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Because of uncertainties regarding their survivability outside of the anti-air umbrella of a battle group, Knox-class frigates are usually thought to be best employed only in an antisubmarine role in support of a battle group in a major theater of operations. A different, offensively oriented sea denial concept for their employment is offered here.

THE KNOX (FF-1052)-CLASS FRIGATE IN AN INDEPENDENT SURFACE ACTION GROUP ROLE: FF-1052 WOLFPACK

by

Lieutenant Commander James W. Speer, U.S. Navy

Background. The 1960s marked the beginning of the U.S. Navy's "High-Low" concept—a concept that is as controversial today as it was then; a concept that, since its conception, has been a pervasive issue in all Navy modernization and procurement programs. For those unfamiliar with the term, the High-Low concept was best described by former Chief of Naval Operations, Adm. Elmo Zumwalt:

... "High" was short for high performance ships and weapons that also were so high-cost that the country could afford to build only a few of them at a time . . . "Low" was short for moderate cost, moderate performance ships and systems that could be turned out in relatively large numbers; they could ensure that the navy could be in enough places at the same time to get its job done.¹

Credit for the High-Low concept has been attributed to Robert McNamara, President Kennedy's Secretary of Defense, and his systems analysis approach to defense spending;² and credit has been claimed by Admiral Zumwalt who states that he first advanced the concept in an article, "A Course for Destroyers," published in 1962 in the U.S. Naval Institute *Proceedings*.³ In that article, then Captain Zumwalt stated:

... the destroyer escort perhaps will be of greatest significance to cold and limited war operations of the future. This ship will probably be a standardized version throughout the navies of the Atlantic Community. It will contain minimal competence in all weapon systems except for ASW in which it will be superior—using the same equipment as provided to the

larger types. It will have a top speed of 23 knots and long range capability. It will likely be the work horse for escort of convoys, but will also have a capability in barrier patrol, short range gunfire support with conventional guns, and escort of the slower amphibious force. (This sacrifice of speed for economic consideration will probably be justified by the long range detection and kill capability of such ships and by the need of the faster enemy subs to come to the barrier or convoy being guarded.)⁴

The phrases "standardized version," "minimal competence," and "economic considerations" used by Zumwalt were key issues for the proponents of the "Low" end of the High-Low concept—more ships for the money.

The *Knox* (FF-1052)-class frigate, authorized for production in the mid-60s, was a major breakthrough for the Low advocates.⁵ The proponents of the High end of the concept, however, did not stand idly by. Within the Navy, controversy raged and sides were taken, and the *Knox*-class frigate was often the target for much of the discord. The High position is satisfactorily stated in the following excerpt from an article appearing in the U.S. Naval Institute *Proceedings* in May 1971:

... In pursuit of an impossible goal, we have championed the building of an entire class of ships thus dedicated and, in a uniquely unhappy mixture of strategic and technological shortsightedness, coupled with political maneuvering to bring more hulls into being, we have wrought the 1052-class of DEs, the greatest mistake in ship procurement the U.S. Navy has known. In seeking to justify their primary ASW role we have built sonars whose size has been the fundamental determinant of many of the ship's characteristics and, in vainly trying for longer detection

ranges, we have given up irrecoverable features of simpler, less costly sonars, to get one whose very operations is tactically self-defeating. The 1052s cannot compete in the threatening environment of today; they cannot defend *themselves*, let alone provide protection for others. Their engineering plants are unreliable and their single screw provides neither the speed for ASW nor the redundancy that a worthy warship must possess. Unable to fulfill the ASW mission, their single gun barrel is evidence of their slighted ability to perform the many valid general purpose missions which destroyer types customarily fill and which, with the decommissionings of older and more versatile types, can no longer be filled today. In yet another sense they represent our continuing fascination with electronics of which we are so strangely proud and ever willing to place aboard at the cost of intrinsic fighting capability. Let no one demur that this present perspective is one of hindsight. Not so. We forged ahead with the 1052s against the evidence of storm flags clearly visible years ago⁶

Thus the stage was set. Between April 1969 and November 1974, 46 *Knox* (1052)-class frigates were commissioned by the U.S. Navy.⁷ Historically important?—Yes! Not only were the *Knox*-class frigates tangible proof that the Low end of the force mix was a reality—they were, altogether, the largest group of destroyer or frigate type warships built to the same design since World War II.⁸ According to Zumwalt, they weren't stars, but they performed adequately.⁹

Unfortunately, adequate performance is not a true testimony to the role the *Knox*-class frigates played in U.S. naval operations during the 70s. Their individual performance may not have been stellar; their inherent capabilities

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minimal and lacking redundancy; but, they went to sea and carried out their assigned missions—repeatedly. They became the workhorse of the Navy's destroyer fleet. By the end of the 70s they were the U.S. Navy's primary surface escort.

Mission and Capabilities. The mission of the FF-1052 class fleet frigate is to conduct prompt and sustained combat operations at sea, worldwide, in support of national interests. It contributes to accomplishing the functions of sea control, with its lesser included function of sea denial, and projection of naval power from those sea areas under United States control. It is capable of this accomplishment as an element of an amphibious group, underway replenishment group (URG), or convoy.

The FF-1052 class is armed with a modern antisubmarine warfare suite, surface-to-surface missiles, and a 5" gun. It has a seabased aviation capability. Operating with an amphibious group, convoy, or URG, it will be capable of destroying hostile air, missile, surface, and submarine platforms which could constitute a threat to U.S. or friendly forces operating in selected maritime areas. It is among the highest capable ships in the fundamental warfare task of antisubmarine warfare, has substantial antisurface ship warfare capability, and will have lesser but significant capability in the task of anti-air warfare in the mid-1980's. It can provide limited NGFS if required. It is capable, in concert with other forces, of defeating simultaneous coordinated attacks by air, surface, and submarine threats in medium-to-low threat hostile environments generated by projected enemy forces in the open

ocean. It is not capable of power projection per se; rather it contributes to this function through the protection it provides to amphibious forces.¹⁰

The preceding mission statement clearly sets forth current, accepted, *Knox*-class frigate platform capabilities and traditional platform roles. Before examining a future, potentially major role of the FF-1052-class frigate, one that is well within its capabilities but not currently used tactically, a look at the FF-1052 platform and its inherent systems capabilities will be helpful.

Vital Statistics

Displacement	3,011 tons
Length	438 feet
Beam	46 3/4 feet
Draft	24 3/4 feet
Propulsion	1 shaft 35,000 HP
Range	4500 nm @ 20 kts
Speed	27 + kts sustained

Weapon systems include the Light Airborne Multipurpose System (LAMPS) helicopter, Basic Point Defense Missile System (BPDMS), anti-submarine rocket (ASROC), torpedoes, and 5"/54 gun.¹¹

LAMPS. This ship-based antisubmarine (ASW) helicopter is equipped with surface search radar, magnetic anomaly detection (MAD) equipment and sonobuoys. It has a range of 420 miles, a ceiling of 22,500 feet and is capable of carrying a weapon payload of two MK-46 ASW torpedoes. It is primarily used as a quick reaction vehicle for standoff localization and attack of submarine contacts generated by the ship's sonar system.¹²

Sonar. The SQS-26 is standard sonar equipment for *Knox*-class frigates. This high-powered, long-range sonar is hull mounted, operates in passive and active modes, and is the primary means of detecting, tracking and classifying underwater targets. The system, in the active mode, is capable of surface, bottom

bounce, and convergence zone modes of operation.¹³ Additionally, numerous FF-1052 units are equipped with SQS-35 Independent Variable Depth Sonar (IVDS). This system, towed astern of the unit, is designed for medium-range detection of submarines in water depths ranging from deep to shallow.¹⁴ The SQS-26 and SQS-35 IVDS sonars proved to be deficient in passive detection and classification capabilities against surface and subsurface targets. To remedy this deficiency, the SQR-18 Tactical Towed Array Sonar (TACTAS) was designed as an interim "fix." TACTAS is designed to be towed at high speeds and is installed on *Knox*-class frigates equipped with the SQS-35 IVDS.¹⁵

Radar. The radar suite on board the *Knox*-class frigates consists of the standard naval air and surface search equipment. The SPS-10 is the surface search radar; air search and tracking capabilities are limited.¹⁶ The SPS-40, the air search and surveillance radar, is used for detection and tracking of long and medium-range air targets.¹⁷

WLR-1. This is the primary electronic support measure (ESM) equipment currently on board the *Knox*-class frigates. Simply put, the equipment is a receiving set for interception and analysis of radio frequency signals. The intelligence gained from proper use of this equipment, when meshed with a valid electronic order of battle, will satisfy a commander's immediate tactical requirements regarding target tracking and identification prior to initiation of attack/avoidance procedures.¹⁸ The WLR-1, however, is in the process of being replaced by the SLQ-32. This system is a major improvement over the WLR-1, which was "manpower-intensive." The SLQ-32 is an electronic detection system with computer assisted processing for automatic and instantaneous identification

of intercepted signals. The system was designed to enhance the ship's self-defense capability against antiship cruise missiles. The system will replace, along with the WLR-1, the WLR-11 and ULQ-6 equipments.¹⁹

5"/54. The *Knox*-class frigate is outfitted with one 5"/54 gun mount. This gun, capable of firing 32 rounds per minute, is the primary tactical weapon for use against air and surface targets and for shore bombardment.

ASROC. This is the primary antisubmarine (ASW) weapon aboard the *Knox*-class frigates. Capable of all weather, day or night operations, the system consists of a MK-46 torpedo or nuclear depth charge attached to a solid propellant rocket motor. This ship-launched ballistic missile has an estimated range of 2-10 kilometers.²⁰

MK-46 Torpedo. This weapon contains both active and passive acoustic homing sensors and is capable of deep, high-speed operation against submarine targets. The weapon is universal in nature in that it can be launched from surface ships, helicopters and ASROC.²¹ In addition to LAMPS and ASROC, the *Knox*-class frigate has four torpedo tubes for surface launch employment of the MK-46 torpedo.

Basic Point Defense Missile System (BPDMS). This system is designed as a close-in air defense system to counter the threat of aircraft and antiship cruise missiles. This system, which is not common to all *Knox*-class frigates, uses a modified 8-tube ASROC launcher and the *Sparrow III* missile.²²

Harpoon. This weapon is a high-subsonic, all-weather, antiship tactical cruise missile that is launched from the ASROC launcher. The payload is a high-explosive penetrating-blast warhead. Once launched, the missile finds its

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target by employing its active radar terminal guidance system.²³

Communications. The *Knox*-class frigate is equipped with a modest communications suite that includes high frequency (HF), ultra-high frequency (UHF), and satellite communications (SATCOM) facilities. These facilities, although not very redundant, permit the FF-1052 to adequately meet all current mission requirements.

The system capabilities, described above, along with the previously cited mission statement, leave no doubt that the primary role of the FF-1052 is antisubmarine warfare (ASW) and anti-surface warfare (ASUW). Tactical thought, however, has relegated the employment of this ship to a primarily antisubmarine warfare role. The anti-surface warfare role has been largely dismissed as too dangerous for the FF-1052—because of its lack of anti-air warfare (AAW) capability—unless the surface-to-surface engagement can take place under the umbrella of carrier- and land-based air support.

This may be a valid determination in a heavy-to-medium threat area but, in medium-to-low threat conditions, it abrogates the antisurface capability provided the FF-1052 by the *Harpoon* missile system. The mission statement notes that the FF-1052 ". . . is capable, in consort with other forces, of defeating simultaneous coordinated attacks by air, surface and submarine threats in medium-to-low threat hostile environments . . ." The picture traditionally visualized by this statement is the non-carrier battle group.

But what about low threat environments? The mission statement and system capabilities imply that the FF-1052, in consort with other FF-1052s, could operate successfully here; in effect, an FF-1052 surface action group (SAG) "wolf-pack." A new mission? No! Just full employment of a current mission capability that is all too frequently overlooked.

FF-1052 Wolfpack. A low threat environment can be categorized as existing in an area of operations wherein enemy assets are limited; the air threat limited to various long-range aircraft based at extended distances, sea-based surveillance and strike aircraft, and small detachments of locally operating shore-based aircraft that are distantly located from their parent commands. The subsurface threat might consist of one or two submarines—the limited number necessitated by the remoteness of the operating area and its relative unimportance in view of U.S. forces located elsewhere. The surface threat would consist of individual warships, auxiliaries, merchants and small groups—perhaps three or four—patrolling warships.

Such an environment exists today in various chokepoints and ocean areas throughout the world—Mozambique Channel, the South Atlantic, Strait of Malacca, Sunda Strait, Lombok Strait, Indian Ocean, Windward Passage, and the Caribbean Sea. The common characteristic of these areas is that they all have major merchant shipping routes, and the majority are also transit routes for Soviet naval vessels. It is inconceivable that during limited wars these routes would cease to be used. Furthermore, during a major war—depending on its location—many of these areas would continue to be used by merchant and naval traffic alike. It is in these areas, against merchant and warship traffic, that the FF-1052 SAG wolfpack would be most effective.

The advantages derived from operating an FF-1052 wolfpack in these chokepoints and ocean areas are:

a. Maintenance of a credible interdiction force in key, but not major, theaters of operation. The credibility of the force is derived from the systems previously described. Radar, sonar, LAMPS and electronic support systems provide warning, surveillance, detection, tracking, classification and targeting

information on the enemy. *Harpoon*, gun, BPDMS and torpedo delivery systems provide a kill capability against surface and subsurface targets from long (60 nm) to close-in ranges; and against air targets at short to close-in ranges.

By operating FF-1052s as a wolfpack, the redundancy of sensors and weapons within the force will enhance force and unit survival and kill capability. Additionally, they can provide mutual technical support if required.

b. Economic operation. The FF-1052 platform, with its "long legs," could cover a wide operating area or could stay in a small operating area for a long period of time.

c. Full utilization of the low end of the force mix. The high end of the force mix, submarine and surface, could then be devoted to major theaters of operation and to battle group operations.

d. Maintenance of a visible naval presence in nonmajor theaters of operation to bolster the morale of allied and nonaligned countries using these areas.

e. Employment of sea denial, on a global scale, in those areas remote from major theaters of operation but often used by Soviet naval forces. Such an employment—offensive in nature—would pay dividends by causing enemy forces to counter the wolfpack threat, thus reducing assets elsewhere, or to cease use of these areas, thereby limiting the mobility of their forces.

The disadvantages of operating a FF-1052 wolfpack in remote chokepoints and ocean areas are:

a. Loss of ship availability for ASW operations in support of battle group and convoy operations. This loss, however, may be negated by the influx of *Spruance* (DD-963) and *Oliver Hazard Perry* (FFG-7)-class ships into the Navy during the 1980s.

b. Vulnerability to large-scale attack from single or multiple platforms. (However, such attacks against the wolfpack, although subjecting it to loss or heavy damage, *would* serve as an

indicator of a major thrust in their area of operation. Additionally, save again to the large-scale air attack, the damage inflicted by the wolfpack may force the enemy to alter his future plans of operation.)

c. Fuel, stores, spare parts and ammunition resupply considerations. The geographic location of the wolfpack would necessitate long treks by resupply ships. This problem, however, may be obviated by using various ports of call in the operating area to provide fuel and stores; ammunition and spare parts may be airlifted to the same areas. Fuel might also be available from various merchant tankers.

The optimum wolfpack composition might consist of three FF-1052 frigates. This makeup would permit adequate system redundancy to carry out all phases of the SAG mission. Not only would adequate and effective mutual support be available in the areas of surveillance, detection, tracking, targeting and kill, but mutual technical and parts support as well. At least two of the units should have TACTAS and BPDMS; all units must have *Harpoon* and LAMPS. Three units would provide the baseline necessary to permit valid localization and intercept/kill of intended targets, in a relatively large area of operation, without excessive demands on the ships' limited speed capability. The FF-1052 wolfpack could be given additional capability by integrating a *Spruance* (DD-963)-class destroyer to serve as a command and control platform and spare parts repository; and, the addition of a *Perry* (FFG-7)-class frigate, with its surface-to-air missile system, would enhance the wolfpack's air defense capability.

Conclusions/Recommendations. The *Knox* (FF-1052)-class frigate was designed to be an inexpensive ship specifically equipped for antisubmarine warfare (ASW) missions. Other traditional naval roles—antiair warfare

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(AAW), antisurface warfare (ASUW), and naval gunfire support (NGFS)—were within the capabilities of the FF-1052 design but because of lack of redundancy and of economic considerations, were relegated to secondary roles. The *Harpoon* surface-to-surface missile system gave the FF-1052 a credible ASUW capability. This capability, however, has been overlooked because traditional naval tactical thought cannot envision employment of an FF-1052 outside of the battle group anti-air umbrella owing to its limited anti-air capability. This thought, however, is contradictory to the fact that there are numerous chokepoints and ocean areas throughout the world that, during any range of confrontation, whether cold war, limited war, or total war, may not be located in a major theater of operation. These areas, because of their value to merchant and military vessels as trade or transit routes, will require some form of U.S. naval presence to ensure safe passage for friendly, and to deny unobstructed passage for enemy, ships. This presence—this merchant/warship interdiction role located in areas remote

from major areas of confrontation (low threat environment)—is well within the capability of the FF-1052 operating in consort with other *Knox*-class frigates: an FF-1052 wolfpack.

The FF-1052 wolfpack concept permits full utilization of the *Knox*-class frigate and negates the possible necessity to employ the high end of the mix—guided missile cruisers/destroyers and submarines—in areas not requiring battle group participation.

BIOGRAPHIC SUMMARY



Lieutenant Commander Speer, a 1981 graduate of the College of Naval Command and Staff, Naval War College, is a graduate of the U.S. Naval Academy. He has served in U.S.S. *Forrest Sherman* (DD 931), U.S.S. *Ainsworth*

(FF 1090), on the staff of Commander Destroyer Division 24, and as Flag Secretary to Commander Cruiser-Destroyer Group TWO. He has been ordered as Executive Officer of U.S.S. *Thorn* (DD 988).

NOTES

1. Elmo R. Zumwalt, Jr., *On Watch* (New York: Quadrangle, 1976), p. 72.
2. Brook Nihart, "CNO Disavows Navy Blame for Ships He Advocated in 1961," *Armed Forces Journal*, 5 April 1971, pp. 15-16.
3. Zumwalt, p. 72.
4. Elmo R. Zumwalt, "A Course for Destroyers," U.S. Naval Institute *Proceedings*, November 1962, p. 38.
5. Zumwalt, *On Watch*, p. 73.
6. Robert H. Smith, "A United States Navy for the Future," U.S. Naval Institute *Proceedings*, May 1971, p. 22.
7. John Moore, ed., *Jane's Fighting Ships, 1980-81* (New York: Jane's Publishing, 1980), p. 659.
8. *Ibid.*, p. 652.
9. Zumwalt, *On Watch*, p. 73.
10. U.S. Office of Naval Operations, *FF 1052 Platform Tactical Manual* (U), NWP 65-3-3 (Washington: November 1978), pp. 1-3. CONFIDENTIAL
11. Norman Polmar, ed., *The Ships and Aircraft of the U.S. Fleet* (Annapolis: Naval Institute Press, 1978), p. 110.
12. *Ibid.*, pp. 285-286.
13. Ronald T. Pretty, ed., *Jane's Weapons Systems, 1980-81* (New York: Jane's Publishing, 1980), p. 679.
14. *Ibid.*, p. 680.
15. *Ibid.*, p. 128.
16. *Ibid.*, p. 523.

18. U.S. Office of Naval Operations, *Navy Training Plan AN/WLR-1C & G (NTP E30-7607A)* (Washington: September 1977), pp. 1-3.
19. Department of the Navy, Navy Electronics Systems Command, *Draft CNO AN/SLQ-32 (U) Navy Training Plan (NTP F 30-7504B)*, Letter ser 1290/AME 107-72 dtd 15 May 1980, pp. 1-1—1-2.
20. Pretry, ed., p. 130.
21. *Ibid.*, p. 132.
22. *Ibid.*, p. 108.
23. *Ibid.*, p. 157.

