighters, and early warning aircraft, have a significant inherent capability to augment the U.S. Navy in the areas of ASUW, mining, AAW, and AR. Additionally, Air Force assets can indirectly enhance Navy capabilities for strike and ASW operations by releasing Navy assets to concentrate on those missions. However, in some situations where the Navy would need help, such as in an actual or impending worldwide conventional war, the Air Force's limited assets are likely to be least available for a maritime role because of heavy tasking to support the conventional land campaign and a high state of SIOP nuclear alert. In implementing a global strategy, these very mobile and capable Air Force assets will have great value in many places for a variety of missions, but planning to effectively use such capability is hindered by the uncertainty over force availability when most needed.

The key to effective use of such limited numbers of highly capable multi-mission forces lies in an effective scheme of force allocation. Over two decades ago General William Momyer stated that because "the full effects of airpower can only be achieved when it is centrally controlled and directed...there must be a command structure to control the assigned airpower coherently and consistently and to assure that the airpower is not frittered away

by dividing it among army and navy commands."[37] The need for effective centralized command and control is even greater today as the numbers of such aircraft as tankers and bombers available for conventional missions are too small to permanently chop an effective force to each theater CINC. We are therefore in a situation with today's force size where in a global conflict we would require rapid JCS level decisions to prioritize needs and move these forces among theater CINCs to most effectively accomplish the goals of the total war effort. Each CINC, in turn, must prioritize and sequence the accomplishment of missions within his theater of operations, with attrition risk being a significant consideration in setting these priorities.

For the CINCs to effectively plan for the use of these resources, they must have a realistic appraisal of their availability when needed. This appraisal must consider the total global situation likely to exist during any contingency involving maritime operations against Soviet forces. In such a situation, force availability may depend upon willingness to do such things as providing CINCPAC with a B-52 force for one or two days of mining operations before shifting that force to CINCLANT for ASUW operations, or temporarily degrading SIOP alert capability to provide tanker support for long range naval air strikes. These issues must be addressed as the CINCs' war plans are examined to ensure that force availability conflicts are resolved and that the plans make the best joint use of forces realistically available. We believe that there is ample justification for conversion of ad-

ditional B-52s to strictly conventional use, so that the JCS have a larger "swing" force to assign to theater commanders for specific maritime and land campaign support missions.

As productive use of Air Force assets is incorporated into maritime contingency plans, we must continue the progress that is being made in equipping and training for those missions. The adaptation of the Harpoon missile to the B-52 and F-16 constitute a quantum leap in Air Force maritime capability. We must, however, ensure that plans to use that capability are supported by adequate stocks of missiles available to tasked units. Also, effective use of that capability against heavily defended Soviet surface combatants requires such further improvements as reducing the B-52 Harpoon launch interval to facilitate saturation of enemy point defenses. We should also consider adapting other standoff weapons to the Air Force maritime role, such as Tacit Rainbow and HARM anti-radiation missiles for suppression of enemy ship defenses. Additionally, weapons such as a conventional cruise missiles could be essential to making the B-52 viable for airfield attacks in support of either land or maritime campaigns.

Furthermore, continued joint Air Force and Navy exercises should continue to test concepts, train crews, and uncover any interoperability problems or potential enhancements. The best ways to communicate and coordinate, such as compatible secure radios or data link, should be determined and procured for all aircraft which might be used in such joint operations. Results of exercises should also be used to estimate the potential gain in

capability from such enhancements as an improved B-52 radar or equipping more Air Force tankers with hose/drogue refueling pods so that such possibilities can be intelligently weighed against the costs.

Perhaps the most critical and far-reaching decisions that must be made concerning the future maritime role of the Air Force concern force planning and procurement in these times of tight budgets. When procurement of a new Air Force aircraft is considered, the possible use of it or the aircraft it replaces in a maritime role should be a significant consideration. Likewise, decisions on whether to retire, retain, or modernize aircraft such as the B-52 should consider the value of these aircraft as options in meeting the requirements of the maritime strategy. These decisions may even require consideration of trade-offs between services, such as weighing the cost and capability of an additional carrier battle group against that of the retention of a portion of the B-52 force. The services must put off parochial concerns to examine such options honestly with the goal being the most cost effective warfighting capability for the nation as a whole. If we as military professionals fail to make such decisions, the Congress will make them for us. General John Vessey stated the goal well when he defined joint operations as "when the unique combat capabilities of two or more services come together to make the whole greater than the sum of the parts in order to kick the tar out of the enemies of the United States."[38]

APPENDIX A

THE MARITIME STRATEGY

The essence of the current U.S. maritime strategy is found in the word "global." The global nature of U.S. economic and political interests results in the need for a global military capability. The U.S. dependence upon worldwide sources of raw materials and the national military strategy requiring the ability to transport large forces to worldwide locations results in the need for the means to protect and control sea lines of communication (SLOCs) all over the world. The strategy behind the U.S. Navy's current procurement program requires the ability to meet those needs on a global scale by shows of force, power projection, or worldwide combat while countering the growing global capability of the Soviet navy.

The Importance of SLOCs

The United States has been referred to as an "island nation" because of its need for the vital sea lines of communication across the vast oceans that separate it from most of the rest of the world. This nation depends upon these lifelines to sources of such essential raw materials as oil and a variety of minerals. These lines are essential to an economy that is part of an increasingly interdependent world economy with growing reliance upon international trade and multinational commercial enterprises. The United States also has worldwide political interests which are just as dependent as economic interests upon secure lines of communication free from the threat or perception that they could be

cut by any foreign power.[39] The current U. S. naval operations in the Persian Gulf are only one example of how U.S. worldwide economic and political interests require the capability to secure SLOCs at the most extreme distances from U.S. shores.

The continuing reality of military threats to U.S. national interests throughout the world further emphasizes the importance of SLOCs to U.S. national security. A majority of likely trouble spots are found much closer to the Soviet Union than to the United States. Budgetary and political considerations do not allow the United States and its allies to maintain and forward base large enough military forces to meet contingencies without long-range transport of considerable reinforcements. A prime example would be the defense of NATO against a Warsaw Pact invasion. An immediate flow of huge amounts of materiel across the Atlantic, 95 percent by ship, would be required to succeed in such a conflict.[40] The importance of SLOCs to the national security of the United States and its allies is a fact well understood by Soviet leaders, as evidenced by Sergei G. Gorshkov, Admiral of the Fleet of the Soviet Union, when he said that "the disruption of the ocean lines of communication, the special arteries feeding the military and economic potentials of these countries, has continued to be one of the most important of the Navy's missions."[41]

The Soviet Threat

Such statements of Soviet intent to pose a threat to sea lines of communication are backed up by the growth in Soviet naval forces. Since World War II, and especially rapidly during the

last two decades, that navy has grown from what was a coastal defense force to a blue-water navy with increasingly global and offensive capability. New classes of surface ships include Moskva-class helicopter cruisers, Kiev-class aircraft carriers with Yak-36 Forger vertical/short takeoff and landing (VSTOL) aircraft, and Kirov-class guided missile cruisers. All of these ships are heavily armed with a variety of rapid fire guns, torpedoes, anti-ship missiles, antiaircraft missiles, and anti-submarine rockets. In addition, the Soviets are building new full size aircraft carriers which may have conventional takeoff and landing capability.[42]

Meanwhile, the Soviets have continued to expand and improve their submarine and naval aviation forces, which continue to be the greatest threat to U.S. commercial shipping and naval forces. The Soviet navy today has substantially more submarines than any navy in history, with a capability vastly superior to that of the German submarines which wreaked havoc upon transatlantic shipping in the early years of World War II.[43] Their array of attack submarines (SSNs) includes both very quiet diesel-electric powered submarines which have become increasingly difficult to detect and track, and nuclear powered submarines with global range and very long underwater endurance. The attack submarines are armed with a variety of weapons including torpedoes, mines, rocket-propelled antisubmarine weapons, and both long and short range cruise missiles for antiship and land attack purposes. Equally significant advances in Soviet ballistic missile submarines (SSBNs) have led

to their latest class, the Typhoon, with a titanium hull much larger than any submarine ever built and carrying twenty sea-launched ballistic missiles that can reach U.S. targets from waters near the Soviet Union.[44]

The Soviets continue to expand and modernize the land-based naval aviation forces upon which they depend for support of maritime operations. These forces include the long range Bear-D surveillance and targeting aircraft and Bear-F and May antisubmarine aircraft. The older Badger bombers, carrying an evolutionary variety of antiship missiles, are being augmented and replaced by the modern swing-wing Backfire bomber armed with the Kitchen antiship missile which has supersonic speed and more than 150 mile range.[45]

With these very capable surface ships, submarines, and air craft, the Soviets have developed the hardware for a formidable maritime warfighting capability. Their frequent deployments to worldwide locations, using their bases in such far-flung strategic locations as South Yemen, Vietnam, and Cuba, give them a significant capability to threaten U.S. political, economic, and military interests in both peace and war if not countered by U.S. forces capable of implementing an effective maritime strategy.

Today's Maritime Strategy

The last decade has been a time of renewed strategic thinking within the U.S. Navy, with a focus on the development of a coherent maritime strategy for the nation. As it has developed, that strategy is a flexible and adaptable concept that supports the na-

tional strategy of deterrence, alliance solidarity, and forward defense. To meet those ends the maritime strategy, with the forces to implement it, must be effective throughout the spectrum of conflict, from peacetime presence and crisis response through global warfare.

Peacetime Presence and Crisis Response

The global nature of the maritime strategy is most apparent in its recognition of the need to maintain a continuing and simultaneous military presence in areas of U.S. national interests throughout the world. Naval forces are ideally suited for such a mission because of their mobility, independence of foreign basing, and visibility that can be quickly increased or decreased by movement into or out of trouble spots. Such forward based forces are quickly available for shows of force or military action in crisis situations. They have proven extremely useful, and often essential, in such contingency operations as rescue of U.S. citizens, terrorist apprehension, punitive strikes, blockades, quarantines, and protection of shipping.[46]

The primary forces to implement this strategy are the Navy's carrier battle groups (CVBGs) built around each of the current fifteen large-deck aircraft carriers, now augmented by four battleship battle groups (BBBGs) built around four recommissioned and modernized World War II battleships. The Navy's goal of maintaining this number of battle groups is driven to a large extent by the peacetime presence and crisis response aspect of the maritime strategy. This number allows sufficient deployed forces

to meet commitments and contingencies (at least four CVBG's deployed at all times), while limiting deployments to six months and allowing reasonable time for ships and crews in home ports.[47]

Global Warfare

The other aspect of the maritime strategy which drives force requirements is that it calls for maintaining global deployments and operations through all phases of a general war situation. If a crisis were to escalate toward war with Soviet Union, the continued forward deployment of naval forces in all areas, as they are reinforced as rapidly as possible by forces normally in home ports, would send important signals to both friends and enemies. Allied solidarity is enhanced when the strategy does not include abandoning friends in any theater, which is the essence and reason for the strategy of forward defense. Deterrence is enhanced when the enemy sees that he cannot limit the theaters of conflict to those he chooses.[48]

If deterrence fails, the forward worldwide deployment of forces increases the opportunity to seize the initiative and fight the war on terms more favorable to the United States and its allies. The strategy is not tied to specific campaign plans, but is a flexible framework for prudent use of forces as opportunities and needs arise in all theaters. If war broke out in central Europe, for instance, Allied naval forces would be in position to bottle up, hunt, and attack soviet surface, submarine, and naval aviation forces as far forward in the North Atlantic and Mediterranean areas as possible, making the primary concern of those So-

viet forces the defense of themselves and their bases, including defense of their SSBN force. Such prosecution of Soviet forces would greatly limit their freedom to cut the SLOCs essential for reinforcement of central Europe and northern Norway. If successful in eliminating the Soviet maritime threat, Allied naval forces could turn increased attention to supporting the central European battle, especially on the northern and southern flanks, through air and amphibious operations. Meanwhile, the maritime forces in other theaters, such as the Far East, would likewise be forcing Soviet maritime forces into a defensive posture, tying down large Soviet forces that could be used in Europe, forcing them to defend the many areas threatened by the U.S. Pacific Fleet. Soviet forces would be denied the freedom to seize areas or bases in such areas as the lightly defended North Pacific, while U.S. maritime forces could strike in places of our choosing. Such global pressure on the Soviet Union, with such unpleasant developments as the progressive loss of a large portion of its SSBN force, would be of great value in controlling escalation and convincing them that ending the war is in their interest.[49]

A common criticism of the Navy's force structure for implementing the maritime strategy in a general war situation is voiced by Norman Friedman of the Brookings Institute. He argues that CVBG's are designed only for power projection ashore and protecting themselves enroute.[50] This represents a somewhat extreme view given the large amount of hardware and training in CVBG's which is devoted to long range Tomahawk targeting against sea surface

targets, employment of Harpoon by surface action groups (SAGs) detached from the CV's escorts, and "war at sea strikes" against distant ships by CV strike packages employing Harpoon and standoff munitions. In addition, with recent great advances in ASW aircraft and shipboard sonars and towed passive detection arrays it can hardly be argued that CVBG's are unprepared to actively seek out and destroy submarines if called for. However, in a medium to high intensity conflict scenario there would be massive coordinated opposition, including large numbers of land-based maritime strike aircraft and attack submarines, in some areas. In such cases CVBGs would be viable only when combined (usually in groups of three) to mass sufficient defensive AAW and ASW capability concurrently with effective strike capability. Obviously, joining the forces available into such groups makes global CVBG coverage increasingly difficult. We simply do not have enough CVBG's to mass naval power everywhere it is needed.

The Maritime Strategy, Soviet Style

To round out the discussion of the maritime strategy and possible theater missions for Air Force maritime aircraft, consider a recent Naval War College Review article which proposed some interesting variations on the scenario assumed by the maritime strategy. In brief, it proposed the feasibility of alternate employment for Soviet diesel and nuclear attack submarines and the use of Soviet maritime lift capabilities to mount an attack into northern Alaska and Canada.[5] These Soviet versions of "forward defense" and "carrying the fight to the enemy" would create even greater

need for maritime aircraft such as the B-52.

In proposing a different type of attack submarine employment, authors Egar and Orr hypothesize the use of some 1700 Soviet research and fishing vessels, all ice-strengthened and many capable of mounting sonars, depth charges, towed passive acoustic arrays, light AA guns, SAM's, and even Helix and Hormone ASW/AAW helos, in northern waters to protect their SSBN bastions. Such a fleet could harry U. S. SSN's and make life very difficult for undefended, low and slow P-3's. Their sheer numbers and nondescript appearance would pose a daunting task to ASUW forces trying to remove them. The payoff from this possible tactic would be the immediate release of Soviet attack submarines from bastion defense and their reemployment in attacking CVBG's and convoys throughout the Atlantic SLOC's. In addition, their SSN's could deploy along the U. S. east coast for attacks with conventional SS-N-21 cruise missiles.[52]

The Soviet capability to mount an invasion of North America centers on a capability to move an estimated forty heavy divisions in icebreaking or ice strengthened merchant shipping within arctic waters. Escort could be provided by ice strengthened naval vessels and icebreaking vessels modified to operate helicopters and jump jets. Cold weather capable air cushion vehicles and overland movement equipment developed for use in Siberia could make landing in the Prudhoe Bay/Mackenzie River Delta areas followed by movement to seize the strategic north slope and central Canadian oil and gas fields a possibility. The confusion and disruption value of

such a mission on the resource flow to Europe would be high. Use of tactical nuclear weapons over friendly territory and given prevailing southerly winds is not a likely defensive option. Perhaps we would have to trade North America for Western Europe in negotiations.[53]

Both the attack submarine redeployment and arctic invasion possibilities would press even harder on our naval forces. Granted, the truly extreme cold weather and difficult terrain often found in the far north and the superior ASW abilities attributed to the latest U. S. SSN's provide counter arguments to the feasibility of these proposals, as does the improvement in North American approach surveillance represented by new systems like the OTH-B backscatter over the horizon radar and North Warning System described by Air Force Magazine.[54] However, if some credibility is allowed to these interesting ideas, it is clear that given the ranges involved and problems of weather and sea ice, additional long range aircraft capable of carrying out maritime missions would be needed to implement a counter-strategy.

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